Language, Beliefs and Concepts

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LANGUAGE, BELIEFS AND CONCEPTS

Jens Allwood

What is the best method of investigating underlying assumptions regarding natural resources in our own society" A first step towards a deeper understanding could be to make an empirical study of some of the ways in which individuals or groups express their attitudes linguistically. What beliefs, attitudes and concepts are expressed by individuals in interviews or in written documents? Can one find hidden perhaps subconscious assumptions behind what is said? How do such assumptions influence beliefs, conceptual systems and ways of thinking?

The approach taken in this part of our project could be characterized as a study of how people think and talk about nature and natural resources. Due to the aims of the project the study is interdisciplinary and is an attempt to confront linguistic, philosophical, psychological and more socially orientated theories about thinking and argumentation with approaches towards nature and natural resources as developed in the natural sciences. In what follows will be outlined some of the ways in which a study of language and language use gives us access to the views the members of a particular society have about nature, energy and natural resources.

I. Studies of beliefs and conceptual fields codified in language

Natural language is for various reasons a good point of departure for an investigation of the beliefs which are prevalent in a culture. It is through language that beliefs are usually expressed and communicated. In order to serve these purposes flexible language must in each culture be adapted to the beliefs dominant in that culture. One consequence of this is that the vocabulary and morphology of language will often codify concepts and beliefs important and useful in the culture connected with that language. Language will in a sense act as a storage for those concepts and views which have been important in the historical development of the particular culture. This is sometimes expressed in a slightly exaggerated form by saying that a language codifies the world view of a certain culture. However beliefs are also stored linguistically in a more direct manner, e.g. in writing, in which form they are available to a historian or an anthropologist who is interested in patterns of thought from earlier periods or other cultures. Drawing on the two types of linguistic codification which have been mentioned above I now want to discuss two ways of approaching people's beliefs about nature and natural resources via language.

1. A study of certain significant terms in different linguistic contexts

The first method is a variant of the method of studying a chosen set of texts from a certain period and place in order to get a picture of the prevalent beliefs, concerning, for example, natural resources. First a number of significant terms such as *nature, energy, raw material, resource, metal, earth, squander, save, efficient, scarcity, create, environment, technology* are chosen. Then their use in a large number of linguistic contexts is studied. A convenient way of doing this sort of study, on present day linguistic material, is to study a so-called concordance, i.e. a list of keywords in alphabetical order where each word is given with some surrounding text ("keyword in context"), usually 5-7 words before and after the keyword.

For example, if one studies the word *nature* in a concordance of Swedish newspaper texts from 1965 and 1976, one finds that it can be connected with the uses outlined below. I will include not only the noun *nature* itself but also inflections such as *nature's,* derivations such as *natural* and certain compounds.

A. Nature as totality, reality

In this use of *nature,* it signifies the totality that everything is part of, i.e. reality. We find examples of the following type in the concordance (the examples are translated from Swedish):

1. Man constitutes one of *nature's* mistakes.
2. *Nature's* accidental combination of homo and sapiens.
3. But everyone is not equally well equipped by *nature.*
4. The cultural environment is the *nature* known to man.
5. … inhuman is the same as against *nature.*

Man is here seen as a part of nature. Even human culture can be seen as a part of a natural whole. A somewhat more limited view of nature can be found in (6) below where *nature* seems to be limited to a totality which is nonspiritual and noncultural. Man is still part of this whole but only as a biological and physical being.

6. law of *nature,* force of *nature, natural* science. *natural* decomposition process.

B. Nature as that Part of the Environment which is Unaffected by Man

Nature is here used in a more limited sense than the above to exclude those parts of the environment which are influenced by man. This usage could thus contradict the above use of *nature* as the whole of reality.

7. *Nature* and cities in Denmark.
8. For both children and adults real *nature is* a lot more exciting (than an arranged environment).
9. The author pits man against *nature* as two gigantic forces.
10. What is *nature* and what is culture?
11. *Natural* environment, *natural* fauna, *nature* reserves.

Nature is here contrasted with man and human culture. Man is no longer a part of nature.

Nature can also be used to convey an impression that something is uninfluenced by man when in actual fact it has been influenced.

12. Now we must extend our *nature* trails.
13. If this gigantic project had not been undertaken the *natural* road to Gustavsberg would already have been built.

The use of *nature* in (12) and (13) is almost opposite to that in (8) and we get the impression that man can create nature. It could perhaps mirror a view of psychological and social processes as independent of human action. One "naturalizes" social life. Compare also 14-16 below.

14. Federal representatives in the board as a *natural* development.
15. *Natural* division of labor.
16. The peasant has a *natural* fear of socialism.

C. Nature as the Nonartificial

A use of *nature* which is close to the one mentioned in B is the one where *nature is* used about something which has developed without human intervention.

17. *Natural* gas, *natural* fertilizer, *natural* color, *natural* skating rink, *natural* rubber, *natural* water source, product of *nature, natural* medicine.

Also products of human culture can be designated thus, e.g. *natural language* which refers to languages which have developed among people without being explicitly invented. In this way, contrast is achieved to languages such as Esperanto or neo and logical, mathematical calculi or computer languages. An interesting combination of *natural* and *size* we find in (18).

18. … a calendar with a picture of a blonde in almost *natural* size dressed in only a fire helmet.

The similarity in size of the figure on the picture to a size which develops independently of direct human control justifies the use of *natural.* Further, it also points to man as a part of nature dependent on natural processes which give him a certain size.

Non artificial nature also exists in man in society and can there come into conflict with what is social which is then seen as something artificial. The examples (19)-(24) illustrate this view.

19. … interaction was characterized by a *natural* appetite for life.
20. …. a categorization which prevents *natural* contacts between people.
21. The journalists today are afraid of Stenmark's straight and *natural* answers to their trivial questions.

22. Laugh *naturally* on stage.
23. *natural* symptoms of old age, *natural* patterns of movement, *natural* need for eroticism.
24. *natural* reaction after weight lifting.

D. Nature as essence

Nature can also be used to signify the essential part of something, that which remains unaffected by the accidental.

25. The *nature* of a TV game, moral *nature,* cultural *nature,* economical *nature,* his own *nature,* her biological *nature.*
26. It is in the *nature* of the thing.
27. Christer has a meek *nature.*
28. One obstacle is human *nature.*

We see that what is *nature* in the sense of essential kernel does not need to be independent of man nor does it need to be nonartificial, as in the *nature* of painting. Here again there is a potential conflict between different meanings of *nature.*

E. Nature as harmony, and as lack of disturbance and strain

In the next set of examples *nature* is used to signify phenomena which are characterized by lack of disturbance and strain or are clear and harmonious.

29. One remembers the *natural* authority with which he appeared.
30. The chronicle and the essay have become his *natural* means of expression.
31. He is very *natural* in his interaction with journalists.
32. Music is included as a *natural* part.
33. … difficult to find *naturally* exclusive fields of employment.
34. The lines are simple and *naturally* follow each other.
35. An experience I want to convey in a way which is *natural* for me, i.e. with music.
36. You cannot describe your hand *naturally.*

What is here natural is what is clear, comprehensible and even systematic, properties which sometimes but not always are characteristic of what is essential to some phenomenon.

F. Nature as that which is expected, explicable or evident.

The step from *nature* as something harmonious to *nature* as something explicable is not far.

37. *Natural* question, *natural* explanation, *natural* thought, *natural* candidates, *natural* point of coordination.
38. It is *natural* for the fund to be represented on the board.
39. It ought to be *natural* to apply for aid early.
40 . . . *naturally* wrote down his experiences in French since he came directly from Russia to Paris.

Perhaps nature when it can be seen as explicable also becomes comprehensible and predictable. If it becomes totally predictable it becomes evident. The use of the adverb *naturally* shows this. One wants to regard natural processes as comprehensible and often also to regard what is comprehensible as natural.

To summarize we can see that the word *nature* (or Swedish *natur)* (in isolated, inflected, derived or compound form in material from Swedish press 1965, 1976, and to some extent also in Swedish and English in general, as the case of translation of Swedish examples to English seems to indicate, has at least the following uses:

(1) Totality, reality
(2) Part of the environment which is unaffected by man
(3) The non-artificial
(4) Essence
(5) Harmony, lack of disturbance and strain
(6) The expected, explicable or evident.

There is a tendency for the adjective *natural* and the adverb *naturally* to take on meanings (3), (5) and (6) and for the noun *nature* to take on meanings (1), (2) and (4). But as can be seen by going back to study the examples the tendency is not completely carried through, e.g. *natural science* seems to involve meaning (1).

Generally, it seems to hold that the word has a very strong positive evaluation. What is natural seems to combine what is beautiful, right and real under one hat. But the different meanings are also in a certain conflict with each other, a factor which probably does not contribute to mutual understanding in the debate on natural resources.

There are two reasons for making a study of the type exemplified. On the one hand such a study can have a heuristic purpose. It can help us to discover a part of the range of concepts, values and beliefs which in our own culture are tied to the linguistic form *nature.* On the other hand a study of this type can be used as evidence of how common certain hypothetical views on nature are.

2. The semantic field of natural resources

Another way of using linguistic material in order to capture some of the characteristic traits in our beliefs about natural resources is to study what we could call *the semantic field of natural resources.*

By a semantic field one usually means the way in which the vocabulary of a language structures a certain area of reality. To some extent this happens in different ways in different languages. For example, in English the words *pig* and *pork, calf* and *veal, sheep* and *mutton, deer* and *venison,* all refer separately to an animal and the meat of that animal. In Swedish there are only separate words for *pig* and *pork,* i.e. *gris* and *fläsk* while in other cases the distinction is made by use of the word *kött* (meat), i.e. *fårkött, kalvkött* (sheep + meat, calf + meat) etc.

Thus, a study of a semantic field can show what conceptual distinctions have had a great enough practical importance in a particular culture to be codified by simple and special words in the vocabulary of its language. Sometimes . the reasons for codification or lack of codification are fairly obvious: the Aztec language, for example, has only one word for snow, ice and cold, while Lappish in its vocabulary distinguishes seven different types of snow. Sometimes the reasons are less obvious, as in the case above with separate words for the animal and for the meat of the animal and can then give rise to reflections as to why the vocabulary has become structured in just that way.

Through reflection over a semantic field it becomes possible some of the more or less explicit background assumptions made in a culture. What is stored in language does not need to be argued for, but can be taken for granted. A study of semantic fields can therefore be a useful addition to a study of more explicitly formulated views.

Let us illustrate this with an example. Why do the following expressions exist in English for phenomena that are connected with earth: dust, rock, cliff, sand, chalk, clay, mote, grain.

Earth, ash, dirt, in, coast, gravel, fecund, fertile, land, soil, ground, crust, mountain terrain, territory, sky, planet, heavenly body, water, world, tellus, terra firma, globus, foundation, property, real estate, field, meadow, heath, turf, marsh, pit, bog, steppe, tundra.

One way to answer this question is to try to isolate the conceptual dimensions that seem to constitute the field. If we compare words like *rock, earth, sand, gravel, mote, grain, dust* we see that there is a dimension of particle size. If we, instead compare words such as *earth, clay, soil, marsh, pit, bog* we see that there is a dimension of wetness. When enough dimensions have been isolated by abstraction, questions can be raised as to why just these dimensions have been important and why the boundaries have been drawn in a particular way within a certain dimension.

What has been said so far about the relationship of the vocabulary to a certain culture also holds true within a society. All the various subcultures of a society have their own vocabularies. A shoemaker has a more subtle conceptual structure and vocabulary for phenomena like heels and soles than members of social groups that have no reason to occupy themselves with shoes.

More generally one can say that language helps the different social groups within a society to pursue certain activities and to store certain knowledge. This in turn has the effect of increasing group solidarity. But it also has the effect that the segregation of a certain group from other groups increases. That is to say, language strengthens homogenous and concerted action within a group, while simultaneously increasing what has to be learned by somebody who wishes to enter the group.

One way of approaching the beliefs about nature and natural resources among a certain group of individuals will therefore be to study the vocabulary of the language used by that group. This will give us a picture of those phenomena related to natural resources that have

been sufficiently important to be codified in the language of the group. Examples of this type of investigation can be found in Miller & Johnson-Laird (1976), Osgood et al (1975) and Berlin & Kay (1969). The results of such investigations can then be compared for different languages, cultures and historical periods and areas of vocabulary of the following type can be investigated:

A. Words for perceptual phenomena: It is well known that languages vary greatly, for example, in their color vocabulary. But also within other perceptual modalities such as smell or touch there are similar variations.

B. Cultural classification of plants and animals: The classificatory systems that exist within different cultures vary considerably. We need only consider our own earlier classification of whales as fish to see that classifications have changed also within our own culture.

C. Cultural classification of types of metal and earth. A study of text books in physics and chemistry from earlier periods in our own culture can give us an indication of how our own systems of classification have changed. A study of the vocabulary in different languages for more abstract concepts like "matter" and "energy" would also be revealing.

D. There are furthermore a large number of words which are connected with religious and ethical beliefs about how we should take care of our resources. For example, in many cultures there are taboos connected with words for food. Such words are often felt to be invested with power and are used in oaths and swearing.

Finally, a few words about linguistic differences other than differences in vocabulary. As far as syntactical differences go, e.g. order of words, no such differences seem to correlate in any obvious way with cultural differences in beliefs or conceptual systems. However, such a correlation can to some extent be established for inflection and derivation in morphology. E.g. certain languages (Navaho) seem to regularly codify the geometrical shape of an object through endings on the nouns designating these objects, while most Indo-European languages originally seem to have had a nominal classification based on sex (masculine, feminine and neuter).

II. More direct studies of beliefs and argumentation

One of the problems which are brought up when one investigates how a conceptual field is codified in a particular language is the question of how great the individual variation is between the different individuals who belong to the culture. A prerequisite to answering the question is a picture of what the conceptual system of single individuals is like. However, this is no easy task. It has for long occupied philosophers, psychologists, sociologists, linguists and information scientists but no generally accepted theoretical model has been developed. Some of the problems that we have to deal with are the following:

(1) How does one best investigate people's beliefs empirically?
(2) How does one best describe a person's system of beliefs (especially if it includes vagueness and inconsistency)? For example, is it important to distinguish between values, attitudes and concepts?
(3) What is the character of the relationship between a person's beliefs and a particular social situation?
(4) Should the model also incorporate an analysis of the relationship between belief and action? For example, prejudice does not always lead to discriminatory behavior.

When it comes to a choice of empirical method there are a set of alternatives which all involve certain problems. If a survey is used it can be directed at such groups of people as children, women, people in different occupations, decision makers and members of political groups, or the environmental movement. The advantage of such a survey is that one obtains representative and quantifiable data. The drawback is that it gives a superficial picture of what is being investigated. Since our interest is directed toward a relatively deep analysis, this is a significant drawback.

An alternative to the survey is some form of in-depth interview. The advantage here is that one can penetrate deeper and leave the interviewer more freedom. The drawback is that the results are not so easily quantifiable and that one has to neglect the question of representativity, in order not to be overburdened with data. A further problem with the in-depth interview is that it can become a learning opportunity both for the interviewer and the interviewee. We might remember how Plato lets Socrates through the maieutical method demonstrate that the slave boy Meno knows Euclidean geometry.

One possible solution to the last problem is to study how people use concepts in problems of different types, e.g. sorting, matrix or memory tasks or to measure how accessible concepts are, through tachistoscopical exposure.

Yet another way is to study conversations, discussions and debates about natural resources. These can be arranged or sought out more naturalistically (see more below).

Finally, there remains direct observation of how concepts are manifested linguistically and non-linguistically. As far as language is concerned, we have already discussed a number of possible methods, but for non-lingustic behavior there is hardly any alternative to direct observation in the field. Some form of participant observation could be appropriate here.

As for the next problem - the problem of how best to describe an individual's beliefs - there is no self evident way of going about this either. The choice of method of description will, however, depend on what type of empirical investigation is chosen.

I take as my starting point in what follows that the available data has been collected by that method which seems to be most difficult to analyze, i.e. through in-depth interviews, where after the interviews the data would be in the form of tape recordings or notes.

A first description of a system of beliefs can then be made by quite simply summarizing those opinions expressed during the interview. Then the system of beliefs can be more systematically described by means of trying to clarify which conceptual relations it presupposes. Relations of interest are *hyponom ' v* and *hyperonomy* (i.e. relations based on class inclusion; thus daschhound is a hyponym, and *animal* a hyperonym, of *dog),* various *ordering relations (is* uranium a more important, better, more dangerous, nicer resource than oxygen), *opposites,* and *synonyms, (degrees of preciseness and specification* in concept dealing with how one concept is distinguished from another and with what things are counted as special instances of a specific concept?) and *logical consequence (if* nature = reality *then* pollution is part of what belongs to nature).

Questions directly aimed at mapping out these and other similar relations can be incorporated in an interview but should in that case be preceded by an unstructured initial phase, where only questions of the type *what do you think about X,* perhaps followed by *why* questions, appear.

By systematically describing beliefs in this manner they become more perspicuous and internal comparisons between different attitude systems are facilitated. An analysis of the type mentioned also gives a picture of a person's intentional depth, cf. Naess 1966. A person's intentional depth with respect to one or several concepts can in fact be said to be just the way in which those concept(s) are embedded in the person's total system of beliefs. As criteria of such embedding can be used, for example, how well a person can make a concept precise and specific and what logical consequences of the beliefs, he is aware of.

An interesting problem which appears when an individual's awareness of logical connections is investigated, is the question of whether there are any contradictions amongst his attitudes. A very considerable difficulty here is that not everything that appears to be a contradiction is one. There are at least two reasons for this: (1) People use words in very different ways. By using the word *nature* in different ways at the same time it is easy to generate apparent contradictions. (2) People do not specify their opinions. If A says to B: *that picture is beautiful* and B denies this, then A and B do not necessarily hold contradictory opinions. It may in fact later become clear that A was thinking only of the choice of color while B was thinking of completely different aspects of the picture.

Therefore, unless there is strong evidence against this, one should in a description of a system of beliefs take it as a general rule that people are consistent and that if contradiction should appear, they have been using one word in several different ways or that they have not specified their opinions sufficiently.

Alongside the cognitive structure within a system of beliefs, an individual's norms and more emotional attitudes should also be described. This is most easily done by means of a description. If we then add certain overriding goals to this system, then we give the system of beliefs, values and concepts the structure which an ideology usually has, and we can describe an individual's ideology regarding natural resources.

As far as the two last problems are concerned - the relationship between beliefs and situation and the relationship between attitudes and action - there are here important and unsolved theoretical problems which perhaps the proposed studies could throw light on. The question of how consistent a person's attitudes are from situation to situation can probably best be studied by observing one person in a large number of situations. In order to make a contribution towards answering the question one should therefore add a description of the interview situation and its influence to the description of the system of attitudes.

As regards the last question about the relationship between attitude and action, in this case too it can probably best be answered by studying the correlation between an individual's attitudes and actions. Perhaps here our study could make a more direct contribution by examining people involved in the environmental movement who have changed their life style. What part have their attitudes and beliefs played in this change?

Based on the above discussion about some of the difficulties involved in empirical studies of beliefs, I will now sketch below four possible methods of more directly studying people's attitudes.

1. Beliefs about natural resources held by certain individuals in selected groups

The first method involves in-depth interviews with people about their views on the environment and natural resources. In spite of the difficulties discussed above, there are many reasons for attempting this approach.

It seems to be the most reasonable way of getting a good and exhaustive picture of a person's beliefs. (2) There seem to be a number of different ways to control the effect the interview has on the interviewee. For example, the interview can proceed in stages where the interviewer's degree of control and interference is increased gradually. (3) By choosing, among others, people from the environmental movement we will attempt to cooperate with researchers who have contact with, through participant observation, a substantial number of persons in, what in Sweden is referred to as, the "Green Wave". These persons are also interesting as opinion setters. However, people from other categories, e.g. school children, people from different occupations or decision makers are also being interviewed.

The questions asked and the analysis of the interview after it has been made are all directed towards the type of cognitive structures which have been discussed above. But we will also pay attention to conceptual problems and dimensions which have to do with our special field of enquiry - natural resources.

These problems and dimensions can be discovered, for example, by studies of concordances and semantic fields in the way illustrated above, but they can also be discovered through investigations in the history of ideas or anthropology. Below some of the dimensions and problems which are brought up when reflecting on the concept of nature are given:

(1) Is reality totally or partly nature - e.g. is only that part of reality which is uninfluenced by man, nature?
(2) Is man wholly, partly or not at all part of nature - e.g. are only the biological parts of man natural?
(3) Is nature and its resources finite or infinite - do things run out?
(4) Is nature an ally or an enemy?
(5) Is nature there to be enjoyed or to be exploited - an object for aesthetical enjoyment or a storage of raw materials?
(6) Does nature need to be protected and cared for or do we need to protect ourselves against nature?
(7) Do we need to be frugal and economical with regard to natural resources?
(8) Should we be respectful and perhaps even fearful of nature?
(9) Is nature fundamentally mystical or is it comprehensible - problematic or unproblematic?
(10) Is nature Divine or is the Divine natural?
(11) Is nature partly or totally social?
(12) Can social life best be understood as a part of nature?
(13) Is nature unchangeable and static or is it changeable and dynamic?
(14) Can nature be destroyed or is it self-healing?
(15) Ought man to change and manipulate nature or should he adapt to it as much as possible?
(16) Is nature useful and useable or is it useless?
(17) Is nature governed by laws and principles or is it wild and unpredictable?

Focussing on fundamental problems and dimensions like the ones in (1)-(17) will have an important connecting role in our project. The questions are such that they can simultaneously be given an anthropological and historical analysis and a more here and now orientated analysis based on linguistic material.

2. Models of systems of belief - can we create consistent systems of thought about nature and natural resources

If one looks at the list of questions (1)-(17) it is obvious that the answers to certain questions naturally can be connected with the answers to other questions. For example, it seems easier to combine the belief that natural resources are finite with the belief that we ought to economize on them than it is to combine the idea that resources are infinite with the need for frugality. In the same way, it seems easier to combine the idea of nature as an ally with the belief that one should protect and take care of nature than it is to combine the idea of nature as a foe with the belief in care and protection.

A third example would be that it is easier to regard nature as a foe if it is something which is external to man than if you see man as part of nature.

In the examples discussed the term *easier* rather than *necessary* has been chosen, since at least in these examples there is no logical contradiction involved in combining the ideas in a way which is the opposite to the one I have described. This gives rise to the following question - what possible consistent systems of beliefs regarding nature and natural

resources are there if one tries to answer all of the 17 questions posed above. What is it that makes certain combinations of views more compatible than others? What assumptions must one make if one chooses to combine beliefs which seem incompatible? Problems of the type illustrated by questions (1)-(17) can be found not only by studying keywords in context or semantic fields but also by mapping out the systems of beliefs of different individuals through in-depth interviews.

As an aid in constructing a model of what beliefs can be combined, traditional logical formalism can be used. Such formalism is useful in that it forces us to adopt a level of precision which makes it easier to determine whether a system of beliefs really is consistent.

Computer simulation provides another possible aid. Using a computer, it is possible to construct very complex systems of beliefs, values and goals. Cf. Power (1977) and Faught (1977). The computer can then itself be used to check if the system constructed is consistent.

If one wants interaction with the computer through use of natural language, one can let the system of beliefs be included in a so-called question answering system, i.e . the computer is programmed in such a fashion that it can answer questions. One could also program the computer not only to answer questions but also to draw inferences and propose different types of action. Thus, a system of this type provides an opportunity to simulate how a particular individual on the basis of a certain system of concepts, beliefs and norms will react to information about a lack or a surplus of energy and raw material. One can let a particular set of norms act as a filter on the information that is received, so that only information which is in accordance with these norms is stored. In this way, different theories about cognitive balance and dissonance can be tested. One could also simulate types of action during a certain historical period on the basis of what we know about the typical norms and beliefs of that period.

3. Natural resources - misunderstandings and forms of argumentation

Applying what we have already said about the ambiguous use of the term *nature* in both speech and writing it seems reasonable to look more directly at debates and discussions about natural resources.

From an empirical point of view this has certain advantages since both direct observation and experimental observation can be used. Thus, we are analyzing some of the TV-debates between politicians prior to the recent Swedish referendum on the use of nuclear energy. When it comes to more arranged, experimental observation the debate is very interesting since it absorbs the consciousness and attention of people to the extent that they forget that they are observed. It is advantageous if the discussions and debates can be combined with in-depth interviews with the participants in the debates. This makes it possible to study on the one hand how people express their beliefs and on the other hand, how their beliefs are affected by debates and discussions - forms of speech interaction which are different from the interview. Finally one can analyze, in more detail, how people

misunderstand each other because of their own beliefs or because they are not able to linguistically express their beliefs.

In the analysis of data such as these, techniques of argumentation analysis can be used, e.g. exposure of *hidden premises* and analysis of *presuppositions.* An example of the first technique is provided by considering whether (41) below is a logically tenable argument.

(41) A: Alfonso is Italian.
B: Then he eats spaghetti.

Since it is rather obvious that the argument is not logically tenable, we can ask what would be required to make B's conclusion follow logically from A's utterance. The easiest way to achieve this is to add a sentence like (42) as a premise to the argument.

(42) All Italians cat spaghetti.

(42) can, thus, be made to function as a hidden premise in the argument, thereby making it valid. The method I have called *exposure of hidden premises can* therefore be described as follows: Observe an argument and cheek if it is logically valid. If it is not, try to find out what would be required in order to make it valid. The additional assumptions that have to be made, are called *implicit premises.* The reasonableness of an argument can then be judged by judging how reasonable are the additional assumptions one has been forced to make.

An example of the other technique - *analysis of presuppositions* - is provided by reflecting on the meaning of sentence (43) below.

(43) Our iron resources are considerable.

Let us now pose the following question: What must be assumed or presupposed in order to find out what really is claimed by (43)? One of the things that are presupposed is what we can call a universe of comparison. As soon as a statement includes an adjective such as *considerable* that can be compared, something to compare with is presupposed. Things are not just big but they are always big in comparison to something else. Thus, we do not really know what is being claimed by (43) before we know what objects of comparison are being presupposed. To engage in presupposition analysis is, thus, to expose underlying assumptions which are necessary in order to understand what statement or claim is being made by a particular utterance. In exactly the same way as we need to expose the implicit premises of an argument, we need to expose the presuppositions of the statements in the argument in order to be able to judge their reasonableness.

Both of the techniques which have been discussed have in common that they through analysis enable us to expose more fundamental attitudes which are presupposed by an argument. A procedure of this type becomes especially interesting if the results it leads to can be compared with the results given by in-depth interviews with the persons who are involved in the argument. That is, it enables us to investigate the relationship between intended and expressed belief on the one hand and on the other hand to study how

misunderstandings and pseudoagreement arise between persons debating who through an interview have shown that they either have very different or very similar views. Such studies can be varied by letting informants not merely discuss but also solve different problems together.

4. Change in and influence of beliefs about natural resources

Some of the most fundamental questions concerning how beliefs of different types are communicated and adopted in a particular society are the following: Who speaks to whom about what? What groups in a society (i) have information about energy and raw materials and (ii) decide which resources should be treated and how, and (iii) carry out the treatment.

Once the groups relevant for these three functions have been established we can further ask: with what other groups do individuals from these groups interact and communicate about natural resources. For example, do the three groups talk to each other internally? To what extent do the same persons belong to all three groups? To what extent is membership in these three groups connected with membership in other groups, e.g. of a religious, political or scientific character?

What is the nature of linguistic communication in these contacts? What vocabulary is used? What sort of conversational style is used - formal or informal? Are there institutionalized forms for communication - does it occur through lectures, seminars, meetings, rituals or ceremonies? What groups of individuals have access to such institutionalized types of communication?

One could also focus on content. What specific aspects of problems concerning natural resources are discussed? What things are seen as relevant for these problems? What are seen as valid and important arguments? Here a connection can be established with the methods of studying debate and argumentation we have mentioned earlier in order to expose how influence and change of belief concerning natural resources are carried out in our society.

How access to different types of communicative situation is distributed among the members of a society to a large extent determines how beliefs and norms are spread and changed in a particular society. It also determines what beliefs and norms will influence important decisions in the society. The factors that decide *who talks to whom about what* are, thus, of interest. Among such factors it is probable that traditional social categories such as sex. education, occupation, regional background, age and income will be important. Especially interesting in order to study change of belief is the age factor. As an alternative to a longitudinal study over time of how an individual's beliefs change, one can make a cross-sectional study of several individuals in different age groups at one and the same time. The differences we find between the different age groups could then give a picture of changes in progress within a particular society.

A study in the sociology of communication in the way sketched here would supplement the earlier suggested studies by more directly investigating which groups within a society have the greatest influence on resources of energy and raw materials and give us some

insight into how beliefs about natural resources are created, transmitted and finally result in action. A further aim is to connect the factors which are important in the sociology of communication with what we know about the role of different forms of production for social development (i.e. the base and superstructure problem).

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Appendix

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