APPENDIX I

COURSE INFORMATION FILE

APPENDIX I

A COURSE IN ENGLISH EXPOSITORY PROSE

INFORMATION FILE

The course objectives

This course is for Brazilian researchers interested in publishing in English. It is assumed that you are already competent writers, who understand that an expository text must be logical, coherent and rigorous. It is also assumed that you possess a fair command of basic English grammar. The objectives of the course are therefore somewhat beyond these aspects of writing: the course will focus on the pecularities of the discourse of English expository prose and some of the more advanced grammar that goes with it, which includes the ways in which sentences and paragraphs are connected to each other, the ways ideas can be emphasized, the overall readability of a text, etc.

Even if your texts in English are grammatically correct, they may still be heavily influenced by the way you are used to organizing texts in Portuguese, and by your not knowing enough about the special conventions of English discourse. This may seriously affect the comprehension of your texts by English-speaking readers because they expect your discourse to be in accordance with the conventions **they** are familiar with. The main objectives of the course are thus to help you perceive:

1. how your English-speaking counterparts organize discourse;

2. what in your own texts might violate the conventions of English expository prose;

and to teach you how to improve your writing by:

3. helping you reread your texts with English-speaking readers in mind;

4. helping you rewrite the parts of your texts which go against the conventions of English expository prose.

The course structure

The course will be divided into three parts. Part one will be very short. You will be simply required to write three short essay-type texts about a topic pertaining to your area of specialization. No instruction will be given at that time. Part two, being the main part of the course, will last about three times longer. The essays you produced in part one will be used to help you improve your writing. Finally, in part three you will be asked to write three more essays. They will help you practise what you have

learnt and will be used to check how much your written English has improved.

The course time-table

Mondays and Wednesdays, from 9:00 to 12:00. Begins next Monday and finishes at the end of October.

The course as an experiment

This course is an experiment in the sense that later on I shall be using your essays as data to analyse what has changed in your writing as a function of the instruction provided. Because this experiment has to be very carefully controlled, it is extremely important that:

a. you attend all sessions of the course

b. you do **not** attend any other course in English while the present course lasts

If you are unable to meet these requirements, you will not be allowed to attend.

The course materials

You are required to select **six** short articles or chapters from books about topics in your field which are written in English, by native speaker of English (British, American, Canadian, Australian, etc.) specialists, and about which you wish to write.

You should also bring with you to the classroom any dictionary or reference book you think you might wish to consult as you write, and your own writing equipment. The dictionaries, grammar book and a text-book on writing in English referred to in the course bibliography will be available in the classroom, but you are advised to purchase your own copies of those.

In addition to this, in you will eventually be given a series of handouts which will be specially prepared for the course.

APPENDIX II

RETROSPECTIVE QUESTIONNAIRE

APPENDIX II

END OF COURSE QUESTIONNAIRE

1. On a scale of 1-5, where 1= very little and 5= a lot, how much have the following contributed to your learning?

	1	2	3	4	5
Reading NS texts					
Writing first three essays					
Writing last three essays					
The course handouts					
Revising your own texts					
Revising your partners' texts					
Revising on your own					
Revising with a partner					
The course bibliography					

2. Did the conventions discussed during the course in any way block (inhibit) your facility of writing? did they in any way make writing easier? Explain.

3. Now that the course has ended, do you feel more prepared than before to improve your writing on your own?
( ) YES
( ) NO

Use the space below to explain why.

APPENDIX III

SAMPLE PRE AND POST-TREATMENT DATA:

T1 to T6 Wilson

EARTH AS AN EVOLVING PLANET

WILSON

Wilson Tarantola

At the beginning the primitive Earth was just a small and cold homogeneous conglomeration belonging to the Solar system, 4.5 billion years ago. Within this system, the position of the primitive Earth was mostly controlled by the density and fusion point equilibrium of its own materials (as similar as to the other planets).

Although this early Earth was relatively cool, at least three mechanisms started to heat up it: a) the impacting of planetesimals (meteorites) which converted their energy motion into heat; b) the gravity compression of the primitive Earth into a smaller volume; c) the desintegration of radioactive elements through the geological time.

Taking with account the bulk of the planet and the time of development of these processes, the most important of these mechanisms was the radioactive one which has been active until the present.

The available thermal models for the early stages of the Earth indicate that, about 1 billion years after the beginning of this heating, the temperature reached about 1500 - 2000°C, which caused the so-called "Iron Catastrophe". This episode corresponds to the formation of a heavy liquid layer within the Earth at depths between 400 and 800 km, which started to sink (like "drops") toward the center of the Earth (This was mostly controlled by the gravity). In consequence of this motion, which acted as a complementary heating parameter, large silicatic fraction of the Earth reached its melting point too.

At that time the density strongly controlled (again) the distribution of the materials within the bulk of the Earth (and at the end) leading to the so called planetary differentiation: the INNER CORE, the mantle and the crust.

The core seems to be made up of Iron - Nickel compounds, the heaviest available materials of the Earth. The mantle is composed by heavier Fe, Mg silicatic materials comprising to the light K, Na silicates and oxides from the crust.

In addition, the radioactive elements such as: U, K, Rb were concentrated within the crust due to their chemical affinities and to the differentiation. Because of the better conductivity of the rocks within the outside shell (i.e. the crust) the Earth started rapidly to cool and after that became a typical zoned stable planet.

(or has became?)

W. Fairbairn

★ WILSON

SOME COMMENTS ABOUT THE EVOLUTION OF THE EARTH CONTINENTAL CRUST.

The crust corresponds to the outer shell of the Earth. At present, the most important documented geological processes has been developed within it. However, the origin of those processes is the mantle which ~~occurs~~ underlays the crust.

Regarding to the evolution of the continental crust the still open question is whether the primitive processes which took place on the early Earth (4.6 - 2.6 billion years ago.) were similar to those occurring nowadays or if the type of evolution through geological time has been mostly homogeneous, without any significant ~~modification~~ changing since 4.6 b.y. ago.

What can be established is that the decreasing of the Earth internal heat production through time (which is dependent on the radioactive elements) must be a factor for the continental growth because the radioactive minerals (which) were concentrated within the crust after the differenciation phenomenon, leading to the progressive cooling of the Planet.

There are at least two main schools concerning on the continental growth through:

- the first proposal is that the continental crust growth was continuous and proportional to the decreasing of the Earth heat flow which is associated to ~~an~~ an equilibrium on the rates of continental accretion and destruction (into the mantle).
- the other proposal is based on a higher continental accretion rate

during the first 2000 million years comparatively to recent periods of the Earth. A complementary proposal suggests that some partial "shrinking" of previous formed crust might be occurred through the geological time.

~~According to the style of the continental crust through this the Precambrian time, there are significant differences~~

In addition, there are some significant differences of the styles of the continental crust generated during the Precambrian time:

In the Archean (>2500 million years period) this crust is characterized by small fragments surrounded by folded supracrustal sequences. These are common features for the so-called Permobile period of the Earth, as described in many continents of the world.

In the Proterozoic period (2.5-0.57 billion years) the structures are typically linear and large zones of continental crust were accretionated. Most of these "linear zones" surrounds the primitive Archean fragments. Within these large platforms typical sedimentary sequences and igneous activity are found.

The dimensions of the crust in the Archean and Proterozoic periods, the differences of structures, as well as the type of rocks supports, as a whole, the progressive changing of the geological processes during the geological time.

10 ARCHEAN ATMOSPHERE AND PRIMITIVE LIFE

WILSON

At present, the Earth atmosphere is due to volcanic outgassing. However, the atmospheric conditions must have changed since the beginning of the planet's evolution.

As supported by direct measurements on volcanoes, the most important gases found in the atmosphere are N_2, O_2, Ar and CO_2, plus different proportions of H_2O. Volcanic gases and the atmosphere have similar Ar/N_2 ratios although H_2O and CO_2 from volcanoes are more abundant.

Thus, the oceans were originated through the condensed water vapor which has outgassed. In turn, most of the CO_2 exceeded dissolved in the ocean like calcium carbonate in limestones. However, a fraction of this CO_2 is used in photosynthesis which converts both H_2O and CO_2 into carbohydrates this process is concomitant with the oxygen-releasing.

During the early Earth, another kind of process differing to the photosynthesis may have been important. This process is called photodissociation and caused oxygen-releasing by breakdown of water molecules by the ultraviolet light from the sun. As known a small fraction of the oxygen molecules is converted to ozone because the early Earth's gravity field limits the releasing of the "heavy" Oxygen molecules. The progressive formation of an ozone outer "trap" tends to reduce the ultraviolet effect, and so photodissociation corresponds to a relevant self-regulating process in terms of further diminishing phenomena.

The early atmosphere (reducing conditions of the) may have predominant as suggested by the photodissociation processes and by the sedimentary rocks as well record. The typical Archean Banded Iron Formation are thought to be deposited in marine environments (liberation of soluble Fe^{++} state) but in the Proterozoic period the Red Beds sediments are quite common (increasing of oxidising surface

conditions. In addition, the existence of Uraninite and Pyrite in (2)
the Archean sedimentary rocks, both only formed in reducing conditions,
in connection with the increasing abundance of Sulphate deposits since 2.5 billion
years ago also support the gradation conditions of the geological atmospheric evolution
towards a more oxidising one.

Concerning the precambrian life the earliest life-forms, as identified
in Archean sedimentary rocks, are the microfossils. If a reducing environment
prevailed during the Archean period, the strong ultraviolet radiation condition of
that atmosphere (which) limited the available
organisms to live in deep water (that radiation destroys all of aminoacids).
the recent discovery of quite complex organisms in 3.5 b.y. rocks
suggests that the photosynthesis may have started
at that time although some chronological variation can be expected
because of the variety of geological phenomena which took
place during the Archean Earth's evolution.

Δ WILSON GEOLOGY OF THE MOON AND LUNAR ROCKS

The morphology of the Moon's surface can be described as a product of impacting cratering combined with volcanic activity, modified by erosional processes under vacuum-like conditions. The surface is mostly covered by pulverized rock debris and fragmented meteorite material, produced through impacting cratering during a long period of time. Moreover, the shape of the Moon's surface was eventually influenced by the lunar rocks which formed by cooling and crystallization of silicate materials. These rocks occur either as solid primary materials, or as the constituents of secondary rocks or regolith (several types of altered lunar materials). Widely dispersed in the regolithic surface, are also many morphologic varieties of impact-generated breccia which, sometimes, can form extensive and thick deposits.

According to the chemical characteristics, the lunar rocks are broadly comparable with the Earth's rocks and include basalts, diorites, gabbros and anorthosites. Three distinct groups have been distinguished for the lunar rocks based on both chemical analyses and age determinations carried out on lunar samples brought to the Earth:

The first group comprises the anorthosite-gabbroic rocks and high Al basalts with ages in the range 4.6 - 4.0 b.y. The second group is characterized by the high K basalts, P, REE basalts which were crystallized from 4.0 to 3.8 b.y ago. The third group comprises Ti, Fe rich basalts which solidified from 3.8 to 3.2 b.y. ago.

Despite of the few lunar rock samples available for research a lot of progress has been reached in the knowledge of the evolution of the Moon. So, now we know that the first lunar rocks crystallized about 4.6 b.y ago. In addition,

the rocks and their components crystallized under the complete absence of water, and this fact also indicates that there are no living or fossil organisms in the Moon's rocks. Thus, it can be established that there are some significant differences between comparable rocks of Earth and Moon, considering age variations and life-forms.

Finally, √ seismic and geophysical studies have been also performed during the Apollo exploration lunar program. According to this research, the Moon is composed into a rigid crust (30-70 km thick), a thick solid mantle and a partially molten core. The crustal rocks must represent the products of both chemical and gravity separation (or "differentiation") from the upper mantle material. The core might be chemically similar to the lower mantle.

+ WILSON

THE PLANET MARS

W. Feirsen

This essay deals with the available informations of Mars produced by the only two American space surveys to this planet. The first spacecraft was the Mariner 9 (1971/72) which took over 7300 pictures of the Martian surface seen from 30000 Km. The most recent one was the Viking spacecraft which landed on Mars in 1976 for direct investigations on its surface.

The surface of Mars is shaped by meteorite impacts and by volcanic erosional and depositional processes. Although in some regions the surface is cratered like the Moon, the most typical features are the gigantic volcanoes and steep canyons. Moreover, the surface of Mars is characterized by features caused by wind erosion and sediment deposits ~~deserts~~ dunes, channelled by fluid erosion.

In order to give an overview of the planet Mars, some of ~~it~~ its features are described below:

Craters of impact origin are widespread over Mars, ranging from 1800 Km in diameter and 4 Km deep (e.g. the Argyre basin) to small craters. Most of these craters seem to be old as, suggested by their eroded shape with low rims and shallow interiors. The cratered terranes dominate the Southern hemisphere and they also constitute about half of the equatorial region. The northern hemisphere reflects less cratered surface, but this shape is probably due to later volcanic and erosional processes.

The volcanoes are the most spectacular features of the Martian surface and the most remarkable volcano is situated in the northern hemisphere. It is named Olympus Mons which is made up of a pile of lavas 20 Km high and 600 Km in diameter. In turn, the southern hemisphere is characterized by smaller and more eroded volcanoes.

In both hemispheres, faults are common features of the Martian crust. Such features have been interpreted as crustal fracturing probably due to tensional adjustment to vertical pressures which resulted from localized volcanic uplift.

Lastly, canyons are similarly of vast dimensions in Martian surface, as exemplified by the Valles Marineris, about 2500 Km long, near the equator of the planet. However, the main canyon is generally between 200 and 100 Km wide and with depths of 5 Km.

Finally, concerning the Martian geology, the available information has been tentatively assessed and maped, based on physical and structural characteristics deduced from the spacecraft photographs. Thus, the features recovered can be ordered and interpreted dealing to a reconstruction of the geological history of Mars. This subject will be my next essay which will also discuss the similarities of the Martian geologic memory between with moon and Earth.

WILSON / T6

MARS COMPARED WITH EARTH AND MOON

WILSON

As we have seen in the second essay, the available knowledge of Mars suggests that it represents an intermediate planet in terms of geological evolution. So, Mars can be considered as a relatively primitive cratered planet, similarly to the Moon, but it also resembles the Earth by its active partially water-eroded crust, volcanic activity and existence of atmosphere.

Likewise the Earth and Moon, Mars probably was affected by meteorite bombardment during its early evolution, about 4.0 billion years ago: some Martian terrains show typical cratered features from this period of time. However, unlike the Moon, the Martian evolution was much longer and complete, resembling the Earth's one, as demonstrated by large volcanoes, lava plains and fault systems. Moreover, Mars seems to indicate some lack of crustal mobility (which characterizes the Earth's evolution) because the volcanoes are huge, the piles of lavas are so vast and they accumulated in a few places over long periods of time.

The thin Martian atmosphere consists of Carbon dioxide (95%) Nitrogen (2-3%) and traces of water vapor, Argon and Oxygen. This atmosphere allowed some solar energy to be converted into wind velocity, despite the Martian surface pressure of 7 millibars (very low if compared with the 1013 millibars of Earth's surface). Thus, unlike the Moon, the surface of Mars has the terrestrial-style wind erosion with weathering of rocks and formation of sedimentary rocks. In addition, the erosional

activity of water on Mars is also suggested by both oxidation of surface rocks and by existence of sinuous surface channels, although it is unknown the duration of the water processes. These channels are similar to those water-eroded features on Earth's surface. Above all of this, Mars probably still contains large quantities of water in the form of "permafrost" (frozen water) beneath its surface.

Finally, the photographs taken from the Viking lander spacecraft showed that Martian surface is similar to many rocky, partially sand-covered terrestrial deserts. Chemical analyses performed on the Martian surface materials suggested the presence of Iron rich basaltic lavas which are comparable with Earth's volcanic rocks. The observed red color of rocks and soil in the surface of Mars is probably due to oxidation of Iron bearing minerals. Lastly, also. Life has been detected until moment.

APPENDIX IV

COURSE MATERIALS

APPENDIX IV

COURSE BIBLIOGRAPHY*

1. HAMP-LYONS,L. & HEASLEY,B. (1987). Study writing. Cambridge: Cambridge University Press.

This is probably one of the best didactic books on writing in academic English available in the market. The sections on "Using Grammar in Writing" contain very useful hints, and it is a book which you can often use on your own, without a teacher's assistance.

2. LEECH,G. & SVARTVIK,J. (1975). A communicative grammar of English. London: Longman.

This grammar book is both accurate and straightforward. It is a very handy reference book to have by your side when last minute doubts about English grammar arise.

3. Collins COBUILD English Language Dictionary.(1987).

Although this appears to be just another dictionary, it is in fact an extremely useful reference book for non-native speakers of English: it contains very clear definitions; there are plenty of examples that show words in context; and, most important, it tells you how to fit words in the grammar of sentences. Unlike most other dictionaries, the COBUILD makes you feel confident about using new words for the first time. It is highly recommended.

4. Roget's Thesaurus.(various editions available).

The Thesaurus is a dictionary of words of related meaning. More specifically, it supplies you with verbs, adjectives, adverbs, nouns, etc. which are semantically similar. It is easy to use and can often help you find the exact word you are looking for. Unlike the COBUILD, however, it does not provide you with definitions or with the grammatical context of words. It is therefore advised that you use the two together.

* The above books are available in Livraria Cultura, Conjunto Nacional

APPENDIX IV

1. PRIMING

If you prime a reader, you prepare him for what is going to come up in your text. Priming is one of the main factors of readability and clarity in English expository prose. Below are a few examples of different levels of text at which a reader can be primed.

1. Whole text

You can prime the reader for the text as a whole by telling him what the text is going to be about in the very beginning the text, e.g.:

a. "The purpose of this report is the preparation of mesophases..."
b. "This paper seeks to give guidelines for the reception of inbred strains and the establishment of their authenticity..."

What do you think these texts are going to be about?

2. Paragraph

You can prime the reader for the next paragraph by using its first sentence to indicate what the rest of the paragraph is going to be about, e.g.:

a. "In recent studies of intestinal ischemia, however, we have found..."
b. "Compression also leads to temperature rise."

What do you think these paragraphs are going to be about? What is their connection with the preceding text?

3. Sentence

You can prime the reader at the level of the sentence by starting it with the topic of the sentence, e.g.:

a. To the north of Sao Paulo, lies Rio de Janeiro.
b. Rio de Janeiro lies to the north of Sao Paulo.

What is sentence (a) primarily about? And sentence (b)?

4. Within sentence contrast

You can prime the reader for different types of contrast within the sentence by using constructions such as:

a. Although X...., Y.....
b. Whereas X....., Y.....
c. While X....., Y.....

5. Within sentence adding

You can prime the reader for an additional piece of information within the sentence by using constructions such as:

a. X is both Y and Z.
b. X is not only Y, but also Z.
c. X is either Y or Z.
d. X is neither Y nor Z.

Now go over texts by NSs of English and take notes of examples of priming at the various levels we have discussed.

2. THE GIVEN-NEW PRINCIPLE

The given-new principle is related to the semantic status of the information contained in a text.

Given is what has already been mentioned in text or what the writer assumes the reader already knows.

New is what has not yet been mentioned in text or what the writer assumes the reader does not know.

According to the given-new principle, given information comes **before** new information. In other words, sentences and paragraphs start with what the reader already knows and finish with what he is being told for the first time. The given-new principle is fundamental to the discourse of English expository prose: it has to do with both priming and the linear progression of ideas in text. These factors greatly contribute to readability. The given-new principle is so powerful that it almost determines the ideal order of paragraphs in a larger stretch of text, the order of sentences in a paragraph, and whether a sentence is to follow the normal order or whether there will be an inversion.

Although it is relatively easy to change paragraphs and sentences around without affecting grammaticality, it is not always easy to invert the order of words in a sentence. Below are a few examples of ways in which you can do this:

1. Complex sentences
- "The results are inconclusive because of uncontrolled variables."
- "Because of uncontrolled variables, the results are inconclusive."

- "Genetic monitoring techniques can normally establish which strain was involved if a genetic contamination is suspected."
- "If a genetic contamination is suspected, genetic monitoring techniques can normally establish which strain was involved."

2. Simple sentences
- "We need more time"
- "It is more time that we need"
- "More time is what we need"

- "The results were obtained by chance"
- "It was by chance that the results were obtained"

The extracts on the following page violate the given-new principle. They also contain some grammar mistakes. How would you rewrite them? If necessary, consult the authors in brackets for clarification.

1. "Lung diseases are responsible for a considerable part of the morbidity and mortality of man [...] In developped countries the environmental contaminants and occupational exposure to toxic volatile solvents are ranked at the top of the list of leading respiratory diseases and injuries." (CIDA)

2. "Although this early Earth was relatively cool, at least three mechanisms started to heat up it: [a)...b)...c)...]

"Taking into account the bulk of the planet and the time of development of those processes, the most important of those mechanisms was the radioactive one..." (WILSON)

3. "...a genetic monitoring program needs to be established beginning with basic cares of the colony.

"The correct nomenclature of the strain asked by the users is a beginning of some guarantee for the quality of the animal received." (SILVIA)

4. "Syntheticmembranes has been used as models to study certain properties of life membrane [...] Deuterium Nuclear Magnetic Resonance (2HNMR) is the used technique." (ELISA)

5. "One of the most recent hypothesis about cellular death concerns with the experimental results from many authors that have shown that cells treated with many etiologic agents develop an increase in intracytoplasmatic Ca++ levels. They correlated this increase with irreseversible cell injury." (SILVIA)

3. SENTENCE-COMPLEXITY

Sentence complexity is related not only to the overall grammatical structure of text, but also to readability and meaning. Unlike poetry or other literary genres, sentence-complexity in English expository prose is more or less predictable:

Complex sentences (sentences which contain subordination) tend to be used to express relationships between ideas.

Simple sentences (single subject, single verb sentences) are normally used to introduce a new idea or emphasize a point.

This conventional blend of simple and complex sentences in text contributes to overall readability because it is an indirect way of letting the reader know which ideas are new or central to text, and which ones are complementary or subsidiary. If you compare your own English texts with those by your native speaker counterparts, and feel you are using complex sentences inappropriately, it is likely that English-speaking readers will find your texts somewhat confusing. If, on the other hand, you have been (wrongly) told to keep all your sentences short and simple, it is possible that your texts will sound boring and choppy. Lastly, if you think your English is influenced by how you organize texts in Portuguese, remember that the tolerance for complex syntax is apparently greater in Portuguese. In other words, you should be especially careful with sentences that contain too much subordination when you are writing in English.

To deal with this, you can rewrite overly complex sentences by splitting them into more than one sentence, by using parallel syntactic contructions, and even by listing items of equivalent semantic status. For example:

a. (confusing)
"Macrophages are an heterogeneous population of cells which involvement with a variety of inflammatory and immunological states largely depends upon their bone-marrow origin, rapid hematogenous distribution, capacity to move through tissue spaces, and, enhanced phagocytic microbicidal function."

a. (less confusing)
Macrophages are cells of a heterogeneous population, whose involvement in a variety of inflammatory and immunological states largely depends on the following four factors:
- their bone-marrow origin;
- their capacity to move through tissue spaces;
- a rapid hematogeneous distribution;
- an enhanced phagocytic and microbicidal function.

b. (confusing)
"Similar studies with ovalbumin demonstrate that animals immunized with this antigen in Freund's incomplete adjuvant (FIA) develop an enhanced DHT reaction, showing that not only after epicutaneous application but also after innoculation of soluble antigens the enhancement of DHT response occurr."

b. (less confusing)
Similar studies with ovalbumin demonstrate that animals with this antigen in Freund's Incomplete Adjuvant (FIA) develop enhanced DHT reactions. The studies indicate that the enhancement of DHT response occurs not only after the epicutaneous application, but also after the innoculation of soluble antigens.

The sentences below are also confusing and contain some mistakes. Try to rewrite them with the sentence complexity issue in mind. If necessary, consult the authors in brackets for clarification.

1. "The fact that treatment with fungicidal drugs can revert this picture reparating the cellular immunity of the patients is in agreement with the idea that those immunodepression is not inherit to the host but caused by circulating fungal elements possibly inducing alterations in the immunological system of the host." (HENRIQUE)

2. "It seems that Ts cells require another distinct cells to be induced, which lack the lyt-2 antigen and resemble Th lymphocytes but have Qa-1 and I-J antigens in its surface." (GUSTAVO)

3. "It is possible to find a mild degree of hemolysis even though there is no 'in vitro' evidence of sensitization, concluding that most, if not all ABO incompatible infants have some degree of hemolytic disease." (THELMA)

4. CONNECTIVES

In English expository prose, very little room is usually left for the reader to infer the relationship between sentences and paragraphs. That is to say, this is primarily the author's responsibility, who must try to tie up sentences and paragraphs in a very clear way. Connectives are words or expressions which tell the reader how ideas are held together in text. Also, they often serve to convey the author's opinion.

There is a large inventory of connectives in English, some of which are synonymous. You should make an effort to use them as much as as variedly as possible if you want your texts to be fluent, clear and non-repetitive. Connectives which come in the beginning of sentences are usually followed by a comma; connectives which come in the middle of a sentence are usually set off by a pair of commas.

The list of connectives below might be useful to you. They are grouped according to similarity of meaning, but not all of them are interchangeable. For more information about their use, it is advised that you consult the COBUILD.

1. LISTING

1.1 When listing without a particular hierarchy:
First(ly),.....;second(ly),.....;third(ly)....ect.
To begin with...;then,.....; finally,.....
To start,.....;next,.....; to conclude.....

1.2 When a list starts with the most important element:
First and foremost.....
First and most important.....

1.3 When a list ends with the most important element:
Above all.....
Last but not least....

2. ADDING

2.1 Adding information that gives further support to what has been previously stated:
Also - Furthermore - Further - Moreover -
Besides - What is more - In addition

2.2 Adding information which is similar to what was said before:
Again - Likewise - Similarly - Correspondingly

2.3 Adding information within the same clause:

Positive:	X is both Y and Z
	X is not only Y, but also Z
Negative:	X is neither Y nor Z
Alternative:	X is either Y or Z
	X is Y or Z

2.4 Adding information which confirms or makes a concession about the truth of a previous sentence:
Indeed (+ confirmation)
True (+ concession)
Actually - In fact - In reality (confirmation/ concession)

3. CONCLUDING OR GENERALIZING
In conclusion - To conclude - To sum up (briefly) - Summarizing - In brief - In short

4. EXPANDING
4.1 By means of neutral examples:
e.g. - For example - For instance - Such as - Including

4.2 By drawing attention to important features or examples:
Notably - Chiefly - Mainly - Mostly - Particularly - In particular - Especially

4.3 By specifying:
viz - namely

5. REFORMULATING
i.e. - That is - In other words - To put it differently

6. EXPRESSING CAUSE/CONSEQUENCE
So - Thus - Therefore - Hence - Consequently - In consequence - As a result of - Because of - Accordingly

7. EXPRESSING CONTRAST
Instead - Rather - Conversely - In comparison - On the contrary - (on the one hand) on the other hand

8. MAKING A CONCESSION
However - In spite of - Despite - Nevertheless - Nonetheless - Notwithstanding - Still - Yet - Although - At any rate - In any case - All the same - Even though

Now skim through an article by a NS and use the COBUILD to make sure you grasp the **exact** meaning of the connectives he or she makes use of. You should also pay attention to **how often** and **where** your NS counterparts use connectives.

5. THE USE OF COMMAS

You may have already noticed that, in English, writers use much fewer commas than in Portuguese. Because the inappropriate use of commas was a very common feature of your texts, below are some general guidelines to orient you:

1. Use a comma to separate two or more **independent** parts of the sentence which are joined by AND, BUT, OR, NOR or FOR:

- Most young Europeans spend their holidays in other European countries, and many students take vacation jobs abroad.
- "I do not think we can conclude that dissent leads to counter-revolution, but it seems certain that dissent in itself does not constitute a revolution."
- "This silence is not surprising, for in those circles Modernism is still regarded with suspicion."

2. If, however, the independent parts of the sentence are short and clarity is not at stake, the comma before AND, BUT, etc. may be omitted:

- John arrived early and Mary came an hour later.

3. Do not use a comma before AND, BUT, etc. when what comes after these conjunctions is not independent (when the subject of the second part of the sentence is the same as that of the first part of the sentence):

- "They injected 10^{5} MHT-1 cells in Balb/e mice and subsequently mixed their spleen cells with spleen cells from animals primed with BIO.02."
- "They do not attempt to condemn such societies but attempt to refute them theoretically."

4. Use commas to set off elements of the sentence which can be removed without changing meaning:

- "The kinetic energy of a fluid, due to its motion, is customarily measured with respect to the Earth's surface, which is assumed to have zero velocity."

5. Do not use commas to set off elements without which the sentence becomes untrue:

- "We shall confine our discussion to specialized respiratory systems which involve only a part of the body."

6. Use a comma before a subordinate clause when it comes before the main clause in the sentence:

- "Although this early Earth started to cool rapidly, at least three elements started to heat it up."

7. Use a comma before a long adverbial if you are fronting it for emphatic purposes:

- After spending a week in conferences, the comission was able to write a report.

8. Use commas to prevent ambiguities:

- From the British, educated Indiand learned the principles of parliamentary democracy.

9. Use commas to set off comment adverbials:

- Indeed, everthing happened as expected.
- His claim, therefore, cannot be verified.

10. Use commas to separate a series of adjectives that describe:

- He is a tall, fat, foreign-looking man.

11. Do not use commas to separate a series of adjectives that identify:

- The tall fat man ordered a pint of beer.

These guidelines are not exhaustive, and some of the suggestions are not based on grammar rules. They do, however, help clarifying meaning. Be especially careful with the following **inappropriate** uses of commas, which were persistent in your essays:

a. The use of a comma without a conjunction to link independent clauses. Usually the two go together (c.f. #1).

b. The use of a comma to set off a long adverbial at the end of the sentence. Usually this is only done when the adverbial comes at the beginning of the sentence (c.f. #7).

c. The use of commas to set off elements without which the sentence becomes untrue. In such cases commas must not be used (c.f. #5).

d. The excessive use of commas in general due to unnecessary inversions. Do not make so many inversions if "priming" or the "given-new principle" are not at stake (c.f. #6).

6. CERTAINTY AND COMMITMENT

In English expository prose, the author's reasoning and his commitment to the ideas in text are extremely important. Texts which focus on facts but neglect opinions tend to sound inconclusive in the eyes of English-speaking readers. As English-speaking writers report on facts, there is a strong tendenc y for them to convey their comment on them too. It is obvious that the strength of such comments must vary if the author is to write truthfully. He may sometimes wish to say something is 100% certain, and sometimes he may simply wish to make a very weak assertion. Some of the language resources which can be used to vary the degree of certainty and commitment in English are listed below:

1. Non-controversial evidence (impersonal commitment, usually backed by quoting references)

It is said that...
It is known that...
There is evidence to suggest that...
Recent findings suggest that...
According to studies in...

2. Irrefutable evidence (complete commitment)

VERBS	ADVERBS
is	certainly
will	definetely
must	clearly
has to	undoubtedly

3. Strong evidence (strong commitment)

VERBS	ADVERBS
can	probably
could	likely
should	presumably

4. Partial evidence (less strong commitment)

VERBS	ADVERBS
may	possibly
might	perhaps
seems to	
appears to	

The general pattern with respect to commitment and certainty in English expository prose is as follows:

a. The author generally starts a text by being impersonal about facts and relies a great deal on evidence which is non-controversial.

b. After that, the author frequently presents specific evidence from his own work or the work by others. His opinion on the strength of such evidence must be made clear.

c. The author tends to conclude his text by giving a personal account of his own interpretation of facts. He must again be careful about his degree of commitment, which depends on the strength of the evidence presented.

Go over the articles you have read and pay particular attention to examples of commitment. Underline the examples you read and discuss with a partner the strength of the assertions underlying them.

7. SYNONYMS AND REFERENCE

You probably know that synonyms are used to avoid excessive repetition. You must be very careful to do this when you are writing articles in English, for synonyms are often the cause of serious ambiguities. While words with a general meaning can indeed make a text sound boring if repeated too often, terminologies which are being used in a very specific sense can make a text ambiguous if you use synonymous words to make reference to a single entity. In other words, if you have started referring to a specific entity by a particular name and then switched to a synonym to avoid repetition, English-speaking readers might be led to think you are using the synonym to refer to a somewhat different entity. English-speaking authors do **not** attempt to avoid repetition in these cases; on the contrary, they tend to use the same terminology throughout the text to make sure there is no room for misunderstanding. This kind of repetition is not a sign of poor style in English expository prose.

The tolerance for this type of repetition, however, varies according to where and how often a particular word or phrase or clause appears in text. For example, you will not want to repeat a term in the same sentence or in sentences which are very close to each other. In such cases, you can*:

a. substitute nouns for pronouns
"My brother was wearing a raincoat. He didn't get wet."
"Have you seen my cigarettes? I feel like somoking one."
"I'd like some paper if you have any"
"Some of the equipment has been damaged, but none was lost"
"The plumage of the male pheasant is far more colourful than that of the felmale."

b. substitute verbs and verb phrases for **do**
"He cooks as well as she does."
"He arrived late but she didn't."

c. substitute clauses for **so**
"John hasn't found a job yet. He told me so."

* see Leech and Svartvik (1975)

While substitution is useful when making reference to a single entity in the same or adjoining sentences, you should be aware that it also has limitations. If you have not made reference to a word or phrase or clause for a while, you must make sure it is repeated in full the next time you mention it. To decide whether to substitute or repeat a term, you must consider its distance from the last point of reference, and, just as in Portuguese, whether there are any entities "in between" which could change the object of reference.

8. WORD ORDER AND ADVERBS

Unlike Portuguese, the order of words in English is very rigid. Most simple affirmative sentences obey the following order:

Most simple affirmative sentences	obey	the following order
SUBJECT	VERB	OBJECT
S	V	O

The above order is normally maintained unless:
1. Special emphasis is given to something other than the subject, in which case whatever is being emphasized is usually fronted:

- Never has such a reaction occurred.

2. The given-new principle does not coincide with the normal SVO order, in which case whatever is given is usually fronted:

- The department has many administrative problems. These problems a computer could easily solve.

The most tricky aspect of word order, however, has to do with the position of adverbs. The placing of abverbs within the sentence depends on various factors. To understand this, you must first learn to distinguish between comment and descriptive adverbials.

Comment adverbials convey the writer's comment or are used to link paragraphs, sentences and clauses. They are peripheral to the sentence structure and are usually set off by commas. They often come in the beginning of the clause:

- "...it is not prudent to limit our discussion only to the release of iron from ferritin. However, ferritin iron constitutes the largest single pool of iron within cells."

Descriptive adverbials describe the time/place/manner/etc. of an action/state/happening. They are intrinsic to the sentence structure and are not usually separated by commas. Their position varies according to length, emphasis and type. When descriptive adverbials are long (i.e. a long adverb phrase), they normally come at the end of the sentence. If you want to emphasize them, you can bring long adverbials to the beginning of the sentence and use a comma to set them off. When you want to emphasize other adverbials, you can also bring them to the beginning of the sentence, but in most such cases you don't use a comma. When descriptive adverbials are not long and you do not really want to emphasize them, then they should come at the end or the middle of the clause*, and what helps you decide between the two is their type.

* END means **after** the **object:**
- He wrote the article yesterday
  O adv

* MIDDLE means **after** the verb **be** (V = be):
- He is never late.
  V adv

* MIDDLE also means **before other verbs** (V ≠ be):
- He never writes
  adv V

* MIDDLE also means **between auxiliary and main verb:**
- He has never written
  aux adv V

TYPE OF ABVERB	POSITION OF ADVERB	
	MIDDLE	END
Place:		X
in Brazil, outside, to the north, there, etc.		
Manner:	(with passive)	X
microscopically, by analysis, carefully, slowly, etc.		
Degree:	X	
thoroughly, barely, scarcely, intensively, greatly, etc.		
Specific time:		X
last week, in 1980, yet, yesterday, etc.		
Duration:		X
for three days, since 1987, the whole night, etc.		
Definite frequency:		X
weekly, hourly, everyday, etc.		
Indefinite frequency:	X	
often, occasionally, frequently, sometimes, etc.		

some position free adverbs: now, then, recently, once, lately, etc.

APPENDIX V

REVISION DATA

CIDA

(pre-treatment final-draft)

Present Concepts on the Mechanismes of Platelet Aggregation

Platelets are the smallest annucleated cells that [1] PLAYED an important role [2] AS in physiological process [3] NAMED Heamostosis [2] AS in pathological deviation [4] CALLED Thrombosis. For [5] BOTH [6] PROCESS [7] PLATELET ACTIVATION AND [8] SUBSEQUENTLY AGGREGATION [9] [9.1] IS NECESSARY TO OCCUR [10] AND [11] ENVOLVES a sequence of morphological and functional changes. [12] The first [13] STEP in platelet aggregation is [14] AT MEMBRANE LEVEL [15] AND [16] REQUIRES ENERGY PROVIDED by [17] intact metabolic process.

[18] During the aggregation [19] release reaction of intra-granular substances occur and serotin, calcium, ADP and [20] ARACHIDONIC ACID METABOLITES are released.

The first pathway of aggregation
[21]ADP [22] IS ACCEPTED TO BE RESPONSIBLE FOR the first pathway of aggregation. [23] WHEN ADP IS ADDED TO [24] platelet rich plasma of human, guinea pig and beagle dog a typical [24.1] BIPHASIS curve of aggregation [24.2] IS OBTAINED. [25][25.1] SOME DRUGS AS indometacin, aspirin, and others non-steroidal anti-inflammatory drugs (NSAID) [25.2] CAN INHIBIT [25.3] ADP INDUCED PLATELET AGGREGATION.

The second pathway of aggregation

(post-treatment revision)

Present Concepts on the Mechanisms of Platelet Aggregation

Platelets are the smallest annucleated cells that [1] PLAY an important role [2] BOTH in ∧ physiological process [3] - Heamostasis [2] AND in ∧ pathological deviation [4] - Thrombosis. For [5] THE ABOVE [6] PROCESSES [9][9.1] IS NECESSARY [7] THE ACTIVATION AND [8] AGGREGATION OF PLATELETS [10] WHICH [11] ENVOLVE a sequence of morphological and functional changes. 1

[12] The first [13] REQUISITE in platelet aggregation is [14] THE MEMBRANE INTEGRITY [15] WHICH [16] IS MAINTAINED by [17] AN intact metabolic process. [18] During the aggregation [19], ∧ release reaction of intra-granular substances occur ∧ and serotin, calcium ADP and [20] METABOLITES OF ARACHIDONIC ACID are released. 2 3 4

The first pathway of aggregation
[21] The first pathway of aggregation [22] IS TRIGGERED BY ADP [23] WHICH [24][24.2] GIVES a typical [24.1] BIPHASIC curve of aggregation in platelet∧rich plasma of human, guinea pig and beagle dog. [25][25.3] THIS PATHWAY [25.2] IS INHIBITED BY [25.1] indometacin aspirin and others non steroidal anti-inflammatory drugs (NSAID). 5 6 7

The second pathway of aggregation
It is [26] DEPENDENT OF ARACHIDONIC ACID, more precisely thromboxane A2 8

It is [26] ARACHIDONIC ACID DEPENDENT, more precisely thromboxane A2 (TXA2). This pathway can also be inhibited by NSAID which desactivate the cycloxygenase enzyme responsible for TXA2 formation.

The third pathway of aggregation
[27] THIS PATHWAY is [28] PAF-ACETHER DEPENDENT and independent from the others mechanisms. It means that it is not inhibited by the drugs [29] DESCRIBED FOR the two formely pathways.

(TXA2). This pathway can also be inhibited by NSAID which desactivate the cycloxygenase enzyme responsible for TXA2 formation. 9

The third pathway of aggregation
[27] IT is [28] DEPENDENT OF PAF-ACETHER and independent of others mechanisms. It means that it is not inhibited by the drugs [29] WHICH ACT ON the two formely pathways. 7,10 11, 12 13

DONY

(pre-treatment final draft)

The [1] POSMODERN condition: comments on a foreword

WheN "La Condition Postmoderne" [2] APPEARED in France [3], in 1979, it provoked a lot of reviews [4]. Jean-François Lyotard [5], [6] by that time, [7] WAS [8][9] A QUITE important philosopher in the european scene, [10] WITH RATHER common similarities with Cornelius Castoriadis and Gilles Deleuse. Lyotard [11] WAS [12] CONSIDERED as a philosopher with a strong influence of Nietzche and his "active nihilism" [13] ON TRYING TO acelerate the decadence of the idea of "truth" [14], WHICH [15][16] HAS BEEN dominating Western minds [17].

[18] On his book, he [18.1] DISCUSSES the [18.2] QUESTION of legitimation and the status of justice in contemporary world. But, more than these, his book is about [19] standing of science [20] AND technology [21], OF technocracy and [22] the control of knowledge and information today. [23] It is a confluence of different themes intersected by controversial analogies.

In the United States edition, printed by [24] University of Minnesota Press, [25] IN 1984, his book [26] HAS a foreword [27] FROM [28] one of the most outsanding marxist literary critic from [28.1] THERE: Frederic Jameson. On writing his foreword, Jameson makes some good comments, emphasizing the importance [29] of the [30] PUBLISHING OF THE BOOK.

(post-treatment revision)

The [1]POSTMODERN condition: comments on a foreword

When "La Condition Postmoderne" [2] WAS PUBLISHED in France [3] in 1979, it provoked a lot of reviews [4] IN MANY WESTERN COUNTRIES. [6] By that time, Jean-François Lyotard [5] - ITS AUTHOR - [7] WAS [8]ALREADY CONSIDERED [9] AN important philosopher in the european scene, [10] WHOSE THOUGHTS WERE MENTIONED TO HAVE common similarities with Cornelius Castoriadis and Gilles Deleuse. Lyotard [11] IS [12] ALSO MENTIONED as a philosopher with a strong influence of Nietzche and his "active nihilism" [13], WHICH IS CHARACTERIZED BY AN ATTEMPT TO acelerate the decadence of the idea of "truth". [14] THIS IDEA, [15] IN NIETZCHE'S OPINION, [16] HAD BEEN dominating Western minds [17] FOR MANY CENTURIES.

[18] He [18.1] DEVELOPS THIS "ACTIVE NIHILISM" BY DISCUSSING on his book the [18.2] POSITION of legitimation and the status of justice in contemporary world. But, more than these, his book is about [19] THE standing of science [20], technology [21] AND technocracy and [22] ALSO ABOUT the control of knowledge and information today. [23] TO SUM UP It is a confluence of different themes intersected by controversial analogies.

In the United States edition, printed by [24] THE University of Minnesota Press, [25] 1984, his book [26] HAD a foreword [27] BY [28] Frederic Jameson, one of the most outsanding

He [31] TRIES to prepare the [32] reader by [33] EXPLAINING [34] the relationship between Lyotard's and Habermas' [35] IDEAS. [36] FOR [36.1] HIM, [36.3] ONE OF THE MOST IMPORTANT DISCUSSION IS the crisis of legitimation, [36.4] WHICH SEPARATES BOTH AUTHORS. [37] FOR Lyotard, [38][39] THIS LEGITIMATION can not be solved [40] WITH the "consensus" as Habermas believes because the invention [41] happens in "dissensus" [42]. Hence, [43] Lyotard, as Jameson observes, will not agree with "Habermas' vision of an evolucionary leap into a new type of rational society, defined in communicational terms as the communication community". Better than in "consensus" [44] Lyotard [45] WILL BE interested in Austin's "language games" [46].

[47][48] FOR COMBAT [49] THE EXPERESSION "POST-INDUSTRIAL SOCIETY", Jameson [50] WILL USE the marxist economist Ernest Mandel, who says that "late capitalism, far from representing a post-industrial society, thus appears as the period in which all branches of the economy are fully industrialized for the first time".

marxist literary critic from [28.1] THIS COUNTRY. On writing his foreword, Jameson makes some good comments, emphasizing the importance [29] ITSELF of the [30] BOOK PUBLISHING. 9

^He [31] INTENDS to prepare the [32] BOOK'S reader by [33] POINTING [34] NEXT the relationship between Lyotard's and Habermas' [35] THOUGHTS, [36] WHO CAN BOTH BE CONSIDERED [36.1] IN [36.2] JAMESON'S OPINION, [36.4] IN OPPOSED SIDE IN THE DISCUSSION RELATED TO [36.3] the crisis of legitimation. [37] IN Lyotard, [38] HE OBSERVES, [39] THIS CRISE OF LEGITIMATION can not be solved [40] BY the "consensus" as Habermas believes because the invention [41] - AN IMPORTANT DEVELOPMENTAL RESOURCE - happens in "dissensus" [42] AND NOT IN "CONSENSUS". Hence, [43] as Jameson observes, Lyotard will not agree with "Habermas' vision of an evolucionary leap into a new type of rational society, defined in communicational terms as the communication community". Better than in "consensus" [44], Lyotard [45] IS interested in Austin's "language games" [46] WHICH PROVOKES A DIVERSITY OF POSSIBILITIES, NOT A CENTRALIZATION OF THE DISCOURSE AS THE IDEA OF CONSENSUS DOES. 10, 11, 12, 13, 14, 15, 16

[47]ANOTHER ASPECT OBSERVED BY JAMESON IS THE EXPRESSION "POST-INDUSTRIAL SOCIETY" USED BY LYOTARD TO DESCRIBE THE CONTEMPORATY WORLD. [48] ON COMBATING [49] THIS EXPERESSION, Jameson [50] USES the marxist economist Ernest Mandel, who says that "late capitalism, far from representing a post-industrial society, thus 17

appears as the period in which all branches of the economy are fully industrialized for the first time".

ELISA

(pre-treatment final draft)

Lyotropic Nematics: Type I DM and Type II CM

1. Introduction

Lyotropic Nematic phases have been [1] described as Type I CM and Type II DM. [2][2.1] Type I and Type II [2.2] CHARACTERIZE the anisotropy of the diamagnetic susceptibility (Dx); for Dx < 0 the mesophase director [2.3] ORIENTS perpendicular to the magnetic field. [3][4] THE DISK SHAPE AND THE CYLINDRICAL SHAPE are denominated DM and CM respectively.

An increase in Dx values can be obtained [5][6] SUCCESSIVELY substituting aliphatic chains of the amphiphile by an aromatic detergent, for instance, KHxB (potassium heptyloxi-benzoate) with no phase change from disk to rods.

The purpose of this report is [7] the preparation [8] of [9] mesophases composed by disks and rods using aromatic detergent at or near mole fraction = 1 in the micelle.

2. Experimental

([10] describes [11][12] the organic synthesis of the compounds [13], the liquid crystal preparation and [14] THE composition [15] and [16][17][17.1] techniques used.)

3. Results

The characterization of the Dx of the mesophases was [18] DONE by 2HNMR of the D2O. [19] a Type I phase [20] was obtained with KHxB/DeoH/NO2SO4/D2O sustains D2O addition between 48 and 52 wight

(post-treatment revision)

Lyotropic Nematics: Type I DM and Type II CM

1. Introduction

Lyotropic Nematic phases have been [1] COMMONLY described as Type I CM and Type II DM. [3] CONSIDERING THE TWO KNOWN SHAPES OF THE AGGREGATES OF THESE PHASES, [4] THE DISK AND CYLINDRICAL SHAPES are denominated Type I DM and Type II CM respectively. [2][2.1] THE DENOMINATION Type I and Type II [2.2] CHARACTERIZES the anisotropy of the diamagnetic susceptibility (Dx); for Dx < 0 the mesophase director [2.4] IS ORIENTED perpendicular to the magnetic field, and for Dx > 0, parallel to the magnetic field.

An increase in Dx values can be obtained [5] BY [6] SUCESSIVELY substituting aliphatic chains of the amphiphile by an aromatic detergent, for instance, KHxB (potassium heptyloxi-benzoate) with no phase change from disk to rods.

The purpose of this report is [7] TO DESCRIBE the preparation [8] AND CHARACTERIZATION of [9] NEW mesophases composed by disks and rods using aromatic detergent at or near mole fraction = 1 in the micelle.

2. Experimental

([10] THIS SECTION describes [11] THREE PROCEDURES [12]: the organic synthesis of the compounds [13]; the liquid crystal preparation and [14] composition [15]; and [16] THE [17][17.1] REQUIRED TECHNIQUES.)

3. Results

percent. The velocity of alignment of this phase [21] IS 5 x 10- 5-1.

[19] A Type II mesophase was prepared with KHxB/DeoH/D2. This phase aligns so rapidly that the powder [22] PATTERN was not observed. [23] The precise characterization of the diamagnetic anisotropy (Dx) was instead performed with [24] spinning sample.

To characterize the micelle shape [25] the two [26] MESPHASES MENTIONED ABOVE were placed in flat capilaries and examined in the polarizing microscope just after being aligned in the magnetic field. Homogeneous alignment (dark field) was obtained for the Type I phase by placing the slide (capilary) such that the magnetic field was perpendicular to the plane of the slide. For [27] Type II phase [28] optical evidences strongly suggest that this mesophase is rod-like nematic. [29][30] MORE precise [31] EXPERIMENTS [32] OBSERVING TYPE II PHASE IN THE MICROSCOPE JUST AFTER ALIGNMENT IN MAGNETIC FIELD [33] WERE NOT achieved [34] because the aligment was [35] rapidly randomized [36].

4. Discussion and Conclusion

The preparation and characterization of [37] THE mesophases with reversed sign of the diamagnetic susceptibility anisotropy presented here together with the results presented in reference 4 lead us to strongly consider the possibility that the two new mesophases were [38] PROPERLY DESCRIBED [39] that our results were conclusive.

The characterization of the Dx of the mesophases was [18] PERFORMED by 2HNMR of D2O. [19] THE Type I phase [20] WHICH was obtained with KHxB/DeoH/NO2SO4 sustains D2O addition between 48 and 52 weight percent. The velocity of alignment of this phase [21] WAS 5 x 10-5-1.

[19] THE Type II mesophase was prepared with KHxB/DeoH/D2. This phase aligns so rapidly that the powder [22] DIAGRAM was not observed. [23] HENCE, the precise characterization of the diamagnetic anisotropy (Dx) was instead performed with [24] A spinning sample.

To characterize the micelle shape [25], the two [26] ABOVE MENTIONED MESOPHASES were placed in flat capilaries and examined in the polarizing microscope just after being aligned in the magnetic field. Homogeneous alignment (dark field) was obtained for the Type I phase by placing the slide (capilary) such that the magnetic field was perpendicular to the plane of the slide. For [27] THE Type II phase [28], optical evidences strongly suggest that this mesophase is rod-like nematic [29] BUT [30] precise [31] EXPERIMENTS [32][33] COULD NOT BE achieved; [34] IN OTHER WORDS, CONCLUSIVE OPTICAL TEXTURES WERE NOT OBSERVED because the alignment [35] IN THE MAGNETIC FIELD was rapidly randomized [36] WHEN THE SAMPLE WAS TAKEN OFF THE MAGNETS.

4. Discussion and Conclusion

The preparation and characterization of [37] THIS mesophases with reversed sign of diamagnetic susceptibility anisotropy presented here together with

the results presented in reference 4 lead us to strongly consider that [39] NOT ONLY the two new mesophases were [38] CORRECTLY CHARACTERIZED [39] BUT ALSO that our results were conclusive.

GUSTAVO

(pre-treatment final draft)

A Molecular Basis for Thymic Selection

T lymphocytes present on their surface molecules which are involved in antigen recognition and cellular growth. [1][2] THE COMPLEX T3-Ti is composed by a dissulfide-linked heterodimer (Ti) associated with three monomorphic T3 molecules. [3] ANOTHER MOLECULE, a 50 KDa glycoprotein (T11), first described as the sheep erythrocyte binding protein, is now claimed to be [4] INVOLVED in [5] ANOTHER activation pathway.

Both molecules seems to transduce a signal to cell genoma which leads to [6] TRANSCRIPTION AND TRANSLATION of interleukin 2 (IL-2) [7][8] followed by [9] secretion of IL-2 and appearance of IL-2 receptor [10] on [11] lymphocyte surface. [12] THEN, the interaction of IL-2 [13] / IL-2r triggers an autocrine growth pathway.

Although [14] T LYMPHOCYTES can be activated by these two distinct [15] PATHWAYS, [16] only the [17] FIRST (T3-Ti) acts through antigen receptor "via". [18] Even [19] IF there is presumably a specific physiological ligand for the latter [20] PATHWAY, ITS IDENTITY is unknown at this moment.

[21] MOREOVER, T3-Ti complex regulates the T11 alternative pathway capacity to lead to a clonal expansion, [22] BESIDE THE POINT that these two [23] ACTIVATION [15] PATHWAYS are independent of one another.

(post-treatment revision)

A Molecular Basis for Thymic Selection

T lymphocytes present on their surface molecules which are involved in antigen recognition and cellular growth. [1] ONE KIND OF THESE MOLECULES, [2] THE T3-Ti COMPLEX, is composed by a dissulfide-linked heterodimer (Ti) associated with three monomorphic T3 molecules. [3] A FURTHER STRUCTURE, a 50 KDa glycoprotein (T11), first described as the sheep erythrocyte binding protein, is now claimed to be [4] PARTICIPATE in [5] AN EXTRA activation pathway. 1

Both molecules seems to 2
transduce a signal to cell 3
genoma which leads to [6] TRANSLATION AND TRANSCRIPTION of interleukin 2 (IL-2), [7] PERHAPS THE MOST IMPORTANT PROTEIN OF THE SYSTEM. [8] THIS EFFECT is followed by [9] THE secretion of IL-2 and appearance of IL-2 receptor [10] (IL-2r) on [11] T lymphocyte surface. [12] CONSEQUENTLY, the interaction of IL-2 [13] AND IL-2r triggers an autocrine growth pathway.

Although [14] T CELLS can be activated by these two distinct [15] ROUTES, [16] T3-Ti COMPLEX AND T11 MOLECULE, only the [17] FORMER acts through the antigen receptor "via". [18] The identity of the latter [20] is unknown at this moment even [19] THOUGH there is presumably a specific physiological ligand for it.

Concerning to thymic differentiation, T lymphocytes must develop [24] IN immunocompetent cells and thereupon the organism acquires a functional T-cell repertoire.

[25] NEVERTHELESS, there should be a mechanism for thymic selection which must eliminate autoreactive cells and at the same time expand T cells which are able to recognize [26] FOREIGN antigens [27] ASSOCIATED WITH SELF-MHC MOLECULES. [28]

[29] IN THIS VIEW, WHILE BOTH T3-Ti AND T11 PATHWAYS CAN BE UTILIZED BY PERIPHERAL T-LYMPHOCYTES, ONLY THE LATTER STRUCTURE IS EXPRESSED ON EARLY STAGES IN THYMOCYTES.

[30] EVIDENCES THAT THAT THIS MOLECULE IS THE EARLIEST TO APPEAR ON T CELL SURFACE AND IT IS STRONGLY CONSERNED THROUGH PHILOGENY GIVE A SUPPORT TO THIS VIEW.

[31] BASED ON THIS, a model was elaborated for the [32] MECHANISM involved in thymic selection [33][34] IN WHICH T lymphocytes with high affinity for self antigens [35][36] via T3-Ti complex would be eliminated avoiding autoreactive cells [38] AND [39] BUT T cells with low affinity for self antigens could not be removed in this selection and, [40][41] probably through T11 molecule, they would be subsequently expanded.

[21] NOTABLY IS THE FACT THAT T3-Ti complex regulates the T11 alternative pathway capacity to lead to clonal expansion, [22] NOTWITHSTANDING THE FACT that these two [23] [15] ROUTES are independent ▲ one another. 4

Concerning to thymic differentiation, T lymphocytes must develop [24] INTO immunocompetent cells and thereupon the organism acquires a functional T-cell repertoire. 9

[25] BECAUSE OF THIS, there should be a mechanism for thymic selection which must eliminate autoreactive cells and at the same time expand T cells which are able to recognize [26] SELF ANTIGENS [27]. [28] IT SEEMS THAT THE FIRST STATEMENT IS IN CONTRAST TO THE SECOND BUT ACTUALLY BOTH OCCUR.

[29]

[30]

[31] AS A RESULT, a model was elaborated for the [32] MECHANISMS involved in thymic selection [33] AND ORGANIZATION OF T CELL REPERTOIRE. [34] HENCE, T lymphocytes with high affinity for self antigens [35], [36] PROBABLY via T3-Ti complex [35], would be eliminated avoiding autoreactive cells [38]. [39] CONVERSELY, T cells with low affinity for self antigens could not be removed in this selection and [40] THEREFORE [41] would subsequently be expanded , probably through T11 molecule.

HENRIQUE

(pre-treatment final draft)

Immunosupression in Paracoccidiodomycosis

Nils K. Jerne and A.A. Nordin developed [1] IN 1963 a simple [2] technique for scoring a single antibody forming cell population. [3] After incubation of [4] sheep red blood cells [5] (SRBC) [6] and lymphoid cells [7] in an agar layer, specific plaque forming cells can be [8] MACROSCOPICALLY VISUALIZED [9] AND [10] the total number of plaques enumerated represents the number of lyphocytes which [11] RESPONDS to SRBC in the population.

[12]

[13][14] to determine whether Paracoccidiodo-mycosis brasiliensis (Pb) infection induces a suppression of antibody production to unrelated antigens [15] we inoculated resistant (A/SN) and susceptible (BIO.A) mice with 5 x 10 6 yeast forms of [16] pathogenic (Pb18) or non-pathogenic (IVIC Pb267) P. brasiliensis. After 21 days [17] these mice were immunized with 2 x 10 8 SRBC and [18] four days later, the number of specific anti-SRBC splenic cells were analysed.

(post-treatment revision)

Immunosupression in Paracoccidiodomycosis

[1] IN 1963, Nils K. Jerne and A.A. Nordin developed a simple, [2] BUT NOTABLE, technique for scoring a single antibody∧forming cell population. [3] BECAUSE OF THIS, after incubation of [4] THE FOLLOWING REAGENTS: sheep red blood cells [5], [6] COMPLEMENT, and lymphoid cells [7], in an agar layer, specific plaque forming cells can be [8] VISUALIZED MACROSCOPICALLY. [9][10] HENCE, the total number of plaques enumerated represents the number of lyphocytes which [11] RESPOND to SRBC in the population. 1

[12]THE PFC-ASSAY HAS BEEN USED TO DETERMINE THE CAPACITY OF ANIMALS TO MOUNT AN ANTIBODY RESPONSE TO FOREIGN ANTIGENS.

[13] IN ORDER [14], to determine whether Paracoccidiodo-mycosis brasiliensis (Pb) infection induces a suppression of antibody production to unrelated antigens [15], we inoculated resistant (A/SN) and susceptible (BIO.A) mice with 5 x 10 6 yeast forms of [16] EITHER pathogenic (Pb18) or non-pathogenic (IVIC Pb267) P. brasiliensis. After 21 days [17], these mice were immunized with 2 x 10 8 SRBC and [18], four days later, the number of specific anti-SRBC splenic cells were analysed.

We observed that [19] the number of specific IgM anti-SRBC B cells were significantly diminished [19.1] ONLY in susceptible 2

We observed that [19][19.1] in susceptible mice, 25 days post-Pb18 infection the number of specific IgM anti-SRBC B cells were significantly diminished. On the other hand, when A/SN and BIO.A mice were infected with the non-pathogenic fungus IVIC Pb267 the number of PFC anti-SRBC response were not different from controls [20] (mice only immunized with SRBC).

These results suggest a direct correlation between susceptibility to P.b. and suppression of antibody response to unrelated antigens.

The mechanisms underlying this parasite-associated immunosupression are unknown. It may be associated with [21] a deficient antigen presentation by the macrophages [22] OR [23] TO an impaired T cell function.

[24] The influence of these immunodeppression state in the development of the [25] DISEASE will be investigated.

mice, 25 days post-Pb18 infection. On the other hand, when A/SN and BIO.A mice were infected with the non-pathogenic fungus IVIC Pb267 the number of PFC anti-SRBC response were not different from controls [20] - mice only immunized with SRBC.

These results suggest a direct correlation between susceptibility to P.b. and suppression of antibody response to unrelated antigens.

The mechanisms underlying this parasite-associated immunosupression are unknown. It may be associated [21][22] NOT ONLY with a deficient antigen presentation by the macrophages [21] BUT ALSO [23] WITH an impaired T cell function.

[24] IN A BRIEF RUN, the influence of these 3
immunodeppression state in 4
the development of the [25]
PARACOCCIDIODOMYCOSIS will
be investigated. 5

SILVIA

(pre-treatment final draft)

Iron chelation prevents tissue injury following ischemia

One of the most intriguing question concerning tissue injury [1] FOLLOWING ischemic anoxia is [2] THE MECHANISM BY WHICH reperfusion with oxygenated blood [3] CAUSES [4] DAMAGE TO THE TISSUE.

[5][6] THIS DAMAGE seems to be [7] MEDIATE by [8] superoxide anion (O2-) and hydrogen peroxide (H2O2) produced in excess during reperfusion. The infusion of superoxide dismutase and catalase together with oxygenated blood greatly the [9] LESION [10] INDICATING that O2- and H2O2 are important substances [11] FOR [12] THE TISSUE INJURY.

[13] [13.1] SUPEROXIDE ANION and HYDROGEN PEROXIDE are produced during reperfusion by two intracellular systems. One is the xanthine oxidase system who is activated during ischemia. [14] THE OTHER SITE IS [15] AT THE MITOCHONDRIA, [16] WHERE DUE TO LOW ADP LEVEL CONSEQUENT TO ANOXIA, [13] [17] OXIGEN IS NOT TOTALLY REDUCED [18] TO OXIGEN ANION [19][19.1] BUT IS PARTIALLY REDUCED WITH CONSEQUENT O2- PRODUCTION.

Although [20] O2- AND H2O2 INCREASED PRODUCTION NO DOUBT [20.1] OCCUR [21], it is also known that [22] CHEMICALLY these two oxidant species are not able to initiate [23] lipid peroxidation, one of the mechanisms [24] OF [25] CELL DAMAGE.

(post-treatment revision)

Iron chelation prevents tissue injury following ischemia

One of the most intriguing question concerning tissue injury [1] CONSEQUENT TO ischemic anoxia is [2] HOW reperfusion with oxygenated blood [3] CONTRIBUTES TO [4] THIS DAMAGE.

[5]IN THIS SITUATION [6] TISSUE INJURY seems to be [7] MEDIATED by [8] BOTH superoxide anion (O2-) and hydrogen peroxide (H2O2) produced in excess during reperfusion. The infusion of superoxide dismutase and catalase together with oxygenated blood greatly the [9] TISSUE INJURY. [10] THIS INDICATES that O2- and H2O2 are important substances [11] TO [12] THIS PHENOMENON.

[13] During reperfusion [13.1] O2- and H2O2 are produced by two intracellular systems. One is the xanthine oxidase system who is activated during ischemia. [14] THE OTHER IS [15] THE MITOCHONDRIAL RESPIRATORY CHAIN [16] [17] THAT CAN NOT REDUCES [13] O2 TOTALLY [18][19] THUS PRODUCING O2-, [19.1] A PARTIALLY REDUCED FORM OF O2. 1

Although [20] NO DOUBT ABOUT INCREASED PRODUCTION OF O2- AND H2O2 [21] DURING REPERFUSION [20.1] EXISTS, it is also known that [22] these two oxidant species are not able to initiate [23] MEMBRANES lipid peroxidation, one of the mechanisms [24] RESPONSIBLE FOR [25] CELL INJURY. [27] [27.1] HOWEVER, LIPID PEROXIDATION CAN BE

[26][26.1] TO THE [26.2] [26.3] PRODUCTION OF [26.4] MORE ACTIVE SPECIES OF OXYGEN [26.5], [26.6] TRANSITION METALS LIKE [26.7] IRON ARE REQUIRED. [27][27.1][27.2] BETWEEN THESE SPECIES, [27.3] HYDROCYL RADICAL (OH) SEEMS TO BE [27.4] THE MOST ACTIVE, [28] AND [28.1] IS PRODUCED by the Haber-Weiss reaction or directly by the reaction between Fe2+ and H2O2.

[29] UNTIL NOW, the exact mechanism by which iron participates in [30] THE IN VIVO MECHANISM OF LIPID PEROXIDATION is not well understood. [31] THE AUTHORS [32] suggest that [33] PROBABLY iron deposition and mobilization from ferritin [34] (an intracellular protein [35] THAT STORES IRON) [36] IS RESPONSIBLE FOR [37] THE [37.1] [37.2] OXIGEN REACTIVE SPECIES GENERATION.

Increased levels of iron where demonstrated in cardiac tissue of animals submitted to reperfusion after ischemia.

If it is true that iron content is important to [38] THE cell damage produced after reperfusion [39] iron chelation should prevent [40] THIS LESION [41] TO OCCURS.

[42] Employing deferoxamine [43] (an iron chelator) [44] IT [45] WAS POSSIBLE TO SHOW that dogs submitted to cardiac arrest were able to survive and showed less neurological damage than [46] THE untreated animals.

[47] The authors suggest that deferoxamine should be used as a therapeutic agent to prevent tissue injury following ischemic anoxia.

INITIATED BY [27.2][27.4] MORE ACTIVE SPECIES OF OXYGEN, LIKE, FOR EXAMPLE, [27.3] OH.

[28] THIS RADICAL [28.1] CAN BE PRODUCED by the Haber-Weiss reaction or directly by the reaction between Fe2+ and H2O2. [26] [26.1] ACTUALLY [26.2][26.6] TRANSITIONAL METALS LIKE [26.3] Fe2+ ARE REQUIRED FOR THE "IN VIVO" PRODUCTION OF [26.4] OH [26.5] AND CONSEQUENT LIPID PEROXIDATION. 2

[29] AT THE PRESENT MOMENT, the exact mechanism by which iron participates in [30] "IN VIVO" LIPID PEROXIDATION is not well understood. [31] AUSTE & WHITE [32] (ADV. FREE RADICAL BIOLOGY AND MEDICINE, 1:1-17, 1985) suggest that [33] PROBABLE iron deposition and mobilization from ferritin [34] - an intracellular protein [35] RESPONSIBLE FOR IRON STORE - [36] ACCOUNT FOR [37] THE GENERATION OF [37.1] MORE ACTIVE SPECIES OF [37.2] OXYGEN.

Increased levels of iron where demonstrated in cardiac tissue of animals submitted to reperfusion after ischemia. 3

If it is true that iron content is important to [38] cell damage produced after reperfusion [39], iron chelation should prevent [40] ITS [41] OCCURENCE.

[42] BY employing deferoxamine [43] - an iron chelator - [44] THE ABOVE CITED AUTHORS [45] DEMONSTRATED that dogs submitted to cardiac arrest were able to survive and showed less neurological damage than [46] untreated animals.

[47] IN CONCLUSION, the authors suggest that deferoxamine should be used as a therapeutic agent to prevent tissue injury following ischemic anoxia.

THELMA

(pre-treatment final draft)

Congenital tuberculosis - report of a case, review of the literature and diagnostic guidelines

congenital tuberculosis, although a rare disease, still occurs and brings a lot of [1] DIFFICULTIES to be correctly diagnosed and treated. the prevention of tuberculosis infection [2] OF [3] THE fetus during pregnancy [4] OR [5] THE NEONATE after birth is possible and requires careful [6] UTILIZATION [6.1] OF KNOWLEDGE, JUDGEMENT AND SUPERVISION of the [6.2] EMPLOYED [6.3] methods.

In the first part [7] the authors presented a case of a female neonate born on september 21, 1956. Her mother had serious tuberculosis identified in pleural effusion, meninges and sputum cultures. the neonat was separated from [8] HER at birth. At the age of 2 months she [9] DEVELOPPED generalized pulmonary tuberculosis. she had already presented fever which was unresponsive to broad-spectrum antibiotics. At that time [10] chest roentgenograms, cerebral spinal fluid and tuberculin reactions were negative. At 5 months of age she was poorly nourished, had hepatosphenonegaly, left foot drop and subcutaneous nodules [11] below the xiphoid and spread on the body. Several biopsy specimens identified M. tuberculosis.

During the subsequent years [12] the patient received continued antituberculosis therapy and presented [13]

(post-treatment revision)

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xiphoid and spread on the body). Several biopsy specimens identified M. tuberculosis.

During the subsequent years [12], the patient received continued antituberculosis therapy and presented [13] intercurrent infections such as varicella, [14] WITH

SOME intercurrent infections such as varicella, [14] WITHOUT exarcebation of [15] HER tuberculosis. The pulmonary lesions [16] as well as the ones in liver, spleen and peritoneum calcified. After four years and three months the therapy was discontinued. At 12 years of age [17], she received isoniazid therapy [18] in order to prevent reactivation of tuberculosis. The patient maintained good health during frequent clinic visits and gave birth to two healthy babies at 21 and 22 years of age.

The reported case was unusual in [19] MANY respects [20]. [21][21.2] [22] The child survived inspite of massive infection in liver, spleen, lungs and peritoneum. [21][21.2][23] It was [23.1] UNDOUBTEDLY [23.2] A CONGENITAL TUBERCULOSIS CASE WITH [23.3] evidendence of hematogeneous infection through the umbilical vein. [24] FURTHERMORE, the antituberculosis therapy was extremely long and did not [25] PRESENT [26] ANY toxic [27] REACTION or side-effects. [28] In the literature [29] there are some [30][31] cases [32] RELATED [33], but none of them with a longer follow-up.

[34][35] ACTUALLY, nowadays [36] THIS RELATED CHILD would have received [37] ISONIAZID PROPHILACTICALLY shortly after birth until it was determined whether [38] THE INFECTION was present or not [39], AND in positive case [40] she would have received isoniazid plus rifampicin.

NO exarcebation of [15] tuberculosis. The pulmonary lesions [16], as well as the ones in liver, spleen and peritoneum calcified. After four years and three months the therapy was discontinued. At 12 years of age [17] she received isoniazid therapy [18] AGAIN in order to prevent reactivation of tuberculosis. The patient maintained good health during frequent clinic visits and gave birth to two healthy babies at 21 and 22 years of age.

The reported case was unusual in [19] SEVERAL respects [20]:
[21] A. [21.1] FIRSTLY, [23] THERE WAS [23.3] IRREFUTABLE evidence of hematogeneous infection through the umbilical vein, PROVING it was [23.2] A CASE OF CONGENITAL TUBERCULOSIS.
[21] B. [21.2] SECONDLY, [22] the child survived in spite of massive infection in liver, spleen, lungs and peritoneum.
[21] C. [24] LASTLY, the antituberculosis therapy was extremely long and did not [25] CAUSE [26] toxic [27] REACTIONS or side-effects.

[28] In the literature [29], there are some [30]SIMILAR [31][32] REPORTED CASES [33] but none of them with a longer follow-up. [34][35] Nowadays, [36] THE ABOVE MENTIONED CHILD would have received [37] PROPHILACTIC ISONIAZID shortly after birth until it was determined whether [38] TUBERCULOSIS was present or not [39]. In positive case [40], she would have received isoniazid plus rifampicin.

The [41] DIAGNOSE of tuberculosis is not easy although there are some

The [41] DIAGNOSIS of tuberculosis is not easy although there are some laboratory [42] RESOURCES available. If there is suspect beyond a pregnant woman , it would be advisable to perform [43] A FEW TESTS SUCH AS [44] A CHEST ROENTOGRAM, [45][46] tuberculin reaction, biopsy of selected places and [47] [47.1][47.2] ALWAYS consider the possibility of therapy [48] AND ALSO [49] THE survey in relatives and partners in order to find out the source of infection. [50][50.1] IF THERE IS PROVED ACTIVE DISEASE, treatment is essencial, but it is suggested not to use streptonycin [51] BECAUSE OF [52] AN ototoxic [53] REACTION in [3] THE fetus. [54][54.1] FINALLY, the [54.2] DETAILED EXAMINATION OF [54.3] PLACENTAS [54.4] IN ORDER TO detect endometritis [54.5] IS ESSENCIAL. [55] In respect to [56] THE newborns, [57] ASIDE FROM [57.1] THE ENLISTED TESTS, there are [58] SOME clinical situations which might call the physician's attention [59]: [60] occurence of respiratory illness [61] THAT IS nonresponsive to [62] ANTIBIOTIC therapy [63] AND occasional superinfection.

laboratory [42] TESTS available. If there is suspect beyond a pregnant woman , it would be advisable to perform [43] [44] CHEST ROENTOGRAMS, [45] AS WELL AS MORE SPECIFIC TESTS SUCH AS [46] THE tuberculin reaction, biopsy of selected places and [54] [54.1][54.2] the CAREFUL STUDY of [54.3] PLACENTA [54.4] TO detect endometritis. [47][47.1] [47.2] IT IS ALSO ADVISABLE TO [54] consider the possibility of therapy [55] WHENEVER SUSPICION IS VERY STRONG. [48][49]∧Survey in relatives and partners should be made in order to find out the source of the infection. [50][50.1] IF ACTIVE DISEASE [50.2] IS CONFIRMED, treatment is essencial, but it is suggested not to use streptonycin [51] DUE TO [52] POSSIBLE [53] ototoxic HAZARDS in [3]∧fetus.

8

9 , 10

19

[55] In respect to [56] newborns, [57][57.1] SPECIFIC TESTS SHOULD BE PERFORMED AND there are [58] TWO clinical situations which might call the physician's attention [59] TOWARDS TUBERCULOSIS: [63] EITHER [60] THE occurence of respiratory illness [61] nonresponsive to [62] PROPER therapy [63] OR occasional superinfection.

WILSON

(pre-treatment final draft)

Archean atmosphere and Primitive Life

At present, the [1] EARTH atmosphere [2] IS [3] DUE TO volcanic outgassing. However, the atmospheric conditions must have changed since the beginning of the planet's evolution. [4].

As supported by direct measurements on volcanoes [5] the most important gases found in the [6] THE atmosphere are N2, O2, Ar and CO2, plus different proportions of H2O. Volcanic gases and [6] THE atmosphere have similar Ar/N2 ratios [7] although [8] H2O AND CO2 [9] FROM volcanoes are [10] more abundant [11].

[12] THUS, [13][14] the [14.1] OCEANS were originated through the exceeded outgassed water vapor which has condensed [14.2]. [15] IN TURN, most of the CO2 was dissolved in the ocean like calcium carbonate in limestones. However, afraction of [16] THIS CO2 is [17] used [18] IN [19] PHOTOSYNTHESIS [20] WHICH CONVERTS both H2O and CO2 into carbohydrates. [21] THIS process is concomitant with the oxygen releasing.

[22] During [22.1] THE EARLY EARTH, another [22.2] KIND of process [22.3] DIFFERING to the photosynthesis may have been important. This process is [23] CALLED photodissociation [24] AND [25] CAUSED oxygen releasing [26] BY breakdown of water molecules [27] BY [28] THE ultraviolet light from the sun. As [29] known [30][31] a small fraction of the oxygen molecules is converted to ozone because

(post-treatment revision)

Archean Atmosphere and Primitive Life

At present, the [1] EARTH'S atmosphere [2] IS RELATED [3] TO volcanic outgassing. However, the atmospheric conditions must have changed since the beginning of the planet's evolution. [4] SO, THIS ARTICLE DEALS WITH SOME CONSTRAINS ABOUT THE EVOLUTION OF ATMOSPHERE AND EARLY LIFE.

As supported by direct measurements on volcanoes [5], the most important gases found in [6] atmosphere are N2, O2, Ar and CO2, plus different proportions of H2O. Volcanic gases and [6] atmosphere have similar Ar/N2 ratios [7], although [8] H2O AND CO2 ABUNDANCES [9] IN volcanoes are [10] HIGHER [11] THAN IN ATMOSPHERE.

[12][13] ACCORDING TO THESE ABUNDANCES, [14] the exceeded outgassed water vapor [14.2] PROGRESSIVELY condensed leading to the origin of the [14.2] OCEAN. [15] SIMULTANEOUSLY, most of the CO2 was dissolved in the ocean like calcium carbonate in limestones. However, a fraction of [16] THE ORIGINAL CO2 is [17] ALSO used [18] BY [19] PHOTOSYNTHESIS PHENOMENON [20] TO CONVERT both H2O and CO2 into carbohydrates. [21] SUCH A process is concomitant with the oxygen releasing. 1 2

[22][22.3] IN CONTRAST to the photosynthesis, another [22.2] TYPE of process may have been important during [22.1] THE EARLY EVOLUTION OF THE EARTH. This process is [23] NAMED

the early Earth's gravity field limits the [32] RELEASING of the "heavy" Oxygen molecules. [33] The progressive formation of an ozone outer "trap" tends to reduce the ultraviolet effect, and [34] SO photodissociation corresponds to a relevant self-regulating process in terms of further dissociation phenomena.

[35] The reducing conditions [35.1] OF the early atmosphere may have [36] predominant [37] as suggested by the photodissociation processes and [38] BY the sedimentary rock record [39] AS WELL. The typical Archean Banded Iron Formation [40] are thought to be deposited in marine environments (liberation of soluble Fe++ state) [41][42] BUT in the Protozoic period [43] THE RED BEDS SEDIMENTS are quite common ([44] INCREASING of oxidising surface conditions). In addition, the existence of Uranite and Pyrite within the Archean sedimentary rocks [45], both only formed [46] IN [47] REDUCING conditions [45], in connection with [48] THE INCREASING ABUNDANCE of sulphate deposits since 2.5 billion years ago also support the [49] GRADATION CONDITIONS OF THE GEOLOGICAL ATMOSPHERIC EVOLUTION [50] TOWARDS A MORE OXIDISING ONE.

[51][52] CONCERNING the precambrian life [53][54] the earliest life-forms [55] AS [56] IDENTIFIED in Archean sedimentary rocks [57] are the microfossils. If a [48] REDUCING environment prevailed during [58] THE ARCHEAN PERIOD, the [59][60] STRONG ULTRAVIOLET RADIATION CONDITION [61] OF THAT ATMOSPHERE [62] limited photodissociation [24] WHICH [25] CAUSES oxygen releasing 3
[26] THROUGH ^breakdown of 4
water molecules [27] DUE TO [28] ultraviolet light from the sun. As [29] IT IS known [30], [31] ONLY a small fraction of the oxygen molecules is converted to ozone because the early Earth's gravity field limits the [32] RELEASE of the "heavy" Oxygen molecules. [33] SO, the progressive formation of an ozone outer 5
"trap" tends to reduce the ultraviolet effect, and [34] THEREFORE photodissociation corresponds to a self- 6
regulating process in terms of further dissociation phenomena.

[35][35.1] DURING early atmospheric conditions, a reduced character may have [36] BEEN predominant [37], as suggested by [38] BOTH the photodissociation processes and [38] the sedimentary rock record. The typical Archean Banded Iron Formation , [40] FOR EXAMPLE, are thought to be deposited in marine environments (liberation of soluble Fe++ state) [41], [42] WHILE in the Protozoic period [43] THE RED BEDS are quite common ([44] INCREASE of oxidising surface conditions.) In addition, the existence of Uranite and Pyrite within the Archean sedimentary rocks [45] - both only formed [46] UNDER [47] REDUCED conditions [45] - in connection with [48] THE INCREASE of Sulphate deposits since 2.5 billion years ago also support the [49] OXIDISING GRADATION OF ATMOSPHERE [50] THROUGH TIME.

[51] ABOVE THIS, [52] THERE IS A RELATION OF the precambrian life [53], [54] AS SUPPORTED BY the earliest life-forms [57]

the [63] AVAILABLE ORGANISMS TO LIVE in deep water ([64] THAT radiation destroys [65] ALL [66] OF amino-acids). [67][68] The recent discovery of quite complex organisms in 3.5 b.y. rocks suggests that [69] THE photosynthesis may have started at [70] THAT time [71] although some [72] CHRONOLOGICAL VARIATION [73] can be expected [74][75] BECAUSE OF [77] THE VARIETY OF GEOLOGICAL PHENOMENA [78] WHICH TOOK PLACE DURING THE ARCHEAN EARTH'S EVOLUTION.

(microfossils) [55][56] FOUND in Archean sedimentary rocks. If a [48] REDUCED environment prevailed during [58] THE ARCHEAN, the [59] EXISTENT [60] STRONG ULTRAVIOLET RADIATION [61][62] PROBABLY limited the [63] LIFE OF THE AVAILABLE ORGANISMS in deep water ([64]^SUCH A radiation destroys [65][66] amino-acids). 7

[67][68] IN ADDITION, the recent discovery of quite complex organisms in 3.5 b.y. rocks suggests that [69] photosynthesis may have started at [70] THE ARCHEAN time [71], although some [72] CHRONOVARIATION [73] ALONG THIS PERIOD can be expected [74] FOR SUCH A PROCESS [75], DUE TO [77] THE DISTINCTION OF THE ARCHEAN PHENOMENA [78]. 8

APPENDIX VI

CODING OF CHANGES IN TERMS OF READING PROCESS, WRITING PRODUCT AND QUALIFICATION

CHANGE #	ANALYSIS OF CHANGE				
	READING PROCESS	WRITING PRODUCT			QUALIF
1.0	acc	lf	morph	vi.s	+
2.0	app	lf	lls	conj.s	+
3.0	app	lf	csf	el.s	i
4.0	app	lf	csf	el.s	i
5.0	app	lf	csf	o.s	u
6.0	acc	lf	morph	ni.s	+
7.0	is	lf	ord	word.r	+
8.0	inf	co		dadv.d	+
9.0	is	lf	ord	phr.r	+
9.1	inf	co		postmod.d	+
10.0	coh	lf	sc	comb.sub	+
11.0	acc	lf	morph	vi.s	c
12.0	lev	of		ind.s	+
13.0	inf	lx		np.s	+
14.0	inf	lf	csf	cls.s	+
15.0	coh	lf	sc	comb.sub	+
16.0	inf	co		cls.d	-
17.0	acc	lf	lls	det.a	+
18.0	lev	of		ind.s	+
19.0	coh	of		punct.a	+
20.0	app	lf	ord	word.r	u
21.0	is	lf	ord	phr.r	+
22.0	inf	lf	csf	cls.s	+
23.0	lev	lf	sc	comb.sub	c
24.0	is	lf	ord	phr.r	+
24.1	acc	lf	morph	oi.s	+
24.2	app	lx		verb.s	c
25.0	is	lf	ord	phr.r	+
25.1	inf	co		premod.d	+
25.2	com	co		vif.d	?
25.3	inf	lx		np.s	+
26.0	lev	lf	ord	word.r	+
27.0	app	lf	csf	pro.s	i
28.0	lev	lf	ord	word.r	+
29.0	coh	lf	csf	cls.s	+

CHANGE #	ANALYSIS OF CHANGE				
	READING PROCESS	WRITING PRODUCT			QUALIF
1.0	acc	of		spell.s	+
2.0	app	lx		verb.s	+
3.0	app	of		punct.d	+
4.0	inf	co		postmod.a	+
5.0	inf	co		app.a	+
6.0	is	lf	ord	phr.r	+
7.0	com	lx		verb.s	+
8.0	inf	co		dadv.a	+
9.0	app	co		dadv.d	+
10.0	inf	co		cls.a	+
11.0	app	lx		verb.s	–
12.0	coh	co		dadv.a	+
13.0	coh	lf	csf	cls.s	+
14.0	lev	lf	sc	sep.sub	+
15.0	com	co		premod.a	+
16.0	app	lf	morph	vi.s	?
17.0	inf	co		postmod.a	+
18.0	is	lf	ord	phr.r	+
18.1	coh	co		cls.a	+
18.2	app	lx		np.s	–
19.0	acc	lf	lls	det.a	+
20.0	lev	lf	csf	el.s	+
21.0	lev	lf	csf	el.s	+
22.0	lev	co		dadv.a	+
23.0	coh	co		sadv.a	i
24.0	acc	lf	lls	det.a	+
25.0	app	lf	csf	el.s	+
26.0	app	lf	morph	vi.s	–
27.0	acc	lf	lls	prep.s	+
28.0	lev	lf	ord	phr.r	+
28.1	app	lf	csf	pro.s	i
29.0	inf	co		postmod.a	i
30.0	acc	lf	ord	word.r	–
31.0	app	lx		verb.s	+
32.0	inf	co		premod.a	–
33.0	app	lx		verb.s	–
34.0	coh	co		sadv.a	i
35.0	app	lx		np.s	–
36.0	lev	lf	sc	comb.sub	+
36.1	is	lf	ord	phr.r	c
36.2	coh	lf	csf	pro.s	+
36.3	inf	lf	csf	cls.s	+
36.4	app	lf	csf	cls.s	–
37.0	app	lf	lls	prep.s	–
38.0	coh	co		cls.a	+
39.0	app	lx		np.s	+
40.0	app	lf	lls	prep.s	+
41.0	inf	co		app.a	+
42.0	coh	co		cjoint.a	+
43.0	is	lf	ord	phr.r	+

CHANGE #	A N A L Y S I S O F C H A N G E			
	READING PROCESS	WRITING PRODUCT		QUALIF
44.0	app	of	punct.a	+
45.0	app	lf morph	vi.s	+
46.0	inf	co	postmod.a	+
47.0	coh	co	sent.a	+
48.0	app	lf lls	prep.s	i
49.0	inf	lf csf	pro.s	c
50.0	app	lf morph	vi.s	+

CHANGE #	ANALYSIS OF CHANGE			
	READING PROCESS	WRITING PRODUCT		QUALIF
1.0	coh	co	dadv.a	+
2.0	is	lf ord	cls.r	+
2.1	app	lx	np.s	i
2.2	acc	lf morph	vi.s	c
2.3	acc	lf morph	vi.s	+
3.0	coh	co	cls.a	+
4.0	inf	lf morph	ni.s	+
5.0	acc	lf lls	prep.a	+
6.0	acc	of	spell.s	-
7.0	coh	lf csf	cls.s	+
8.0	inf	co	cjoint.a	+
9.0	inf	co	dadv.a	u
10.0	app	lf csf	el.s	+
11.0	lev	co	app.a	+
12.0	lev	of	punct.a	+
13.0	app	of	punct.s	c
14.0	acc	lf lls	det.d	+
15.0	app	of	punct.a	+
16.0	app	lf lls	det.a	+
17.0	app	lf ord	word.r	u
17.1	app	lx	mod.s	u
18.0	app	lx	verb.s	+
19.0	coh	lf lls	det.s	+
20.0	coh	lf lls	comp.a	+
21.0	app	lf morph	vi.s	+
22.0	app	lx	np.s	+
23.0	coh	co	sadv.a	+
24.0	acc	lf lls	det.a	+
25.0	app	of	punct.a	+
26.0	app	lf ord	word.r	+
27.0	app	lf lls	det.a	+
28.0	app	of	punct.a	+
29.0	coh	lf sc	comb.coo	+
30.0	inf	co	premod.d	+
31.0	acc	lf morph	ni.s	-
32.0	inf	co	postmod.d	+
33.0	app	co	vif.a	+
34.0	inf	co	cls.a	+
35.0	inf	co	postmod.a	+
36.0	inf	co	postmod.a	+
37.0	acc	lf lls	det.s	-
38.0	app	lx	mod.s	u
39.0	com	lf csf	o.s	u

CHANGE #	ANALYSIS OF CHANGE				
	READING PROCESS	WRITING PRODUCT			QUALIF
1.0	coh	co		app.a	+
2.0	coh	lf	ord	word.r	+
3.0	app	lx		np.s	i
4.0	app	lx		verb.s	-
5.0	inf	lx		mod.s	+
6.0	app	lf	ord	word.r	+
7.0	inf	co		postmod.a	+
8.0	lev	lf	sc	sep.sub	+
9.0	acc	lf	lls	det.a	+
10.0	coh	co		app.a	+
11.0	coh	co		premod.a	+
12.0	coh	lx		sadv.s	i
13.0	app	lf	csf	el.s	+
14.0	app	lx		np.s	u
15.0	app	lx		np.s	u
16.0	coh	co		app.a	+
17.0	app	lf	lls	det.s	+
18.0	is	lf	ord	cls.r	+
19.0	app	lf	lls	conj.s	+
20.0	app	lf	csf	el.s	c
21.0	app	lx		sadv.	-
22.0	app	lx		sadv.s	+
23.0	inf	co		premod.d	+
24.0	coh	lf	lls	prep.s	+
25.0	coh	lx		sadv.s	?
26.0	app	lx		mod.s	?
27.0	inf	co		postmod.d	?
28.0	coh	co		sent.a	+
29.0	inf	co		par.a	?
30.0	inf	co		par.d	?
31.0	coh	lx		sadv.s	-
32.0	app	lf	morph	ni.s	+
33.0	coh	co		cjoint.a	+
34.0	lev	lf	sc	sep.sub	i
35.0	com	co		sadv.a	?
36.0	lev	of		punct.a	+
37.0	lev	lf	sc	sep.coo	+
38.0	coh	co		sadv.a	+
39.0	app	lx		np.s	u
40.0	coh	co		sadv.a	+
41.0	is	lf	ord	phr.r	+

CHANGE #	ANALYSIS OF CHANGE			
	READING PROCESS	WRITING PRODUCT		QUALIF
1.0	app	lf	ord phr.r	u
2.0	com	co	dadv.a	+
3.0	coh	co	postmod.a	i
4.0	inf	co	premod.a	u
5.0	coh	co	app.d	-
6.0	inf	co	cjoint.a	+
7.0	app	of	punct.a	-
8.0	lev	lf	ord word.r	+
9.0	lev	lf	sc sep.coo	+
10.0	coh	co	sadv.a	i
11.0	acc	lf	morph vi.s	+
12.0	inf	co	sent.a	+
13.0	app	lf	csf o.s	u
14.0	acc	of	punct.a	-
15.0	app	of	punct.a	+
16.0	coh	lf	lls conj.s	i
17.0	app	of	punct.a	+
18.0	app	of	punct.a	+
19.0	is	lf	ord phr.r	-
19.1	inf	co	dadv.a	u
20.0	oth	of	punct.s	u
21.0	lev	lf	ord phr.r	?
22.0	coh	lf	csf o.s	?
23.0	acc	lf	lls prep.s	+
24.0	coh	co	sadv.a	i
25.0	coh	lx	np.s	+

CHANGE #	ANALYSIS OF CHANGE				
	READING PROCESS	WRITING PRODUCT			QUALIF
1.0	inf	lf	lls	prep.s	+
2.0	app	lf	csf	pro.s	-
3.0	com	lx		verb.s	+
4.0	coh	lf	csf	pro.s	+
5.0	coh	co		dadv.a	u
6.0	app	lx		np.s	c
7.0	acc	of		spell.s	+
8.0	coh	lf	lls	conj.s	+
9.0	coh	lx		np.s	+
10.0	coh	lf	sc	sep.sub	-
11.0	app	lf	lls	prep.s	i
12.0	app	lx		np.s	-
13.0	lev	lf	ord	phr.r	+
13.1	inf	lx		np.s	+
14.0	coh	lf	csf	el.s	+
15.0	coh	lf	csf	cls.s	+
16.0	inf	co		cls.d	-
17.0	app	lf	csf	cls.s	c
18.0	inf	co		postmod.d	+
19.0	is	lf	ord	cls.r	+
19.1	app	lf	csf	cls.s	+
20.0	app	lf	ord	word.r	i
20.1	app	lx		np.s	i
21.0	coh	co		dadv.a	+
22.0	inf	co		dadv.d	+
23.0	inf	co		premod.a	+
24.0	coh	lf	lls	prep.s	+
25.0	app	lx		np.s	u
26.0	is	lf	ord	cls.r	c
26.1	coh	co		sadv.a	i
26.2	is	lf	ord	phr.r	c
26.3	inf	co		premod.a	+
26.4	coh	lx		np.s	c
26.5	inf	co		cjoint.a	+
26.6	acc	lf	morph	dr.s	+
26.7	app	lx		np.s	c
27.0	coh	lf	ord	cls.r	+
27.1	coh	co		sadv.a	c
27.2	app	co		postmod.d	+
27.3	inf	co		app.d	-
27.4	com	lf	morph	dr.s	+
28.0	lev	lf	sc	sep.coo	c
28.1	com	co		vif.a	+
29.0	app	lx		dadv.s	+
30.0	inf	lx		np.s	+
31.0	coh	lx		np.s	+
32.0	inf	co		postmod.a	+
33.0	app	lf	morph	dr.s	+
34.0	oth	of		punct.s	u
35.0	inf	lf	csf	cls.s	-

CHANGE #	ANALYSIS OF CHANGE			
	READING PROCESS	WRITING PRODUCT		QUALIF
36.0	app	lx	verb.s	c
37.0	app	lf ord	word.r	+
37.1	coh	co	premod.a	+
37.2	acc	of	spell.s	+
38.0	app	lf lls	det.d	+
39.0	lev	of	punct.a	+
40.0	inf	lf csf	pro.s	+
41.0	app	lf morph	dr.s	+
42.0	acc	lf lls	prep.a	+
43.0	app	of	punct.s	u
44.0	inf	lf csf	el.s	+
45.0	inf	lx	verb.s	+
46.0	app	lf lls	det.d	+
47.0	coh	co	sadv.a	i

CHANGE #	ANALYSIS OF CHANGE				
	READING PROCESS	WRITING PRODUCT			QUALIF
1.0	app	lf	morph	ni.s	u
2.0	app	lf	lls	prep.s	+
3.0	acc	lf	lls	det.d	-
4.0	app	lf	lls	conj.s	+
5.0	app	lf	morph	ni.s	c
6.0	app	lx		verb.s	u
6.1	inf	co		postmod.d	+
6.2	app	lx		mod.s	c
6.3	inf	co		premod.a	+
7.0	app	of		punct.a	+
8.0	coh	lf	csf	pro.s	+
9.0	acc	of		spell.s	+
10.0	app	of		punct.a	+
11.0	lev	of		punct.a	+
12.0	app	of		punct.a	+
13.0	app	co		opdet.d	+
14.0	app	lf	lls	prep.s	+
15.0	acc	lf	lls	comp.d	+
16.0	app	of		punct.a	+
17.0	app	of		punct.d	-
18.0	inf	co		dadv.a	+
19.0	app	lf	csf	o.s	u
20.0	app	of		punct.s	+
21.0	lev	of		o.s	+
21.1	lev	of		o.s	+
21.2	lev	co		sadv.a	+
22.0	coh	lf	ord	cls.r	+
23.0	coh	lf	ord	phr.r	+
23.1	com	co		sadv.d	+
23.2	app	lf	ord	word.r	+
23.3	com	co		premod.a	+
24.0	app	lx		sadv.s	c
25.0	app	lx		verb.s	+
26.0	app	co		opdet.d	-
27.0	app	lf	morph	ni.s	u
28.0	lev	of		ind.s	+
29.0	app	of		punct.a	i
30.0	coh	co		premod.a	+
31.0	app	lf	ord	word.r	+
32.0	app	lx		verb.s	+
33.0	app	of		punct.d	+
34.0	lev	of		ind.s	+
35.0	coh	co		sadv.d	+
36.0	app	lf	lls	det.s	+
37.0	app	lf	ord	word.r	?
38.0	coh	lx		np.s	+
39.0	lev	lf	sc	sep.coo	+
40.0	app	of		punct.a	+
41.0	acc	lf	morph	dr.s	-
42.0	app	lx		np.s	+

CHANGE #	ANALYSIS OF CHANGE			
	READING PROCESS	WRITING PRODUCT		QUALIF
43.0	inf	co	premod.d	+
44.0	app	lf morph	ni.s	+
45.0	inf	co	premod.a	+
46.0	app	lf lls	det.a	+
47.0	lev	lf sc	sep.coo	+
47.1	inf	co	dadv.d	+
47.2	com	co	vif.a	+
48.0	lev	lf sc	sep.coo	+
49.0	acc	lf lls	det.d	i
50.0	is	lf ord	cls.r	+
50.1	is	lf ord	word.r	+
50.2	app	lx	verb.s	+
51.0	app	lf csf	o.s	u
52.0	inf	co	premod.a	+
53.0	app	lx	np.s	?
54.0	coh	lf ord	cls.r	+
54.1	app	co	sadv.d	c
54.2	app	lx	np.s	u
54.3	app	lf morph	ni.s	+
54.4	app	lf csf	o.s	u
54.5	com	lx	vif.s	+
55.0	lev	of	ind.s	+
56.0	app	lf lls	det.d	+
57.0	app	lf sc	sep.sub	+
57.1	app	lx	mod.s	+
58.0	inf	lf lls	det.s	+
59.0	app	lf lls	comp.a	+
60.0	acc	lf lls	det.a	+
61.0	app	lf csf	el.s	+
62.0	inf	lx	mod.s	?
63.0	coh	lf lls	conj.s	-

CHANGE #	ANALYSIS OF CHANGE				
	READING PROCESS	WRITING PRODUCT			QUALIF
1.0	acc	lf	lls	det.a	+
2.0	com	lx		verb.s	+
3.0	acc	lf	lls	prep.s	c
4.0	inf	co		sent.a	+
5.0	app	of		punct.a	+
6.0	acc	lf	lls	det.d	-
7.0	app	of		punct.a	+
8.0	app	lx		np.s	-
9.0	app	lf	lls	prep.s	+
10.0	app	lx		adj.s	c
11.0	app	co		postmod.a	c
12.0	app	co		sadv.d	+
13.0	inf	co		cls.a	-
14.0	is	lf	ord	phr.r	+
14.1	app	lf	morph	ni.s	-
14.2	inf	co		dadv.a	u
15.0	oth	lx		dadv.s	?
16.0	coh	lf	csf	pro.s	+
17.0	coh	co		dadv.a	+
18.0	acc	lf	lls	prep.s	i
19.0	inf	lx		np.s	-
20.0	coh	lf	csf	cls.s	+
21.0	app	lf	lls	det.s	-
22.0	is	lf	ord	phr.r	+
22.1	inf	lx		np.s	+
22.2	app	lx		np.s	+
22.3	app	lf	csf	cls.s	i
23.0	app	lx		verb.s	i
24.0	app	lf	sc	comb.sub	-
25.0	coh	lf	morph	vi.s	+
26.0	app	lf	lls	prep.s	+
27.0	app	lf	lls	prep.s	+
28.0	app	lf	lls	det.d	-
29.0	app	lf	csf	el.s	i
30.0	app	of		punct.a	+
31.0	inf	co		dadv.a	+
32.0	acc	lf	morph	dr.s	+
33.0	coh	co		sadv.a	i
34.0	app	lx		sadv.s	c
35.0	is	lf	ord	phr.r	+
35.1	app	lf	lls	prep.s	+
36.0	acc	lf	lls	v.a	+
37.0	app	of		punct.a	+
38.0	app	lf	csf	el.s	c
39.0	lev	lf	ord	word.r	+
40.0	coh	co		sadv.a	+
41.0	app	of		punct.a	+
42.0	app	lf	sc	comb.sub	+
43.0	inf	lx		np.s	?
44.0	acc	lf	morph	dr.s	+

CHANGE #	ANALYSIS OF CHANGE				
	READING PROCESS	WRITING PRODUCT			QUALIF
45.0	lev	of		punct.s	+
46.0	app	lf	lls	prep.s	+
47.0	app	lf	morph	vi.s	+
48.0	app	lx		np.s	+
49.0	inf	lx		np.s	+
50.0	app	lx		np.s	+
51.0	coh	co		dadv.a	i
52.0	app	lf	csf	cls.s	i
53.0	app	of		punct.a	+
54.0	coh	co		cls.a	c
55.0	acc	lf	lls	conj.d	c
56.0	app	lx		verb.s	+
57.0	is	lf	ord	word.r	+
58.0	app	lx		np.s	+
59.0	inf	co		premod.a	u
60.0	inf	lx		np.s	+
61.0	inf	co		postmod.d	c
62.0	com	co		sadv.a	?
63.0	is	lf	ord	word.r	-
64.0	app	lf	lls	det.s	+
65.0	inf	co		opdet.d	+
66.0	acc	lf	lls	prep.d	+
67.0	lev	of		ind.s	+
68.0	coh	co		sadv.a	u
69.0	acc	lf	lls	det.d	+
70.0	coh	lf	csf	pro.s	+
71.0	app	of		punct.a	+
72.0	app	lx		np.s	?
73.0	inf	co		dadv.a	+
74.0	inf	co		postmod.a	+
75.0	app	of		punct.a	+
76.0	app	lf	lls	prep.s	+
77.0	app	lx		np.s	-
78.0	inf	co		postmod.d	-

CHANGE # / PARICIP.	ANALYSIS OF CHANGE			
	READING PROCESS	WRITING PRODUCT		QUALIF
CIDA				
1.0	acc	lf	lls det.a	n
2.0	acc	lf	lls det.a	n
3.0	acc	lf	morph vi.s	n
4.0	app	of	punct.a	n
5.0	app	of	o.s	n
6.0	app	lf	ord word.r	n
7.0	acc	lf	morph oi.s	n
8.0	app	lf	lls det.s	n
9.0	acc	lf	morph vi.s	n
10.0	coh	lf	csf pro.s	n
11.0	inf	co	cls.d	n
12.0	coh	co	sadv.a	n
13.0	app	lf	lls det.s	n
DONY				
1.0	app	lx	verb.s	n
2.0	app	lx	mod.s	n
3.0	is	lf	ord cls.r	n
4.0	acc	lf	lls prep.s	n
5.0	inf	co	postmod.d	n
6.0	acc	lf	lls det.a	n
7.0	acc	lf	morph oi.s	n
8.0	app	lf	morph dr.s	n
9.0	acc	lf	morph ni.s	n
10.0	coh	co	cls.a	n
11.0	coh	lf	csf pro.s	n
12.0	lev	lf	ord word.r	n
13.0	acc	lf	lls det.d	n
14.0	app	lf	morph vi.s	n
15.0	acc	of	spell.s	n
16.0	app	lf	lls conj.s	n
17.0	app	lx	verb.s	n
ELISA				
1.0	coh	lf	morph vi.s	n
2.0	acc	lf	lls prep.s	n
3.0	app	lx	np.s	n
GUSTAVO				
1.0	acc	lf	lls prep.s	n
2.0	acc	lf	morph vi.s	n
3.0	app	lx	verb.s	n

CHANGE # / PARICIP.	ANALYSIS OF CHANGE				
	READING PROCESS	WRITING PRODUCT			QUALIF
4.0	acc	lf	lls	prep.a	n
5.0	acc	lf	lls	prep.d	n
HENRIQUE					
1.0	acc	of		o.s	n
2.0	acc	lf	morph	vi.s	n
3.0	acc	lf	morph	oi.s	n
4.0	acc	lf	lls	prep.s	n
5.0	coh	co		dadv.a	n
SILVIA					
1.0	acc	lf	morph	oi.s	n
2.0	acc	lf	lls	prep.s	n
3.0	coh	of		spell.s	n
THELMA					
1.0	app	lf	ord	word.r	n
2.0	coh	co		postmod.a	n
3.0	app	lf	morph	vi.s	n
4.0	coh	lf	csf	pro.s	n
5.0	app	lf	lls	prep.s	n
6.0	app	lf	lls	det.s	n
7.0	acc	lf	lls	det.a	n
8.0	coh	lf	csf	cls.s	n
9.0	acc	lf	lls	det.a	n
10.0	acc	lf	lls	prep.s	n
11.0	acc	of		spell.s	n
WILSON					
1.0	app	lf	morph	oi.s	n
2.0	acc	lf	morph	dr.s	n
3.0	acc	lf	morph	dr.s	n
4.0	acc	lf	lls	det.a	n
5.0	acc	lf	ord	word.r	n
6.0	app	lx		verb.s	n
7.0	coh	co		sadv.a	n
8.0	acc	lf	lls	prep.s	n

APPENDIX VII

CODING OF CHANGES ACCORDING TO WHETHER OR NOT THEY WERE TREATMENT-SPECIFIC

CHANGE #	TYPE OF CHANGE
1.0	other
2.0	treatment
3.0	other
4.0	other
5.0	treatment
6.0	other
7.0	other
8.0	treatment
9.0	treatment
9.1	other
10.0	treatment
11.0	other
12.0	other
13.0	other
14.0	other
15.0	treatment
16.0	other
17.0	other
18.0	other
19.0	treatment
20.0	other
21.0	treatment
22.0	other
23.0	treatment
24.0	treatment
24.1	other
24.2	treatment
25.0	treatment
25.1	other
25.2	treatment
25.3	treatment
26.0	other
27.0	treatment
28.0	other
29.0	other

CHANGE #	TYPE OF CHANGE
1.0	other
2.0	other
3.0	treatment
4.0	other
5.0	treatment
6.0	treatment
7.0	treatment
8.0	treatment
9.0	other
10.0	other
11.0	other
12.0	other
13.0	other
14.0	treatment
15.0	treatment
16.0	other
17.0	other
18.0	treatment
18.1	other
18.2	other
19.0	other
20.0	treatment
21.0	treatment
22.0	treatment
23.0	treatment
24.0	other
25.0	other
26.0	other
27.0	other
28.0	other
28.1	treatment
29.0	other
30.0	other
31.0	other
32.0	other
33.0	other
34.0	treatment
35.0	other
36.0	treatment
36.1	treatment
36.2	treatment
36.3	other
36.4	other
37.0	other
38.0	treatment
39.0	other
40.0	other
41.0	other
42.0	other
43.0	treatment

CHANGE #	TYPE OF CHANGE
44.0	treatment
45.0	other
46.0	other
47.0	treatment
48.0	other
49.0	treatment
50.0	other

CHANGE #	TYPE OF CHANGE
1.0	treatment
2.0	treatment
2.1	other
2.2	other
2.3	other
3.0	treatment
4.0	other
5.0	other
6.0	other
7.0	other
8.0	other
9.0	other
10.0	treatment
11.0	treatment
12.0	treatment
13.0	treatment
14.0	other
15.0	treatment
16.0	other
17.0	treatment
17.1	other
18.0	other
19.0	other
20.0	other
21.0	other
22.0	other
23.0	treatment
24.0	other
25.0	treatment
26.0	treatment
27.0	other
28.0	treatment
29.0	treatment
30.0	other
31.0	other
32.0	other
33.0	treatment
34.0	treatment
35.0	other
36.0	other
37.0	treatment
38.0	treatment
39.0	other

CHANGE #	TYPE OF CHANGE
1.0	treatment
2.0	treatment
3.0	treatment
4.0	other
5.0	treatment
6.0	other
7.0	other
8.0	treatment
9.0	other
10.0	treatment
11.0	treatment
12.0	treatment
13.0	treatment
14.0	treatment
15.0	treatment
16.0	treatment
17.0	treatment
18.0	treatment
19.0	other
20.0	other
21.0	treatment
22.0	treatment
23.0	other
24.0	other
25.0	treatment
26.0	treatment
27.0	other
28.0	treatment
29.0	other
30.0	other
31.0	treatment
32.0	other
33.0	other
34.0	treatment
35.0	treatment
36.0	treatment
37.0	treatment
38.0	treatment
39.0	treatment
40.0	treatment
41.0	treatment

CHANGE #	TYPE OF CHANGE
1.0	other
2.0	treatment
3.0	treatment
4.0	treatment
5.0	treatment
6.0	other
7.0	treatment
8.0	treatment
9.0	treatment
10.0	treatment
11.0	other
12.0	treatment
13.0	other
14.0	treatment
15.0	treatment
16.0	treatment
17.0	treatment
18.0	treatment
19.0	treatment
19.1	other
20.0	other
21.0	treatment
22.0	other
23.0	other
24.0	treatment
25.0	treatment

CHANGE #	TYPE OF CHANGE
1.0	other
2.0	other
3.0	other
4.0	treatment
5.0	treatment
6.0	treatment
7.0	other
8.0	treatment
9.0	treatment
10.0	treatment
11.0	other
12.0	treatment
13.0	other
13.1	treatment
14.0	treatment
15.0	other
16.0	other
17.0	other
18.0	other
19.0	treatment
19.1	other
20.0	treatment
20.1	other
21.0	treatment
22.0	other
23.0	other
24.0	other
25.0	treatment
26.0	treatment
26.1	treatment
26.2	treatment
26.3	other
26.4	treatment
26.5	other
26.6	other
26.7	treatment
27.0	other
27.1	treatment
27.2	other
27.3	treatment
27.4	treatment
28.0	treatment
28.1	treatment
29.0	other
30.0	other
31.0	other
32.0	treatment
33.0	other
34.0	other
35.0	other

CHANGE #	TYPE OF CHANGE
36.0	other
37.0	treatment
37.1	other
37.2	other
38.0	other
39.0	treatment
40.0	treatment
41.0	other
42.0	other
43.0	other
44.0	treatment
45.0	other
46.0	other
47.0	treatment

CHANGE #	TYPE OF CHANGE
1.0	other
2.0	other
3.0	other
4.0	treatment
5.0	other
6.0	other
6.1	other
6.2	other
6.3	other
7.0	treatment
8.0	treatment
9.0	other
10.0	treatment
11.0	treatment
12.0	treatment
13.0	other
14.0	other
15.0	other
16.0	treatment
17.0	treatment
18.0	treatment
19.0	other
20.0	treatment
21.0	treatment
21.1	treatment
21.2	treatment
22.0	treatment
23.0	treatment
23.1	treatment
23.2	other
23.3	treatment
24.0	treatment
25.0	other
26.0	other
27.0	other
28.0	other
29.0	treatment
30.0	other
31.0	treatment
32.0	other
33.0	treatment
34.0	other
35.0	treatment
36.0	treatment
37.0	other
38.0	treatment
39.0	treatment
40.0	treatment
41.0	other
42.0	other

CHANGE #	TYPE OF CHANGE
43.0	treatment
44.0	other
45.0	treatment
46.0	other
47.0	treatment
47.1	other
47.2	treatment
48.0	treatment
49.0	other
50.0	treatment
50.1	treatment
50.2	other
51.0	other
52.0	treatment
53.0	other
54.0	treatment
54.1	treatment
54.2	other
54.3	other
54.4	other
54.5	treatment
55.0	other
56.0	other
57.0	treatment
57.1	other
58.0	other
59.0	other
60.0	other
61.0	other
62.0	other
63.0	treatment

CHANGE #	TYPE OF CHANGE
1.0	other
2.0	other
3.0	other
4.0	treatment
5.0	treatment
6.0	other
7.0	treatment
8.0	other
9.0	other
10.0	other
11.0	other
12.0	treatment
13.0	treatment
14.0	treatment
14.1	other
14.2	other
15.0	treatment
16.0	treatment
17.0	treatment
18.0	other
19.0	other
20.0	other
21.0	treatment
22.0	treatment
22.1	other
22.2	other
22.3	other
23.0	other
24.0	treatment
25.0	other
26.0	other
27.0	other
28.0	other
29.0	other
30.0	treatment
31.0	other
32.0	other
33.0	treatment
34.0	treatment
35.0	treatment
35.1	other
36.0	other
37.0	treatment
38.0	other
39.0	treatment
40.0	treatment
41.0	treatment
42.0	treatment
43.0	other
44.0	other

CHANGE #	TYPE OF CHANGE
45.0	other
46.0	other
47.0	other
48.0	other
49.0	other
50.0	other
51.0	treatment
52.0	other
53.0	treatment
54.0	treatment
55.0	other
56.0	other
57.0	treatment
58.0	treatment
59.0	other
60.0	other
61.0	other
62.0	treatment
63.0	treatment
64.0	treatment
65.0	other
66.0	other
67.0	other
68.0	treatment
69.0	other
70.0	treatment
71.0	treatment
72.0	other
73.0	other
74.0	other
75.0	treatment
76.0	other
77.0	other
78.0	other

CHANGE # / PARICIP.	TYPE OF CHANGE
CIDA	
1.0	other
2.0	other
3.0	other
4.0	treatment
5.0	other
6.0	other
7.0	other
8.0	treatment
9.0	other
10.0	treatment
11.0	other
12.0	treatment
13.0	other
DONY	
1.0	other
2.0	other
3.0	treatment
4.0	other
5.0	other
6.0	other
7.0	other
8.0	other
9.0	other
10.0	treatment
11.0	treatment
12.0	other
13.0	other
14.0	other
15.0	other
16.0	other
17.0	other
ELISA	
1.0	other
2.0	other
3.0	treatment
GUSTAVO	
1.0	other
2.0	other
3.0	other

CHANGE # / PARICIP.	TYPE OF CHANGE
4.0	other
5.0	other
HENRIQUE	
1.0	other
2.0	other
3.0	other
4.0	other
5.0	treatment
SILVIA	
1.0	other
2.0	other
3.0	other
THELMA	
1.0	treatment
2.0	other
3.0	other
4.0	treatment
5.0	other
6.0	other
7.0	other
8.0	other
9.0	other
10.0	other
11.0	other
WILSON	
1.0	other
2.0	other
3.0	other
4.0	other
5.0	other
6.0	other
7.0	treatment
8.0	other