

AN ANATOMY OF HUMAN MENTAL LIFE

An anatomy of human mental life
Psychology in unideological reconstruction

incorporating
The synapse-state theory of mental life

Peter Naur

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Preface

The background and justification of this book are presented in the Introduction. It was worked out from 2003 October to 2004 August. Initially my plan was to present merely a detailed critical reconstruction of the subject matter. Unexpectedly, during this reconstruction, in 2003 November, I discovered the synapse-state theory of mental life, as presented in sections 4.4 and 4.5.

In conformity with the general tenor of the presentation, I have chosen the form of expression and typography, including punctuation, exclusively from a concern that what I want to say may emerge with the highest clarity, without any concern for conventional notions of politeness or principles of style.

References to the list of Literature at the end of the book are given in a form shown by this example: (James, 1890).

I am indebted to Jesper Hermann for the suggestions to use the *Oxford Encyclopedia of Psychology* and *The Penguin Dictionary of Psychology* as descriptions of present-day psychology, and for steady encouragement to the writing. I wish to express my gratitude to Erik Frøkjær for his constant and unfailing help and encouragement to my work on the book and to my grandson Jacob Naur for his enthusiastic response to it.

Peter Naur, Gentofte, Denmark, 2004 September 20

1. Introduction

The anatomy of human mental life presented in this book is the result of an unideological reconstruction of psychology. Such a reconstruction has become necessary as a consequence of what shall here be called the ideological decay of psychology in the Twentieth Century. By the ideological decay of psychology is here understood that decisive insight into human thinking, as it had been established at the beginning of the century, in the course of the century has been pushed aside, forgotten, and replaced by fallacious ideological notions. This decay is described in sections 2 and 3.

Denoting the reconstruction *unideological* is meant to signify that it is a matter of *description* of the relevant phenomena. In more detail the reconstruction is a matter of establishing a set of descriptive locutions for the subject of psychology, to wit, human thought activity.

The reconstruction presented implies a rejection of a large part of what nowadays is taught as well-established psychology, particularly in academic contexts. The reconstruction implies that the field of psychology today finds itself in an extraordinary and untenable situation. It goes without saying that this claim for its justification will require an unusual approach. As explanation of the approach that has been chosen, something shall be said about the impulses that have led to it.

Important impulses go back to my activity as astronomer during the years 1943 to 58. In this activity I had occasion to follow the debate that under the flag of theory of knowledge was concerned with what can be considered sound natural science, and also such issues as the debate between Einstein and Bohr about the understanding of quantum physics. In this context my attention was particularly attracted by an article by Bertrand Russell: 'On the Notion of Cause' (Russell, 1912). In this article Russell argues in detail that the talk of 'cause' in relation to a highly developed branch of natural science of which I had knowledge at first hand, namely gravitational astronomy, is a swamp of fallacies. These fallacies are entirely matters of what is said by philosophers. Ever since antiquity, philosophers have claimed that science is a matter of finding causes. Russell showed that what is said in a standard philosophical dictionary about *cause* is confused and contradictory. He then showed that what the gravitational astronomers are concerned with is nothing that may be called causes, but are *descriptions* of the motions of the heavenly bodies. Russell concluded his introduction thus:

In the following paper I wish, first, to maintain that the word 'cause' is so inextricably bound up with misleading associations as to make its complete extrusion from the philosophical vocabulary desirable; ... The law of causality, I believe, like much that passes muster among philosophers, is a relic of a bygone age, surviving, like the monarchy, only because it is erroneously supposed to do no harm.

From this impulse there was in 1957 just a step to considering the talk of causal description in quantum mechanics, in particular Niels Bohr's concern about what he called 'the renunciation of a causal mode of description of atomic processes' (Bohr, 1949). Bohr's manner of expression here made it clear to me that Russell's analysis was unknown to Bohr, which I confirmed through a direct question to him about it.

These impulses had a deep influence on my understanding of several important issues having relation to my scientific work in astronomy:

1) Science and scholarship are matters of description, not of any philosophical 'logic' or 'truth'.

2) Philosophers' talk of science and scholarship is merely an expression of pretentious ignorance and is harmful to the understanding of scientific and scholarly activities.

3) Philosophical fallacies, for example about causes, tend to be repeated unimpededly for thousands of years.

4) Philosophical fallacies are tied to the use of certain particular terms, such as for example 'cause'.

Other impulses came from my activity in computing, particularly after 1959. Here I was confronted at close hand with claims about human thinking, under the designation 'artificial intelligence'. These claims in the first instance were made by certain people in computing without background in psychology, who claimed that before long they would have constructed something they called an 'intelligent machine'. In a second round this psychological incompetence was taken over by the psychologists under the banner 'the cognitive revolution'. Here we see the deaf eagerly accepting insight about the colors from the blind.

In this context I had the occasion to study and review a series of relevant new works that are concerned with thinking (see Naur, 1985a, 1988a, 1989a, 1993b, 1995a). In this reviewing I found not a single work that talks competently about human thinking. More specifically I found that classical psychology, as presented in William James's *Principles of Psychology* (James, 1890) was practically unknown. Those few authors who referred to this work spoke about it in terms of the highest regard, but revealed themselves upon closer examination to be ignorant of most of James's insight. This was the case for example of Bertrand Russell (1921, 1945) and I. K. Moustgaard (1981). In this way I saw confirmed time after time that James's work, in spite of its status as a classic, is unknown or only quite poorly understood.

At the same time my work in computing constantly confronted me with problems that have the way people think and perceive as important aspects. This aspect is so prominent in my works that when in 1992 I had the opportunity to publish a selection of 60 of them from the years 1951 to 1990 in book form I choose the title: *Computing: A Human Activity* (Naur, 1992). Among the works in this collection that as a main theme has human thinking and linguistic activity may be mentioned: *The Place of Programming in a World of Problems, Tools and People* (1965), *Programming Languages, Natural Languages, and Mathematics* (1975), *Programming As Theory Building* (1985b), *Intuition in Software Development* (1985c), *Thinking and Turing's Test* (1986), *Programming Languages Are Not Languages* (1988b), *Human Knowing, Language, and Discrete Structures* (1988c), *The Place of Strictly Defined Notation in Human Insight* (1989b), *Causes and Human Expectations and*

Intents (1989c), *Computing and the So-called Foundations of the So-called Sciences* (1990). This line in my works has been continued in *Understanding Turing's Universal Machine—Personal Style in Program Description* (Naur, 1993a), *Datalogi som videnskab* (Naur, 1995b, reprinted in Appendix 2 as *Computing as Science*), and *CHI and Human Thinking* (Naur, 2000, reprinted in Appendix 1).

James's *Principles of Psychology* (James, 1890) by its purely descriptive approach to the human thought activity confirmed my understanding of science and scholarship as description, and additionally presented a clarification of the question of knowing which reveals the emptiness of the philosophical talk of logic, *Erkenntniss*, knowledge, and theory of knowledge. The results of my considerations of these issues I presented in a book *Knowing and the Mystique of Logic and Rules* (Naur, 1995c). Here the first part presents a detailed justification of using James's *Principles of Psychology* as the main basis of the description of mental activity. The second part discusses and questions the importance of rules in mental activity. The third part treats the relation between data processing and mental activity. The fourth part brings an extensive discussion of the understanding of coherent description as the core of science and scholarship in any field.

In my next work I aimed at a broad clarification of what I shall call the harmful influence of philosophical fallacies on the understanding of human thinking. This clarification I presented in *Antifilosofisk Leksikon: Tænkning - Sproglighed - Videnskabelighed* (Naur, 1999), in which a series of locutions that have usually been applied to human thinking are confronted with pronouncements by prominent philosophical authors. The constructive result of this clarification is a psychology which has been purged of philosophical distortions, presented in the form of 38 descriptive terms for mental activity, including *habit*, *the stream of thought*, *association*, and *acquainting*. Later I published an English version of the book under the title *Antiphilosophical Dictionary: Thinking - Speech - Science/Scholarship* (Naur, 2001).

In the same vein I joined Erik Frøkjær in an investigation of the importance of philosophical locutions in scientific and scholarly work, through direct inquiries to active scientists and scholars. The result of the investigation is available in the paper *Philosophical Locutions in Scientific and Scholarly Activity* (Naur and Frøkjær, 2000, reprinted in Appendix 3).

This sets the scene of the present work, which presents an *extendeddescription of mental life, an anatomy*, purged of ideological (philosophical) fallacies (prepared in a preliminary version in Danish, Naur, 2002). For clarity such a description has to be explained by its contrast to the prevailing situation of psychology, in particular what I shall call the ideological decay of psychology in the twentieth century and its outcome: the American-psychology-enterprise.

As documentation of the prevailing situation of psychology I have used mostly *Encyclopedia of Psychology (EncPsych)*, Oxford University Press, 2000. 51 articles in the *EncPsych*, by 63 authors, are examined in detail. This examination fully confirms the ideological decay of psychology. In fact, every one of these articles is found to be marred by fallacies, mostly ideological.

Unexpectedly the work on the description led in November 2003 to the development of the synapse-state theory of mental life, presented in sections 4.4 and 4.5 (Naur, 2004).

To the main argumentation is added a detailed argument that William James's *Principles* must be considered a supreme scientific contribution of mankind, which justifies that the reconstruction presented builds directly upon James's work. In its greatness James's work is comparable only to Newton's *Principia*. However, unlike Newton's work, that of William James is unknown by present day scientists, evidenced by that fact that everything said about the contents of his *Principles* in the *EncPsych* is misleading or false.

The pronouncements by present day psychologist quoted from the *EncPsych* will be identified by their keyword in bold type, e.g. **PSYCHOLOGY**, followed within brackets by volume and page numbers and the name of the author.

2. The ideological decay of psychology

The three articles **PSYCHOLOGY: Nineteenth Century Through Freud** [*EncPsych* 6, 394-403, Thomas H. Leahey], **PSYCHOLOGY: Early Twentieth Century** [*EncPsych* 6, 403-410, Jill Morawski], and **PSYCHOLOGY: Post-World War II** [*EncPsych* 6, 410-416, Joseph F. Rychlak and Andrea Struckman], by what they say, what they distort, and what they omit, in a concentrated form present the ideological decay of psychology. This is directly evident from the fact that the development of psychology during the nineteenth and twentieth centuries is described in the articles, not as a continued elaborating description of the relevant phenomena and development of better forms of description for them, but as a controversy between ideologies, as discussed in detail below.

The word *ideology* will here be used to designate a set of normative evaluations of the way some relevant matters have to be described, in analogy with the use of the word to designate a set of normative evaluations of the way society should be described. A central ideological issue in this context is what the word 'psychology' is or should be used to designate.

Put in another way the ideological decay of psychology in the nineteenth and twentieth centuries consists therein that the psychologists, instead of concerning themselves with describing the phenomena of mental life have put forward and have been in conflict about ideological views, such as empiricism, functionalism, behaviorism, and cognitivism.

The ideological orientation in the articles prevails, not only in the subjects discussed, but in the way the articles are formulated, in the domination of references to ideologies, such as idealism, positivism, empiricism, and materialism, rather than to specific pronouncements about mental life by named authors.

As another prevailing feature of the three articles, they distort what William James says in his *The Principles of Psychology* (1890), or ignore it. As will be made clear in the following discussion, distortion and ignorance of William James's work is a central feature of the ideological decay of psychology.

2.1 The spurious ‘science’-issue

Thomas H. Leahey’s article *PSYCHOLOGY: Nineteenth Century Through Freud*, [EncPsych 6, 394-403], presents the ideological orientation right from the first sentence: ‘Psychology became a science in the nineteenth century.’. Talking about something ‘becoming a science’ is pure ideology. There is only ideology to tell how being ‘a science’ is different from being ‘a field of study and description’.

The article by Leahey continues as follows:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... Subject Matter. What does psychology study? The Cartesian paradigm gave one answer: Psychology is the study of consciousness, and the first psychologists defined psychology as the *science* of consciousness. They claimed a fixed subject matter, consciousness, and a unique method, introspection, for examining it. However, no science of human nature could completely avoid studying what people do.

This raises a host of questions. Who are ‘the first psychologists’? How does one recognize them? How can one know that somebody who studies something he calls psychology, is studying what is here called the *science* psychology? Is Herbert Spencer one of the first psychologists referred to? He published *The Principles of Psychology* in 1855. Is Alexander Bain one of them? He published *Mental and Moral Science: A Compendium of Psychology and Ethics* in 1868. Is William James one of them? James says in *The Principles of Psychology* (James, 1890):

PSYCHOLOGY is the Science of Mental Life, both of its phenomena and their conditions. The phenomena are such things as we call feelings, desires, cognitions, reasonings, decisions, and the like; (vol. 1 p. 1) ... PSYCHOLOGY IS A NATURAL SCIENCE. That is, the mind which the psychologist studies is the mind of distinct individuals inhabiting definite portions of a real space and of a real time. With any other sort of mind, absolute Intelligence, Mind unattached to a particular body, or Mind not subject to the course of time, the psychologist as such has nothing to do. (vol. 1 p. 183) ... THE METHOD OF INVESTIGATION - *Introspective Observation is what we have to rely on first and foremost and always.* The word introspection need hardly be defined—it means, of course, the looking into our own minds and reporting what we there discover. *Every one agrees that we there discover states of consciousness* (vol. 1 p. 185).

These pronouncements do not indicate consciousness as the fixed subject matter of what James is dealing with. James’s subject matter is ‘Mental Life, both its phenomena and their conditions’. Discovering *states of consciousness* does not claim consciousness as ‘a fixed subject matter’; it implies nothing about what the word *consciousness* might denote, or that it denotes anything. Neither do the pronouncements proclaim introspection to be a ‘unique method’ to be applied, but only ‘what we have to rely on first and foremost’.

Leahey’s words about ‘avoid studying what people do’ make no sense in relation to James’s book. James’s Chapter IV titled *Habit* in its second sentence says:

2.1 The spurious 'science'-issue

'In wild animals, the usual round of daily behavior seems a necessity implanted at birth; in animals domesticated, and especially in man, it seems, to a great extent, to be the result of education.'

In addition to Chapter IV his Chapters XXIII titled *The Production of Movement* and XXIV titled *Instinct* are mostly concerned with people's behavior.

In summary of the passage from Leahey quoted: by using such phrases as 'psychology as a science' and the word 'consciousness' as though they had clear, significant meanings, the passage gives an illusion that it presents a clear picture of some works of the nineteenth century. In reality the passage reveals ignorance and misunderstanding of some important matters presented in James's *Principles*. In its sly manner the passage is typical of ideological misguidance.

The next section in Leahey's article talks about a number of questions raised from several sides challenging what is called 'psychology's status as a science'. As will be indicated below it holds that every one of these questions has been discussed and answered by William James in his *Principles*. Leahey writes:

'PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... A Science and Its Methods ... Could psychology, especially defined as the study of consciousness, be a science at all? If so, what sort of science should it be and what methods should it use? These questions were debated throughout the nineteenth century. Some thinkers, especially the post-Kantian German idealist and the founder of positivism, Auguste Comte (1798-1857) expressed serious doubt about whether there could be a science of mind and consciousness at all. ... Comte proposed a hierarchy of sciences from which psychology was pointedly excluded. ... The soul (*psuche*) did not exist, Comte held, so there could be no science (*logos*) of it. ... Comte's ideas were later refined by the logical positivists, whose philosophy of science provided arguments for redefining psychology as the science of publicly observable behavior.'

Comte's views were discussed and dismissed by James in his Vol. 1 p. 188-90. Leahey writes further:

'PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... A Science and Its Methods ... Idealists doubted that conscious experience, the *empirical ego*, could be quantitatively measured. Experience might be qualitatively described, but without numerical measurement in more than one dimension, there could be no mental equivalent of Newton's mathematical laws, and thus no science of the mind.'

This is pure ideology, an expression of presumptuous ignorance of what is called 'Newton's mathematical laws' and their significance. There is no difference in principle between qualitative and quantitative forms of description. Forms of description are infinitely varied. The so-called laws of nature are descriptions. To impose a ban on particular forms is merely ideology. James presents an elaborate description of the empirical ego in his Chapter X, The Consciousness of Self, vol. 1, p. 291-401, summarized in section 5.2 below.

Leahey writes:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... A Science and Its Methods ... the impossibility of studying the self, the transcendental ego.’

What ‘the transcendental ego’ denotes only an ideologist can tell. James discusses the transcendental theory on pages 360-370 of his chapter X, The Consciousness of Self. On page 370 he concludes: ‘To sum up, then, my own opinion of the transcendentalist school, it is (whatever ulterior metaphysical truth it may divine) a school in which psychology at least has naught to learn, and whose deliverances about the Ego in particular in no wise oblige us to revise our own formulation of the Stream of Thought.’

Leahey writes:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... A Science and Its Methods ... they agreed that if psychology was going to be a science it should aspire to discover the laws governing mind and behavior. The model for psychology was physics ... the historian Wilhelm Dilthey (1833-1911) said that there was not one kind of science but two: *Naturwissenschaft* for whom the model was physics, aiming at laws, prediction, and control; and *Geisteswissenschaft* ... was modelled after history.’

The claims and distinctions made here are merely ideology. All the fields of ‘*wissenschaft*’ are concerned with study and description. What distinguishes a particular field is what is studied and described. The so-called laws of physics are descriptions of a certain form. William James in his *Principles* presents descriptions in the form of laws in many places, e.g. in his Chapter XIV, Association, and his Chapter XVII, Sensation.

Leahey writes further:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... A Science and Its Methods ... one of the most profound and difficult issues facing the scientific explanation of human mind and behavior ... Natural science deals with causes of events, but human action involves reasons and motives that are not physical causes. ... Motives and reasons are related to human moral (social) life, not to our physical lives, and therefore it was (and is) unclear how they should be treated by natural science.’

This is entirely spurious. Natural science does not deal with causes of events. The claim that it does is merely philosophical (ideological) nonsense. This was made clear by William James in his chapter XXVIII (vol. 2, p. 671) where he says: ‘Take for example the principle that “nothing can happen without a cause.” We have no definite idea of what we mean by a cause, or of what causality consists in. ... The word ‘cause’ is, in short, an altar to an unknown god; an empty pedestal still marking the place of a hoped-for statue.’

2.1 The spurious 'science'-issue

As mentioned in the Introduction the falsity of the particular claim that natural sciences deal with causes was established by Bertrand Russell (1912). The matter has been further discussed in (Naur, 2001b).

There is no unclarity about how 'motives and reasons' should be treated in a field of study and description. They should, of course, be studied and described, just like any other relevant issue. William James presents some concrete examples in his chapter XXII, Reasoning.

2.2 Philosophical confusions

The next section in Leahey's article starts to discuss such issues as:

'PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... Empiricism and Idealism ... idealists and empiricists waged a battle over the *nature of mind and reality*, empiricists subordinated *the subjective to the objective*, and idealists subordinated *the objective to the subjective*, ... There were empiricists ... who agreed with the idealists that the only *knowable reality* was the *world of ideas*, The key distinction here is the split between empiricists who viewed the *mind* as relatively passive and idealists who saw it as active.'

In these pronouncements the words italicized here do not denote anything specific in the context of the study and description of mental life. Moreover, the article refers to attitudes as held, not by named authors in definite writings, but by abstract personalities called empiricists and idealists. For these reasons these pronouncements in the article are irrelevant to the study and description of mental life. In the article they are said to be 'battles over metaphysics', which perhaps is meant to say the same thing.

Exceptionally Leahey's article refers to the work of William James by name. Here the article is totally misleading and reveals ignorance of the most important contributions in James's *Principles*. The article introduces James's name in an aside: 'There were empiricists, such as William James in his radical empiricism ...'. In this way James is claimed to agree with the following text: 'Both groups [empiricists and idealists] accepted the general picture of the Cartesian theatre ... Empiricists identified mind with consciousness and depicted consciousness as a surface onto which ideas were directly projected by sensory processes in the brain. ... Ideas containing more than one distinct sensation were thought of as compounds made up of many atomic sensory units ...'

Claiming William James's work in psychology to agree with these descriptions of mental life is totally senseless. The claim reveals that Leahey argues from a profound misunderstanding of the very core of James's description of the mental life. James in his *Principles* from 1890 emphatically rejected the Cartesian theatre, as the very first issue in his description of the stream of thought/feeling (vol. 1 p. 224, the first paragraph). In James's description there is no spectator of a Cartesian theatre. As James writes: '*The first fact for us, then, as psychologists, is that thinking of some sort goes on.*' This insight is one of James's most important contributions. It is the starting point of his whole

description of the stream of thought/feeling. (The matter has been discussed in (Naur, 2001b) which also mentions that the same point was taken up 60 years later in (Ryle 1949)).

Again the notion of ‘compounds made up of many atomic sensory units’ is emphatically rejected by James. After a lengthy discussion he concludes on page 236 of Chapter IX, The Stream of Thought: ‘A *permanently existing ‘idea’ or ‘Vorstellung’ which makes its appearance before the footlights of consciousness at periodic intervals, is as mythological an entity as the Jack of Spades’*. In vol. 1, on p. 553, he confirms: ‘But the whole historic doctrine of psychological association is tainted with one huge error—that of the construction of our thoughts out of the compounding of themselves together of immutable and incessantly recurring “simple ideas”.’ Accordingly James describes the contents of the stream of thought/feeling as mental objects that are complicated wholes.

Leahey’s article continues:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... Empiricism and Idealism ... In empiricists’ hands, psychology, defined as the science of consciousness, became a kind of mental chemistry. ... This kind of psychology was a tendency in all early psychology laboratories ... Its purest expression was in Edward Bradford Titchener’s (1867-1927) structural psychology.’

By this statement James’s *Principles* was rejected by or unknown to those who are here called empiricists.

Leahey’s article continues to present such issues as:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... Empiricism and Idealism ... Idealists followed Kant in refusing to identify *mind* with *consciousness*. ... *Consciousness* was not a mirror of *the world outside*. ... *The transcendental ego* imposed *necessary and universal categories of understanding* on perceptions, constructing *reality as we know it*. ... saying the *self posited the outside world into existence*. ... The philosophy of idealism had important implications for psychology as the study of consciousness. The most important concerned the scope of *scientific psychology* and the *existence and nature of will*. By setting the *transcendentalego* outside the possibility of experience, it implied that *thought* and other *higher mental processes* perforce eluded *scientific study*.’

What relevance these metaphysical issues may have to the study and description of mental life is as uncertain as are the issues themselves. In any case, every one of them is brushed aside as false or irrelevant by James’s *Principles*. The final claim ‘that *thought* and other *higher mental processes* perforce eluded *scientific study*’ is contradicted by the fact that James in his *Principles* presents a description that is clearly the result of *scientific study*.

Leahey’s article continues to talk of

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... Empiricism and Idealism ... The German founder of psychology, Wilhelm Wundt (1832-1920).’

2.2 Philosophical confusions

What is to be understood by ‘psychology’ in this context, and what Wundt was founder of, is unclear, however. Wundt’s early work on quantitative experiments in psychology is described at length by James in many places of his *Principles*. Wundt’s later work on *Völkerpsychologie* is said by Leahey to be concerned with ‘thought and most other higher mental processes through their expression in language, myth, and culture’. Such issues are only a peripheral part of the study and description of mental life. James deals with some of them in his Chapter XXI, The Perception of Reality, and incidentally in many other places of his book.

Leahey’s section on **Empiricism and Idealism** concludes on p. 396 with a series of statements that are phrased entirely in ideological terms and thus elude discussion:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... Empiricism and Idealism ... idealism soon vanished from psychology psychology proceeded as a *comprehensive science* on the model of physics Wundt’s rivals, who emphasized experimentation and a thoroughgoing *naturalism* *idealist influences* persist ... in the *cognitive psychology* of perception and memory ... in the movements of *contextualism* and *constructivism* *Cognitive psychologists* ... do say that the *world as we experience and remember it* is shaped by an *active mind* *Contextualists and constructivists* ... insist that all *knowledge* is *socially constructed*.’

The next section in Leahey’s article presents the controversies of such ghostly figures as ‘most psychologists’, ‘materialists’, ‘dualists’, ‘psychologists in the empiricist camp’, ‘idealists’, ‘old psychologists’, ‘new psychologists’, and ‘most behaviorists in the twentieth century’. They discuss such philosophically ideological issues as:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... Mind or Matter? ... In severing the *mind* from the *world*, René Descartes severed the *mind* from the *body*. the role and even *existence of mind* became problematic ... Are there *other minds*? ... **How are Mind and Body related? ... Do minds exist? ...** ... the care of the *soul*, which for them [the old psychologists] was the proper mission of psychology suggested that we, too, are *soulless machines*’ one seems forced to conclude that *we are machines having no control over our behavior*. Purpose (flexibly pursuing a goal when faced with obstacles) seemed, like David Hume’s vanishing self, to be an *illusion in need of explanation*. It remains unclear how *matter generates consciousness*. ... **Are there Other Minds Than Mine? ...** How do I know if other beings *have minds*?’.

In these pronouncements the words italicised here do not denote anything specific in the context of the study and description of mental life, and so none of these issues are relevant to that study and description.

Leahey claims that

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Central Controversies ... Mind or Matter? ... A chess-playing computer program has a purpose (winning) and generates possible moves from among which it chooses the most promising. Seeing humans as machines—as cognitive science does today—is not inconsistent with seeing them as having goals and exercising choice’.

This is nonsense, typical of the kind coming out of the ideological decay of psychology, in this case related to misconceptions about how computers operate and have to be programmed. Any purpose and choice related to a chess-playing computer program resides with the programmer who designs the program. The purpose of winning is formulated by the programmer as the overall operational structure of the program. The choice of the most promising move must be formulated by the programmer as certain particular instructions in the program the computer is made to execute. Thus it is the task of the programmer to make the choices of the most promising move for any situation that may arise in the game and to formulate all these choices as instructions, already before the program is put to any use. Thus, since the programmer is not put under any time restraint when making these choices, the human chess player is under a handicap when playing against a chess-playing program.

Leahey’s claims in these sections rest on the assumption that there is something called philosophy which is generally important. As found in the investigation reported in Appendix 3 this assumption has no empirical ground whatever.

2.3 Confusions of methods and measurements

The next section in Leahey’s article is titled **Innovations**. Here the ideological bias appears in the manner the matters are described. This appears right from the start:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Innovations - Innovations of the nineteenth century transformed philosophical psychology into scientific psychology’.

The talk here of ‘philosophical psychology’ and ‘scientific psychology’ is pure ideology.

The following subsection in Leahey’s article opens with another piece of ideology:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Innovations ... Neuroscience ... thinkers had proposed speculative theories of how mental processes were linked to the brain and nervous system.’

This assumes an ideology that imposes a form of description such that it makes sense to say that ‘mental processes’ are ‘linked to’ other things. It excludes a description that would make an entire living organism the subject of description and say that mental processes as well as brain and nervous system are properties of that organism. The synapse-state theory of mental life proposed in sections 4.4 and 4.5 is a description of precisely this form.

2.3 Confusions of methods and measurements

The following account of the work of F. J. Gall is entirely confused by being expressed in terms of phrases that only make sense within a particular ideology : ‘a mistaken method’ and ‘mental faculties’. The phrase ‘Gall was the first behavioral psychologist, inspecting brain and behavior instead of introspecting consciousness’ implies the claim that psychologists who are not here classed as ‘behavioral’ did not inspect brain and behavior. This claim is erroneous. As a matter of fact, the Chapters II, III, and IV, in James’s *Principles* are entirely about brain and behavior, and include a discussion of Gall’s work.

The basic flaw of the endeavor of Gall and his phrenologist followers was not a matter of ‘a mistaken method’, but that this endeavor rests on a claim that a person’s behavior may be derived from a certain particular set of elements, so-called ‘mental faculties’ or ‘mental abilities’, that describe the person, such as ‘the tendency to commit murder’ and ‘the ability to be a musician’, and that the phrenologists proceeded on the basis of this claim without ever making a sound empirical verification of its validity.

This flawed character of the phrenologists’s procedure, the lack of empirical verification of the claims adopted, is typical of several other techniques that build on claims about human mental life, that have been haunting the Western World, particularly America, until this day.

The ideological bias in Leahey’s account of the work of the phrenologists is partly put right in his following account of the discoveries of Broca, Fritsch, and Hitzig. It makes sense to say that ‘Fritsch and Hitzig discovered centers that controlled specific movements of the dog’s limbs.’ However, describing Broca’s discovery in terms of ‘loss of a specific mental ability, language’ is ideological misguidance. ‘Language’ does not designate anything specific. What Broca actually observed in his patients was a loss of the specific ability to make the speech organs produce articulated speech.

Leahey concludes his section on Neuroscience with an account of what he calls ‘a general picture of the brain and nervous system’, called ‘the reflex theory of the brain’. As conclusion he says that ‘The reflex theory, often allied to empiricism and associationism, constrained psychological theory for a century. An example is James’s famous theory of emotions ...’. This is one way of stating what I shall call the ideological decay of psychology. The core of this decay is that James’s *Principles*, which when newly published, around 1900, was recognized as a classic of psychology, is pushed aside, misunderstood and misquoted.

Leahey’s next section opens as follows:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Innovations ... Methods. Following the scientific revolution, being a natural scientist meant quantitatively measuring one’s subject matter, and ideally, performing experiments.’

This whole phrase is merely ideology, of the most foolishly philosophical, misleading kind. ‘Methods’ implies the claim that scientific activity is a matter of applying or acting according to something given that may be called methods. This is false; there is nothing in common to the way in which successful scientists have proceeded when accomplishing their achievements, nothing that may be called ‘scientific method’, as discussed in (Naur 1995c).

‘The scientific revolution’ implies that there has been an event at a definite time in the past when the manner of proceeding in pursuing scientific matters underwent a permanent change. This is historically false. The successful, revolutionary change in the manner of describing matter in motion accomplished by Galileo and Newton followed as a result of rejecting the Aristotelian ideology of motion. But this immediately resulted in the adoption of Newtonian mechanics as a new ideology.

‘Quantitatively measuring’ has been applied to phenomena in physics and astronomy for thousands of years. It has no special relation to the Galilean-Newtonian revolution in describing matter in motion.

Later in Leahey’s article we read:

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Innovations Methods Following Descartes, philosophers had introspected their minds, but never settled such seemingly straightforward questions as how many ideas consciousness held at a single time. Led by Wundt, scientific psychologists saw that the failure of philosophical or armchair introspection lay in its lack of methodical control.’

This displays the absurdity resulting from the ideology of ‘quantitatively measuring’. By this ideology the psychologist will count ‘how many ideas consciousness held at a single time’ without even hesitating to ask whether it makes sense to talk of ‘consciousness’ as a container of something, and ‘ideas’ as separate items that may be held.

The talk of ‘the failure of philosophical or armchair introspection’ in this context is another piece of absurd ideology. It follows a statement that ‘Psychophysical scaling, like mental chronometry, was a staple in the early laboratories and remains in use today, for example in measuring pain’, but pain is there to be measured only as one result of the patient’s introspection. The talk of ‘failure of introspection’ is nonsense.

A further ill effect of the ideology of ‘quantitatively measuring’ is displayed in the following account of the work of Francis Galton. The account describes his introduction of tests of people. However, no mention is made of Galton’s discovery, published in 1880, that individuals differ very much in imagination. This discovery was initiated by empirical investigations, with no quantitative measuring at all, asking many people to decide by introspection whether they were able to imagine their breakfast table. This important discovery only makes sense when the introspective experience of the stream of consciousness is recognized. Therefore it had to be ignored by the ideologists who declared introspection to be inadmissible.

In Leahey’s final paragraphs of the subsection we learn that

‘PSYCHOLOGY: Nineteenth Century Through Freud ... Innovations Methods ... Galton was interested in the evolution of mental abilities, chiefly intelligence. ... Although Galton pioneered mental testing, his own tests proved to be of little value, and were replaced by sounder ones, such as Alfred Binet’s (1857-1911) test of intelligence. ...

2.3 Confusions of methods and measurements

Mental testing changed psychology. It broadened the scope of psychology to include topics such as intelligence and personality that lay outside introspective and experimental reach. ... Mental testing thus represented a step toward defining psychology as a science of behavior, the study of what people do, rather than what they experience.'

This is absurd, for several reasons. First, calling a certain testing procedure applied to people a 'test of intelligence' is merely verbiage. It contributes nothing to having the scope of the study and description of mental life include intelligence as a topic.

Second, as a matter of fact Binet's so-called 'test of intelligence' depends on reactions of the person tested in which the person gives expression to items that are only available to that person by introspection, and so, far from lying outside introspective reach, mental testing is entirely dependent upon introspective evidence.

Third, claiming 'what people do' to be an alternative to 'what they experience' is nonsense. What people do is part of what they experience. Behaviorism merely imposes an arbitrary restriction on what will be studied and described in a sound field of study and description of mental life.

2.4 Three 'psycho'-ideologies

Leahey's article continues with a section starting as follows:

'PSYCHOLOGY: Nineteenth Century Through Freud ... Founding Psychologies - Scientific psychology had three foundings. The first was the psychology of consciousness established by Wilhelm Wundt (1832-1920). The second was the psychology of adaptation, begun by popular writer Herbert Spencer (1820-1903), but given greatest voice by William James (1842-1910). The third was psychoanalysis, launched by Sigmund Freud (1856-1939).

This is a puzzling statement. What is meant by foundings?

What is actually reviewed in this section are three activities of the years 1880-1950, their common features being that each was pursued under considerable academic and public attention and was sailing under a designation having the syllable 'psycho' somewhere in it: 'psychology of consciousness', 'psychology of adaptation', and 'psychotherapy and psychoanalysis'. By the use of the syllable 'psycho' in three very special ways, each of the activities was a pursuit of an ideology.

The 'psychology of consciousness' pursued by Wundt was concerned with a restricted aspect of mental life and was committed to an ideology that insisted on describing it in terms of a Cartesian theatre, displaying 'ideas' held together by something called 'association', and investigating it experimentally.

The 'psychology of adaptation' was concerned with certain aspects of biological evolution.

'Psychotherapy and psychoanalysis' were concerned with therapies for insane people.

Presenting these three activities in a section starting '**Founding Psychologies.** Scientific psychology ...' is incomprehensible for several

reasons. First, none of the three activities was concerned with study and description of mental life. Second, only the first of the three activities was particularly concerned with quantitative measurements, said in the section about Methods above to be distinctive of 'the scientific revolution'. Third, it is said among many other things that 'Freud's dedication to scientific universality led him to formulate a universal law from a single case', a glaring instance of an unscientific approach. This is just one example of how the words 'science' and 'scientific' are used by Leahey in this text purely ideologically, as an invocation, without any specific descriptive meaning, and without any regard to the descriptive meaning the words might have been given when used by other authors.

Leahey further writes:

'PSYCHOLOGY: Nineteenth Century Through Freud ... Founding Psychologies ... Psychology of consciousness ... Wundt's theories were challenged by the Gestalt psychologists, who rejected the idea that consciousness is composed of associated ideas, and by the related act psychology of Franz Brentano (1838-1917), which focused on mental activity rather than conscious content. ... Oswald Külpe (1862-1915) tried ... to study thinking with experimental introspection.'

These statements imply a total ignorance or rejection of William James's contribution. In fact, each of the three issues was explicitly discussed and resolved in a context of a study and description of mental life in James's *Principles* from 1890.

When William James is mentioned by Leahey in this context, what is referred to is his interest in pragmatism dating from around the years 1900-1910. The presentation thus confirms that James's contribution from 1890 is entirely lost from sight of, or suppressed by, those, such as Thomas H. Leahey, who around year 2000 concern themselves with something they call psychology.

Further evidence of Leahey's ignorance of James's contribution follows:

'PSYCHOLOGY: Nineteenth Century Through Freud ... Founding Psychologies ... Psychology of Adaptation ... James himself remained a psychologist of consciousness. However, after James, consciousness gradually disappeared from psychology. Functionalism gradually turned into behaviorism, concerned with action rather than thought. The psychology of adaptation has proved itself adaptive, remaining the broad orientation of the vast majority of working psychologists.'

This is an eloquent evidence of the way ideology has taken over completely. Saying that 'James himself remained a psychologist of consciousness' is false. He never was one. Saying that 'consciousness gradually disappeared from psychology' is misleading. What happened was that some of those that call themselves psychologist adopted an ideology that puts a ban on talking about what people experience and feel, by James called the stream of consciousness. The phrase 'behaviorism, concerned with action rather than thought' implies the false claim that psychologists before the domination of behaviorism, such as James, were not concerned with action.

2.4 Three 'psycho'-ideologies

Leahey's article ends with a brief section titled **Toward the Twentieth Century**. This is a series of statements mostly expressed in terms of phrases that do not designate anything clearly and therefore are unworthy of serious attention: 'nineteenth-century psychology', 'the Freudian unconscious made manifest', 'psychologists offered worldviews to replace those that had failed', 'Gestalt psychology and its philosophical ally, phenomenology, proposed a new holistic analysis of consciousness', 'psychological ideas affected how people understood themselves, others, and their society', 'the foundation of a new, psychological society.'

The only clear statement in the section says: 'John B. Watson launched the movement of behaviorism, which would dominate twentieth-century American psychology.' This is another indication of the ideological decay of twentieth-century psychology.

2.5 Founding the American-psychology-enterprise

Jill Morawski's article, **PSYCHOLOGY: Early Twentieth Century** [*EncPsych* 6, 403-410], opens as follows:

PSYCHOLOGY: Early Twentieth Century - In the early 1900s American psychology was still a modestly sized enterprise, but it was in a propitious position to advance, for it had a rich cache of intellectual ideas about mental life from which to draw that had been developed in the previous century. In addition, the young profession had ample room to locate in the ongoing expansion of colleges and universities, and could make contact with an engaging public interested in things "psychological." Psychology did prosper in this climate. By the end of World War II the science had secured an influential place in American society and had created a host of subspecialties applicable to a myriad of intellectual and social problems. ...

The simultaneous growth in volume of work produced and the construction of theories and methods is not explicable in terms of crucial discoveries or the creation of an optimum theory of the human mind. Rather, psychology's bid to become a *bona fide* science and, hence, a legitimate and reliable instrument for assessing and regulating human life, required that the discipline attain a certain consensus among its practitioners over what counts as valid knowledge. Perhaps more important, the strong identification with scientific utility demanded that the discipline develop research techniques which could be used efficiently as well as effectively to calibrate and evaluate psychological phenomena. Consequently, psychologists strove to generate knowledge that was useful to the administration of life, both private and public. Any account of the viable theories, schools, and systems of early-twentieth-century psychology must attend to the numerous forces (both internal and external to the science) that fostered the maturation of only a few credible perspectives and methodologies.'

This passage expresses the ideological decay of psychology in a number of ways. First, the passage makes it clear that a dominating use of the word 'psychology' as used here is to designate primarily, not a field of study and description, but very differently something called American psychology, which is immediately said to be an 'enterprise' having a certain size. Five lines later it is denoted 'the young profession', again three lines later 'psychology', and two lines later 'the science'. In the next two paragraphs it is denoted, successively, 'psychology', 'a *bona fide* science', 'the discipline', and 'a scientific, academic psychology'. This switch between denotations is confusing and fraudulent. It implies a claim that the enterprise, whatever it is, is in some sense scientific. Any such claim is inherently false; being scientific is a property of a certain activity of creating descriptions and of the descriptions resulting therefrom, but neither of enterprises, nor of professions.

The same fraud is expressed in the phrase 'a *bona fide* science and, hence, a legitimate and reliable instrument for assessing and regulating human life'. No *bona fide* science (in the ordinary sense of a field of study and description) could be an 'instrument for assessing and regulating human life', assessing and regulating human life being a matter for moralists, not scientists.

The statement

'PSYCHOLOGY: Early Twentieth Century not explicable in terms of crucial discoveries or the creation of an optimum theory of the human mind. Rather, psychology's bid to become ... a legitimate ... instrument for assessing and regulating human life ... required that the discipline attain a certain consensus among its practitioners over what counts as valid knowledge.'

indicates that the practitioners of the American-psychology-enterprise are concerned over the enterprise being recognized as 'a legitimate ... instrument for assessing and regulating human life', grounding this legitimacy, not in the scientific validity of certain descriptions (theory), but on consensus among its practitioners. In other words, the practitioners of the enterprise effectively claim a privileged right in 'assessing and regulating human life'.

This is confirmed in the continued phrase:

'PSYCHOLOGY: Early Twentieth Century Perhaps more important, the strong identification with scientific utility demanded that the discipline develop research techniques which could be used efficiently as well as effectively to calibrate and evaluate psychological phenomena'.

This says effectively that the establishment of tests was needed so as to hide the fraudulent assumption of dictatorial rights of the practitioners of the American-psychology-enterprise in 'assessing and regulating human life' under a cloak of 'scientific utility'.

The American-psychology-enterprise has been very successful. The most amazing thing in this context is the way in which the American public at large has submitted to it for almost a century, longer than the Russians have submitted to Stalinism.

2.5 Founding the American-psychology-enterprise

The remainder of Morawski's article makes sense only as an account of how the practitioners of the American-psychology-enterprise managed to pull their fraud on the American public over the period 1910-50, written by someone who is herself part of the enterprise. One of the tricks was the ever repeated claim of the scientific validity of the enterprise. The significance of this trick is clearly recognized by Morawski:

'PSYCHOLOGY: Early Twentieth Century Psychology in Society - The two decades between 1890 and 1910 constituted a crucial time for the professional foundation of psychology. Americans were coming to recognize the value of science, notably its apparent utility in enhancing commercial productivity and health. Science, including psychology, ultimately was portrayed as a practical pursuit, and American psychologists adopted this utilitarian attitude.

The trick is pulled by Morawski herself in the article, by the ever recurrent hammering on the words 'science' and 'scientific': In **Ideas galore**: '... this pluralistic science', '... creating a scientific psychology', '... conception of scientific psychology', 'The scientific task of the psychologist ...', '... vision of psychological science', '... a natural science model of psychology', 'His conception of science ...', '... committed to establishing a scientific psychology ...', '... scientific psychology encompassed all features of mental life ...', '... in popular as well as scientific articles.', '... to place psychology among the natural sciences.', '... the ensuing constriction in scientific activities', '... American psychologists had a new understanding of the science ...', '... resumed their scientific investigations ...'. In **Psychology in Society**: '... a unique opportunity to demonstrate psychology's scientific efficacy.', '... psychologists' war involvement elevated the status of science in general and mental testing in particular', '... while psychology did not contribute significantly to the war effort, the science benefited tremendously from psychologists' involvement.' In **Methods of Inquiry**: '... were critical to the science's self-definition ...', '... positivism, a philosophy of science ...'. In **Schools and Systems**: '... consensus about psychology's status as a science ...', '... the commitment to a practical science'. In **Behaviorism**: '... rejected the study of consciousness as unscientific;', '... to be a natural science', '... the desire for psychology to be a science', '... a remarkably useful science.'. In **Testing and Classifying**: '... seems scientifically and culturally at odds ...', 'The data and theories from these scientific projects ...', '... political as well as scientific implications ...', '... modern science's metaphysical distinction between culture and nature.'. In **Disciplinary Expansion**: '... a genuinely American psychology—one that was rigorously scientific, ... ', '... the ideology of its scientific theories, psychology ...',

About the first rise of the American-psychology-enterprise Morawski writes:

'PSYCHOLOGY: Early Twentieth Century Ideas galore - If psychology at the turn of the century were to be depicted in terms of intellectual leadership, then several individuals would be needed to represent this pluralistic science, it would be accurately represented via the diverse

works of Edward B. Titchener, William James, and G. Stanley Hall. - Although all three psychologists shared a dedication to creating a scientific psychology, they differed significantly in what each meant by the word *scientific* and what the intellectual foundation of this “psychology” would be.’

By talking about ‘this pluralistic science’ this passage adds yet an item to the confusion around what is here denoted ‘psychology’. Perhaps the word ‘pluralistic’ is here meant to promote the notion that there is something ‘scientific’ about the continued fight, during the twentieth century, between several mutually incompatible and conflicting ideologies. This notion is false.

About Titchener’s work we learn from Morawski’s article that

‘PSYCHOLOGY: Early Twentieth CenturyIdeas galore ... All mental events, according to Titchener, consisted of some combination of a finite number of basic sensation-elements.’

This indicates that Titchener continued to describe mental life in terms of elements. James at the very start of his *Principles* from 1890 subjects this ‘associationist’ school to a careful critical analysis, and shows its inadequacy in accounting for mental life. Also, a good deal of James’s Chapter IX on the *Stream of Thought* already appeared in *Mind* for January 1884, when Titchener was 17 years old. There is no excuse for his failure to learn from it. Titchener’s whole approach was obsolete.

Talking about Titchener’s work as contributing to ‘intellectual leadership’ around 1900 makes for a sorry picture of American psychology.

2.6 William James’s *Principles* misunderstood and misjudged

About William James’s contribution, Morawski writes:

‘PSYCHOLOGY: Early Twentieth CenturyIdeas galore ... His conception of science, as well as his understanding of psychological life, was founded on pragmatism, a distinctly American philosophical position claiming that beliefs were never certain but were deemed veridical if they produced successful action. Influenced by Darwinism as well, James held that beliefs evolve and that it is the function, not the content, of mental events that constitute the proper subject matter of psychology. According to James, consciousness and the will had evolved and were central components of mental life. His *Principles* (1890) outlined a discipline on these premises ...’

Here we have an expression of a core issue of the ideological decay of American-psychology, to wit: *William James is given great credit for his contribution to psychology, but no one understands, neither what this contribution was, nor the greatness of it.*

Corruption, neglect, and repression, of what James writes in his *Principles* is significant of the ideological decay. James has to be explained away, because by James’s description of mental life it is clear that any talk of personal mental qualities is senseless and thus that testing for mental qualities, which is basic to the American-psychology-enterprise, is a fraud.

2.6 William James's *Principles* misunderstood and misjudged

The whole passage by Morawski quoted above is entirely misleading. The issues mentioned in the passage were discussed by James in his writings only in the years 1900-10, more than ten years after the publication of *Principles*. Thus James's book *Pragmatism* was published in 1907. Neither the word 'pragmatism', nor the name of its originator, Charles Peirce, nor any of the other issues mentioned in the passage, appear in *Principles*. The premises of James's *Principles* are not any of the issues mentioned by Morawski, but his critical discussions of writings on mental life written by earlier authors, making up the first part of his book.

A similarly defect understanding of James's *Principles* is displayed even in the special article about William James [*EncPsych* 4, 382-385, Raymond E. Fancher], which says:

JAMES, WILLIAM (1842-1910), American psychologist and philosopher. Although he never conducted original psychological research or formulated a systematic psychological theory, William James was arguably the most important figure in the establishment of scientific psychology in America. Finally appearing in 1890, *The Principles* comprised 28 chapters in 2 volumes and nearly 1,400 pages. Following a brief introduction on "the scope of psychology," this work opened with a discussion of the functions and actions of the brain—a tradition followed by most introductory psychology textbook authors who came after him. Then came a chapter on "Habit," whose early and prominent placement undoubtedly owed something to the importance of that subject in James's own conflict and its resolution. Chapters devoted to the "Automaton Theory," the "Mind-Stuff Theory," "The Methods and Snares of Psychology," and "The Relations of Minds to Other Things" dealt with the general nature and methods of psychology vis-à-vis other sciences. Subsequent chapters took up the "stream of thought": the self, attention, conception, discrimination and comparison, association, time perception, memory, sensation, imagination, three kinds of perception (of things, of space, and of reality), reasoning, the production of movement, instinct, the emotions, will, and hypnotism. - The work as a whole is unsummarizable, except perhaps to note that it is studded throughout with striking metaphors, *bon mots*, engaging personal observations, and practical tips. ...'

The poverty of insight of the author of these lines, testified particularly by the first lines quoted here, is beyond belief. This author claims that James 'never conducted original psychological research or formulated a systematic psychological theory'. The fact is that James was a genius observer of the thinking going on, and combined this with a genius for finding striking, metaphorical expression to describe his findings. More original and rich research on mental life has never been done by anyone. Added to this, what James presented in his *Principles* was an entirely original, new *form of description of mental life*, in addition to a *description of mental life in this form which is unique in its scope and richness*.

As a whole James's *Principles* was a scientific contribution which in its greatness is only equalled by Newton's *Principia*. Newton's work is analogous to James's *Principles* in that it presents a wholly new form of description of its

subject matter, to wit, description of matter in motion in terms of velocities, accelerations, and forces, and in addition applies this form of description to a variety of phenomena.

The two works are similar also in having as their point of departure the description of an everyday phenomenon, which is there to be observed by anyone. In Newton's *Principia* this description appears in Definition 5, on the third page of the book:

'A stone whirled in a sling endeavors to leave the hand that is whirling it, and by its endeavor it stretches the sling, doing so the more strongly the more swiftly it revolves; and as soon as it is released, it flies away. The force opposed to that endeavor, that is, the force by which the sling continually draws the stone back toward the hand and keeps it in an orbit, I call centripetal ...'

This description is the only one of phenomena mentioned by Newton in his introductory definitions that gives expression to hands-on experience. Undoubtedly the description is inspired by Newton's own experience from playing in his childhood. It displays the three descriptive elements: velocities, accelerations, and forces, and their interaction. In the description of this phenomenon in terms of these elements lies the whole of Newtonian mechanics.

In James's *Principles* the initial observation is stated on the first page of Chapter IX, The Stream of Thought:

'The first fact for us, then, as psychologists, is that thinking of some sort goes on. I use the word thinking, in accordance with what was said on p. 186, for every form of consciousness indiscriminately. If we could say in English 'it thinks,' as we say 'it rains' or 'it blows,' we should be stating the fact most simply and with the minimum of assumption. As we cannot, we must simply say that thought goes on.'

The words 'The work as a whole is unsummarizable' is merely evidence that the writer of the article, Raymond E. Fancher, has failed to grasp its message. As a matter of fact, in its overall plan James's book is a sublime, model example of what a scientific contribution in any subject should be:

- First a critical discussion of how some relevant subject matter has been described by earlier authors, here mainly Chapters V, "Automaton Theory", and VI, "Mind-Stuff Theory", which are detailed, critical rejections of earlier descriptions of mental life;

- Second a description of the subject in which new subject matter and/or new forms of description are presented, here from page 224 and most of the rest of the book.

The Chapters VII, "The Methods and Snares of Psychology", and VIII, "The Relations of Minds to Other Things", discuss the *problems of description of mental life*.

James's new form of description of mental life is supported by four pillars, which together constitute the essence of his contribution. In extreme concentration (they are discussed in more detail in the later sections of this book) they are:

2.6 William James's *Principles* misunderstood and misjudged

- **Habit:** '... living creatures ... are bundles of habits.' Chapter IV.

- **The stream of thought:** 'the first fact for us, as psychologists, is that thinking of some sort goes on.' That thinking which is experienced by everyone of us, bringing forth an ever changing continuum of thoughts and feelings, is denoted the stream of thought. Chapters IX and X.

- **Association:** the law of the habitual changes of the thought objects in the stream of thought. Chapter XI.

- **Acquainting:** 'the mind can always intend, and know when it intends, to think of the Same.' Chapter XII.

The remaining chapters of James's book describe mental life in terms of these four pillars. In these descriptions all the so-called philosophical issues related to mental life are swept off the table as irrelevant and worthless.

James's *Principles* falls short of perfection only in the arrangement of the matter

their testing activities.

James in his *Principles* presented a description of mental life which displayed the inadequacy of descriptions in terms of elements. Accordingly, when presented in relation to the American-psychology-enterprise James is quoted only for his metaphysics, while his psychology is suppressed.

Stanley Hall had only fuzzy notions of human mental life. However, by his foundings of a journal and an association he organized the American-psychology-enterprise.

The establishment of the American-psychology-enterprise as ‘a legitimate and reliable instrument for assessing and regulating human life’ is described clearly by Morawski:

‘PSYCHOLOGY: Early Twentieth Century Psychology in Society - ... In the first decade of the century, psychology had yet to devise sophisticated techniques that could be applied to social reform agendas, but psychologists both benefited from and contributed to a discourse about expertise that was to set the stage for later applications of psychology to human welfare. Psychologists rehearsed the thesis that people needed expert guidance. As Robert Yerkes (1876-1956) put it, “Millions of human beings—unfortunate but all unconscious of what they are missing—go through life blind to the psychological world” (1911, p. 13). Yerkes’s observation that humans needed psychological guidance found its test site in the entrance of the United States into World War I. ... Twelve committees of the American Psychological Association were established for these ends, and psychologists quickly developed a rating scale for selecting suitable candidates for officer training and an intelligence test for detecting those individuals who were mentally unfit for service in the army.’

Here we have set forth, clearly with the approval of the writer, Jill Morawski, the characterization of the American-psychology-enterprise as an ideological movement, similar to a church, committed to social reform and to offering humans psychological guidance. As the core we have the conviction that the practitioners know better than anybody else.

We learn that the practitioners were able to develop a rating scale and an intelligence test quickly. They did not have to go through an investigation of the validity of their scale and test, which is a slow and difficult business—they just knew they were right, with the conviction of true believers.

In the continuation of the above report we also learn that

‘PSYCHOLOGY: Early Twentieth Century Psychology in Society - The actual efficacy of these tests is debatable, as are psychologists’ overall effects on the war effort. However, psychologists’ war involvement elevated the status of the science in general and mental testing in particular.’

So the American-psychology-enterprise went forth triumphantly, in spite of the failure of their first major contribution. True believers are not deterred by facts.

2.8 Emergence of behaviorism

About the ideas behind the American-psychology-enterprise Morawski writes:

‘PSYCHOLOGY: Early Twentieth Century ... Schools and Systems - ... it appears that in the decade following World War I psychologists staged their last substantive disputes of the nature of their discipline. ... Experimental research replaced the outmoded notion of human reason. ... The tremendous faith in experimentation, combined with positivist beliefs in the study of observables and the commitment to a practical science, tilted the contest heavily in favor of behaviorism, a theory commitment that would dominate research until the 1970s.

Behaviorism - Although behaviorism has diverse intellectual roots going back into the nineteenth century, the name John B. Watson (1878-1958) has become eponymous with the idea of behaviorism. Trained as an animal psychologist at the University of Chicago, Watson gave a series of lectures in 1913, which in its published form was to become known as the behaviorist manifesto. The manifesto rejected the study of consciousness as unscientific; it claimed that to be a natural science, psychology must be dedicated to the study of observable behaviors that represent the human organisms’ adjustment to their environment.’

As written by Watson himself in *Psychology as the behaviorist sees it*, *Psychological Review*, 20, 158-177, 1913:

‘Psychology as the behaviorist sees it is a purely objective, experimental branch of natural science. Its theoretical goal is the prediction and control of behavior. Introspection forms no essential part of its methods nor is the scientific value of its data dependent on the readiness with which they lend themselves to interpretation in terms of consciousness. The behaviorist, in his efforts to get a unitary scheme of animal responses, recognizes no dividing lines between man and brute.’

So here we have the prophet and decalogue of the American-psychology-enterprise. As with any dogma, it is of course beyond rational discussion. Noting that the claims given in support of the behaviorist dogma are arbitrary, without any ground in the manner other fields of study and description are pursued, will not impress the believers of the creed.

What is studied by the practitioners of the American-psychology-enterprise is described by Morawski:

‘PSYCHOLOGY: Early Twentieth Century ... Methods of Inquiry - ... Predominant in the new laboratories were the techniques of what was later critically termed brass instrument psychology. These were the methods of experimental introspection where subjects are presented with standard, controlled situations (stimuli) and instructed to give readily quantifiable or classifiable responses. ... Americans such as E. L. Thorndike developed highly controlled laboratory experiments for assessing mental abilities. ... Soon American psychologists came to value an experimental method characterized by scrupulous control of stimulus variables and environmental conditions of the laboratory, precise

measurements, and distinct roles of experimenter and subject. Experimentation became the hallmark of the science and the central feature in the training of new psychologists. Notable here is the fact that other methods were used in the early years of the century: survey techniques, observations in natural settings, self-report, case studies, and testing techniques. Although these techniques would continue to be employed, they routinely were perceived as falling short of the objectivity, control, and predictability afforded by laboratory experimentation.'

In short: what is studied by the practitioners of the American-psychology-enterprise are human beings in laboratory situations. What the practitioners of the American-psychology-enterprise are ready to be wise about is said by Morawski:

'PSYCHOLOGY: Early Twentieth Century Psychology in Society - ... Psychology could explain the stock market crash of 1929, as well as marital discord, racial prejudice, and the adolescent's misbehavior. It was used to argue for certain immigration laws just as it was employed to guide parents in toilet training their children.'

A particular, major flaw in the behaviorist dogma is related to argumentation about *introspection*, that made for a confusion of issues that are at the core of mental life. Morawski writes:

'PSYCHOLOGY: Early Twentieth Century Ideas Galore - ... [According to] Titchener's psychology ... mental processes were nothing more than combinations of elemental sensations. The scientific task of the psychologist was to use rigorous methods of introspection to record and catalogue these basic sensations ... - **Methods of Inquiry** - ... methods of experimental introspection where subjects are presented with standard, controlled situations (stimuli) and instructed to give readily quantifiable or classifiable responses ... Wundt's version of introspection was intended to uncover the elements of consciousness by observing and recording the dependence of sensory experiences on stimulation varying in intensity, temporal duration, and location. ... Techniques of introspection were designed to study abstract mental events, ultimately to reveal basic sensation-elements and the laws of their connection. ... Despite its strong and rigorous beginnings, introspection did not fare well in America. Not only was the method (and the underlying theory of mental events) inhospitable to practical applications, but it did not suit the growing spirit of positivism, a philosophy of science that argued for the exclusive study of observable phenomena and not abstract entities.'

As clear from these quotations and the quotation from Watson above the word 'introspection' is used only in the phrase 'methods of introspection'. Such methods are used to investigate what is called 'elemental sensations', 'the elements of consciousness', 'basic sensation-elements', 'mental events'. When description of mental life in terms of elements of any sort is rejected, as it is rejected by James in his *Principles*, this is then taken to imply a rejection of anything denoted 'introspection'. But this is throwing out the child with the bath water. *Introspection is the only way the core phenomenon of mental life, the stream of thought/feeling, is experienced.* Introspection is in no way tied to a description of mental life in terms of elements.

2.8 Emergence of behaviorism

All told there seems little doubt that Watson's rejection of introspection was directed towards Titchener's element psychology. James's *Principles* seems so have been unknown to both Titchener and Watson.

There is nothing mysterious about introspection; it is done by every one of us more or less all the time. Whenever I give a moment's thought to how I am feeling, I am introspecting my stream of thought/feeling. That I have a headache I only know introspectively. When I ask someone for information about anything, I am inviting that other person to introspect his or her stream of thought/feeling, in which the information I am looking for will hopefully have come present by habitual association from my inquiry. That mental life takes place in this way is clearly described by James in his *Principles*.

But this is declared by the creed of the American-psychology-enterprise to be forbidden territory. That creed forbids any mention of the core phenomenon of mental life and the way that phenomenon appears to every one of us.

What is actually studied by the American-psychology-enterprise is explained by Morawski thus:

'PSYCHOLOGY: Early Twentieth Century Methods of Inquiry - ... the focus on observable behaviors and learning afforded the opportunity to create laboratory analogs to everyday activities: experimenter could devise experimental situations, for instance, which simulated the classroom, labor tasks, or social interactions.'

So what the practitioners of the American-psychology-enterprise study is the behavior of people who simulate doing something. They are persons who in some way, usually by being paid a certain fee, are made to do some acting, in a special laboratory setting set up, and according to instructions given to them, by the experimenter. So this sort of acting is what the practitioners of the American-psychology-enterprise are wise about, after having observed it in countless costly experiments.

What does this tell about the behavior of people who are not acting? Nothing. Or about the behavior of people who would never consent to do the acting the experimenters ask them to do? Nothing.

Neither does it tell anything about such issues of mental life as:

- the stream of thought/feeling
- the law governing the change of the thought object
- knowing
- feelings
- imagery
- perception
- understanding and uttering speech
- creativity
- reasoning

Every one of these issues has its place in the description of mental life presented by William James in his *Principles* from 1890, a scientifically valid description if ever there was one.

The ideological character of the American-psychology-enterprise is confirmed by many references to ideological concerns of the practitioners of the enterprise in Morawski's article:

'PSYCHOLOGY: Early Twentieth Century Behaviorism
... behaviorism promised to deliver a remarkably useful science. Its anticipation of revealing laws of habit formation and learning was exceptionally well suited to the reform ideologies of social control. In fact its mechanistic model of behavior adjustment combined with its implicit social hierarchy (of experts and the unknowing) has been found to buttress the emerging corporate culture of America ...'

'PSYCHOLOGY: Early Twentieth Century Testing and Classifying ... The various projects for quantifying the mind and distinguishing differences between minds, especially in regard to what was believed to be intelligence, clearly if unfortunately demonstrates just how psychology was infused with cultural interests. ... Yet, in addition to the practical impetus, mental testing served racist purposes; ... Numerous psychologists, for instance, utilized the newly devised intelligence tests and test data to examine supposed racial and ethnic differences in intelligence. Once again, these projects to quantify mental traits were undergirded by dominant cultural beliefs; in many cases these were racist and sexist ... Such developments in tests and test usage indicate that the measurement of differences was intimately connected with theories of inheritance (and nature-nurture debates) as well as with the political dynamics of American culture. ... These research programs produced a discourse on nature versus nurture: was intelligence inherited, was educational success the result of learning, do early childhood experiences influence the formation of personality? At no point were these debates simply or only academic. Psychologists' involvement in eugenics campaigns and their lobbying for immigration laws, for instance, were linked with their deterministic belief in the biological basis of psychological attributes.'

3. Issues of the American-psychology-enterprise from the years 1920 to 2000

3.1 Behaviorism and contenders

Joseph F. Rychlak and Andrea Struckman's article **PSYCHOLOGY: Post-World War II** [*EncPsych* 6, 410-416] is expressed in terms of the ideological decay of psychology throughout. The article accounts for a series of controversies over pseudo-questions, provoked by the behavioristic ideology, which insists on accounting for mental life (which of course includes the bodily movements and feelings experienced by the organism) in terms that exclude most of the contents of the stream of thought/feeling of that organism. The article opens as follows:

'PSYCHOLOGY: Post-World War II - Psychology in the pre-World War II was on the threshold of becoming both a major academic discipline and an applied profession. It had some unresolved problems, particularly involving mind-body issues, but in the main the academic wing of psychology had adopted British empiricism as its philosophy and was therefore behavioristic in orientation. The professional wing had been struggling to achieve its unique identity. We will survey the post-World War II era in terms of these academic and professional developments. Our focus is on the United States, which was actually the leader in psychological studies before the war.'

This expresses the ideological decay of psychology right away. In the whole passage there is not a single phrase that relates to psychology understood as the study and description of mental life. So-called 'mind-body issues', whatever they are, are irrelevant to psychology in this sense. The talk about 'British empiricism as its philosophy ... therefore behavioristic in orientation' is pure ideology. In no manner does it make sense to say that adopting the dogma of behaviorism would be part of adopting a dogma of British empiricism, whatever it is. The 'unique identity' of the 'professional wing' denotes nothing clearly in the context.

It is further clear from these remarks that Rychlak and Struckman will claim that it makes sense to distinguish between American-academic-psychology and the American-psychology-enterprise. This is an indirect confirmation that the American-psychology-enterprise has to be described as an ideological movement.

Rychlak and Struckman continue:

'PSYCHOLOGY: Post-World War II ... Academic Developments - Although behaviorism had dominated academic circles since the 1920s, there were significant variations in outlook within this camp. - **Behaviorism Versus Gestalt Psychology.** John B. Watson (1878-1958), the father of behaviorism, was no longer active in academia, but there were three major figures vying for leadership: Clark L. Hull (1884-1952), E. C. Tolman (1886-1959), and B. F. Skinner (1904-1990). All of these men were committed to psychology as a science, which at that time meant Newtonian science. The philosophical outlook of Newtonianism was realism. A scientist was someone who not only sought to empirically

validate his or her theory through a “control and prediction” logic of a hypothesis corresponding to “observed reality”, but a restriction was placed on the kind of theory a “genuine” scientist might use to explain any observed findings. All causal analysis had to be done in terms of mechanistic or “efficient” causation—the sort of thing that takes place when one billiard ball bumps into another; the first ball thrusts the second along. The stimulus-response (S-R) sequence in Watsonian behaviorism is conceived in a similar antecedent-consequent fashion.

In this passage the discussion continues to be concerned, not with study and description of mental life, but with ideological dogma, in certain places marked out in the passage itself by the use of quotes. In fact, it holds that each of the phrases ‘psychology as a science’, ‘Newtonian science’, ‘philosophical outlook of Newtonianism was realism’, ‘A scientist was someone who not only sought to empirically validate his or her theory through a “control and prediction” logic of a hypothesis corresponding to “observed reality”’, ‘the kind of theory a “genuine” scientist might use to explain any observed findings’, ‘causal analysis’, and ‘mechanistic or “efficient” causation’, is irrelevant to the study and description of mental life.

It is further made clear in the passage that whatever these phrases talk about, they express items of dogmatic restrictions: ‘a restriction was placed upon the kind of theory a “genuine” scientist might use’, ‘All causal analysis had to be done ...’.

Rychlak and Struckman continue:

‘PSYCHOLOGY: Post-World War II ... Academic Developments ... Behaviorism Versus Gestalt Psychology. ...
... Problems among the behaviorists arose over the nature of the mechanistic process. ... Gestalt theory draws on continental philosophy, which emphasizes organization, totality, and the essential quality of things. The British followed a Lockean, bottom-up strategy of explanation, while the Gestaltists pursued a more Kantian, top-down phenomenological approach. British empiricism called for observing reality, which was presumably “there” to be concretely measured. Phenomenologists believed that the observer contributed to what was under observation, that there was no completely free-standing reality “there” to measure in the first place.’

This presentation is expressed in purely ideological terms: ‘the nature of the mechanistic process’, ‘organization, totality, and the essential quality of things’, ‘bottom-up strategy of explanation’, ‘top-down phenomenological approach’, ‘reality’, ‘completely free-standing reality’. The presentation fails to indicate what relevance Gestalt psychology may have to the study and description of mental life.

This question is clarified in the more extensive explanation found in **GESTALT PSYCHOLOGY** [*EncPsych* 3, 486-489, Michael Wertheimer]. Here we find:

3.1 Behaviorism and contenders

'Gestalt psychologists rejected the "constancy hypothesis" that was generally taken for granted early in the twentieth century, namely that there is a constant point-for-point correspondence between physical characteristics of a stimulus and the psychological attributes of the resulting sensation. In numerous experiments they demonstrated that local perceptual qualities vary not just with the local stimulus but with the contexts that surround the stimulus. Percepts are not immutable correlates of the local physical stimuli that give rise to them, but reflect specific interactive relational aspects of a stimulus complex. The well-known perceptual constancies (size, shape, color, brightness, etc.) are all inconsistent with the "constancy hypothesis"; for example, the perceived brightness of a small spot in a large visual field depends upon not only the light intensity of the spot itself but also the intensity of the spot's surround. Comparably, color contrast phenomena disprove the "constancy hypothesis"; the same grey circle will appear greenish if surrounded by violet, or yellow if surrounded by blue. Perceptual attributes such as size, shape, color, brightness, movement, etc., are *relationally determined*. - Relational determination also plays a crucial role in many cognitive (and physiological) functions other than sensation and perception. - While it is central in perceptual organization (as in controlling what aspects of a complex sensory input will be perceived as figure and which as ground) ...'

One issue here is the "constancy hypothesis". This is claimed to be generally taken for granted early in the twentieth century. This claim indicates ignorance of James's *Principles*, in which the "constancy hypothesis" is discussed at length and rejected in Chapter VI, Mind-Stuff Theory. As far as this aspect of mental life is concerned, Gestalt psychology is merely repeating in different words what was presented already by James.

A second issue is the claim that 'Relational determination ... is central in perceptual organization (as in controlling what aspects of a complex sensory input will be perceived as figure and which as ground)'. This claim is false, as evidenced by common experience. What is perceived as figure and what as ground is not given by the sensory input. The viewer of a bouquet of flowers is able to select any one of the flowers as the figure, which makes the rest of bouquet part of the ground, or may select the whole bouquet as the figure, seeing the surrounding as the ground, and may shift the attention arbitrarily between such different perceptual organizations. Similarly, while a symphony orchestra is playing the listener may shift the attention between hearing any one instrument, or hearing the total sound. These aspects of perception are perfectly accounted for in a description of mental life in terms of habit, the stream of thought, attention, association, and acquainting, as presented in James's *Principles*. The Gestaltists' false claim indicates that this was unknown to them.

Rychlak and Struckman continue:

'PSYCHOLOGY: Post-World War II ... Academic Developments Behaviorism Versus Gestalt Psychology.
... .. Tolman borrowed enough from Koffka to generate a conflict with

Hull. Tolman had modified Watson's simple S-R habit formulation to suggest that there was a "cognitive map" that animals (white rats) acquired while learning to do things like running a maze. ... Tolman referred to his approach as *purposive behaviorism*.

Some of what is said here suggests vaguely a relevance to the study and description of mental life. Thus talking about 'a "cognitive map" that animals (white rats) acquired' may indicate that Tolman adopted a description of mental life in terms of what in the article by Leahey above was called a Cartesian theatre.

The discussion gives evidence that the both Hall and Tolman, as well as the authors of the article, Rychlak and Struckman, are ignorant of James's description of mental life in his *Principles*, according to which a person's behavior takes place by habitual associations from the thought object in the stream of thought. This thought object may include imagery, such as a visual image of a map of a territory.

Rychlak and Struckman continue:

'PSYCHOLOGY: Post-World War II ... Academic Developments ... Behaviorism Versus Gestalt Psychology. ...
... Tolman believed that an animal's improvement in maze running from trial to trial was empirical proof of purpose. ... The debate over whether behavior was purposive and what "purpose" could mean was never solved Skinner favored Hull's position that human behavior lacked true purpose ... Our verbal usage is shaped, so that even though we may say "I intend to drink some water" just before doing so, this is not an intentional, purposive action."

The talk here of 'empirical proof of purpose' and 'this is not an intentional, purposive action' is senseless in relation to the description of mental life, no matter what 'purpose' is taken to denote. If it is taken to denote an element of mental life, this would imply a return to element psychology, obsolete since 1890.

But as anyone knows, the word 'purpose' is not used ordinarily to denote something, whether 'mental element' or anything else, but descriptively, about certain actions that raise particular questions about the attitude of the person taking them. In order to know whether we will describe an action taken by a person as purposive or not we have to ask that person: Did you do it on purpose, yes or no? Being purposive is not just a property of an action, it expresses an attitude of the person doing the action. The question whether a rat running in a maze acts purposively cannot be answered, since we cannot speak with rats.

The phrase 'Our verbal usage is shaped, so that ...' is empty verbiage. There is no such definite thing as 'verbal usage'.

Rychlak and Struckman continue:

'PSYCHOLOGY: Post-World War II ... Academic Developments ... Behaviorism Versus Gestalt Psychology. ...
... In the mid-1950s there was an extremely influential research project which seemed to prove that people participating in experiments could be manipulated linguistically ... This issue of conditioning with or without awareness and cooperation is still being debated ...

3.1 Behaviorism and contenders

This is dumbfounding. American psychologists ask whether people participating in experiments can be manipulated linguistically! But of course they can. Such an experiment is nothing but verbal manipulation, how otherwise would people be made to participate? Surely they are not driven by a whip. The naïve blindness of American psychologists seems to be without bound.

Rychlak and Struckman continue:

‘PSYCHOLOGY: Post-World War II ... Academic Developments ... Behaviorism Versus Gestalt Psychology. ...
... The older, Darwinian rationale for comparative psychology has given way to an even more assertive—and controversial—theory known as *sociobiology* ... this view holds that psychology will one day be explained away by biology. Biological perspectives in psychology have spawned different disciplines in psychology such as biological psychology, physiological psychology, psychobiology, and neuroscience. ... All of these disciplines are concerned with the biological mechanisms underlying human thought and behavior in the form of sensing, synthesizing, integrating, and responding to the environment.’

Words, words, words (Hamlet). Rychlak and Struckman continue:

‘PSYCHOLOGY: Post-World War II ... Academic Developments ... Behaviorism Versus Gestalt Psychology. ...
... In the 1920s, Jean Piaget had initiated a series of cognitive studies on the acquisition of knowledge in children. ... his work was generally ignored until the 1960s when, along with questioning of behavioristic theory, there was a growing sympathy among psychologists for cognitive speculations. ... Piaget had postulated a developmental sequence of four major stages through which he believed children sequentially matured. In recent years this stage theory has been brought into question ...’

This is expressed in terms of a phrase that fails to denote anything clearly in relation to the study and description of mental life: ‘acquisition of knowledge’.

3.2 Emergence of cognitivism

As described by Rychlak and Struckman the next development of the American-psychology-enterprise was divinely inspired. They write:

‘PSYCHOLOGY: Post-World War II ... Academic Developments ... A Cognitive Revelation. Beginning in roughly 1960 the term *cognitive* changed from a Kantian (continental) to a Lockean (British) interpretation. This was to have an influence on the development of behaviorism, as reflected in the theorizing of Albert Bandura (1986). Trained in the Hullian tradition, Bandura added significantly to this style of S-R explanation by postulating a triadic form of causation—including a person’s (1) internal cognitions, affects, and biology; (2) external, overt behaviors; and (3) environmental pressures to perform or believe in certain ways. Each of these sources of causation influenced the other in a reciprocal manner. An

important cognitive influence on a person's performance in life's challenging circumstances is *self-efficacy*. This is the sense of conviction that a person has regarding whether he or she can execute the behavior required to produce some outcome—such as passing an examination, or hosting a party. As it is a learned behavior, achieved by accomplishing challenging tasks as well as modelling the behavior of others, Bandura's self-efficacy is seen by some as a further development of mediational theorizing. Bandura believes that agency (producing desired results) can be understood through triadic causation and the development of efficacy both in persons and social groups.

The divine inspiration here reveals itself in an imposing salvo of rhetorical artillery. And what does this say? It says that people develop feelings about what they are in a position to do, and that these feelings influence what they actually do. It manages to roll this triviality, which is obvious to any child, into no less than 196 words, of which fully 175 are superfluous.

This triviality is then the opening fanfare of the 'Cognitive Revolution'. About this we further learn from Rychlak and Struckman:

'PSYCHOLOGY: Post-World War II ... Academic Developments ... A Cognitive Revelation. ... Returning to the matter of how cognition is to be understood, a Kantian (phenomenological) formulation is framed in the first-person or introspective terms, considering things from the perspective of "I, me, us, we" and so on. A Lockean (empiristic) understanding of cognition is framed in a third-person or extraspective perspective, referring to "that, it, they, them" and so on.

This passage talks of cognition, but gives no clue to what this term is taken to denote. It merely presents a mist of philosophical inanities.

Further confusion is added when the matter is justified by the following account of defect understanding from Rychlak and Struckman:

'PSYCHOLOGY: Post-World War II ... Academic Developments ... A Cognitive Revelation. ... This shift in meaning of cognition was the result of a 'Cognitive Revolution' that descended upon psychology. The impetus for this revolution in psychological theorizing was the perfection of electronic computer technology. The term *artificial intelligence* (AI) was coined to typify this approach. The general consensus is that AI as a field of study was born at an institute sponsored by the Rockefeller Foundation, held at Dartmouth College in the summer of 1956 (Newell & Simon, 1972, pp. 873-889). ... This self-correcting capacity of negative feedback has prompted many AI enthusiasts to believe that negative feedback is the same thing as purposive behavior, intentionality, or free will (Rosenblueth, Wiener, & Bigelow, 1943). - Alan Turing (1912-1954) further captured the imagination of psychologists when he introduced a strategy in which a computer expert could write machine programs that misled people into thinking that the machines which processed these programs were alive (1950).'

3.2 Emergence of cognitivism

The speculations sketched here I shall call the AI-mythology. The AI-mythology builds upon several items of defect understanding. One item was the myth of the thinking machine. This was initiated by Turing when in 1950 he posed the question ‘Can a machine think?’ This question immediately displays a defect understanding of mental life. Thinking is not something done by someone. As stated by James: ‘*The first fact for us, then, as psychologists, is that thinking of some sort goes on.*’ A detailed critical analysis of Turing’s article from 1950 may be found in P. Naur: *Thinking and Turing’s Test* (1986).

Another item of defect understanding of the AI-mythology is the claim that the intents had by a programmer when designing a program may be said to be had by the computer while it executes the program. In other words that the computer may be said to have intents. This false claim has already been discussed in section 2.2 above in connection with the purpose assigned to chess-playing programs.

A third item of defect understanding of the AI-mythology is the claim that mental processes are, or can be understood as, such sequential data processes that take place in digital computers. This is obviously wrong, since, as said by James, ‘... living creatures ... are bundles of habits’. A habit is something tending to take place in a person, with the further characteristic that a habit is reinforced each time it is activated. Habits depend on the plasticity of the organic material. A computer has no habits. The execution of an operation in a computer leaves the program controlling the computer action unchanged. The hardware of a computer is not plastic.

A fourth item of defect understanding, related to the third, is expressed by the talk of ‘knowledge’ as a commodity held in a container, ‘memory’. This manner of talking entirely fails to describe the experience everybody has of the thought objects as they appear in our stream of thought. This fallacy is central to cognitivism, further discussed below.

A fifth item of defect understanding, also related to the third, is related to talking about ‘intelligence’ as a specific human ability. This would imply a return to element psychology, obsolete since 1890.

More about the ‘Cognitive Revolution’ is found in the two articles **COGNITIVE PSYCHOLOGY: History of the Field**, [*EncPsych 2*, 150-153, Robert L. Solso and Otto H. MacLin], and **COGNITIVE PSYCHOLOGY: Theories** [*EncPsych 2*, 153-158, David A. Balota and Michael J. Cortese]. The first of these articles opens as follows:

‘COGNITIVE PSYCHOLOGY: History of the Field. At the beginning of the twenty-first century, cognitive psychology is a broad field concerned with memory, perception, attention, pattern recognition, consciousness, neuroscience, representation of knowledge, cognitive development, language, thinking, and human and artificial intelligence.’

This declaration immediately raises a number of questions concerning the way the words are used. First of all, the use of the designation ‘cognitive psychology’ and the word ‘field’. With the use of the word ‘psychology’ it is immediately suggested that what is talked about is related to what James in his *Principles* explains as the very first thing, quoted in section 2.1 above:

‘PSYCHOLOGY is the Science of Mental Life, both of its phenomena and their conditions. The phenomena are such things as we call feelings, desires, cognitions, reasonings, decisions, and the like;’

This raises the question: What is it in what is called ‘cognitive psychology’ that makes it different from psychology as studied and described by James in his *Principles*?

Some of the answer to this question is suggested by the words added as explanation. Several of these: perception, attention, consciousness, neuroscience, and thinking, denote items that are part of James’s subject.

However the remaining: memory, pattern recognition, representation of knowledge, cognitive development, language, and human and artificial intelligence, are alien to James’s presentation. As discussed below they indicate fallacies of cognitive psychology.

A central fallacy is related to the use of the word ‘memory’, which is given a meaning entirely different from the one discussed by James. ‘Memory’ is used by James in his Chapter XVI, Memory, in this context:

‘The chapter which lies before us deals with the way in which we paint the remote past, as it were, upon a canvas of our memory, and yet often imagine that we have direct vision of its depths.’

In cognitive psychology ‘memory’ quite differently denotes a container of a sort, holding some sorts of elements.

The use of the word ‘memory’ to denote a container seems to derive from Alan Turing, who was the one to claim an essential similarity between data processing devices and human beings. Already on the first page of his report Proposed Electronic Calculator (Turing, 1945) he writes:

‘These requirements all involve *storage of information or mechanical memory.*’

In the report he continues to use the word ‘storage’. However, in section 16, Alternative Forms of Storage, he says:

‘(ii) *Survey of available storage methods.* - The accompanying table gives very rough figures for the various available types of storage and the quantities defined above. This table must not be taken too seriously.’

In the table he gives data for 17 different types of storage, such as relays and storage tubes, and then, additionally, for ‘Cerebral cortex’.

Turing continued his argumentation for the similarity between data processing devices and human beings in his article from 1950 which was mentioned above as part of the AI-mythology.

It would have been fortunate if Turing’s advice not to take his table too seriously had been heeded. And indeed, computer people mostly ignored Turing at this point. Thus in the report of the meeting where the first computer to actually produce useful work, the EDSAC, was inaugurated at Cambridge University, England, on 1949 June 22-25, a meeting attended by Alan Turing, the words ‘store’ or ‘storage’ are used exclusively. In the IFIP-ICC Vocabulary of Information Processing from 1966 the word ‘store’ is recommended, while ‘storage’ and ‘memory’ are deprecated.

3.2 Emergence of cognitivism

However, in cognitive psychology the story of 'memory' as a container is adopted as central. No one seems to notice that this story is unintelligible. What is held in 'memory'? If it holds 'representation of knowledge', what is this knowledge and its representation? And what about the person's know how? How are the contents of 'memory' coupled to the ongoing, daily activity of the person?

This unintelligibility is brought into sharp focus if one asks for a description, in terms of contents of 'memory', of any everyday situation, for example that two persons meet, one puts out his hand and says: 'What is your name?', the other one takes the hand and answers: 'Clara'. What contents of 'memory' are involved here? How do they relate to and influence the actions of the two persons? These are wide open questions.

This unintelligibility should be contrasted with James's description of mental life in terms of habits, the stream of thought, associations, and acquainting. In this form of description the situation is entirely transparent, simply a series of rapid changes of the thought objects of the two persons, as directed by their habitual associations. Each thought object has in it, as it were, the entire organism of the person, including motions of the bodily organs and feelings.

The talk of 'memory' in cognitive psychology is a brushed-up version of the stage of the Cartesian theatre, which otherwise was thought to be obsolete in 1910.

The unintelligibility of the cognitive notion of memory is further discussed in section 4.8 below.

'Pattern recognition' denotes a data processing techniques that is used in certain computer applications. By this technique the computer is made to recognize which of a given set of patterns is at hand in a set of data given as input. This technique is irrelevant to human perception. As described by James, human perception takes place by the habitual associations that drive the continuous changes in the stream of thought. By such an association something which is sensed, for example by the eyes, may by association call forth in the stream of thought something already known by acquaintance by the person. Such association is not restricted to recognizing any given set of patterns or other items. It depends only on the associative habits the person has acquired in previous life. The claim that perception takes place as pattern recognition is a central fallacy of cognitive psychology.

Talking of 'representation of knowledge' displays a philosophical fallacy, dominant in Kant, the claim that it makes sense to talk of knowledge as something definite that may be represented. This fallacy is evident as soon as one asks for a specimen of this something, which no one is able to present. James cleared the issue with his distinction between knowing-by-acquaintance and knowing-about and his relating these to the stream of thought with its thought objects and acquaintance objects.

'Language' denotes nothing definite. James talks of linguistic habits, not of language.

'Human intelligence' belongs to element psychology, which became obsolete in 1890. 'Artificial intelligence' is a more recent myth, as discussed above.

It follows from this that talking of cognitive psychology as a field is misguided. Cognitive psychology, from what is put forward here, is an ideology, a set of dogmas about how one should talk about certain things. Two central issues of this ideology are denoted memory and knowledge, as indicated by the term ‘cognitive’.

3.3 Flaws of cognitivism

Solso and MacLin’s article continues over two and a half columns of print to present what is called a history of cognitive psychology, covering several millennia. Considering that this ideology was unknown until 1955 this makes little sense, and in fact for the time up to 1850 the presentation is similar to many other brief historical accounts of confusions that are called philosophical, only distinguished by a constant hammering on the word ‘knowledge’. For the time after 1850 the account covers some of the ideological conflicts of the American-psychology-enterprise, indicating what is said to be ‘the emergence of a cognitive discipline’. In this account two points shall be noted. We read:

‘COGNITIVE PSYCHOLOGY: History of the Field ... Philosophical Period During the eighteenth century, philosophical debate over the source of knowledge took place between the empiricists and the nativists. A British empiricist believed knowledge came from experience. However, the nativists believed knowledge was innate and based on structural characteristics and properties inherent in the brain. Modern cognitive psychologists continue to argue these matter, although usually with scientific data.’

This shows how cognitive psychology revives philosophical pseudo-questions that became obsolete with James’s *Principles*. We further read:

‘COGNITIVE PSYCHOLOGY: History of the Field ... Early Experimental Period No less important were his [William James’s] thoughts about attention and memory and his distinction of a dichotomy memory store—primary and secondary memory—led directly to experiments in the 1960s on that topic.’

This is plain nonsense. As discussed above and in sections 4.8 and 9.2 below James uses the word ‘memory’ quite differently from the cognitivists. The meaningless statement put forward here is yet another confirmation that James’s *Principles* is unknown to later psychologists.

The section by Solso and MacLin headed **Cognitive Revolution** presents a long series of statements that mostly are declarations of faith hailing what is claimed to be ‘a new way of understanding the science of the mind’. These declarations are expressed in such vague unclarity that they escape meaningful discussion of their relevance to the study and description of mental life. Where they refer to concrete contributions of named scientists they mostly fail to clarify what these contributions are and whether they have any validity, and how or why they may be claimed to support the cognitive ideology. Typical examples are:

3.3 Flaws of cognitivism

‘COGNITIVE PSYCHOLOGY: History of the Field ... Cognitive Revolution In 1955, Simon and Newell developed a computer capable of solving a mathematical proof ... As a result the hypothetical Turing test was devised ... Chomsky ... postulated the existence of a cognitive structure of an innate language acquisition device.’

Nothing is said about Chomsky’s own admission that his whole approach lacks support in human linguistic activity, since as he says in (Chomsky, 1971) ‘the problems of universal semantics still remain veiled in their traditional obscurity’ (cf. section 14.4 below).

The clearest part of the section is this:

‘COGNITIVE PSYCHOLOGY: History of the Field ... Cognitive Revolution George A. Miller made a distinction between short-term and long-term memory and his influential paper *The Magic Number Seven, Plus or Minus Two* (Miller, 1956) addressed the limited capacity of short-term memory and introduced the concept of chunking—the idea that the limits of short-term memory could be extended by grouping information into larger units of information.’

This is followed by a description of other findings related to ‘memory’ which concludes:

‘COGNITIVE PSYCHOLOGY: History of the Field ... Cognitive Revolution This discovery further advanced the notion that humans were complex information-processing creatures who processed incoming information through a series of stages.’

This account, far from confirming the validity of cognitivism, merely presents evidence that it is defect. What is demonstrated is that the notion of ‘memory’ as a container does not work, that it immediately requires to be dressed up with complications.

This defect of cognitivism is glaring in a comparison with the description of human action in terms of habits. As is well known from universal common experience, habits are acquired only by being trained, and they will decay if not exercised. That it is so is experienced as a central circumstance in the life of every performing artist. All the talk about ‘memory’ and information processing is irrelevant to human mental life.

Another example of a defect of cognitivism which is not recognized as such by its high priests may be found in (Miller, 1995). In this report Miller describes a so far unsuccessful project in which he hopes to achieve a system that processes natural languages as people do. He describes language in terms of words, word senses, and linguistic contexts. By this manner of describing the linguistic activity Miller gets stuck. He says that ‘Choosing between alternative senses of a polysemous word is a matter of distinguishing between different sets of linguistic contexts in which the word form can be used to express the word sense’ and then concludes that ‘How people make such distinctions is not well understood.’

But this impasse arises merely from Miller’s inadequate description of the linguistic process. Talking of verbal ‘word senses’ given by ‘sets of linguistic contexts’ is an impossible way of describing human linguistic activity. Choosing between alternative senses of a polysemous word does not arise when people

speak. The action of each person engaged in the conversation consists of the continuous changes in the person's thought object. What each word means appears in each person's stream of thought, by the associations coming in the situation from that person's habits. Typically the meaning of a word is ephemeral, entirely a matter of the particular conversation taking place. This is obvious for such common words as 'the', 'he', and 'she'.

This explanation confirms the remark above about the 'traditional obscurity of universal semantics'. 'Universal semantics' is a chimera. There are only individual persons' habits.

In the final section of Solso and MacLin's article we learn:

'COGNITIVE PSYCHOLOGY: History of the Field ... Modern Cognitive Psychology The science of human cognition is still undergoing transformation due to major changes in computer technology and brain science. As a result cognitive psychology has converged with computer science and neuroscience to create a new discipline called cognitive science.'

One presentation of this so-called new discipline may be found in a book: (Eckardt, 1993). A review of this book is found in (Naur, 1995a). By this review the author fails in her effort to argue for the field.

3.4 Cognitivist pseudo-problems

In **COGNITIVE PSYCHOLOGY: Theories** [EncPsych 2, 158-158] David A. Balota and Michael J. Cortese describe five cases of what is called 'some of the theoretical issues that have been addressed in cognitive psychology'. The first case is introduced thus:

'COGNITIVE PSYCHOLOGY: Theories ... Bottom-up Versus Interactive Models of Pattern Recognition - Models of perception attempt to explain, in large part, how patterns are recognized.'

It continues over two columns to discuss the data processing techniques of pattern recognition. As already discussed above the claim that perception takes place as pattern recognition is a central fallacy of cognitive psychology.

The second case is introduced thus by Balota and Cortese:

'COGNITIVE PSYCHOLOGY: Theories ... Attention Selection: Early or Late - One of the most difficult issues that cognitive scientists have had to grapple with is how to empirically address and theoretically model human attention. For example, how do people at a crowded party ignore distracting information and focus on (attend to) one conversation?'

This is another non-problem, arising solely from the fallacious cognitive claim that perception takes place as pattern recognition. As described by James, quoted in section 5.2 below, in perception certain parts of the stream of thought are acquaintance objects invoked by sense impressions. As always, at any time, the person turns the attention to whatever part of the momentary thought object is interesting, and may at will turn the attention at different things, including things that are not at the moment in the field of view.

3.4 Cognitivist pseudo-problems

What the person's attention is drawn to is not given just by the scenario before the person, it depends also on the person's perceptual habits and momentary feelings of interest. This is so whether the person is in a crowded party or not.

The third case is introduced thus by Balota and Cortese:

'COGNITIVE PSYCHOLOGY: Theories ... Separate Versus Unitary Memory Systems - Our intuitions would suggest that there are a number of distinct types of memory systems. ... there is a rich history of memory research that has been viewed as supporting distinct types of memory systems such as short-term, long-term, implicit, explicit, etc.'

This is yet another non-issue arising out of the 'memory'-fallacy of cognitivism. The issue dissolves when mental life is described in terms of habits and associations. Every habit involves the entire human organism, but the different organs partake in different degrees. For example, a trumpet player must practise habits in which his lips and fingers are very mobile in very specific ways while most of the rest of the organism must keep still. Undoubtedly parts of the brain, such as Broca's convolution which is known to be active in articulation of speech, are also active in trumpet playing. However, the cognitive disputes about 'types of memory systems' are spurious.

The fourth case is introduced thus by Balota and Cortese:

'COGNITIVE PSYCHOLOGY: Theories ... Analog Versus Propositional Representations of Mental Images - Humans have little difficulty imagining stimuli that are typically perceived via the senses. For example, we have little difficulty imagining a shiny red apple or a yellow school bus. The theoretical issue that has concerned researchers in this area is the form of representations to generate these images.'

As presented here this statement is revealing of the fallacies of cognitive psychology. First, in the first six words we find the cognitivist talking about humans who imagine things. But imagining things is a matter of introspection, a subject tabooed since the strangulation of psychology by behaviorism. By this taboo what is said to be imagined has no clear relation to the contents of 'memory' which are central in cognitivism.

The statement continues to claim that 'we have little difficulty imagining a shiny red apple or a yellow school bus'. This claim shows that whoever makes it is ignorant of classical results of empirical psychology. As found by Galton around 1880 and described above, people differ greatly in what they are capable of imagining. There undoubtedly are persons who will say that they can imagine a shiny red apple, but there are also many who will deny such a thing.

In any case, this does not tell what is implied when a person says it. In particular, talking about generating 'these images' in this context is senseless. That a person says that he or she is now seeing or imagining a shiny red apple implies nothing about that there is anywhere an image of a shiny red apple with properties that may be examined.

What it does imply is something that is unknown and unknowable in cognitive psychology, which nowhere admits that people experience a stream of thought which can be examined by introspection. It implies something that can only be expressed in terms of James's description of mental life, in this way: On

the assumption that the person exercises normal English habits of using the word 'imagine' and is speaking honestly, it implies nothing more or less than that the person imagines something that he or she is already acquainted with and is used to calling a shiny red apple. Consequently all the following talk of 'representations to generate these images' is idle.

The fifth case is introduced and further described by Balota and Cortese by obscure phrases such as:

'COGNITIVE PSYCHOLOGY: Theories ... Connectionist Versus Symbolic Representations - One issue that has recently received a considerable amount of attention is the level of description needed for models of higher-level cognition such as language processing and problem solving. For example, how might one build a theory of orthography, phonology, or syntax within a language? ... Thus, linguistic models are often forced to provide a separate processing route for such exceptions. ... connectionist modelling ... These models do not assume any rules, and are mathematically specified. Knowledge of a domain is contained in the values of weighted connections linking units ... '.

However, intermixed into this obscurity a number of passages to some extent clarify what has actually been done:

'COGNITIVE PSYCHOLOGY: Theories ... Connectionist Versus Symbolic Representations ... a set of rules that specify how the constituents can be combined within a language. ... Such rules provide a descriptive account of many phenomena ... as in most rules, there are many exceptions ... the values of weighted connections linking units that are either built into the models or are adjusted according to a gradual learning algorithm that updates activation patterns based on the frequency of exposure to a given stimulus ...'

This passage, in spite of its confusing reference to inessential technical details manages to tell what the whole thing is about: empirical study of language habits. And so the latest triumph of cognitive psychology is a return to description of language habits as it has been practised by linguists for centuries, achieving a peak in Otto Jespersen's description of English habits in the seven volumes of his *Modern English Grammar*, summarized in his *Essentials of English Grammar* (Jespersen, 1933). However, there is no evidence that the cognitive return to empirical study of language habits has yielded any significant new descriptions of any language habits.

So what is described in these articles as Cognitive Psychology is a totally flawed description of mental life, grounded in the AI-mythology. What is revolutionary about it is merely that it violates the behavioristic ban on talking about mental life. The whole story is yet another confirmation that James's *Principles* is unknown to the practitioners of the American-psychology-enterprise. In fact, as already said James presents a perfectly coherent description of knowing and perception in terms of habits, the stream of thought, associations, and acquainting.

3.5 The American-psychology-enterprise 1945-2000

About the activity of the practitioners of the American-psychology-enterprise in the half century from 1945 we learn from Rychlak and Struckman in **PSYCHOLOGY: Post-World War II** [*EncPsych* 6, 410-416], first about the kind of problem facing the more than 100,000 members of the professional organizations:

‘PSYCHOLOGY: Post-World War II ... Professional Developments ... At the end of World War II about 44,000 servicemen and women were hospitalized with service-connected problems. A large proportion of them suffered from psychological maladjustments of one sort or another. ... To meet the need for counselling and psychotherapy, in 1946 the U.S. Veterans Administration introduced a program to train clinical psychologists that was to have a tremendous influence on the growth of the profession. The subsequent Korean and Vietnam wars also helped further the use and acceptance among the broader public of such psychological treatments.’

About the therapies applied by practitioners of the American-psychology-enterprise in treating the patients suffering from psychological maladjustments we learn from Rychlak and Struckman:

‘PSYCHOLOGY: Post-World War II ... Professional Developments Although there were clinicians who had a consistent theoretical outlook in their work, such as the nondirective therapists who followed Carl Rogers, the theoretical rationale employed by most applied psychologists is best typified as eclectic. That is, surveys consistently revealed that a psychologist working in the field adapted her or his theory to the problem at hand, rather than adjusting the problem to fit only one preconceived theory.’

About the success of the therapeutic work we learn from Rychlak and Struckman:

‘PSYCHOLOGY: Post-World War II ... Professional Developments ... A continuing debate in clinical work has to do with just how successful psychotherapy is, and whether or not we really can train people to be effective therapists. The evidence suggests that psychotherapy per se does help people to adjust (Lambert & Bergin, 1992). But there is little proof that having advanced training in clinical work makes a great difference.

About the interests of academic psychologists during the period we learn from Rychlak and Struckman:

‘PSYCHOLOGY: Post-World War II ... Academic Developments ... Humanistic Psychology ... By the 1970s there was much criticism of the traditional interpretation of psychology as a physical or natural science. ... Those psychologists who wished to humanize psychology, or to make it more relevant to everyday living, promoted alternative approaches such as qualitative research, hermeneutics, dialogue, transcendental meditation, and transpersonal psychology to mention a few of the leading recommendations. ... Critics charged that traditional laboratory research was resulting in minuscule, arcane findings

read by few and adding up to very little of lasting worth. ... A strong trend to so-called *constructionist* (or constructivist), theoretical formulations in psychology began to be seen in the 1980s and 1990s, leading to what is sometimes called a “postmodern” form of explanation. The binding tie of many if not all postmodernist views is a conviction that it is impossible to arrive at a truth that is certain Thus at the beginning of the twenty-first century we find academia seemingly poised to effect some basic changes in its theoretical approach. ... Only time will tell.’

In these reports from Rychlak and Struckman there appears not the slightest trace of a recognition that psychology most properly is seen as analogous to the field of medicine. Not the slightest trace of a recognition that psychological maladjustments, their symptoms, and such therapies that may be undertaken with a view to alleviating them, are vitally important fields of scientific study and description. Not the slightest trace of a recognition that the development of descriptive insight into these fields may convert the present quackery into a scientifically grounded set of therapies.

As just one example from the history of medicine: blood-letting, a harmful procedure, was used for centuries as a therapy for all sorts of ailments, until in 1830 it was finally denounced in a study by Marshall Hall, a pioneer of scientific physiology. (Hall’s paper on reflex action from 1837, a fundamental scientific contribution, was refused publication by The Royal Society in London as absurd—a typical case of the reactions of the established scientific institutions, as they continue to this day.)

One example of tragic consequences of the quackery has been presented by Peter Medawar (1975) in a review of the book *The Victim is Always the Same* by I. S. Cooper. Medawar concludes his review: ‘The opinion is gaining ground that doctrinaire psychoanalytic theory is the most stupendous intellectual confidence trick of the twentieth century.’ The discussions of the present book indicate that the entire American-psychology-enterprise should be included along with doctrinaire psychoanalytic theory in this pronouncement.

With respect to adopting and practising a scientific attitude to their field the practitioners of the American-psychology-enterprise in the year 2000 place themselves roughly where their colleagues in medicine could be found around year 1800.

The indifference of the academic practitioners of the American-psychology-enterprise to the therapeutic work done by the clinicians is the direct outcome of behaviorism. By this ideology human mental experience, the core of any psychotherapy, is forbidden ground. The sufferings of the victims of terrible wars is declared by the academic practitioners of the American-psychology-enterprise to be an unscientific topic that simply cannot be discussed.

The large scale quackery of the American-psychology-enterprise is a specifically American phenomenon. It is displayed regularly in American literature and movies, in which the characters are shown lying on the couch of the ever present psychoanalyst. Example: the films of Woody Allen.

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Another example: the best-selling novel *Portnoy's Complaint* by Philip Roth. The whole text of this novel is a satire on the 'confessions' of the I of the story, Alexander Portnoy, to his 'shrink', Dr. O. Spielvogel. At one point of these confessions Portnoy quotes his girl friend as saying: 'I'm going to call your office *a lot*. Because I like everybody to know I belong to somebody. That's what I've learned from the fifty thousand dollars I've handed over to that shrink.' The preface of the novel is a definition, in mock-scientific style, of the disorder 'Portnoy's Complaint', concluding: 'It is believed by Spielvogel that many of the symptoms can be traced to the bonds obtaining in the mother-child relationship', displaying the typically Freudian generalization from a single case. To at least one European observer it is a source of constant puzzlement that, as evidenced by such examples, a prominent section of American intellectuals take the quackery of the American-psychology-enterprise seriously, let themselves be guided by it, and pay for it.

Establishing a therapy for a human ailment, and applying it to patients, are not scientific jobs. They are matters of invention and practice. But studying symptoms of ailments, and investigating and comparing therapies for their effectiveness *are* scientific jobs. It is the kind of thing done on a large scale by researchers in medicine. Investigating a therapy for its effectiveness cannot be trusted to the inventor of the therapy. It is troublesome since it is not sufficient to establish that the therapy has led to a cure of the ailment. It is necessary to check that the ailment would not have cured itself, even without the therapy.

Further, there is generally neither a best way of identifying an ailment from symptoms, nor a best therapy for it. These things are improved all the time, by new inventions. But it *is* a scientific job to determine the relative qualities of such therapies that have been invented at any particular time. But these important scientific problems are unrecognized by the academic practitioners of the American-psychology-enterprise.

A further picture of the American-psychology-enterprise in the half century from 1945 may be gleaned from *The Penguin Dictionary of Psychology* (PD) by Arthur S. Reber, professor of psychology, first published 1985. The Preface explains that this dictionary is the outcome of the author's taking notes of words as they were actually employed at meetings, conferences, colloquia, or in conversation, over a twenty years period. It may therefore be taken to indicate how subjects were discussed by the practitioners of the American-psychology-enterprise around 1960-80.

As a highly significant issue in this context, PD is an improper dictionary. As discussed in section 14.2 below a dictionary is a catalog of language habits of a population, usually arranged around words, having *examples* of the use of words and phrases and *explanations* of the examples. As a typical example may be mentioned Webster's Encyclopedic Unabridged Dictionary (WEUC), quoted in section 16.2 below. However, PD has no examples and the explanations given are not notes on examples, but are the author's personal notes on the words. For many words the explanation says that the word is elusive. This makes no sense, however. A fish may be elusive, not a word. Said about words used at meetings etc. can only mean that the people at these meetings have been talking unclearly,

using words with no clear meaning in the context. This is a highly significant result of the author's note-taking at meetings etc. of the practitioners of the American-psychology-enterprise.

The personal character of the explanations in PD dominates in the articles on some of the central terms. Thus the article on *psychology* reads:

'psychology Psychology simply cannot be defined; ... As a distinct discipline psychology finds its roots a mere century and a half back ... Since then it has been variously defined as 'the science of the mind', 'the science of mental life', 'the science of behaviour', etc. All such definitions, of course, reflect the prejudices of the definer more than the actual nature of the field.'

This explanation makes the blunder to argue from the assumption that there is such a thing as 'the actual nature of the field', and talking about this although giving no explanation of what is meant by 'the field'. It further makes the mistaken claim that there can be definitions that are not 'prejudices of the definer'. The explanation in the article as a whole is a dense mist.

As mentioned in section 14.6 below any definition amounts to the definer saying effectively: from now on, in this context, I shall use X to denote such and such. This is clear from the explanation of *definition* in WEUC:

definition: 2. the formal statement of the meaning or significance of a word, phrase, etc.

The word *psychology* can certainly be defined. As a matter of fact WEUC states two different definitions:

psychology: 1. the science of the mind or of mental states and processes; the science of human nature. 2. the science of human and animal behavior.

The trouble about the term *psychology* is not that it cannot be defined, but that it has been appropriated by ideologists such as behaviorists who refuse to study and describe mental life, and who do not confine themselves to using certain terms to denote particular things, but assume dictatorial rights in deciding how other people should use them.

In another central article in PD dominated by the author's personal notes we read:

'behaviourism ... Today most psychologists feel uncomfortable with radical behaviourism: there seems to be something unsatisfying about excising the causal role of internal, covert or mental processes in explanations of what it is people do ... Yet, in a sense, since all agree that what people *do* is the ultimate test ...'

This explanation is entirely misty since it is unclear how the talk of 'causal role' and 'explanations of what it is people do' relates to human experience. As illustration, a person reading the newspaper can be seen to move the eyeballs in numerous small jerks. Are these jerky movements part of 'what the person does?' If so what are the explanations of them? It may then happen that while reading the newspaper the person's attention suddenly switches to the thought of an urgent telephone call the person has to make. Is this switch of attention part of 'what the person does?' If so what is the explanation of it?

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What is here claimed to be agreed by all, ‘what people *do* is the ultimate test’, makes no clear sense. The argument for behaviorism is as senseless in 1984 as it was when it was launched in 1913.

Put in other words: describing human experience in terms of ‘explanations of what it is people do’ is a hopeless project. As said by William James, the first fact of psychology is: *thinking goes on*. That is what has to be studied and described.

The article in PD on *feeling* reads:

‘feeling It is particularly difficult to isolate precise usages of this term since even the most technical are contaminated by popular connotations. 1. Most generally, experiencing, sensing or having a conscious process. More specifically: 2. A *sensory impression*, meaning a sensation such as warmth or pain. 3. An *affective state*, as in a sense of well-being, depression, desire, etc. 4. One of the dimensions of emotion, particularly in reference to the hypothesized elementary emotional continua, such as in Wundt’s dimensions of feeling. 5. *Belief*, as in a vague opinion or notion about something not supported by any real evidence.

The difficulty with the term is that its use is nearly always metaphoric and somehow we all seem quite convinced that we know what we mean when we use it.’

This article in its self-contradiction, verbosity, and muddle, which leaves the reader totally confused, is typical of the PD as a whole. For comparison, take the article in WEUC about *feeling*, quoted in section 16.2 below. By building upon 5 examples this makes the matter entirely clear. It is in perfect accord with William James’s description of the stream of thought presented in section 5.2, which states that every state of consciousness has thoughts and feelings, the feelings coming in unlimited shades and variations.

The debacle of the description of *feeling* in PD matches the descriptions of specific feelings, again displayed in a comparison with WEUC. The quotations from WEUC in section 16.2 have 33 words that are explained in terms of ‘feeling’ or ‘emotion’. The way these words are explained in PD is as follows:

Not found in PD (15): admiration, agitate, contempt, disappointment, envy, excite, exhilaration, glad, hope, joy, passion, possession, proud, want, worry

Word found in PD, *not* explained in terms of feeling or emotion (6): affection, dream, interest, obsession, prejudice, temper

Word found in PD, explained in terms of feeling or emotion (12): anger, animosity, anxiety, attitude, fear, jealous, love, mood, pleasure, regret, shame, sympathy

Thus of the 33 words explained as feelings in WEUC only 12 are thus explained in PD, showing how this central aspect of human mental life is neglected in PD.

PD confirms that the practitioners of the American-psychology-enterprise are totally ignorant of William James’s *Principles*, as follows:

- The article on *Jamesian* makes the false statement that ‘there is no broad, structured theory associated with James’s work’.

- The article on *habit* has not one word to indicate that habit is the ground of all human activity, including speech, every person being, as James says, a bunch of habits.
- The article on *instinct* claims falsely that ‘the first school of psychology to make instinct a central concept was the FREUDIAN’, cf. section 4.6 below.
- In 31 articles on *association* there is not one word to indicate that every moment to moment change of any person’s state of consciousness, the stream of thought, including perception of sense impressions and language signs, is a matter of habitual associations.
- The article on *perception* has not one word to indicate that all perception, whether the items are perceived as language signs or not, happens by association.
- The article on *attention* has not one word to indicate that the selective function of attention is active in anyone’s stream of thought at every moment.
- The article on *plasticity* has not one word to indicate that all habits are grounded in the plasticity of the neural material.
- The article on *time* has not one word to indicate the experience of the *specious present*.
- The article on *stream of consciousness* claims that ‘As introduced by William James, a term used to emphasize the notion that consciousness is not a static thing made up of discrete elements ...’. This is mistaken. The term is used by James to denote the experience had by any person at every waking moment of life, the thinking going on.

That the practitioners of the American-psychology-enterprise are committed to the cognitive ideology is displayed in PD in such entries as *cognitive psychology* and *memory*.

As a whole, to judge from the account given in PD, everything said by the American-psychology-entrepreneurs at their conferences etc. is throwing about with words that denote nothing clearly.

And so in the four quotations from the *EncPsych* and in PD we have an overview of the outcome of the ideological decay of psychology, expressed in terms of the activity of the practitioners of the American-psychology-enterprise in the half century from 1945, in summary:

- *The discussions of the phenomena of mental life are totally dominated by invalid ideologies: behaviorism and cognitivism, resulting in a confusion by which there is no clear common understanding of the terms being used and a failure to account for the life experience had by anyone.*
- *The psychotherapy practised is quackery on a continental scale.*
- *The academic activity consists of confused ideological skirmishes and laboratory experiments with slight relevance to human life, while the quackery performed by the psychotherapists is ignored.*

Tellingly, the one and only quotation given in WEUD as example of the use of ‘quack’ is this: *a quack psychologist who complicates everyone’s problems.*

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The basis of any work in medicine, the first part of the subject presented to any student, is a description of the human body, so-called anatomy. Similarly, the basis of any work on mental life ought to be a description of that life, as it goes on in any person of normal sanity. This is what James presented in his *Principles*, and that is what the remaining part of the present presentation shall bring, in a concentrated form.

4. Habits and synapse states

4.1 Each person is a bundle of habits

As pointed out by William James in Chapter IV of his *Principles of Psychology* (James, 1890): THE MOST IMPORTANT GENERAL PROPERTY OF THE THINKING AND BEHAVIOR OF PEOPLE IS THAT EACH PERSON IS A BUNDLE OF HABITS.

As illustration of this it lies close at hand to consider first how it happens when people want to perform especially difficult things, things that most people do not even just try, such as ballet dancing, or violin playing, or juggling with four balls at the same time. As well known there is only one way in which a person may arrive at mastering such a skill, namely practice, in other words by performing the action, as well as possible, time after time, in the right way. But that is simply training of habits.

But habits cover far, far more. All our becoming aware of things around us that we see, hear, and feel, that activity we call perception, is entirely a matter of the habits we each of us have trained. Further our moving about among things, the way we move arms and legs when we walk around, is almost entirely habitual. As also when we talk with each other, the way we perceive what others say to us, and the way we move tongue, lips and other speech organs, all this has been trained as habits. All learning and education is a matter of training new habits.

Any part of a person may participate actively in a habit. Those parts of the organism that do not participate actively have to be passive during the performance of the habit. *In this sense every habit involves the entire organism of the person.*

The importance of habits in the life of any person must be considered to be a firmly established matter; it is confirmed to each of us, every waking moment of our life.

4.2 Habits of musicianship

The variety of habits and their interplay and development may be illustrated very concretely in the skills involved in playing a musical instrument, such as the clarinet. Clarinet playing depends on the activity of many parts of the player's body, in particular (1) the lips that by their hold around the mouthpiece put the reed in such a state that it produces the tone, (2) the lungs and the abdominal muscles that form the stream of air past the reed that makes it vibrate, (3) the fingers and arms that hold the instrument and cover some of the holes so as to

have a particular tone produced, (4) the ears that let the player hear the tone produced and thereby make him direct the lips and muscles so as to have the desired tone produced, and (5) the eyes by which the player reads the music.

When playing the instrument these organs of the player are involved in a complicated pattern of different habits. Each such habit has to be trained, and each habit will gradually decay when not practised. The time scales of the training and the decay of the habits differ widely among the habits.

The habits of holding the instrument and of closing a particular combination of holes for a given note written in the music with the fingers are trained over the first few years of practising the instrument and these habits decay slowly, over years.

The habits of the actions of the lips and the abdominal muscles are more complicated. The first development of the lips to produce an adequate tone requires daily practice over a period of several years. In this activity not only the habit of controlling the lips is trained, but the anatomical parts of the lips undergo semipermanent changes. These changes become critical if the intensity of the practice or performance of the instrument is forced beyond a certain level, typically several hours a day, which may produce damage to the lips in the form of painful swollenness. In any case, if not practised the lip control habits decay rapidly, in a few days or weeks. For this reason, the practice of long, sustained tones is the most important daily discipline in the playing of any wind instrument.

Further habits have to be trained by the player who wants to play directly from printed music. These habits allow significant development. The beginner on the instrument will practise to read one note of music at a time and immediately do the appropriate bodily motions to make the tone come forth. With steady practice over years the player may gradually acquire the skill to read from the music a phrase having several notes and then perform the series of bodily movements required to produce the corresponding series of tones, with their proper durations as described in the music. Such a habit is required for the player to be able to play rapid passages from sight, and is similar to the habit of a person who has trained the skill to read a verbal text aloud fluently, again reading a whole phrase of the text at a time, which then gives rise to a series of movements of the speech organs.

Still further habits have to be trained when the player prepares the performance of a piece of music he has not played before. This involves the habits of playing the phrases of the music in sequence, that is to have the playing of each phrase lead to the playing of the next following one by habitual association. Training the habits of a new, difficult piece of music may require many months of daily practice. If later not maintained by regular practice, those parts of these habits that involve movements and actions will usually decay, over a few months, while other parts may be retained over many years.

A day-by-day development of music performance habits I have personally observed many times when working systematically on overcoming a particular technical difficulty while learning to play a new piece of music. Typically such a difficulty consists of a short, quick passage of notes in sequence, such that the playing of it requires the fingers of the player to perform an unfamiliar sequence of complicated movements.

4.2 Habits of musicianship

In systematic work on solving such a difficulty a basic principle to be followed by the player is never to play the passage faster than to have all the tones come forth perfectly, in other words, always avoid training a bad habit! In this work the metronome, the machine which can be set to give off regular ticks at any preset rate, is indispensable. On the first day of practice I will start to play the passage several times with the metronome set at such a slow tempo that I simply cannot play it wrong. Then I will play it again several times, at each repetition increasing the tempo set by the metronome very slightly, continuing this increase of tempo only so long as the passage comes out perfectly, with all tones right. I will then make a note of the fastest tempo achieved on that day. The following days I will practise in the same way, always starting the exercise at the dead slow tempo. I can then observe that the fastest safe tempo achieved will increase from day to day, typically such that this tempo will have doubled after one or two weeks, merely as a result of a few minutes of daily systematic practice.

Thus in any performance of a well trained clarinet player a whole family of different habits, with different time-scales of training and decay, will be activated together.

The linguistic activity of each person depends on the training and performance of habits in a similar manner. New habits come in particularly each time the person begins to have speaking intercourse with a new circle of persons which has enough common activity to have developed its distinctive tongue, reflecting the common of concerns of the circle.

4.3 The plasticity of the nervous system

In addition to describing the manifestations of habits over a broad field of human activities, William James also discusses assumptions about what is the physiological ground of habits. He does not hesitate to join in the understanding that at his time had already been stated by a number of his psychological predecessors (James, 1890, vol. 1, p. 105):

'the phenomena of habit in living beings are due to the plasticity‡ of the organic materials of which their bodies are composed. ‡Note: In the sense above explained, which applies to inner structure as well as to outer form.'

At the time of James's *Principles*, 1890, the biological ground of the plasticity of the organic materials was unknown, but only few years later the plasticity was established, largely through the researches of Charles S. Sherrington (1857-1952), as reported in the following quotations from *The Integrative Action of the Nervous System*, 1906, 2nd. ed. 1948, reprinted 1973, page 13-14:

'Nervous conduction has been studied chiefly in nerve-trunks. Conduction in reflexes is of course for its spatially greater part conduction along nerve-trunks, yet reflex conduction in toto differs widely from nerve-trunk conduction. - Salient among the characteristic differences between conduction in nerve-trunks and in reflex-arcs respectively are the following: Conduction in reflex-arcs exhibits: (1) slower speed as measured by the latent period between application of stimulus and appearance of end-effect, this difference being greater for weak stimuli than for strong; (2) less close

correspondence between the moment of cessation of stimulus and the moment of cessation of end-effect, i.e. there is a marked 'after-discharge'; (3) less close correspondence between rhythm of stimulus and rhythm of end-effect; (4) less close correspondence between the grading of intensity of the stimulus and the grading of intensity of the end-effect; (5) considerable resistance to passage of a single nerve-impulse, but a resistance easily forced by a succession of impulses (temporal summation); (6) irreversibility of direction instead of reversibility as in nerve-trunks; (7) fatigability in contrast with comparative unfatigability of nerve-trunks; (8) much greater variability of the threshold value of stimulus than in nerve-trunks; (9) refractory period, 'bahnung', inhibition, and shock, in degrees unknown for nerve-trunks; (10) much greater dependence on blood-circulation, oxygen (Verworn, Winterstein, v. Baeyer, etc.); (11) much greater susceptibility to various drugs-anaesthetics.'

Of these properties, (3), (5), (7), and (9) are matters of plasticity in the conduction in reflex-arcs.

As an example of the empirical basis of these assertions, this is quoted from Sherrington's observations related to (5), temporal summation (p. 36-37):

'We find striking instances of the summation of subliminal stimuli given by the scratch-reflex [of the dog]. The difficulty of exciting a reflex by a single-induction shock is well known. A scratch-reflex cannot in my experience be elicited by a single-induction shock, or even by two shocks, unless as physiological stimuli they are very intense and delivered less than 600 milliseconds apart. Although the strongest single-induction shock is therefore by itself a subliminal stimulus for this reflex, the summation power of this reflex mechanism is great. Very feeble shocks, each succeeding the other within a certain time—summation time—sum as stimuli and provoke a reflex. Thus long series of subliminal stimuli ultimately provoke the reflex. I have records where the reflex appeared only after delivery of the fortieth successive double shock, the shocks having followed each other at a frequency of 11.3 per sec., and where the reflex appeared only after delivery of the forty-fourth successive make shock, the shocks having followed at 18 per sec.'

Sherrington discusses at length the evidence on what part of the organic material gives rise to the difference between conduction in reflex-arcs and nerve-trunks. Through this discussion his attention is drawn to (p. 15-17):

'the existence at the confines of the cells composing the organism of "surfaces of separation" between adjacent cells. The characters distinguishing reflex-arc conduction from nerve-trunk conduction may therefore be largely due to intercellular barriers, delicate transverse membranes, in the former. - In view, therefore, of the probable importance physiologically of this mode of nexus between neurone and neurone it is convenient to have a term for it. The term introduced has been *synapse*.'

This in particular means that the most likely location of the plasticity of the organic material will be the synapses.

4.3 The plasticity of the nervous system

Sherrington further says (p. 157):

‘There is abundant evidence that different synapses differ from one another. That neurones should differ in the threshold value of the stimulus necessary to excite them seems only natural. The arguments adduced by Goldschneider point in the same direction. Many of the phenomena considered in the first three lectures [quoted above] are easiest explicable by such differences. The distinctions between different synapses in regard to ease of alteration by strychnine and by tetanus toxin emphasize this probability further.’

4.4 The synapse-state description of the total organism

The description of the nervous system established by Sherrington suggests the following form of description of the neural properties of mental life, which hereafter will be denoted *the synapse-state theory of mental life*: With the plasticity of the organic material located in the synapses, it will be distributed throughout the body. The number of synapses in the body is of the same order as the number of the nerve cells they connect, which in the human organism is about 10,000,000,000. These synapses are not all biochemically identical. The way they increase their efficiency upon activation, and the rate of their regression upon inactivation, undoubtedly is different from one synapse to another. At any moment each synapse will be in a certain state of efficiency. The mental state of the organism is then given by the momentary state of efficiency of each of the synapses.

The structure of the nervous system according to this theory is suggested in the pattern on the cover of this book. The synapse kinds are suggested by different oval shapes and the synapse states by different texture patterns.

The remainder of the present and the following sections will indicate how human mental life may be described in terms of the synapse-state theory.

Being alive means that the organism is in continual change in which at any moment a certain part of the nerves and the synapses transmit impulses, which are distributed into the network of nerves according to the current state of efficiency of the synapses, each synaptic efficiency in its turn being changed by the transmission intensity that it is subjected to, typically increasing when the intensity is high, decreasing when it is low.

The overall life activity presumably is maintained by impulses circulating in certain neuron/synapse paths that form closed circles. This activity of the organism is what is experienced as the stream of thought. At any time a number of such circulations, each supported by a neuron/synapse circle in some place in the organism, may be supposed to be active. Each different major state of consciousness, such as waking, sleep, and hypnotic trance, may then correspond to some particular circulation taking place. A cursory inspection of typical electroencephalographic records suggests that the circulation frequency (circulations per second) of such a major-state-controlling circle in each of certain states is approximately as follows: excited (beta rhythm): 17; relaxed (alpha rhythm): 10; drowsy: 5; asleep: 1; deep sleep: 2; coma: 0.8.

Transitions between the major states happen when one or several of certain neuron/synapse circles change from being active to passive or *vice versa*. Such transitions will be influenced by other synapses. The daily wake-sleep transition may be influenced by a neuron/synapse circle making one circulation per day.

A circular neuron/synapse path may include an organ other than a synapse that undergoes a change upon activation by a nerve impulse, such as a muscle. Circles of this kind are well known from their control of such organic functions as the heart beat and peristaltic movements.

Many more secondary circulations may be assumed to be in play, depending on the state of activity of the organism. Such characteristic phenomena as the 'warming up' of the organism which is an important part of the activity of any kind of performers such as athletes and musicians, may be understood as the starting up of particular circulations. Relaxation and rest may then be understood to give rise to a corresponding closing down of certain circulations.

Other circulations may account for such a phenomenon as sexual arousal. All the various aspects of male sexual arousal may in fact be understood in terms of one or a few circulations that account for the feeling of sexual excitement, one circulation that stimulates the muscles that control the erection, and one circulation that when released stimulates the muscles that give rise to the orgasm.

A synaptic circle comes into being when all the synapses of the circle come into such a state that the circle will support the circulation. This does not have to happen at the same time for all the synapses of the circle. Once the synapses along the circle have all come into an appropriate state, the circle will, as long as the states of its synapses have not decayed through inactivity, support the circulation of an impulse for a certain length of time whenever the circle is triggered by an impulse at a suitable point.

Thus the pattern of potential neuron/synapse circulations in the organism, that is which neuron/synapse paths would become active in a circulation if the organism were influenced by some particular stimulus, is a matter of steady change, reflecting the development and exercise of habits in the organism.

The participation of a particular neuron/synapse path in a particular circulation at a certain moment does not exclude that the same neuron/synapse path is activated in a different way, perhaps in a different circulation, a moment later.

Instincts would come about from such circles that develop in the organism so as to be ready to be activated without prior training.

This description of the major mental/organic states further suggests a mechanism of how mental life is influenced by conditions that influence the chemical constituents of the blood stream, such as hunger, thirst, or drugs. The description assumes that the synapses belong to a number of different kinds, differing in their plastic properties, the different kinds of synapses being distributed throughout the nervous system in a definite way. Each different condition may then give rise to a specific reaction in the nervous system by the blood stream influencing the plastic properties of just one kind of synapse in a particular way. As mentioned above, the influence upon synapses of drugs has already been reported by Sherrington (1906) as quoted above.

4.4 The synapse-state description of the total organism

This description of the nervous system accords with the absence of any kind of long-lived elements or atoms in mental life. The only elements in this context are the individual synapses. The more permanent neuron/synapse circles support, not elements of mental life, but particular states or functions. Any particular mental activity or family of mental activities is a matter of a set of habits, and thus will unfold itself only as the result of the state and operation of many synapses and circles. This is illustrated concretely in the above description of musicianship.

4.5 The neural activity of the *stream-of-thought

The present section will present the synapse-state description of the common features of the stream of thought, as it is experienced by anyone at any time. As a consequence of the ideological decay of psychology there is around year 2000 no commonly established vocabulary for describing these features. In order to assure a valid presentation of the synapse-state theory it has therefore been necessary to define the relevant terms explicitly. This has been done by marking the use of all such terms with an asterisk, e.g. *association. Terms thus marked have to be understood in the way they are used in James's *Principles*, as explained in sections 5-13 below. For the convenience of the reader, the most relevant parts of James's original text are also given below under the heading *James's explanations of the asterisked terms*.

Neural networks and layers

By the synapse-state theory, the activity described by James as the *stream-of-thought happens in a particular part of the neuron/synapse network of the organism, a part having a vast number of neurons and synapses. In what follows this part will be called the *thought network*. At any moment the state of the synapses in the thought network will be such that certain of the *neuron/synapse paths in this network have been put in a conductive state*. Being conductive is a matter of degree, being dependent on the momentary plastic state of the synapses along the path. It is assumed that the plastic properties of the synapses generally are such that the passing of impulses through a synapse will increase its conductivity. While not excited the conductivity of a synapse will gradually decay over a period, here called the *plastic time scale*.

The thought network operates as a whole, integrated into the total organism. For purposes of description the thought network will be considered to be divided into five closely interconnected layers, each distinguished by the plastic time scale of its synapses and the aspects of the *stream-of-thought handled by it as follows:

Sense-layer: plastic time scale: a few milliseconds; *makes what is received from sense organs appear in the *stream-of-thought* thus to some extent drowning out what comes in the *stream-of-thought from the item-layer.

Attention-layer: plastic time scale: one second; *directs the changing of *attention* between excited parts of the sense-layer, the item-layer, and the motor-layer.

Specious-present-layer: plastic time scale: ten seconds; *controls the progression and overlapping in time of the excited parts of the item-layer and the motor-layer, according to their *association*.

Item-layer: plastic time scale: months, years. Explained below.

Motor-layer: plastic time scale: months, years. Similar to item-layer, having *motor-networks* rather than item-networks. Whatever is excited leads to *muscular activations* rather than to thinking experienced.

Item networks and *thought-objects

Any such *long term item of mental life that is ready to come present with its *fringes (*knowledge-about, etc.) as part in the *stream-of-thought*, for example *each item that is retained or *remembered* over long periods ready for recall, is held in the item-layer in the form of *those parts of the item- and motor-layers that become excited when one particular node (*acquaintance-object) is excited*. I shall call such a part of the item- and motor-layers an *item network*. What comes in an item network will depend on the strength of its excitation, and on the state of the synapses that come along the paths that are reached by the excitation. Thus an item network will be different from one excitation to the next, accordingly as the states of the synapses change. These changes reflect the development of the **knowledge-about* the acquaintance object. An item network is *not* a fixed subnetwork of the thought network.

The *thinking experienced* by the person at a particular moment—the **thought-object*—is *whatever parts of the item- and motor-layers are excited* at that moment. Any **thought-object* is a very complicated whole, in which it is possible to distinguish a number of *items *known-by-acquaintance* (item-networks), each item coming in the **thought-object* with a **fringe* of **feelings*, relations to other parts, and **knowledge-about* it. When an item network is excited at its initial node all this comes forth as excitations in the item- and motor-layers, the various parts being excited at different degrees of strength, depending on the conductivity of the neuron/synapse paths through which they receive their excitation. During periods when an item network is not excited (thought of as part of the **thought-object*) the decay of the synaptic efficiencies will gradually weaken its synaptic links. However, any part of an item network may be linked also to other item networks and may have its synapses strengthened through the excitation of these.

***Association, *attention, and *perception**

Whenever two parts of either layers are excited at the same time, or within the same **specious-present*, the conductivity of a neuron/synapse path that leads from one to the other will be strengthened. This is the mechanism of **association*. Plausibly this mechanism will depend on the action of a kind of neuron/synapse path that allows transmission of an impulse in both directions, in which the plasticity of the synapse is such that the efficiency of transmission is increased whenever the path receives an impulse from both directions simultaneously. When subsequently one of the two parts becomes excited, impulses exciting the other one will come through the synapse.

The neural paths in the item-layer that support the actual **remembered-recall* (memory) have been described accurately by James (1890), as quoted from [I 655] below.

When the person is in a normal waking state a very small, continually changing fraction of the sense-, item-, and motor-layers is excited. These excitations and their changes are brought about by the activity of the attention-layer and the specious-present-layer of the thought network.

4.5 The neural activity of the *stream-of-thought

The attention-layer, having its plastic time scale of the order of a second, directs the change of the *attention among the parts excited at any moment and the alternation of what James describes as the *substantive-parts and the *transitive-parts of the *stream-of-thought. *Attention plausibly primarily consists in brief increases of the excitation–highlighting–of such parts of items in the sense-, item- and motor-layers that are already weakly excited, passing this highlighting quickly around from one such part to another under the control of a neuron/synapse circulation. Such highlighting will lead to the *formation and strengthening of *associations* among parts of all those items that are excited at the moment.

Plausibly this *attention-highlighting mechanism, like the *association mechanism, will depend on the action of a neuron/synapse path that allows transmission of an impulse in both directions, in which the plasticity of the synapse is such that the efficiency of transmission is increased whenever the path receives an impulse from both directions simultaneously.

The *attention-highlighting of a part of the sense-layer will lead to excitation of such parts in the item-layer with which it is linked by *association, this being the mechanism of *perception.

Plausibly the *transitive-parts of the *stream-of-thought arise from straight excitations of the particular items, while the *substantive-parts achieve their relative stability by being excited by a fast circulation that maintains its excitation for a duration of about one second. The *stream-of-thought lands in a *substantive-part whenever a new associative link has been formed.

Thinking of time and the *specious-present

The specious-present-layer, having time scales of the order of ten seconds, directs the change of the *thought-object—those parts of the item- and motor-layers which are excited—as induced by the *habits of *association of the *thought-objects. These changes likewise support the *thinking-of-time* in terms of the *specious-present by which each *thought-object lingers during a period of many seconds while the following *thought-objects are already becoming excited.

James's explanations of the asterisked terms

The asterisked terms are defined in the presentation of James's *Psychology* (1890) given in sections 5-10 below. For the convenience of the reader, these definitions are also given below in brief extracts from James's text, with replacement everywhere of James's term 'conception' by 'acquainting'. James (1890) writes (volume and page no.s given within square brackets):

- *States-of-consciousness

[I 185] The word introspection ... means ... the looking into our own minds and reporting what we there discover. *Every one agrees that we there discover *states-of-consciousness.* ... All people unhesitatingly believe that they feel themselves thinking, and that they distinguish the mental state as an inward activity or passion, from all the objects with which it may cognitively deal.

- *Knowledge-of-acquaintance and *knowledge-about

[I 221] *There are two kinds of knowledge* broadly and practically distinguishable: we may call them respectively **knowledge-of-acquaintance* and **knowledge-about...*[I 221] I am acquainted with many people and things, which I know very little about, except their presence in the places where I have met them. I know the color blue when I see it ... ; but *about* the inner nature of these facts or what makes them what they are, I can say nothing at all. I cannot impart acquaintance with them to any one who has not already made it himself.

- *Thinking goes on

[I 224] *The first fact for us, then, as psychologists, is that *thinking of some sort goes on.*

- Thought is in constant change

[I 230] ... *no state once gone can recur and be identical with what it was before.* ... [I 231] *there is no proof that the same bodily sensation is ever got by us twice. What is got twice is the same OBJECT.* We hear the same *note* over and over again;

- The *stream-of-thought

[I 237] *Within each personal consciousness, thought is sensibly continuous.* ... [I 239] *Consciousness ... A 'river' or a 'stream' are the metaphors by which it is most naturally described. ... let us call it the *stream-of-thought, of consciousness, or of subjective life.*

- The continuity of thought comes in the *fringe of the thought

[I 240] *Into the awareness of the thunder itself the awareness of the previous silence creeps and continues; for what we hear when the thunder crashes is not thunder pure, but thunder-breaking-upon-silence-and-contrasting-with-it.* ... [I 241] *the *feeling of the thunder is also a *feeling of the silence as just gone.* ... [I 241] *We name our thoughts simply, each after its thing, as if each knew its own thing and nothing else. What each really knows is clearly the thing it is named for, with dimly perhaps a thousand other things. It ought to be named after all of them, but it never is. Some of them are always things known a moment ago more clearly; others are things to be known more clearly a moment hence. Our own bodily position, attitude, condition, is one of the things of which some awareness, however inattentive, invariably accompanies the knowledge of whatever else we know. We think; and as we think we feel our bodily selves as the seat of the thinking. If the thinking be our thinking, it must be suffused through all its parts with that peculiar warmth and intimacy that make it come as ours.*

- *Substantive-parts and *transitive-parts of the *stream-of-thought

[I 243] *This difference in the rate of change [of our thoughts] lies at the basis of a difference of subjective states of which we ought immediately to speak. When the rate is slow we are aware of the object of our thought in a comparatively restful and stable way. When rapid, we are aware of a passage, a relation, a transition from it, or between it and something else. ... Let us call the resting-places the '*substantive-parts', and the places of flight the '*transitive-parts', of the *stream-of-thought.*

4.5 The neural activity of the *stream-of-thought

- The *fringe of every thought has *feelings and *knowledge-about

[I 245] If there be such things as *feelings at all, *then so surely as relations between objects exist in rerum naturâ, so surely, and more surely, do *feelings exist to which these relations are known.* ... [I 258] Let us use the words *psychic overtone, suffusion, or *fringe*, to designate the influence of a faint brain-process upon our thought, as it makes it aware of relations and objects but dimly perceived. If we then consider the *cognitive function* of different states of mind, we may feel assured that the difference between those that are mere ‘acquaintance’, and those that are ‘knowledges-about’ (see I 221, quoted above) is reducible almost entirely to the absence or presence of psychic *fringes or overtones.

- The *thought-object comes as an undivided unity

[I 275] ... the *Object* of your thought is really its entire content or deliverance, neither more nor less. ... [I 276] The object of every thought, then, is neither more nor less than all that the thought thinks, exactly as the thought thinks it, however complicated the matter, and however symbolic the manner of the thinking may be. [I 276] ... *however complex the object may be, the thought of it is one undivided state of consciousness.* ... [I 278] *There is no manifold of coexisting ideas; the notion of such a thing is a chimera. Whatever things are thought in relation are thought from the outset in a unity, in a single pulse of subjectivity, a single psychosis, *feeling, or state of mind.*

- *Attention chooses in the *stream-of-thought

[I 284] *The stream is always interested more in one part of its object than in another, and welcomes and rejects, or chooses, all the while it thinks* ... [I 420] *There is no such thing as voluntary *attention sustained for more than a few seconds at a time.* ... [I 421] *No one can possibly attend continuously to an object that does not change.*

- The mind can always intend, and know when it intends, to think of the Same

[I 459] THE SENSE OF SAMENESS - ... two kinds of knowledge of things, bare acquaintance with them and *knowledge-about them. ... ‘*the principle of constancy of the mind’s meanings*’, and which may be thus expressed: ‘*The same matters can be thought of in successive portions of the mental stream, and some of these portions can know that they mean the same matters which the other portions meant*’. One might put it otherwise by saying that ‘*the mind can always intend, and know when it intends, to think of the Same*’. ... [I 461] *The function by which we thus identify a numerically distinct and permanent subject of discourse is called *ACQUAINTING; and the thoughts which are its vehicles are called *acquaintance objects.* ... [I 464] *ACQUAINTINGS ARE UNCHANGEABLE

- The *stream-of-thought contains imagery

[II 44] *Sensations, once experienced, modify the nervous organism, so that copies of them arise again in the mind after the original outward stimulus is gone.* [II 44] ... Fantasy, or Imagination, are the names given to the faculty of reproducing copies of originals once felt. [II 44] ... The phenomena ordinarily ascribed to imagination, however, are those mental pictures of possible

sensible experiences, to which the ordinary processes of associative thought give rise.

- *Association: how the *thought-objects change

[I 553] *There are, then, mechanical conditions on which thought depends, and which, to say the least, determine the order in which is presented the content or material for her comparisons, selections, and decisions. ... [I 554] *Association, so far as the word stands for an effect, is between THINGS THOUGHT OF—it is THINGS, not ideas, which are associated in the mind. We ought to talk of the *association of objects, not of the *association of ideas. ... [I 561] THE LAW OF CONTIGUITY ... objects once experienced together tend to become associated in the imagination, so that when any one of them is thought of, the others are likely to be thought of also, in the same order of sequence or coexistence as before. ... the most natural way of accounting for it is to conceive it as a result of the laws of *habit in the nervous system;*

- How time is perceived: the sensible present has duration: the *specious-present

[I 606] *... The knowledge of some other part of the stream, past or future, near or remote, is always mixed in with our knowledge of the present thing. ... all our concrete states of mind are representations of objects with some amount of complexity. Part of the complexity is the echo of the objects just past, and, in a less degree, perhaps, the foretaste of those just to arrive. Objects fade out of consciousness slowly. If the present thought is of A B C D E F G, the next one will be of B C D E F G H, and the one after that of C D E F G H I—the lingerings of the past dropping successively away, and the incomings of the future making up the loss. ... [I 608] THE SENSIBLE PRESENT HAS DURATION ... [I 609] The only fact of our immediate experience is ... ‘the *specious-present.’ ... [I 636] Duration and event together form our intuition of the *specious-present with its content.*

- *Remembered-recall: memory

[I 653] *... the phenomenon of memory ... [I 655] A simple scheme will now make the whole cause of memory plain. Let n be a past event; o its ‘setting’ (concomitants, date, self present, warmth and intimacy, etc., etc., as already set forth); and m some present thought or fact which may appropriately become the occasion of its recall. Let the nerve-centres, active in the thought of m , n , and o , be represented by M, N, and O, respectively; then the existence of the paths M—N and N—O will be the fact indicated by the phrase ‘retention of the event n in the memory,’ and the excitement of the brain along these paths will be the condition of the event n ’s actual recall. The retention of n , it will be observed, is no mysterious storing up of an ‘idea’ in an unconscious state.*

- *Sensation and *perception

[II 1] *From the physiological point of view both sensations and perceptions differ from ‘thoughts’ (in the narrower sense of the word) in the fact that nerve-currents coming in from the periphery are involved in their production. In perception these nerve-currents arouse voluminous associative or reproductive processes in the cortex; but when sensation occurs alone, or with a minimum of perception, the accompanying reproductive processes are at a minimum too.*

4.5 The neural activity of the *stream-of-thought

Neural topology and synapse kinds

The present theory presupposes a network of neurons connected by synapses of several different kinds. About these given properties only a few suggestions shall be given here. It seems clear that at least two different major kinds of synapses have to be at work, the one kind taking care of items of the thought objects having long term stability, the other kind being at play in the rapid moment to moment changes of the stream of thought. It seems plausible that the topology of the network of the neurons also will come in several different styles in different parts of the thought network, accommodating various kinds of cycles.

The synapse-state theory of the nervous system suggests a wide field for empirical neurological studies. One area would be to identify and locate certain of the circulations. As the analysis technique, electroencephalographic analysis suggests itself, at least for such circulations that take place in extended neuron/synapse circles. For example, it seems plausible that the circulations active in male sexual arousal take place in extended neuron/synapse circles that involve synapses in the lower spine, which might reveal themselves by their associated electrical potentials. The alpha and beta rhythmic circulations, neural activity suggests different parts of the empirical

different parts of the thought system suggest different parts of the

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special point that man has more instincts than any other mammal. He describes them under the headings: sucking; biting; clasping; pointing; expressing desire by sound; carrying to the mouth; crying; smiling; protrusion of the lips; turning the head aside; holding head erect; sitting up; standing; locomotion; climbing; vocalization; imitation; emulation or rivalry; pugnacity; anger; resentment; sympathy; the hunting instinct; fear of strange men and animals, of black things and holes, of high places, of the supernatural; appropriation or acquisitiveness; kleptomania; constructiveness; play; curiosity; sociability and shyness; secretiveness; cleanliness; modesty, shame; love; jealousy; parental love.

4.7 The false-track behaviorist view of nervous activity

The impressive insight into the nervous system achieved by Sherrington was not taken up by the practitioners of the American-psychology-enterprise. Like that of James before him, Sherrington's insight was suppressed under the dominance of behaviorism. We read:

'BIOLOGICAL PSYCHOLOGY [*EncPsych* 1, 423, Mark R. Rosenzweig] ... **Plasticity of the Nervous System.** ... William James (1890) speculated that learning is related to anatomical changes at neural junctions, as did neurobiologists Eugenio Tanzi (1893), Santiago Ramon y Cajal (Cajal, 1894), and Charles Sherrington (Foster & Sherrington, 1897). In the same publication, Sherrington proposed the term "synapses" for these junctions (Foster & Sherrington, 1897, p. 929). - Initial publications about learning in animals by Edward Thorndike (1898) and Ivan P. Pavlov (1906) encouraged research on neural mechanisms of learning. Psychologist Shepard I. Franz was the first to seek to determine the site of learning in the brain by combining Thorndike's methods of training and testing animals with the technique of induced localized brain lesions. Franz later inducted Karl Lashley, and through Lashley many others, into research on this topic. ... '

And further:

'NEUROPSYCHOLOGY: Theories [*EncPsych* 5, 421-22, Stuart M. Zola and James D. Brady] ... Karl Lashley (1890-1958) joined the localization debate in the early twentieth century. Lashley began his explorations into the neural correlates of psychological constructs as a student of James Watson (1878-1958) working primarily on conditioned reflexes. ... In his pivotal work *Brain Mechanisms and Intelligence* (1929), he formulated two laws concerning the relationship between the cortex and learned behaviors. First, his law of mass action stated that the degree of impairment to learned behavior is proportional to the amount of cortex removed. Second, according to his law of multipotentiality, every single part of the cortex participated in multiple functions. ... Lashley concluded that no single region of the cortex was responsible for the retention of individual learned behavior.'

By these pronouncements Lashley has failed to find any such localization of learned behavior that his research program set out to find. But Lashley's two laws accord perfectly with the synapse-state description of the nervous system presented above, by which the mental life is at all times a matter of the total organism.

4.7 The false-track behaviorist view of nervous activity

The later development is described by Rosenzweig:

‘BIOLOGICAL PSYCHOLOGY [EncPsych 1, 423] ... **Plasticity of the Nervous System.** ... In fact, around the middle of the twentieth century, major advances were beginning to occur in research on the neural mechanism of learning and memory. Some of these resulted from recently developed techniques, such as single-cell electrophysiological recording, electron microscopy, and use of new neuro-chemical methods. Another major influence encouraging research on neural mechanisms of learning and memory was Donald O. Hebb’s 1949 monograph, *The Organization of Behavior*. ... Much current neuroscience research concerns properties of what are now known as Hebbian synapses.’

The Organization of Behavior (New York, 1949) by Donald O. Hebb (1904-1985) opens with an *Introduction*, consisting on pages *xi* to *xv* of a background discussion and on the remaining pages *xvi* to *xix* of an outline of the theory developed in the rest of the book. The background discussion is mostly concerned with ideological worries. They are treated in ways that are more likely to confuse the reader than to enlighten him. Thus, concerning the writings of Pavlov or Freud it is said on page *xii* that ‘Ego, Id, and Superego are conceptions that help one to see and state important facts of behavior, but they are also dangerously easy to treat as ghostly realities: as anthropomorphic agents ...’. Again on page *xiii* we learn that ‘The risk, on the one hand, is of forgetting that one has oversimplified the problem; one may forget or even deny those inconvenient facts that one’s theory does not subsume. On the other hand is the risk of accepting the weak-kneed discouragement of the vitalist, of being content to show that existing theories are imperfect without seeking to improve them.’

Certain claims of the background discussion express ideological prejudices. Thus on page *xiii* it says: ‘All one can know about another’s feelings and awareness is an inference from what he *does*—from his muscular contractions and glandular secretions.’ This is behaviorist nonsense. Whoever uses the words ‘feelings’ and ‘awareness’ thereby explicitly acknowledges his own introspection. The feeling of anger is a matter of introspection. Having noted that the anger is there we may describe it and observe that its properties are muscular contractions and glandular secretions, but that which we describe in this way is an introspective fact. We may assume that the other person’s muscular contractions and glandular secretions arise together with his feeling of anger, but only he can tell for sure.

Hebb in this background discussion makes no reference to James’s *Principles* and there is no recognition that not only has every one of the ideological worries been explicitly cleared, but *the main problem solved*, by James. Thus in the very first paragraph of the *Introduction* on page *xi* Hebb says that

‘There is a long way to go before we can speak of understanding the principles of behavior to the degree that we understand the principles of chemical reaction.’

Hebb is ignorant that the principles of behavior have been explicitly stated by James when he writes, as quoted above in sections 4.1 and 4.3: ‘Each person is a

bundle of habits' and 'the phenomena of habit in living beings are due to the plasticity[‡] of the organic materials of which their bodies are composed. †Note: In the sense above explained, which applies to inner structure as well as to outer form.'

Hebb's *Introduction* from page *xvi* states his problem and sketches his solution:

'The central problem with which we must find a way to deal can be put in two different ways. Psychologically, it is the problem of thought: some sort of process that is not fully controlled by environmental stimulation and yet cooperates closely with that stimulation. From another point of view, physiologically, the problem is that of the transmission of excitation from sensory to motor cortex. ... [*xvi*] In mammals even as low as the rat it has turned out to be impossible to describe behavior as an interaction directly between sensory and motor processes. Something like *thinking*, that is, intervenes. ... [*xvi*] What is the nature of such relatively autonomous activities in the cerebrum? Not even a tentative answer is available. ... [*xvi-xvii*] But the recalcitrant data of animal behavior have been drawing attention more and more insistently to the need of some better account of central processes. ... [*xviii*] What is the neural basis of expectancy, or of attention, or interest? ... [*xviii*] In modern psychology such terms are an embarrassment; they cannot be escaped if one is to give a full account of behavior, but they still have the smell of animism: and must have, until a theory of thought is developed to show how "expectancy" or the like can be a physiologically intelligible process.

In the chapters that follow this introduction I have tried to lay a foundation for such a theory. It is, on the one hand and from the physiologist's point of view, quite speculative. On the other hand, it achieves some synthesis of psychological knowledge, and it attempts to hold as strictly as possible to the psychological evidence in those long stretches where the guidance of anatomy and physiology is lacking. ... [*xviii*] In outline, the conceptual structure is as follows:

Any frequently repeated, particular stimulation will lead to the slow development of a "cell-assembly," a diffuse structure comprising cells in the cortex and diencephalon (and also, perhaps, in the basal ganglia of the cerebrum), capable of acting briefly as a closed system, delivering facilitation to other such systems and usually having a specific motor facilitation. A series of such events constitutes a "phase sequence"—the thought process. Each assembly action may be aroused by a preceding assembly, by a sensory event, or—normally—by both. The central facilitation from one of these activities on the next is the prototype of "attention." ... [*xix*]

The kind of cortical organization discussed in the preceding paragraph is what is regarded as essential to adult waking behavior. It is proposed also that there is an alternate, "intrinsic" organization, occurring in sleep and in infancy, which consists of hypersynchrony in the firing of cortical cells.

On the background of the synapse-state description presented above this solution is unacceptable. It makes assumptions of 'the slow development of a "cell-assembly,"' a notion that has no physiological ground. And even with this arbitrary assumption, the solution fails to account, for:

4.7 The false-track behaviorist view of nervous activity

- the continuous, incessant mental activity, displayed both in the experience of the stream of thought and in electroencephalographic records,
- the effect on the organism as a whole of what is described in the statement: ‘acting briefly as a closed system, delivering facilitation to other such systems and usually having a specific motor facilitation’,
- the development of habits involving a variety of time scales,
- temporary changes in the state of sensitivity of the organism, such as sexual arousal. The failure of the solution in this area is discussed by Hebb on pages 207-237 of his book,
- the variety of states of consciousness, such as sleep and hypnotic trance.

Hebb’s approach fails because it starts from a desire to describe the stimulus-response notion of behaviorism. It makes the incessant activity of mental life an incidental matter. This is precisely the approach that James warns against, in the very first paragraph of Chapter IX of his *Principles*.

What Hebb tried but failed to do has been achieved in the synapse-state description of mental life presented above.

4.8 The ‘memory’-fallacy of cognitivism

The *EncPsych* has no entry under ‘habit’. Considering the central importance of habit in William James’s description of mental life in his *Principles* this is another indication that this work is unknown to present day psychologists. Upon closer look one will find that some aspects of mental activity that are primarily manifestations of habit will be found discussed in the *EncPsych* under ‘memory’, ‘working memory’, and ‘learning’. However, as will be discussed in detail below, replacing habit by a notion of ‘memory’ as a central issue in the description of mental life is meaningless.

The article by Endel Tulving [*EncPsych* 5, 160-162] starts:

‘MEMORY: An Overview - *Memory* is the general name applied to a wide variety of biological devices by which living organisms acquire, retain, and make use of skills and knowledge. ... Although at one time the dominant view was that memory was in some sense a “unitary” capability, to-day the multiplicity of forms and kinds of memory is widely even if not universally accepted.’

This statement displays the basic defects of the notion of memory as a core item of mental life. As discussed below it is unclear what is talked about, and the relation to mental life is left in the dark. First, what are the postulated ‘biological devices’? What properties do they have? How do they relate to the nervous system? How do they relate to mental life? How does such a device retain a skill, such as violin playing? All this is unclear.

Further, by saying that ‘living organisms acquire, retain, and make use of’ certain things, it is implied that there is something, the ‘living organisms’, that are capable of doing certain things. But how does this doing take place? Where in this manner of description do we find an account of this activity? Nowhere!

The part of text that comes closest to making sense is this: ‘living organisms acquire, retain, and make use of skills’, but even this phrase is

misleading. A skill, according to Webster's Encyclopedic Unabridged Dictionary, is 'the ability, coming from one's knowledge, practice, aptitude, etc. to do something well'. As such it cannot be acquired, retained, and made use of. A skill is not a thing. But it can be trained, practised, and performed. It is a habit.

Similarly with knowledge. By Webster's Dictionary knowledge is 'acquaintance with facts, truths, or principles, as from study or investigation.' Being acquainted with a certain issue is the habit by which a particular acquaintance object comes forth in the stream of thought in certain situations, such as when asked by somebody about the issue.

The unintelligibility of the opening continues in Tulving's following discussion concerning 'studying memory', where we learn:

MEMORY: An Overview ... laboratory studies of memory, in which the learner is given specific training on a certain task, or exposed to some specific stimulus material, and subsequently tested on the performance of the task, or on the retention of some aspect of the material. ... Indeed, one of the most important contributions made by Ebbinghaus, the father of the modern study of memory, was the adoption of the input-output approach.'

In relation to memory understood as biological devices with no clearly described properties the significance of the input-output approach is just unclear. On the other hand, it is quite clear when reinterpreted in terms of habits. Tulving's remark on Ebbinghaus again confirms that James's *Principles* is unknown, cf. section 9.2 below.

Certain statements testify other flaws of understanding, such as:

MEMORY: An Overview ... there is also little doubt that in human beings language and memory greatly influence each other not only in development but also in everyday use.

This talk of 'language and memory ... influencing each other' is meaningless since neither memory nor language denote anything clearly, and so it remains unclear what it means to say that they exert an influence. In the stream of thought items of language only have to occur at the moments when spoken words are heard or spoken by the person. But undoubtedly much silent soliloquy is going on in many people, according to personal imaging styles and habits.

Another defect understanding appears in this passage:

MEMORY: An Overview ... Another fundamental division in human memory, one that also cannot be made in studies with animals and other nonverbal individuals, is that between memory and conception, as described by William James in the 1890s, or, as we say today, between episodic memory and remembering on the one hand, and semantic memory and knowing on the other. *Remembering* consists in explicit retrieval of stored information, *knowing* consists in implicit retrieval.'

This passage is evidence of a total lack of understanding of James's description of mental life. It makes a fallacious claim about the fundamental property of the stream of thought that by James is called conception, and which in this book, preferably, is called acquainting. Acquainting is the function by which we identify a numerically distinct and permanent subject of discourse (James, vol. 1, p. 461). Talking about 'retrieval' makes no sense in relation to James's description.

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MEMORY: Coding Processes, [*EncPsych* 5, 162-166, Fergus I. M. Craik and Scott C. Brown] starts as follows: 'What is meant by coding processes in memory? First, it is clear that all mental processes are represented by neural activities in the brain, and in that sense, there are neural codes that stand for our mental experiences. But cognitive psychologists typically mean something less reductionist than that; when they talk about codes, they are referring to the qualitative nature of the mental representation of an object, a word, an idea, a sound, or other experienced event.'

By this opening it is immediately made clear that since the discussion starts from untenable, false claims, the subject of the article is empty. It talks about 'all mental processes' in the plural. There are no such things as mental processes. In the mental life of each human being there is just one thing going on: thinking, the stream of thought. That is implied in the personal unity of the person. There is only just one I in each of us.

It continues to claim that 'mental processes are represented by neural activities in the brain'. This is nonsense. The thinking going on is a matter of the whole organism, including the neural activities in the brain.

It continues to speak of 'an object, a word, an idea, a sound, or other experienced event'. This is nonsense. There are no atoms in mental life, this was made clear by James.

It goes on assuming that there is a definite 'encoded representation' for each 'experienced event', such as a word. This is totally false. What appears in the stream of thought of a person who is invited to think about some word is an entirely personal matter, even when the word is one commonly used by many people, such as 'America'. As described by James any item in the stream of thought appears with a fringe of other matters that in the person's thought are directly present with it. What comes in this fringe will change according to the personal development of the habits of the person.

The emptiness of the subject is confirmed in the substance of the article. It continues for six columns merely presenting a series of speculations about what properties the hypothetical codes might have. These speculations are such that might enter into a computer programmer's planning of a data processing program. Not a word is spoken of how the postulated codes might be determined, not a single instance of a concrete code for anything is given, and no relation to the known physiological properties of the sense organs is indicated. The whole article is airy speculation, without any relevance to mental life.

MEMORY: Constructive Processes, [*EncPsych* 5, 166-169, Elizabeth R. Grant and Stephen J. Ceci] reports on empirical studies that confirm that (1) when people are asked to describe past incidents in their lives their descriptions tend to be inaccurate, (2) when invited to retell a story they have been told at an earlier occasion people tend to modify the formulation and to add details to it that are their own invention, and (3) having modified a story people tend to retain their modified formulation when challenged later. These trivial observations all confirm that when retelling a story the person acts according to habit from the total situation in which the person currently finds himself or herself. The observations all contradict any notion that retelling happens as a sort of copying from some kind of 'memory'.

MEMORY: Memory Systems, [*EncPsych* 5, 169-172, Daniel L. Schacter] continues to elaborate on the unintelligible notion of memory as central in mental life. It postulates the presence of five separate 'memory systems'.

In support of this division into five parts the argumentation makes use of data on the activity and/or impairment of various parts of the brain of a person engaged in certain particular mental activities, claiming that the activity in this particular part proves that the particular mental activity is located there.

This 'localization claim', that the heightened activity of a localized region of the brain during some particular mental activity is a proof that that region is the exclusive agent of that mental activity, is a fallacy. Any mental activity is a matter of the total organism, even if the activity of some of the parts of the organism is weak.

As demonstration of the invalidity of the 'localization claim' consider the activity of a violin player. Violin playing is a highly developed skill, depending on lifelong training and practising of a number of elaborate habits, involving motions of the body, particularly the fingers and the arms, and the reading of music. By the 'localization claim' this skill would have to be localized in such a part of the players organism that when impaired damages the execution of the skill. By this argument the skill of violin playing is located in the player's left arm. Absurd!

In the article **MEMORY: Memory and Aging**, [*EncPsych* 5, 172-175], Roger A. Dixon pursues the subject given in the title, adopting the notion of five separate 'memory systems' postulated in the article by Daniel L. Schacter. With five columns of text and 22 references the author makes it clear that in spite of much effort not a single valid item of insight into human mental life has been established by this approach. The article confirms that the talk of memory is a dead end in describing human mental life.

The article **MEMORY: Brain Systems**, [*EncPsych* 5, 175-178, Richard F. Thompson] starts as follows:

'It now seems clear that various forms and aspects of learning and memory involve particular systems, networks, and circuits in the brain. In the broadest sense, learning can be defined as changes in behavior and awareness as a result of experience, excluding effects of damage, drugs, and so on. Memory is simply the awareness and/or the expression in behavior of what has been learned. A major distinction is made between short-term and long-term memory. - **Short-Term Memory** - William James first distinguished between short-term memory, which lasts only briefly, and long-term, or relatively permanent, memory.'

With this the confusion is total. The vocabulary is swimming. The terms 'learning' and 'memory' are used in ways that have no relation to the usage of the other authors quoted above. The term 'awareness' is used to denote what?

The remark about William James is false, yet another evidence that his work is unknown. James explicitly rejects the idea of memory as a matter of storage when he says (1890, I 655):

4.8 The 'memory'-fallacy of cognitivism

'The *retention* of *n*, it will be observed, is no mysterious storing up of an 'idea' in an unconscious state. It is not a fact of the mental order at all. It is a purely physical phenomenon, a morphological feature, the presence of these 'paths,' namely, in the finest recesses of the brain's tissue.'

Further confusion is exhibited in the following passage:

'MEMORY: Brain Systems ... Long-Term Memory ... Declarative and Procedural Memory ... On the other hand, procedural is much more of a grab bag category. In addition to nonassociative learning and basic associative learning (classical and instrumental conditioning), it includes priming and motor skills. Priming really refers to the procedure used to measure it, namely, humans are given words to learn, then tested by presenting, for example, the first two letters of the word, the priming stimulus, and asked simply to say any word (with appropriate controls for guessing frequency, etc.). This aspect of learning can occur without awareness, hence it is placed in the procedural category. *Motor skills* can be included in instrumental learning, particularly for animal studies, but complex motor skills like talking and playing musical instruments are best viewed as a separate category.'

These remarks show that the postulation of five different kinds of memory is based on confusion. The localization claims made in the article are as invalid as those made in the article by Daniel L. Schacter titled *Memory Systems*.

The remark by Richard F. Thompson:

'MEMORY: Brain Systems ... Long-Term Memory ... Declarative and Procedural Memory ... It is important to stress that episodic memory of one's past experience is not at all like a video recording. Such memories are dynamic, fragmented, and can be modified by subsequent experience.'

confirms once more what was said above concerning retelling of stories, that the person at any time acts according to habit from his or her total, current situation, again contradicting any notion that retelling happens as a sort of copying from some kind of 'memory'.

The article **WORKING MEMORY** [*EncPsych* 8, 276-79, Alan Baddeley] after mentioning several different uses of the term 'working memory' repeats the false claim that 'the idea that memory might be split into a durable long-term component and a briefer short-term element extends back at least to the nineteenth century, when William James proposed the distinction between a long-term secondary memory and a brief primary memory.'

The article continues to review 11 works from the period 1968 to 1999, being a continued reiteration of the presentation of some notion of 'memory' followed by the explanation why that notion fails to account for the facts of human experience. The total debacle of the whole activity is expressed when it is said that 'The most complex and least understood component of working memory is the central executive.'

LEARNING: An Overview [*EncPsych* 5, 1-3, Michael Domjan] strikingly displays the absurdity of the behaviorist ideology. On the one hand the article

never tires of emphasizing that only the behavioral evidence, the stimulus/response pattern, matters: ‘... an organism’s response ...’, ‘... a pervasive feature of human behavior ...’, ‘Learning can be identified only by a change in the behavior or performance of an organism.’, ‘To accommodate instances of learning that are not immediately evident in a change in behavior ...’, ‘... a change in the “mechanism of behavior” rather than a change in behavior itself ...’, ‘... more transient sources of behavioral change ...’, ‘... that are related to the learned behavior. Changes in behavioral mechanisms ...’, ‘... changes that do not require exposure to specific stimuli.’, ‘... the neural mechanism of behavior’, ‘... a change in the mechanisms of behavior. Since behavioral mechanisms ...’, ‘... that the behavior is caused by prior experience.’

On the other hand, mixed into this is a series of pronouncements in terms of phrases that have no behavioral meaning, and thus are meaningless in the context, marked here by italics: ‘... require some *linguistic competence* and involve *conscious awareness*’, ‘... something that has been learned is *accessible to consciousness*’, ‘... absence of *conscious awareness*, ...’, ‘... *fatigue* or temporary changes in *motivation*.’, ‘... learning is fundamentally a *theoretical construct*. It is not something that can be observed and measured directly. This is true in part because learning involves a change in the *mechanism of behavior*.’, ‘... one has to be sure that the behavior is *caused by* prior experience.’

Further absurdity of the behaviorist approach is displayed when the article says: ‘To accommodate instances of learning that are not immediately evident in a change in behavior, in many definitions learning is said to involve a change in “behavioral potential”’. Any talk of “behavioral potential” contradicts the description of the organism as a stimulus-response machine.

The absurdity of the behaviorist account of learning is closely related to the memory-fallacy, as directly expressed in the statement: ‘Learning and memory are like two sides of a coin.’ The whole story is a painful failure to describe in behaviorist terms what has been said very simply by William James: Every person is a bunch of habits. The thinking going on within us will in practically every moment of our life contribute to reinforcing some habit(s). We talk of learning when a person makes a deliberate effort to develop a certain particular habit, but trying to capture learning in a strict definition is senseless and idle.

LEARNING: Molecular and Cellular Aspects [*EncPsych* 5, 3-5, William T. Greenough and James E. Black] explains the numerous attempts that have been made to find physiological support for Hebb’s speculative ‘theory of thought’. The results of the attempts have all been tentative. They are of very slight interest as soon as it is clear that even if totally successful they would not overcome the defects of Hebb’s theory enumerated at the end of section 4.7 above.

LEARNING: Conditioning Approach [*EncPsych* 5, 5-8, Isidore Gormezano] reports on the frustrated attempts over a hundred years of making sense of experiments on learning in animals in terms of a handful of different kinds of ‘memory’. The frustrations are made clear in the article through the recurrent admissions of failure. There is no trace of a recognition in the article that as soon as the behaviorist notion of learning as a matter of ‘memory’ is replaced by understanding of learning as training of habits, and of every habit to be a matter of the plasticity of the synapses in the entire organism, all the experiments can readily be understood.

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LEARNING: Cognitive Approach for Humans [*EncPsych* 5, 8-11, Henry L. Roediger III and Michelle L. Meade] is yet another confirmation of the absurdity of the cognitivist notion of learning as putting some kind of items into the learning person's memory-container. The article reports on a variety of experiments in which some sharply defined items supposedly are put into some persons memory-container, but subsequently fail to be found there, and only stick there after several acts of cramming. All these experiments prove just one thing: that the notion of learning as putting something into a memory-container fails to account for what happens. On the other hand, describing the experiments as the training of habits that are matters, not of just some memory-container, but of the entire organism, accounts perfectly for all the experimental findings.

LEARNING: Cognitive Approach for Animals [*EncPsych* 5, 11-13, E. John Capaldi] has as its main theme that 'animal learning has been converted into animal learning and cognition', and thus joins in the cry of hail for cognitivism. The article displays the ideological bias from the very first paragraph, which talks about questions 'that were all but taboo 25 years ago'. However, the lifting of the taboo has hardly let any clarity into the discussion, since the four questions that are given as examples of the new 'cognitive' insight are phrased in terms that give little meaning in the context of mental life of animals.

The article is a confused potpourri of ideological issues: 'association formation', 'transitive inferences', 'Pavlovian conditioning', 'Instrumental conditioning', 'acquisition of causal knowledge', 'memory', 'serial learning', mixed up with items of taken from element psychology: 'concept learning', 'ability to time events', 'ability to enumerate events', 'ability to encode spatial information', 'animal language ability'. The article fails to present any insight into mental life.

There is no mention of James's precise characterization of the difference between man and brute (James, 1890, II 348ff, quoted in section 14.1 below): man's superior ability of association by similarity, which is what gives rise to human speech: man's deliberate intention to apply a sign to everything.

There is no trace of realization that most of the questions alleged to can be fully understood as matters of instinct and habit, in the manner these will develop within the limitations imposed by the anatomical equipment of each species of animal, while the talk of a specific 'language ability' is senseless. That this is so will be clear from such examples as: (1) Commonly young children will react to such things as machines by imitating their sounds, even at an age when they have lively habits of speech. However, in time they outgrow this manner of reaction and will tend to talk about what they experience. (2) The parrot is successful in imitating human speech since it has the proper speech producing organs. But it has no instinct of curiosity, so it develops no habits of reacting on the situation, neither by spoken sounds nor in any other way. It only imitates whatever is spoken to it. (3) A dog has lively instincts of curiosity. If trained by his master a dog will develop these instincts of curiosity into habits of lively reaction on the situation in which he finds himself. However, having only very poor organs for verbal articulation the dog will have to express his reaction mostly by nonvocal means of expression, such as movements of the head and tail.

5. The stream of thought and thought objects

5.1 The problems of describing the thinking going on

The stream of thought is William James's designation in his *Principles* (1890) for the core phenomenon of mental life, that which is experienced by every human being in all our waking hours: *thinking goes on*.

Describing the thinking going on raises several difficult problems. One difficulty is that since the phenomenon is so totally pervasive in anybody's life, everybody takes it for granted and will refer to aspects of it as a matter of course. We will all occasionally say that we feel rotten or that we will think about something. Thus a certain vocabulary is commonly used to refer to aspects of the thinking we experience, but these uses are merely vaguely suggestive. We all have some very sloppy habits when it comes to mentioning aspects of the thinking we experience.

For this reason anybody who tries to establish a description of the thinking going on as a whole is up against a problem of vocabulary. If he uses the common vocabulary, but defining his manner of using it explicitly, as he must if his description is to be coherent, his readers will tend to forget his definitions and continue to understand his terms in the sloppy ways they are used to, and will then fail to understand his description properly. If instead he introduces a vocabulary of special terms for aspects of the thinking going on, his readers will tend to miss the connection of his description to their own experience.

James in his description has chosen to use mostly the common vocabulary, but using it in special ways, often in the context of carefully selected metaphors. As a central example, he will occasionally use the word 'consciousness', but mostly in the phrase 'state of consciousness', avoiding to assign any meaning to the word 'consciousness' by itself. Concerning some of the central terminology James says himself:

[I 184-185] THE METHOD OF INVESTIGATION — *Introspective Observation is what we have to rely on first and foremost and always*. The word introspection need hardly be defined—it means, of course, the looking into our own minds and reporting what we there discover. *Every one agrees that we there discover states of consciousness*. ... [I 185] All people unhesitatingly believe that they feel themselves thinking, and that they distinguish the mental state as an inward activity or passion, from all the objects with which it may cognitively deal. ... [I 185] ... We ought to have some general term by which to designate all states of consciousness merely as such ... [I 185]... 'Feeling' has the verb 'to feel', both active and neuter, and such derivatives as 'feelingly,' 'felt,' 'feltness,' etc., which make it extremely convenient. But on the other hand it has specific meanings as well as the generic one, sometimes standing for pleasure and pain, and being sometimes a synonym of '*sensation*' as opposed to *thought*; whereas we wish a term to cover sensation and thought indifferently. ... [I 186] ... The word *psychosis* has been proposed ... [I 186] 'Thought' would be by far the best word to use if it could be made to cover sensations. ... [I 186]

In this quandary we can make no definitive choice, but must, according to the convenience of the context, use sometimes one, sometimes another of the synonyms that have been mentioned. *My own partiality is for either FEELING or THOUGHT. ...*'

5.1 The problems of describing the thinking going on

Another major difficulty is that the thinking going on is an extremely complicated and elusive phenomenon. By far most of what takes place in it is of short duration and faint, it comes and goes as a puff of air. Only by virtue of James's genius as an introspective observer and by his no smaller genius in finding striking expression to describe his findings he has succeeded in forming a full, coherent description of the thinking going on. But the difficulty is evident from the fact that for even just the first overview description of the thinking going on, what James calls 'a painter's first charcoal sketch upon his canvas', he has needed the 63 pages 224 to 290 of his Chapter IX. For his more detailed description he needed Chapter XII on the sense of Sameness, Chapter XIV on the law of habit in the thinking going on, and Chapter XVIII, Imagination. This latter chapter describes properties of the thinking going on that are strikingly different from one person to another.

However, as testified throughout this book, particularly in section 5.3, even with his genius James has failed in his effort. Not a single one among the many authors of the *EncPsych* who refer to James's work has succeeded in understanding him properly. One possible reason for this sad fact is that his book is overwhelmingly rich in details, to the extent that it will be a rare reader indeed who does not feel lost at the first reading of many passages of it. James admitted as much in his Preface, where he writes that 'the work has grown to a length which no one can regret more than the writer himself' and then goes on to suggest how matters may be skipped by the beginning readers. A further reason may be that the arrangement of matters and the use of terms in some places is confusing. This undoubtedly arose because a large part of James's book came into being as independent chapters, first published over a period of ten years.

In view of this situation, what is given below as James's description is not a summary, which could never approach the quality of James's original, neither is it the full text of it. It consists of extracts from James's text, omitting a wealth of observations that support the argument without being essential, rearranged and with some substitutions of terms so as to enhance the coherence. Throughout all omissions are indicated by volume and page number within square brackets and the terminology is explained where it deviates from James's original.

5.2 Extracts of William James's description of the stream of thought

[I 224] Chapter IX
THE STREAM OF THOUGHT

We now begin our study of the mind from within. ... [I 224] The only thing which psychology has a right to postulate at the outset is the fact of thinking itself ... [I 224] *The first fact for us, then, as psychologists, is that thinking of some sort goes on.*

FIVE CHARACTERS IN THOUGHT

How does it go on? We notice immediately five important characters in the process, of which it shall be the duty of the present chapter to treat in a general way:

- 1) Every thought tends to be part of a personal consciousness.
- 2) Within each personal consciousness thought is always changing.
- 3) Within each personal consciousness thought is sensibly continuous.
- 4) It always appears to deal with objects independent of itself.
- 5) It is interested in some parts of these objects to the exclusion of others, and welcomes or rejects—*chooses* from among them, in a word—all the while.

In considering these five points successively, we shall have to plunge *in medias res* as regards our vocabulary, ... [I 225]

1) *Thought tends to Personal Form.*

When I say *every thought is part of a personal consciousness*, ‘personal consciousness’ is one of the terms in question. Its meaning we know so long as no one asks us to define it, but to give an accurate account of it is the most difficult of philosophical tasks. This task we must confront in the next chapter; here a preliminary word will suffice. - In this room—this lecture-room, say—there are a multitude of thoughts, yours and mine ... [I 226] each belongs with certain others and with none beside. My thought belongs with my other thoughts, and your thought with your other thoughts. ... [I 226] It seems as if the elementary psychic fact were not *thought* or *this thought* or *that thought*, but *my thought*, every thought being *owned*. ... [I 226] The universal conscious fact is not ‘feelings and thoughts exist,’ but ‘I think’ and ‘I feel.’ ... [I 227] it is, and must remain, true that the thoughts which psychology studies do continually tend to appear as parts of personal selves. - I say ‘tend to appear’ rather than ‘appear,’ on account of those facts of sub-conscious personality, automatic writing, etc., of which we studied a few in the last chapter. ...’

James’s fuller account of this issue is his Chapter X, *The Consciousness of Self*, of 112 pages, a sublime expression of James’s genius for observation and description of mental life. Long passages of the chapter describe introspective experience. In other passages James characterizes the emotions of Self that are aroused by Self’s constituents in terms of numerous examples of the ordinary concerns of people. In discussing the pure principle of personal identity James supports his argument by dressing it up with striking similes.

Chapter X is summarized by James thus:

‘[I 400] To sum up now this long chapter. The consciousness of Self involves a stream of thought, each part of which as ‘I’ can 1) remember those which went before, and know the things they knew; and 2) emphasize and care paramourly for certain ones among them as ‘*me*,’ and *appropriate to these* the rest. The nucleus of the ‘*me*’ is always the bodily existence felt to be present at the time. Whatever remembered-past-feelings *resemble* this present feeling are deemed to belong to the same *me* with it. Whatever other things are perceived to be *associated* with this feeling are deemed to form part of that *me*’s *experience*; and of them certain ones (which fluctuate more or less) are reckoned to be themselves *constituents* of the *me* in a larger sense,—such as the clothes, the material possessions, the friends, the honors and esteem which the person receives or may receive. This *me* is an empirical aggregate of things objectively known.

5.2 Extracts of William James's description of the stream of thought

Here it is relevant to supplement from the full text of Chapter X, [I 329]:

The empirical life of Self is divided, as below, into

	Material	Social	Spiritual
SELF-SEEKING	Bodily Appetites and Instincts Love of Adornment, Foppery Acquisitiveness, Constructiveness Love of Home, etc.	Desire to please, be noticed, admired etc. Sociability, Emulation, Envy, Love, Pursuit of Honor, Ambition, etc.	Intellectual, Moral and Religious Aspiration, Conscientiousness
SELF-ESTIMATION	Personal Vanity, Modesty, etc. Pride of Wealth, Fear of Poverty	Social and Family Pride, Vainglory, Snobbery, Humility, Shame, etc.	Sense of Moral or Mental Superiority, Purity, etc. Sense of Inferiority or of Guilt

The summary of Chapter X continues [I 400]:

The *I* which knows them cannot itself be an aggregate, neither for psychological purposes need it be considered to be an unchanging metaphysical entity like the Soul, or a principle like the pure Ego, viewed as 'out of time.' It is a *Thought*, at each moment different from that of the last moment, but *appropriative* of the latter, together with all that the latter called its own. All the experiential facts find their place in this description, unencumbered with any hypothesis save that of the existence of passing thoughts or states of mind. The same brain may subserve many conscious selves, either alternate or coexisting; but by what modifications in its action, or whether ultra-cerebral conditions may intervene, are questions which cannot now be answered.

If anyone urge that I assign no *reason* why the successive passing thoughts should inherit each other's possessions, or why they and the brain-states should be functions (in the mathematical sense) of each other, I reply that the reason, if there be any, must lie where all real reasons lie, in the total sense or meaning of the world. If there be such a meaning, or any approach to it (as we are bound to trust there is), it alone can make clear to us why such finite human streams of thought are called into existence in such functional dependence upon brains. This is as much as to say that the special natural science of *psychology* must stop with the mere functional formula. *If the passing thought be the directly verifiable existent which no school has hitherto doubted it to be, then that thought is itself the thinker*, and psychology need not look beyond. The only pathway that I can discover for bringing in a more transcendental thinker would be to *deny* that we have any *direct* knowledge of the thought as such. The latter's existence would then be reduced to a postulate, an assertion that there *must be a knower* correlative to all this *known*; and the problem *who that knower is* would

have become a metaphysical problem. With the question once stated in these terms, the spiritualist and transcendentalist solutions must be considered as *prima facie* on a par with our own psychological one, and discussed impartially. But that carries us beyond the psychological or naturalistic point of view.'

Concerning property 2) of the stream of thought James says [I 229]:

2) *Thought is in constant Change.*

... [I 229-230] *no state once gone can recur and be identical with what it was before.*

... [I 230] We all recognize as different great classes of our conscious states. Now we are seeing, now hearing; now reasoning, now willing; now recollecting, now expecting; now loving, now hating; and in a hundred other ways we know our minds to be alternately engaged. But all these are complex states. The aim of science is always to reduce complexity to simplicity; and in psychological science we have the celebrated 'theory of *ideas*' which, admitting the great difference among each other of what may be called concrete conditions of mind, seeks to show how this is all the resultant effect of variations in the *combination* of certain simple elements of consciousness that always remain the same. These mental atoms or molecules are what Locke called 'simple ideas'. Some of Locke's successors made out that the only simple ideas were the sensations strictly so called. Which ideas the simple ones may be does not, however, now concern us. It is enough that certain philosophers have thought they could see under the dissolving-view-appearance of the mind elementary facts of *any* sort that remained unchanged amid the flow.

And the view of these philosophers has been called little into question, for our common experience seems at first sight to corroborate it entirely. Are not the sensations we get for the same object, for example, always the same? ... [I 231] It seems a piece of metaphysical sophistry to suggest that we do not; and yet a close attention to the matter shows that *there is no proof that the same bodily sensation is ever got by us twice.*

What is got twice is the same OBJECT. We hear the same *note* over and over again; ... [I 231] The realities, concrete and abstract, physical and ideal, whose permanent existence we believe in, seem to be constantly coming up again before our thought, and lead us, in our carelessness, to suppose that our 'ideas' of them are the same ideas. ... [I 231-233]

... Every thought we have of a given fact is, strictly speaking, unique, and only bears a resemblance of kind with our other thoughts of the same fact. When the identical fact recurs, we *must* think of it in a fresh manner, see it under a somewhat different angle, apprehend it in different relations from those in which it last appeared. And the thought by which we cognize it is the thought of it-in-those-relations, a thought suffused with the consciousness of all that dim context. Often we are ourselves struck at the strange differences in our successive views of the same thing. ... [I 233-236]

... *A permanently existing 'idea' or 'Vorstellung' which makes its appearance before the footlights of consciousness at periodical intervals, is as mythological an entity as the Jack of Spades.*

5.2 Extracts of William James's description of the stream of thought

What makes it convenient to use the mythological formulas is the whole organization of speech, which, as was remarked a while ago, was not made by psychologists, but by men who were as a rule only interested in the fact their mental states revealed. They only spoke of their states as *ideas of this or of that thing*. ... [I 236-237]

The changes taking place in the stream of thought will be further described in section 8 on Association.

Concerning property 3), James says [I 237]:

3) *Within each personal consciousness, thought is sensibly continuous.*

I can only define 'continuous' as that which is without breach, crack, or division. ... [I 237]

1. That even where there is a time-gap the consciousness after it feels as if it belonged together with the consciousness before it, as another part of the same self;

2. That the changes from one moment to another in the quality of the consciousness are never absolutely abrupt.

The case of the time-gaps, as the simplest, shall be taken first. ... [I 237-238]

... On waking from sleep, we usually know that we have been unconscious, and we often have an accurate judgment of how long. ... [I 238] [In] the sense of the parts being inwardly connected and belonging together because they are parts of a common whole, the consciousness remains sensibly continuous and one. What now is the common whole? The natural name for it is *myself, I, or me*.

When Paul and Peter wake up in the same bed, and recognize that they have been asleep, each one of them mentally reaches back and makes connection with but *one* of the two streams of thought which were broken by the sleeping hours. ... [I 238] The past thought of Peter is appropriated by the present Peter alone. He may have a *knowledge*, and a correct one too, of what Paul's last drowsy states of mind were as he sank into sleep, but it is an entirely different sort of knowledge from that which he has of his own last states. He *remembers* his own states, whilst he only *conceives* Paul's. Remembrance is like direct feeling; its object is suffused with a warmth and intimacy to which no object of mere conception ever attains. This quality of warmth and intimacy and immediacy is what Peter's *present* thought also possesses for itself. So sure as this present is me, is mine, it says, so sure is anything else that comes with the same warmth and intimacy and immediacy, me and mine. ... [I 239]

Consciousness, then, does not appear to itself chopped up in bits. Such words as 'chain' or 'train' do not describe it fitly as it presents itself in the first instance. It is nothing jointed; it flows. A 'river' or a 'stream' are the metaphors by which it is most naturally described. *In talking of it hereafter, let us call it the stream of thought, of consciousness, or of subjective life*.

But now there appears, even within the limits of the same self, and between thoughts all of which alike have this same sense of belonging together, a kind of jointing and separateness among the parts, of which this statement seems to take no account. I refer to the breaks that are produced by sudden *contrasts in the quality* of the successive segments of the stream of thought. If the words 'chain' and 'train' had no natural fitness in them, how came such words to be used at all? Does not a loud explosion rend the consciousness upon which it abruptly breaks, in twain? Does not every sudden shock, appearance of a new object, or change in a sensation, create a real interruption, sensibly felt as such, which cuts the conscious stream across at the moment at which it appears? Do not such interruptions smite us every hour of our lives, and have we the right, in their presence, still to call our consciousness a continuous stream?

This objection is based partly on a confusion and partly on a superficial introspective view.

The confusion is between the thoughts themselves, taken as subjective facts, and the things of which they are aware. ... [I 240] A silence may be broken by a thunder-clap, and we may be so stunned and confused for a moment by the shock as to give no instant account to ourselves of what has happened. But that very confusion is a mental state, and a state that passes us straight over from the silence to the sound. ... [I 240]

The superficial introspective view is the overlooking, even when the things are contrasted with each other most violently, of the large amount of affinity that may still remain between the thoughts by whose means they are cognized. Into the awareness of the thunder itself the awareness of the previous silence creeps and continues; for what we hear when the thunder crashes is not thunder *pure*, but thunder-breaking-upon-silence-and-contrasting-with-it. ... [I 240-241] the *feeling* of the thunder is also a feeling of the silence as just gone. ... [I 241] Here, again, language works against our perception of the truth. We name our thoughts simply, each after its thing, as if each knew its own thing and nothing else. What each really knows is clearly the thing it is named for, with dimly perhaps a thousand other things. It ought to be named after all of them, but it never is. Some of them are always things known a moment ago more clearly; others are things to be known more clearly a moment hence. Our own bodily position, attitude, condition, is one of the things of which *some* awareness, however inattentive, invariably accompanies the knowledge of whatever else we know. We think; and as we think we feel our bodily selves as the seat of the thinking. If the thinking be *our* thinking, it must be suffused through all its parts with that peculiar warmth and intimacy that make it come as ours. ... [I 242-243]

[The] difference in the rate of change [of our thoughts] lies at the basis of a difference of subjective states of which we ought immediately to speak. When the rate is slow we are aware of the object of our thought in a comparatively restful and stable way. When rapid, we are aware of a passage, a relation, a transition *from* it, or *between* it and something else. As we take, in fact, a general view of the wonderful stream of our consciousness, what strikes us first is this different pace of its parts. Like a bird's life, it seems to be made of an alternation of flights and perchings.

5.2 Extracts of William James's description of the stream of thought

The rhythm of language expresses this, where every thought is expressed in a sentence, and every sentence closed by a period. The resting-places are usually occupied by sensorial imaginations of some sort, whose peculiarity is that they can be held before the mind for an indefinite time, and contemplated without changing; the places of flight are filled with thoughts of relations, static or dynamic, that for the most part obtain between the matters contemplated in the periods of comparative rest.

Let us call the resting-places the 'substantive parts', and the places of flight the 'transitive parts', of the stream of thought. It then appears that the main end of our thinking is at all times the attainment of some other substantive part than the one from which we have just been dislodged. And we may say that the main use of the transitive parts is to lead us from one substantive conclusion to another.

Now it is very difficult, introspectively, to see the transitive parts for what they really are. If they are but flights to a conclusion, stopping them to look at them before the conclusion is reached is really annihilating them. Whilst if we wait till the conclusion *be* reached, it so exceeds them in vigor and stability that it quite eclipses and swallows them up in its glare. ... As a snowflake crystal caught in the warm hand is not longer a crystal but a drop, so, instead of catching the feeling of relation moving to its term, we find we have caught some substantive thing, usually the last word we were pronouncing, statically taken, and with its function, tendency, and particular meaning in the sentence quite evaporated. ... [I 244-245]

... If there be such things as feelings at all, *then so surely as relations between objects exist in rerum naturâ, so surely, and more surely, do feelings exist to which these relations are known.* There is not a conjunction or a preposition, and hardly an adverbial phrase, syntactic form, or inflection of voice, in human speech, that does not express some shading or other of relation which we at some moment actually feel to exist between the larger objects of our thought. If we speak objectively, it is the real relations that appear revealed; if we speak subjectively, it is the stream of consciousness that matches each of them by an inward coloring of its own. In either case the relations are numberless, and no existing language is capable of doing justice to all their shades.

We ought to say a feeling of *and*, a feeling of *if*, a feeling of *but*, and a feeling of *by*, quite as readily as we say a feeling of *blue* or a feeling of *cold*. Yet we do not: so inveterate has our habit become of recognizing the existence of the substantive parts alone, that language almost refuses to lend itself to any other use. The Empiricists ... [I 246] have said nothing of that obverse error, of which we said a word in Chapter VII, (see I 195), of supposing that where there is *no* name no entity can exist. ... [I 246-249]

Feelings of Tendency

So much for the transitive states. But there are other unnamed states or qualities of states that are just as important and just as cognitive as they ... [I 250] Examples will make clear what these inarticulate psychoses ... [I 250] are like.

Suppose three successive persons say to us: 'Wait!' 'Hark!' 'Look!'

Our consciousness is thrown into three different attitudes of expectancy, although no definite object is before it in any one of the three cases. Leaving out different actual bodily attitudes, and leaving out the reverberating images of the three words, which are of course diverse, probably no one will deny the existence of a residual conscious affection, a sense of the direction from which an impression is about to come, although no positive impression is yet there. Meanwhile we have no names for the psychoses in question but the names hark, look, and wait.

Suppose we try to recall a forgotten name. The state of our consciousness is peculiar. There is a gap therein; but no mere gap. It is a gap that is intensely active. A sort of wraith of the name is in it, beckoning us in a given direction, making us at moments tingle with the sense of our closeness, and then letting us sink back without the longed-for term. If wrong names are proposed to us, this singularly definite gap acts immediately so as to negate them. They do not fit into its mould. And the gap of one word does not feel like the gap of another, all empty of content as both might seem necessarily to be when described as gaps. ... [I 251] Which is to say that our psychological vocabulary is wholly inadequate to name the differences that exist, even such strong differences as these. But namelessness is compatible with existence. There are innumerable consciousnesses of emptiness, no one of which taken in itself has a name, but all different from each other. ... [I 252]

The truth is that large tracts of human speech are nothing but *signs of direction* in thought, of which direction we nevertheless have an acutely discriminative sense, though no definite sensorial image plays any part in it whatsoever. ... [I 253]

... And has the reader never asked himself what kind of a mental fact is his *intention of saying a thing* before he has said it? It is an entirely definite intention, distinct from all other intentions, an absolutely distinct state of consciousness, therefore; and yet how much of it consists of definite sensorial images, either of words or of things? Hardly anything! ... [I 253] The intention *to-say-so-and-so* is the only name it can receive. One may admit that a good third of our psychic life consists in these rapid premonitory perspective views of schemes of thought not yet articulate. ... [I 253-254]

Now what I contend for, and accumulate examples to show, is that 'tendencies' are not only descriptions from without, but that they are among the *objects* of the stream, which is thus aware of them from within, and must be described as in very large measure constituted of *feelings of tendency*, often so vague that we are unable to name them at all. It is, in short, the re-instatement of the vague to its proper place in our mental life which I am so anxious to press on the attention. ... [I 254-56]

Again, when we use a common noun, such as *man*, in a universal sense, as signifying all possible men, we are fully aware of this intention on our part, and distinguish it carefully from our intention when we mean a certain group of men, or a solitary individual before us. In the chapter on Conception (in this book renamed Acquainting) we shall see how important this difference of intention is. It casts its influence over the whole of the sentence, both before and after the spot in which the word *man* is used. ... [I 257-258]

5.2 Extracts of William James's description of the stream of thought

Let us use the words *psychic overtone*, *suffusion*, or *fringe*, to designate the influence of a faint brain-process upon our thought, as it makes it aware of relations and objects but dimly perceived.

If we then consider the *cognitive function* of different states of mind, we may feel assured that the difference between those that are mere 'acquaintance', and those that are 'knowledges-about' (see I 221, quoted below) is reducible almost entirely to the absence or presence of psychic fringes or overtones. Knowledge *about* a thing is knowledge of its relations. Acquaintance with it is limitation to the bare impression which it makes. Of most of its relations we are only aware in the penumbral nascent way of a 'fringe' of unarticulated affinities about it. And, before passing to the next topic in order, I must say a little of this sense of affinity, as itself one of the most interesting features of the subjective stream.

In all our voluntary thinking there is some topic or subject about which all the members of the thought revolve. Half the time this topic is a problem, a gap we cannot yet fill with a definite picture, word, or phrase, but which, in the manner described some time back, influences us in an intensely active and determinate psychic way. Whatever may be the images and phrases that pass before us, we feel their relation to this aching gap. To fill it up is our thought's destiny. Some bring us nearer to that consummation. Some the gap negates as quite irrelevant. Each swims in a felt fringe of relations of which the aforesaid gap is the term. Or instead of a definite gap we may merely carry a mood of interest about with us. Then, however vague the mood, it will still act in the same way, throwing a mantle of felt affinity over such representations, entering the mind, as suit it, and tingeing with the feeling of tediousness or discord all those with which it has no concern.

Relation, then to our topic or interest is constantly felt in the fringe, and particularly the relation of harmony and discord, of furtherance or hindrance of the topic. When the sense of furtherance is there, we are 'all right'; with the sense of hindrance we are dissatisfied and perplexed, and cast about us for other thoughts. Now *any* thought the quality of whose fringe lets us feel ourselves 'all right', is an acceptable member of our thinking, whatever kind of thought it may otherwise be. Provided we only feel it to have a place in the scheme of relations in which the interesting topic also lies, that is quite sufficient to make of it a relevant and appropriate portion of our train of ideas.

For the important thing about a train of thought is its conclusion. That is the *meaning*, or, as we say, the topic of the thought. That is what abides when all its other members have faded from memory. Usually this conclusion is a word or phrase or particular image, or practical attitude or resolve, whether rising to answer a problem or fill a pre-existing gap that worried us, or whether accidentally stumbled on in reverie. In either case it stands out from the other segments of the stream by reason of the peculiar interest attaching to it. This interest *arrests* it, makes a sort of crisis of it when it comes, induces attention upon it and makes us treat it in a substantive way.... [I 260-271]

This is all I have to say about the sensible continuity and unity of our thought as contrasted with the apparent discreteness of the words, images, and other means by which it seems to be carried on. Between all their substantive elements there is 'transitive' consciousness, and the words and images are 'fringed', and not as discrete as to a careless view they seem. Let us advance now to the next head in our description of Thought's stream.

The discussion of property 4) *Human thought appears to deal with objects independent of itself; that is, it is cognitive, or possesses the function of knowing*, has been prepared by James in his Chapter VIII:

Chapter VIII - THE RELATION OF MINDS TO OTHER THINGS ... [I 199-216]

THE RELATION OF MINDS TO OTHER OBJECTS ... [I 216]

The mind's relations to other objects than the brain are *cognitive and emotional* relations exclusively, so far as we know. It *knows* them, and it inwardly *welcomes or rejects* them ... [I 216]

Now the *relation of knowing* is the most mysterious thing in the world. If we ask how one thing *can* know another we are led into the heart of *Erkenntnisstheorie* and metaphysics. The psychologist, for his part, does not consider the matter so curiously as this. Finding a world before him which he cannot but believe that *he* knows, and setting himself to study his own past thoughts, or someone else's thoughts, of what he believes to be that same world; he cannot but conclude that those other thoughts know it after their fashion even as he knows it after his. Knowledge becomes for him an ultimate relation that must be admitted, whether it be explained or not, just like difference or resemblance, which no one seeks to explain. ... [I 216-218]

The psychologist's attitude toward cognition will be so important in the sequel that we must not leave it until it is made perfectly clear. *It is a thoroughgoing dualism*. It supposes two elements, mind knowing and thing known, and treats them as irreducible. ... [I 218-221]

There are two kinds of knowledge broadly and practically distinguishable: we may call them respectively *knowledge of acquaintance* and *knowledge-about*. Most languages express the distinction; thus ; *noscere, scire; kennen, wissen; connaître, savoir*. I am acquainted with many people and things, which I know very little about, except their presence in the places where I have met them. I know the color blue when I see it, and the flavor of a pear when I taste it; I know an inch when I move my finger through it; a second of time, when I feel it pass; an effort of attention when I notice it; but *about* the inner nature of these facts or what makes them what they are, I can say nothing at all. I cannot impart acquaintance with them to any one who has not already made it himself. I cannot *describe* them, make a blind man guess what blue is like, define to a child a syllogism, or tell a philosopher in just what respect distance is just what it is, and differs from other forms of relation. At most, I can say to my friends, Go to certain places and act in certain ways, and these objects will probably come. All the elementary natures of the world, its highest genera, the simple qualities of matter and mind, together with the kinds of relation that subsist between them, must either not be known at all, or known in this dumb way of acquaintance without *knowledge-about*.

5.2 Extracts of William James's description of the stream of thought

In minds able to speak at all there is, it is true, *some* knowledge about everything. Things can at least be classed, and the times of their appearance told. But in general, the less we analyze a thing, and the fewer of its relations we perceive, the less we know about it and the more our familiarity with it is of the acquaintance-type. The two types of knowledge are, therefore, as the human mind practically exerts them, relative terms. That is, the same thought of a thing may be called knowledge-about it in comparison with a simpler thought, or acquaintance with it in comparison with a thought of it that is more articulate and explicit still.

The grammatical sentence expresses this. Its 'subject' stands for an object of acquaintance which, by the addition of the predicate, is to get something known about it. We may already know a good deal, when we hear the subject named—its name may have rich connotations. But, know we much or little then, we know more still when the sentence is done. We can relapse at will into a mere condition of acquaintance with an object by scattering our attention and staring at it in a vacuous trance-like way. We can ascend to knowledge *about* it by rallying our wits and proceeding to notice and analyze and think. What we are only acquainted with is only *present* to our minds; we *have* it, or the idea of it. But when we know about it, we do more than merely have it; we seem, as we think over its relations, to subject it to a sort of *treatment* and to *operate* upon it with our thought. The words feeling and thought give voice to the antithesis. Through feeling we become acquainted with things, but only by our thoughts do we know about them. Feelings are the germ and starting point of cognition, thoughts the developed tree. The minimum of grammatical subject, of objective presence, of reality known about, the mere beginning of knowledge, must be named by the word that says the least. Such a word is the interjection, as *lo! there! ecco! voilà!* or the article or demonstrative pronoun introducing the sentence, *the, it, that*. In Chapter XII we shall see a little deeper into what this distinction, between the mere mental having or feeling of an object and the thinking of it, portends. ... [I 222-224]

In Chapter IX, elaborating on property 4) *Human thought appears to deal with objects independent of itself; that is, it is cognitive, or possesses the function of knowing*, James continues the description of knowing:

... [I 271] The reason why we all believe that the objects of our thoughts have a duplicate existence outside, is that there are *many* human thoughts, each with the *same* objects, as we cannot help supposing. The judgment that *my* thought has the same object as *his* thought is what makes the psychologist call my thought cognitive of an outer reality. The judgment that my own past thought and my own present thought are of the same object is what makes *me* take the object out of either and project it by a sort of triangulation into an independent position, from which it may *appear* to both. *Sameness* in a multiplicity of object appearances is thus the basis of our belief in realities outside of thought. In Chapter XII we shall have to take up the judgment of sameness again. ... [I 272-275]

James's Chapter XII will be discussed in section 6 below. Meanwhile in Chapter IX James continues to characterize *thought objects*:

[I 275] We have been using the word Object. *Something must now be said about the proper use of the term Object in Psychology.*

In popular parlance the word object is commonly taken without reference to the act of knowledge, and treated as synonymous with individual subject of existence. Thus if anyone ask what is the mind's object when you say 'Columbus discovered America in 1492', most people will reply 'Columbus', or 'America', or, at most, 'the discovery of America'. They will name a substantive kernel or nucleus of the consciousness, and say the thought is 'about' that,—as indeed it is,—and they will call that your thought's 'object'. Really that is usually only the grammatical object, or more likely the grammatical subject, of your sentence. It is at most your 'fractional object'; or you may call it the 'topic' of your thought, or the 'subject of your discourse'. But the *Object* of your thought is really its entire content or deliverance, neither more nor less. It is a vicious use of speech to take out a substantive kernel from its content and call that its object; and it is an equally vicious use of speech to add a substantive kernel not articulately included in its content, and to call that its object. Yet either one of these two sins we commit, whenever we content ourselves with saying that a given thought is simply 'about' a certain topic, or that that topic is its 'object'. The object of my thought in the previous sentence, for example, is strictly speaking neither Columbus, nor America, nor its discovery. It is nothing short of the entire sentence, 'Columbus-discovered-America-in-1492'. And if we wish to speak of it substantively, we must make a substantive of it by writing it out thus with hyphens between all its words. Nothing but this can possibly name its delicate idiosyncrasy. And if we wish to *feel* that idiosyncrasy we must reproduce the thought as it was uttered, with every word fringed and the whole sentence bathed in that original halo of obscure relations, which, like a horizon, then spread about its meaning. ... [I 276]

The object of every thought, then, is neither more nor less than all that the thought thinks, exactly as the thought thinks it, however complicated the matter, and however symbolic the manner of the thinking may be. It is needless to say that memory can seldom accurately reproduce such an object, when once it has passed from before the mind. It either makes too little or too much of it. Its best plan is to repeat the verbal sentence, if there was one, in which the object was expressed. But for inarticulate thoughts there is not even this resource, and introspection must confess that the task exceeds her powers. The mass of our thinking vanishes for ever, beyond hope of recovery, and psychology only gathers up a few of the crumbs that fall from the feast.

The next point to make clear is that, *however complex the object may be, the thought of it is one undivided state of consciousness.* ... [I 276-278]

... *There is no manifold of coexisting ideas; the notion of such a thing is a chimera. Whatever things are thought in relation are thought from the outset in a unity, in a single pulse of subjectivity, a single psychosis, feeling, or state of mind.* ... [I 278]

... If, for example, the thought be 'the pack of cards is on the table,' we say, "Well, isn't it a thought of the pack of cards? Isn't it of the cards as included in the pack? ... [I 278]

5.2 Extracts of William James's description of the stream of thought

Now not one of these assumptions is true. The thought taken as example is, in the first place, not of 'a pack of cards.' It is of 'the-pack-of-cards-is-on-the-table,' an entirely different subjective phenomenon, whose Object implies the pack, and every one of the cards in it, but whose conscious constitution bears very little resemblance to that of the thought of the pack *per se*. ... [I 279-283]

The last peculiarity of consciousness to which attention is to be drawn in this first rough description of its stream is that

5. *It is always interested more in one part of its object than in another, and welcomes and rejects, or chooses, all the while it thinks*

The phenomenon of selective attention and of deliberative will are of course patent examples of this choosing activity. But few of us are aware how incessantly it is at work in operations not ordinarily called by these names. Accentuation and Emphasis are present in every perception we have. We find it quite impossible to disperse our attention impartially over a number of impressions. ... [I 284] We actually *ignore* most of the things before us. ... [I 284-285] But what are things? Nothing, as we shall abundantly see, but special groups of sensible qualities, which happen practically or aesthetically to interest us, to which we therefore give substantive names, and which we exalt to this exclusive status of independence and dignity ... [I 285]

And then, among the sensations we get from each separate thing, what happens? The mind selects again. It chooses certain of the sensations to represent the thing most *truly*, and considers the rest as its appearances, modified by the conditions of the moment. Thus my table-top is named *square*, after but one of an infinite number of retinal sensations which it yields ... [I 285-286]

That [selective] industry goes on to deal with the things thus given in perception. A man's empirical thought depends on the things he has experienced, but what these shall be is to a large extent determined by his habits of attention. ... [I 286-287]

If, now, leaving the empirical combination of objects, we ask how the mind proceeds *rationally* to connect them, we find selection again to be omnipotent. In a future chapter we shall see that all Reasoning depends on the ability of the mind to break up the totality of the phenomenon reasoned about, into parts, and to pick out from among these the particular one which, in our given emergency, may lead to the proper conclusion. ... [I 287-288]

Looking back, then, over this review, we see that the mind is at every stage a theatre of simultaneous possibilities. Consciousness consists in the comparison of these with each other, the selection of some, and the suppression of the rest by the reinforcing and inhibiting agency of attention. ... [I 288] the world of each of us, howsoever different our several views of it may be, all lay embedded in the primordial chaos of sensations, which gave the mere *matter* to the thought of all of us indifferently. ... [I 288-289] Other minds, other worlds from the same monotonous and inexpressive

chaos! My world is but one in a million alike embedded, alike real to those who may abstract them. ... [I 289-402]

CHAPTER XI - ATTENTION ... [I 402-403]

Every one knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneous possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. ... [I 404-405]

TO HOW MANY THINGS CAN WE ATTEND AT ONCE?

The question of the *'span' of consciousness* has often been asked and answered ... [I 405] The number of *things* we may attend to is altogether indefinite, depending on the power of the individual intellect, on the form of the apprehension, and on what the things are. When apprehended conceptually as a connected system, their number may be very large. But however numerous the things, they can only be known in a single pulse of consciousness for which they form one complex 'object' (I 276ff.), so that properly speaking there is before the mind at no time a plurality of *ideas*, properly so called. ... [I 405-416]

THE VARIETIES OF ATTENTION

The things to which we attend are said to *interest* us. Our interest in them is supposed to be the *cause* of our attention. ... [I 416]

Attention may be divided into kinds in various ways. It is either to *a*) Objects of sense (sensorial attention), or to *b*) Ideal or represented objects (intellectual attention). It is either *c*) Immediate; or *d*) Derived ... [I 416]. Furthermore, Attention may be either *e*) Passive, reflex, non-voluntary, effortless; or *f*) Active and voluntary.

Voluntary attention is always derived; we never make an effort to attend to an object except for the sake of some remote interest which the effort will serve. ... [I 416].

In *passive immediate sensorial attention* the stimulus is a sense-impression, either very intense, voluminous, or sudden, ... [I 416-418]

Passive intellectual attention is immediate when we follow in thought a train of images exciting or interesting *per se*; derived, when the images are interesting only as means to a remote end, or merely because they are associated with something which makes them dear. ... [I 418-420]

There is no such thing as voluntary attention sustained for more than a few seconds at a time. What is called sustained voluntary attention is a repetition of successive efforts which bring back the topic to the mind. ... [I 420-421] *No one can possibly attend continuously to an object that does not change. ... [I 421-422]*

... Helmholtz writes:

Now just as little can we carry out our purpose to keep our attention steadily fixed upon a certain object, when our interest in the object is exhausted, and the purpose is inwardly formulated in this abstract way. *But we can set ourselves new questions about the object, so that a new interest in it arises, and then the attention will remain riveted.* The relation of attention to will is, then, less one of immediate than of mediate control.

5.2 Extracts of William James's description of the stream of thought

These words of Helmholtz are of fundamental importance. And if true of sensorial attention, how much more true are they of the intellectual variety! The *conditio sine quâ non* of sustained attention to a given topic of thought

derived is classed as passive as when it is classed as voluntary. So that on the whole we may confidently conclude—since in mature life we never attend to anything without our interest in it being in some degree derived from its connection with other objects—that *the two processes of sensorial adjustment and ideational preparation probably coexist in all our concrete attentive acts.* ... [I 434-437]

It has been said, however, that we may attend to an object on the periphery of the visual field and yet not accommodate the eye for it. ... [I 437] Helmholtz states the fact so strikingly that I will quote his observations in full. He was trying to combine in a single solid percept pairs of stereoscopic pictures illuminated instantaneously by the electric spark. The pictures were in a dark box which the spark from time to time lighted up; and, to keep the eyes from wandering betweenwhiles, a pin-hole was pricked through the middle of each picture, through which the light of the room came, so that each eye had presented to it during the dark intervals a single bright point.... [I 437] Helmholtz now found that simple linear figures could, when the eyes were thus kept immovable, be perceived as solids at a single flash of the spark. But when the figures were complicated photographs, many successive flashes were required to grasp their totality.

“Now it is interesting,” he says, “to find that, although we keep steadily fixating the pin-holes and never allow their combined image to break into two, we can, nevertheless, before the spark comes, keep our attention voluntarily turned to any particular portion we please of the dark field, so as then, when the spark comes, to receive an impression only from such parts of the picture as lie in this region. ...” ... [I 438]

2. But if the peripheral part of the picture in this experiment be not physically accommodated for, what is meant by its sharing our attention? What happens when we ‘distribute’ or ‘dispense’ the latter upon a thing for which we remain unwilling to ‘adjust’? This leads us to that second feature in the process, the ‘*ideational preparation*’ of which we spoke. *The effort to attend to the marginal region of the picture consists in nothing more nor less than the effort to form as clear an idea as is possible of what is there portrayed.* ... [I 438-442]

... Every stir in the wood is for the hunter his game; for the fugitive his pursuers. Every bonnet in the street is momentarily taken by the lover to enshroud the head of his idol. The image in the mind *is* the attention; the *preperception*, as Mr. Lewes calls it, is half of the perception of the looked-for thing.

It is for this reason that men have no eyes but for those aspects of things which they have already been taught to discern. ... [I 443-444] In short, *the only things which we commonly see are those which we preperceive*, and the only things which we preperceive are those which have been labelled for us, and the labels stamped into our mind. If we lost our stock of labels we should be intellectually lost in the midst of the world. ... [I 444-459]

5.3 James's description of the thinking going on unknown in the *EncPsych*

The discussions of the present section will confirm the observations of section 5.1 by documenting that James's description of the first phenomenon of mental life, the thinking going on, is unknown to the authors of the *EncPsych*. This claim will be justified below by an analysis of the articles in which one might expect a recognition of the phenomenon to be displayed.

First articles under the heading **CONSCIOUSNESS AND UNCONSCIOUSNESS**. The first article under this heading starts:

'CONSCIOUSNESS AND UNCONSCIOUSNESS: An Overview [*EncPsych* 2, 268-72, G. William Farthing] *Mind, consciousness, unconscious, subconscious, nonconscious, state of consciousness, reflective consciousness, self-consciousness*: What do these terms mean, and how do they relate to each other? One of the difficulties in studying topics such as consciousness and unconsciousness is the variety of meanings that different writers have given to these terms.

This manner of speaking assumes that there are 'topics such as consciousness and unconsciousness'. This assumption makes sense only as the expression of an ideology. As a matter of fact, the whole discussion in the article makes sense only as an expression of the cognitive ideology. This is made explicitly clear throughout, by the quotations of the definitions of 'mind' by Hebb and Farthing, and the definitions of 'consciousness', 'primary consciousness', and 'reflective consciousness' by Farthing. In the section **Unconscious, Nonconscious, and Preconscious** the ideology is the one of Freud.

Later Farthing writes:

'CONSCIOUSNESS AND UNCONSCIOUSNESS: An Overview ... Characteristics of Consciousness ... The intentionality of consciousness was one the five higher-order characteristics of consciousness described by William James, ...'

This is a distortion of what James wrote. As quoted in section 5.2 above, James's five characters are of *the thinking going on*, not of anything denoted consciousness. Thus the whole subsection is evidence of a distorted understanding of James. In this way James is made to support the cognitivist talk of *episodic memory*, which is senseless. The cognitive ideology has no support in James's description of the thinking going on. Of James's rich insight presented above not a trace can be found in Farthing's article.

The article by Philip Mericle: **CONSCIOUSNESS AND UNCONSCIOUSNESS: Processes** [*EncPsych* 2, 272-75] wavers uncertainly between a number of ways of speaking, none of them clear. In the first paragraph it speaks of 'classification of mental processes' without making it clear what mental processes are.

The second paragraph is developed from the initial statement which says that 'conscious experience is so obvious that it need no definition', again without further explanation.

In the third paragraph it proposes 'to think of consciousness as a stream of thoughts'. It goes on to claim that 'William James used the metaphor, the stream of consciousness, to describe how consciousness selects, shapes, and moulds our thoughts so that we experience a continuous flow of ideas, sensations, and images. ...' This pronouncement, which talks of 'consciousness' as an actor which is capable of 'selecting, shaping, and moulding our thoughts' is totally alien to James's presentation. The paragraph fails utterly to account for James's insight.

In the fourth paragraph it introduces 'unconsciousness' by the statement: 'unconsciousness is obscure because no one experiences mental processes that do not lead to awareness.' The obscurity noted here lies thick over the rest of the article. It is confirmed in the final paragraph where it is said that '... despite the success of studies investigating functional differences between conscious and unconscious processes, other aspects of the difference between consciousness and unconsciousness remain completely mysterious.'

Thus Mericle's article gives not the slightest evidence of insight into James's description of mental life.

The article **CONSCIOUSNESS AND UNCONSCIOUSNESS: Cross-Cultural Experience** [EncPsych 2, 275-77, Erika Bourguignon] opens with a passage including:

'William James (1890/1950), in *The Principles of Psychology* spoke of the "stream of consciousness", emphasizing the continuous and variable nature of consciousness as a process. Thus the concept of consciousness as a process is alien to James's

of consciousness as a process. Thus the concept of consciousness as a process is alien to James's

5.3 James's description of the thinking going on unknown in the *EncPsych*

'In contrast, William James (1890/1950) emphasized the functional significance of attention. He argued that there are many items simultaneously available to the senses that fail to enter into one's conscious experience. They fail to register because they are not of interest to the observer. In short, experience is what one agrees to attend to; without selective interest, experience would be utter chaos.'

This pronouncement implies a claim that what James calls attention is a matter of 'items ... available to the senses'. As evident from the account of James's descriptions given above, this claim is fallacious.

Accordingly the concerns of the remainder of the article have no relation to the stream of thought and attention as described by James. Instead the article deals with what is stated as 'the practical significance of the fact that humans are quite limited in their ability to process information.'

What actually emerges from the article is that describing what happens when people hear speech in terms of information processing, rather than in terms of the stream of thought, is senseless. This is displayed explicitly in the following description of an experiment:

'ATTENTION: An Overview ... Perceptual Selectivity - In an important early study, Cherry (1953) played two simultaneous auditory messages to subjects, one message to each ear Subjects were asked to repeat back one of the messages word-by-word as it was presented When they were finished, they were then asked to report the other, unattended message.'

In this description it is ignored that asking a subject to repeat something back is to ask the subject to do introspection. Whatever is said by the subject comes from his or her stream of thought. Asking a person to attend to a message spoken into one ear is asking the person to pay voluntary attention, in James's sense as described above, to particular parts of his or her thought objects. What the subject then says about the part of the thought object thus attended to says nothing about how that part relates to the sound spoken into the subject's ear, and in particular does not confirm that any information processing has taken place. As a matter of fact, as described by James in his Chapter on Association to be discussed in section 8 below, what appears in the stream of thought when a person is spoken to is entirely a matter of the person's perception habits. Information processing, as it happens in computers, says nothing about it.

The story of these experiments confirms the defects of the AI-mythology mentioned in section 3.2 above and the fallacy of the cognitivist ideology, but contributes nothing to the understanding of mental life.

The article **ATTENTION: Models of Attention** [*EncPsych* 1, 295-99, Claus Bundesen] accounts for further attempts to describe certain features of human perception in terms of information processing. The failure of these attempts, stated in the conclusion: 'No extant model has accounted for the full range of empirical data', once more confirms the fallacy of the underlying cognitivist ideology.

The article **DAYDREAMS** [*EncPsych* 2, 437-439, Eric Klinger] is the one in the *EncPsych* which comes closest to recognizing the thinking going on, in so far as it starts: 'Daydreams are part of the stream of thoughts and images that occupy most of a person's waking hours.' However, the article is entirely concerned to establish that what is called daydreams is a clearly distinguished part of that thinking going on. This is a losing project since daydreaming is just a matter of the direction of the ever changing attention described by James, as reported above in section 5.2. While daydreaming the person momentarily turns the attention to matters not present before the person, which most likely every person will do a million times every day.

6. The sense of sameness and acquainting (conception)

The sense of sameness is introduced by William James in Chapter XII of his *Principles* (1890), a chapter having the title Conception. This is a case of an unfortunate choice of a term, inviting to a whole family of confusing notions that are attached to the word 'concept', already mentioned by James himself on his page I 461 and discussed in section 14.6 below. Quoting James literally, and so retaining his terms 'conception' and 'concept' would be a way of giving new support to these confusions. For this reason I have in the following quotations from James replaced all references to 'conception' and 'concept' by, respectively, 'acquainting' and 'acquaintance object'.

[I 459] Chapter XII - ACQUAINTING - THE SENSE OF SAMENESS

In Chapter VIII, p. I 221 (quoted in section 5.2 above), the distinction was drawn between two kinds of knowledge of things, bare acquaintance with them and knowledge about them. The possibility of two such knowledges depends on a fundamental psychical peculiarity which may be entitled '*the principle of constancy of the mind's meanings*', and which may be thus expressed: '*The same matters can be thought of in successive portions of the mental stream, and some of these portions can know that they mean the same matters which the other portions meant*'. One might put it otherwise by saying that '*the mind can always intend, and know when it intends, to think of the Same*'.

This *sense of sameness* is the very keel and backbone of our thinking. We saw in Chapter X how the consciousness of personal identity reposed on it, the present thought finding in its memories a warmth and intimacy which it recognizes as the same warmth and intimacy it now feels. ... [I 459]

Note, however, that we are in the first instance speaking of the sense of sameness from the point of view of the mind's structure alone, and not from the point of view of the universe. We are psychologizing, not philosophizing. That is, we do not care whether there be any *real* sameness in *things* or not, or whether the mind be true or false in its assumptions of it. Our principle only lays it down that the mind makes continual use of the *notion* of sameness, and if deprived of it, would have a different structure from what it has. In a word, the principle that the mind can mean the Same is true of its *meanings*, but not necessarily of aught besides. ... [I 460]

6. The sense of sameness and acquainting (conception)

The name which I have given to the principle, in calling it the law of constancy in our meanings, accentuates its subjective character, and justifies us in laying it down as the most important of all the features of our mental structure.

Not all psychic life need be assumed to have the sense of sameness developed in this way. In the consciousness of worms and polyps, though the same realities may frequently impress upon it, the feeling of sameness may seldom emerge. We, however, running back and forth, like spiders on the web they weave, feel ourselves to be working over identical materials and thinking them in different ways. And the man who identifies the materials most is held to have the most philosophic mind.

ACQUAINTING DEFINED

The function by which we thus identify a numerically distinct and permanent subject of discourse is called ACQUAINTING; and the thoughts which are its vehicles are called acquaintanceobjects. ... [I 461] The word 'acquainting' is unambiguous. It properly denotes neither the mental state nor what the mental state signifies, but the relation between the two, namely, the *function* of the mental state in signifying that particular thing. It is plain that one and the same mental state can be the vehicle of many acquaintings, can mean a particular thing, and a great deal more besides. If it has such a multiple acquainting function, it may be called an act of compound acquainting.

We may acquaint realities supposed to be extra-mental, as steam-engine; fictions, as mermaid; or mere *entia rationis*, like difference or nonentity. But whatever we do acquaint, our acquainting is of that and nothing else—nothing else, that is, *instead* of that, though it may be of much else *in addition* to that. Each act of acquainting results from our attention singling out some one part of the mass of matter for thought which the world presents, and holding fast to it, without confusion. ... [I 461-462]

Each acquainting thus eternally remains what it is, and never can become another. The mind may change its states, and its meanings, at different times; may drop one acquainting and take up another, but the dropped acquainting can in no intelligible sense be said to *change into* its successor. The paper, a moment ago white, I may now see to have been scorched black. But my acquainting 'white' does not change into my acquainting 'black'. ... Thus, amid the flux of opinions and of physical things, the world of acquaintings, or things intended to be thought about, stands stiff and immutable, like Plato's Realm of Ideas.

Some acquaintings are of things, some of events, some of qualities. Any fact, be it thing, event, or quality, may be acquainted sufficiently for purposes of identification, if only it be singled out and marked so as to separate it from other things. Simply calling it 'this' or 'that' will suffice. ... [I 462-63]

Most of the objects of our thought, however, are to some degree represented as well as merely pointed out. Either they are things and events perceived or imagined, or they are qualities apprehended in a positive way.

Even where we have no intuitive acquaintance with the nature of a thing, if we know any of the relations of it at all, anything *about* it, that is enough to individualize and distinguish it from all the other things which we might mean. Many of our topics of discourse are thus *problematic*, or defined by their relations only. ... [I 463-464]

ACQUAINTINGS ARE UNCHANGEABLE

The fact that the same real topic of discourse is at one time acquainted as a mere 'that' or 'that which, etc.', and is at another time acquainted with additional specifications, has been treated by many authors as a proof that acquaintings themselves are fertile and self-developing. ... [I 464]

... Now I say that where the new knowledge merely comes from *thinking*, the facts are essentially the same, and that *to talk of self-development on the part of our acquaintings is a very bad way of stating the case*. Not new sensations, as in the empirical instance, but new acquaintings, are the indispensable conditions of advance.

For if the alleged cases of self-development be examined it will be found, I believe, that the new truths affirms in every case a *relation* between the original subject of acquainting and some new subject conceived later on. ... [I 465] Thus I have an acquainting of equidistant lines. Suddenly, I know not whence, there pops into my head the acquainting of their meeting. ... [I 465] Original acquaintings to start with; adventitious acquaintings pushed forward by multifarious psychologic causes; comparisons and combinations of the two; resultant acquaintings to end with; which latter may be of either rational or empirical relations. ... [I 465]

... When the several notes of a chord are sounded together, we get a new feeling from their combination. This feeling is due to the mind reacting upon that group of sounds in that determinate way, and no one would think of saying of any single note of the chord that it 'developed' of itself into the other notes or into the feeling of harmony. So of acquaintings. No one of them develops into any other. But if two of them are thought at once, their *relation* may come to consciousness, and form matter for a third acquainting. ... [I 466-467]

... Acquaintings form the one class of entities that cannot under any circumstances change. They can cease to be, altogether; or they can stay, as what they severally are; but there is for them no middle way. They form an essentially discontinuous system, and translate the process of our perceptual experience, which is naturally a flux, into a set of stagnant and petrified terms. The very acquainting of flux itself is an absolutely changeless meaning in the mind: it signifies just that one thing, flux, immovably. ... [I 468]

'ABSTRACT' IDEAS

... There are philosophers who deny that associated things can be broken asunder at all, even provisionally, by the acquainting mind. ... [I 468-471]

It is easy to lay bare the false assumption which underlies the whole discussion of the question as hitherto carried on. That assumption is that ideas, in order to know, must be cast in the exact likeness of whatever things they know, and that the only things that can be known are those which ideas can resemble. ... [I 471]

6. The sense of sameness and acquainting (conception)

Now our own blunt statements about the ultimateness of the cognitive relation, and the difference between the 'object' of the thought and its mere 'topic' or 'subject of discourse' (cf. pp. I 275 ff.), are all at variance with any such theory; ... [I 471] All that a state of mind need do, in order to take cognizance of a reality, intend it, or be 'about' it, is to lead to a remoter state of mind which either acts upon the reality or resembles it. ... [I 471-472]

The sense of our meaning is an entirely peculiar element of the thought. It is one of those evanescent and 'transitive' facts of mind which introspection cannot turn round upon, and isolate and hold up for examination, as an entomologist passes round an insect on a pin. In the (somewhat clumsy) terminology I have used, it pertains to the 'fringe' of the subjective state, and is a 'feeling of tendency', ... [I 472]. The geometer, with his one definite figure before him, knows perfectly that his thoughts apply to countless other figures as well, and that although he *sees* lines of a certain special bigness, direction, color, etc., he *means* not one of these details. When I use the word *man* in two different sentences, I may have both times exactly the same sound upon my lips and the same picture in my mental eye, but I may mean, and at the very moment of uttering the word and imagining the picture, know that I mean, two entirely different things. Thus when I say: 'What a wonderful man Jones is!' I am perfectly aware that I mean by man to exclude Napoleon Bonaparte or Smith. But when I say: 'What a wonderful thing Man is!' I am equally well aware that I mean to *include* not only Jones, but Napoleon and Smith as well. This added consciousness is an absolutely positive sort of feeling, transforming what would otherwise be mere noise or vision into something *understood*; and determining the sequel of my thinking, the later words and images, in a perfectly definite way. We saw in Chapter IX that the image *per se*, the nucleus, is *functionally* the least important part of the thought. ... [I 472] We ... affirm that the power to think things, qualities, relations, or whatever other elements there may be, isolated and abstracted from the total experience in which they appear, is the most indisputable function of our thought.

UNIVERSALS

After abstractions, universals! The 'fringe', which lets us believe in the one, lets us believe in the other too. An individual acquainting is of something restricted, in its application, to a single case. A universal or general acquainting is of an entire class, or of something belonging to an entire class, of things. The acquainting of an abstract quality is, taken by itself, neither universal nor particular. If I abstract *white* from the rest of the wintry landscape this morning, it is a perfectly definite acquainting, a self-identical quality which I may mean again; ... [I 473] ... when, later, I universalize or individualize its application, and my thought turns to mean either *this* white or *all possible* whites, I am in reality meaning two new things and forming two new acquaintings. Such an alteration of my meaning has nothing to do with any change in the image I may have in my mental eye, but solely with

the vague consciousness that surrounds the image, of the sphere to which it is intended to apply. We can give no more definite account of this vague consciousness than has been given on pp. I 249-266. ... [I 474-478]

Truly in comparison with the fact that every acquainting, whatever it be of, is one of the mind's immutable possessions, the question whether a single thing, or a whole class of things, or only an unassigned quality, be meant by it, is an insignificant matter of detail. Our meanings are of singulars, particulars, indefinites, and universals, mixed together in every way. ... [I 479] The only value of universal characters is that they help us, by reasoning, to know new truths about individual things. ... [I 480]

It may seem hardly necessary to add (what follows as a matter of course from pp. I 229-237, and what has been implied in our assertions all along) that *nothing can be acquainted twice over without being acquainted in entirely different states of mind*. Thus, my arm-chair is one of the things of which I have an acquainting; I knew it yesterday and recognized it when I looked at it. But if I think of it to-day as the same arm-chair which I looked at yesterday, it is obvious that the very acquainting of it as the same is an additional complication to the thought, whose inward constitution must alter in consequence. In short, it is logically impossible that the same thing should be *known as the same* by two successive copies of the same thought. As a matter of fact, the thoughts by which we know that we mean the same thing are apt to be very different indeed from one another. We think the thing now in one context, now in another; now in a definite image, now in a symbol. Sometimes our sense of its identity pertains to the mere fringe, sometimes it involves the nucleus, of our thought. We never can break the thought asunder and tell just which one of its bits is the part that lets us know which subject is referred to; but nevertheless we always *do* know which of all possible subjects we have in mind. Introspective psychology must here throw up the sponge; the fluctuations of subjective life are too exquisite to be arrested by its coarse means. It must confine itself to bearing witness to the fact that all sorts of different subjective states do form the vehicle by which the same is known; ... [I 480-481]

... As a rule we are fully aware that we have thought before of the thing we think of now. The continuity and permanence of the topic is of the essence of our intellection. We recognize the old problems, and the old solutions; and we go on to alter and improve and substitute one predicate for another without ever letting the subject change.

This is what is meant when it is said that thinking consists in making *judgments*. A succession of judgments may all be about the same thing. The general practical postulate which encourages us to deep thinking at all is that by going on to do so we shall judge better *of the same things* than if we do not. In the successive judgments, all sorts of new operations are performed on the things, and all sorts of new results brought out, without the sense of the main topic ever getting lost. At the outset, we merely *have* the topic; then we *operate* upon it; and finally we have it again in a richer and and truer way. A compound acquainting has been substituted for the simple one, but with full consciousness that both are of the Same.

6. The sense of sameness and acquainting (conception)

The distinction between having and operating is as natural in the mental as in the material world. As our hands may hold a bit of wood and a knife, and yet do naught with either; so our mind may simply be aware of a thing's existence, and yet neither attend to it nor discriminate it, neither locate nor count nor compare nor like nor dislike nor deduce it, nor recognize it articulately as having been met with before. At the same time we know that, instead of staring at it in this entranced and senseless way, we may rally our activity in a moment, and locate, class, compare, count, and judge it. There is nothing involved in all this which we did not postulate at the very outset of our introspective work: realities, namely, *extra mentem*, thoughts, and possible relations of cognition between the two.

The result of the thought's operating on the data given to sense is to transform the order in which experience *comes* into an entirely different order, that of the *acquainted* world. There is no spot of light, for example, which I pick out and proceed to define as a pebble, which is not thereby torn from its mere time- and space-neighbors, and thought in conjunction with things physically parted from it by the width of nature.

Compare the form in which facts appear in a text-book of physics, as logically subordinated laws, with that in which we naturally make their acquaintance. The acquainting scheme is a sort of sieve in which we try to gather up the world's contents. Most facts and relations fall through its meshes, being either too subtle or insignificant to be fixed in any acquainting. But whenever a physical reality is caught and identified as the same with something already acquainted, it remains on the sieve, and all the predicates and relations of the acquainting with which it is identified become its predicates and relations too; it is subjected to the sieve's network, in other words. Thus comes to pass what Mr. Hodgson calls the translation of the perceptual into the conceptual order of the world.

In Chapter XXII we shall see how this translation always takes place for the sake of some subjective *interest*, and how the acquainting with which we handle a bit of sensible experience is really nothing but a teleological instrument. *The whole function of acquainting, of fixing, and holding fast to meanings, has no significance apart from the fact that the acquirer is a creature with partial purposes and private ends.* There remains, therefore, much more to be said about acquainting, but for the present this will suffice.

The sense of sameness and acquainting are unknown to the authors of *EncPsych*. The articles under the heading 'concept' will be discussed in section 14.6 below.

7. Knowing-about and imagery

7.1 James's description of knowing-about and imagination

Knowing-about was introduced by James (1890) together with knowledge of acquaintance as the two kinds of knowledge, as quoted above in section 5.2. In James's further explanations of the five characters of the stream of thought, knowing-about appears as what comes as the *fringe* of the thoughts. As already quoted in section 5.2 above:

'If we then consider the *cognitive function* of different states of mind, we may feel assured that the difference between those that are mere 'acquaintance', and those that are 'knowledges-*about*' is reducible almost entirely to the absence or presence of psychic fringes or overtones. Knowledge-*about* a thing is knowledge of its relations. Acquaintance with it is limitation to the bare impression which it makes. Of most of its relations we are only aware in the penumbral nascent way of a 'fringe' of unarticulated affinities about it.'

As what comes in the fringe James has already described a great variety of feelings: of our own bodily condition, of relations between objects, of tendency. In addition the fringe will have knowledge-about in the form of items of description, for example names of colors.

Other knowledge-about comes in the form of *imagery*. When Peter says to Paul: Tell me about your mother, this request will instantly, by association, make Paul think of his mother, which is a way of saying that the request calls forth in Paul's stream of thought a thought object that includes the acquaintance object of his mother, with its fringe of all that Paul *knows about* his mother. The fringe will contain thousands of matters, of many kinds. It may for instance contain the descriptive fact, in some form, of the date of the mother's birthday. Other of these kinds may be what we shall call *imagery*, which is something that in the way we experience it by introspection has a certain likeness to the kind of things we receive by way of our senses, either through sight, hearing, or touch. Perhaps part of what comes to Paul when he thinks of his mother is the look of her face, or her voice as she says something.

James describes the matter thus:

Chapter XVIII, IMAGINATION [II 44]

Sensations, once experienced, modify the nervous organism, so that copies of them arise again in the mind after the original outward stimulus is gone. No mental copy, however, can arise in the mind, of any kind of sensation which has never been directly excited from without... [II 44]

... Fantasy, or Imagination, are the names given to the faculty of reproducing copies of originals once felt. The imagination is called 'reproductive' when the copies are literal; 'productive' when elements from different originals are recombined so as to make new wholes... [II 44]

... The phenomena ordinarily ascribed to imagination, however, are those mental pictures of possible sensible experiences, to which the ordinary processes of associative thought give rise. ... [II 45]

7.1 James's description of knowing-about and imagination

OUR IMAGES ARE USUALLY VAGUE

... [II 45-49] a blurred picture is just as much a single mental fact as a sharp picture is; and *the use of either picture by the mind to symbolize a whole class of individuals is a new mental function* ... [II 49].

Our ideas or images of past sensible experiences may then be either distinct and adequate or dim, blurred, and incomplete. ... [II 49]

Until very recent years it was supposed by all philosophers that there was a typical human mind which all individual minds were like, and that propositions of universal validity could be laid down about such faculties as 'the Imagination'. Lately, however, a mass of revelations have poured in, which make us see how false a view this is. There are imaginations, not 'the Imagination,' and they must be studied in detail.

INDIVIDUALS DIFFER IN IMAGINATION

The first breaker of ground in this direction was Fechner, in 1860. ... [II 50-51]

Fechner's intention was independently executed by Mr. Galton, the publication of whose results in 1880 may be said to have made an era in descriptive Psychology.

'It is not necessary,' says Galton, 'to trouble the reader with my early tentative steps....[II 51-52]

To my astonishment, I found that *the great majority of the men of science to whom I first applied protested that mental imagery was unknown to them, ...[II 52]*

On the other hand, when I spoke to persons whom I met *in general society*, I found an entirely different disposition to prevail. *Many men and a yet larger number of women, and many boys and girls, declared that they habitually saw mental imagery, and that it was perfectly distinct to them and full of color.'*...[II 52-57]

A person whose visual imagination is strong finds it hard to understand how those who are without the faculty can think at all. *Some people undoubtedly have no visual images at all worthy of the name*, and instead of *seeing* their breakfast-table, they tell you that they *remember* it or *know* what was on it. This knowing and remembering takes place undoubtedly by means of verbal images ... [II 58-60]

'*The auditory type*,' says M. A. Binet [1886], '*appears to be rarer than the visual*. Persons of this type imagine what they think of in the language of sound. ... [II 60-61]

The *motor type* remains—perhaps the most interesting of all, and certainly the one of which least is known. Persons who belong to this type ... make use, in memory, reasoning, and all their intellectual operations, of images derived from movement.'...[II 61-63]

Most persons, on being asked *in what sort of terms they imagine words*, will say 'in terms of hearing.' It is not until their attention is expressly drawn to the point that they find it difficult to say whether auditory images or motor images connected with the organs of articulation predominate. ... [II 63-65]

Touch-images are very strong in some people. ... [II 65-68]

THE NEURAL PROCESS WHICH UNDERLIES IMAGINATION?

... [II 68-70] *In common cases of imagination it would seem more natural to suppose that the seat of the process is purely cerebral, and that the sense-organ is left out.* ... [II 70-72] *all these facts would force us to admit that the subjective difference between imagined and felt objects is less absolute than has been claimed, and that the cortical processes which underlie imagination and sensation are not quite as discrete as one at first is tempted to suppose. That peripheral sensory processes are ordinarily involved in imagination seems improbable; that they may sometimes be aroused from the cortex downwards cannot, however, be dogmatically denied.*

7.2 The confusion in the *EncPsych* around imagination

The treatment in the *EncPsych* of any aspect of imagination is dominated by the narrow-minded behaviorist-cognitivist orientation which prevails throughout, and which makes it impossible to refer to the core of the matter: the thinking going on.

The article on imagination starts:

‘IMAGINATION [*EncPsych* 4, 227-230, Jerome L. Singer]. The ability of human beings to generate mental representations of objects, persons, or physical and social events not immediately presented to the senses ...’

Here ‘ability ... to generate mental representations’ is an item of element psychology that is alien to the behaviorist-cognitivist ideology. It designates nothing clearly in the context.

The article continues with a brief, sketchy, historical outline covering 5000 years. Here the most explicit passage is this:

‘The great chapters, “The Stream of Thought” and “The Self,” in William James’s 1890 textbook, *The Principles of Psychology*, called attention to the broader role of imagination as an adaptive function well beyond the reproduction of recently presented stimuli.’

The claim here that James talks of ‘imagination as an adaptive function’ is nonsensical. Moreover, in the two chapters mentioned (taking “The Self” to be a faulty rendering of James’s title “The Consciousness of Self”), James nowhere talks of imagination, which is treated in his later chapter having that title, as quoted above. In spite of this reference to James, the author Jerome L. Singer nowhere in his article gives any evidence that he has any understanding of what James presents in his chapter on “The Stream of Thought” and how this relates to imagination, as presented above. Further Singer fails to report on the most important observation concerning imagination ever made, Galton’s discovery described above, which is described at length by James in his Chapter XVIII.

In a section titled **IMAGINATION - Modern Research Approaches** Singer describes four different study activities. From these descriptions there emerges no concrete insight into mental life whatsoever.

A section titled **IMAGINATION - Current Theories** continues these barren accounts by claiming that ‘The imaginative dimension of human experience is generally linked to four kinds of specific processes.’ Here the obsolete Cartesian theatre, discussed in section 2.2 above, is given a new lease of life.

7.2 The confusion in the *EncPsych* around imagination

The account further postulates that ‘all human thought takes place along two dimensions ...’. This claim is supported merely by purely anecdotal evidence concerning the physicist Einstein’s thought experiments and an incidental remark from physicist Niels Bohr related to how he was led ‘to formulate the mathematico-physical theory of complementarity, a major step in modern quantum physics’. Of solid substance there is none.

The last paragraph continues to talk in cognitivist terms of ‘replaying of stored memories’, which is as empty as the notion of memory, discussed in section 4.8 above.

8. Association, the dynamics of mental life

Association is James’s designation for the manner in which habit manifests itself in mental life. James (1890) starts his description thus [I 550]:

Chapter XIV - ASSOCIATION

After discrimination, association! Already in the last chapter I have had to invoke, in order to explain the improvement of certain discriminations by practice, the ‘association’ of the objects to be distinguished, with other more widely differing ones. It is obvious that the advance of our knowledge *must* consist of both operations; for objects at first appearing as wholes are analyzed into parts, and objects appearing separately are brought together and appear as new compound wholes to the mind. Analysis and synthesis are thus the incessantly alternating mental activities, a stroke of the one preparing the way for a stroke of the other, much as, in walking, a man’s two legs are alternatively brought into use, both being indispensable for any orderly advance.

The analogy between discrimination and association suggested here by James is misleading. As described by James discrimination is a certain matter of perception—i.e. reaction to sense impressions—while association is a matter of the way the stream of thought changes from one moment to the other. The confusing antithesis of these two mental functions arises thereby, that James in his discussion of association in this chapter has occasion to argue at length and strongly against the earlier view of association, whereby our understanding of compound things comes about by a mental function by which we combine elementary ‘ideas’ by ‘associating’ their elements. This earlier sort of association is indeed the antithesis of discrimination. But this notion of association is rejected by James most emphatically, as a main issue in his description of mental life. In the extracts below these parts of James’s discussion are omitted. - Discrimination will be discussed in section 11 below.

James continues [I 550]:

The manner in which trains of imagery and consideration follow each other through our thinking, the restless flight of one idea before the next, the transitions our minds make between things wide as the poles asunder, transitions which at first sight startle us by their abruptness, but which, when scrutinized closely, often reveal intermediating links of perfect

naturalness and propriety—all this magical, imponderable streaming has from time immemorial excited the admiration of all whose attention happened to be caught by its omnipresent mystery. And it has furthermore challenged the race of philosophers to banish something of the mystery by formulating the process in simpler terms. The problem which the philosophers have set themselves is that of ascertaining *principles of connection* between the thoughts which thus appear to sprout one out of the other, whereby their peculiar succession or coexistence may be explained. ... [I 551-553]

There are, then, mechanical conditions on which thought depends, and which, to say the least, determine the order in which is presented the content or material for her comparisons, selections, and decisions. ... [I 553]

But the whole historic doctrine of psychological association is tainted with one huge error—that of the construction of our thoughts out of the compounding of themselves together of immutable and incessantly recurring ‘simple ideas’. It is the cohesion of these which the ‘principles of association’ are considered to account for. In Chapters VI and IX we saw abundant reasons for treating the doctrine of simple ideas or psychic atoms as mythological; and, in all that follows, our problem will be to keep whatever truths the associationist doctrine has caught sight of without weighing it down with the untenable incumbrance that the association is between ‘ideas’.

Association, so far as the word stands for an effect, is between THINGS THOUGHT OF—it is THINGS, not ideas, which are associated in the mind. We ought to talk of the association of objects, not of the association of ideas. ... [I 554-555]

Association occurs as amply between impressions of different senses as between homogeneous sensations. ... [I 555] In fact, the ‘objects’ of our perception, as trees, men, houses, microscopes, of which the real world seems composed, are nothing but clusters of qualities which through simultaneous stimulation have so coalesced that the moment one is excited actually it serves as a sign or cue for the idea of the others to arise. ... [I 555-561]

THE LAW OF CONTIGUITY

... the facts we have run over can all be summed up in the simple statement that *objects once experienced together tend to become associated in the imagination, so that when any one of them is thought of, the others are likely to be thought of also, in the same order of sequence or coexistence as before.* This statement we may name the law of *mental association by contiguity.* ... [I 561]

Whatever we name the law, since it expresses merely a phenomenon of mental habit, *the most natural way of accounting for it is to conceive it as a result of the laws of habit in the nervous system;* ... [I 562-563]

The psychological law of association of objects thought of through their previous contiguity in thought or experience would thus be an effect, within the mind, of the physical fact that nerve-currents propagate themselves easiest through those tracts of conduction which have been already most in use. Descartes and Locke hit upon this explanation, which modern science has not yet succeeded in improving. ... [I 563-566]

8. Association, the dynamics of mental life

THE ELEMENTARY LAW OF ASSOCIATION

... [I 566] Let us then assume as the *basis* of all our subsequent reasoning this law: *When two elementary brain-processes have been active together or in immediate succession, one of them, on reoccurring, tends to propagate its excitement into the other.* ... [I 566-567]

The amount of activity at any given point in the brain-cortex is the sum of the tendencies of all other points to discharge into it, such tendencies being proportionate (1) to the number of times the excitement of each other point may have accompanied that of the point in question; (2) to the intensity of such excitements; and (3) to the absence of any rival point functionally disconnected with the first point, into which the discharges might be diverted. ... [I 567-569]

Impartial Redintegration

The ideal working of the law of compound association, were it unmodified by any extraneous influence, would be such as to keep the mind in a perpetual treadmill of concrete reminiscences from which no detail could be omitted. ... [I 569-570]

Let us call this *impartialredintegration*. Whether it ever occurs in an absolutely complete form is doubtful. ... [I 570-571]

ORDINARY OR MIXED ASSOCIATION

This case helps us to understand why it is that the ordinary spontaneous flow of our ideas does not follow the law of impartial redintegration. *In no revival of a past experience are all the items of our thought equally operative in determining what the next thought shall be. Always some ingredient is prepotent over the rest.* ... [I 571-572] In subjective terms we say that *the prepotent items are those which appeal most to our INTEREST.* ... [I 572-577]

Habit, recency, vividness, and emotional congruity are, then, all reasons why one representation rather than another should be awakened by the interesting portion of a departing thought. ... [I 577-578]

ASSOCIATION BY SIMILARITY

... [I 578] But now let us suppose that that selective agency of interested attention, which may thus convert impartial redintegration into partial association—let us suppose that it refines itself still further and accentuates a portion of the passing thought, so small as to be no longer the image of a concrete thing, but only of an abstract quality or property. Let us moreover suppose that the part thus accentuated persists in consciousness (or, in cerebral terms, has its brain-process continue) after the other portions of the thought have faded. *This small surviving portion will then surround itself with its own associates* after the fashion we have already seen, and the relation between the new thought's object and the object of the faded thought will be a *relation of similarity*. The pair of thoughts will form an instance of what is called '*Association by Similarity*'.

The similars which are here associated, or of which the first is followed by the second in the mind, are seen to be *compounds*. Experience proves that this is always the case. *There is no tendency on the part of SIMPLE 'ideas', attributes, or qualities to remind us of their like.* ... [I 579]

... When we affirm the similarity of two compound things, we should always say *in what respect it obtains*. ... [I 579-583]

ASSOCIATION IN VOLUNTARY THOUGHT

... [I 583] It is now necessary to examine what modification is made in the trains of our imagery by the having of an end in view. The course of our ideas is then called *voluntary*. ... [I 583-584]

But in the theoretic as well as in the practical life there are interests of a more acute sort, taking the form of definite images of some achievement, be it action or acquisition, which we desire to effect. The train of ideas arising under the influence of such an interest constitutes usually the thought of the *means* by which the end shall be attained. If the end by its simple presence does not instantaneously suggest the means, the search for the latter becomes an intellectual *problem*. The solution of problems is the most characteristic and peculiar sort of voluntary thinking. Where the end thought of is some outward deed or gain, the solution is largely composed of the actual motor processes, walking, speaking, writing, etc., which lead up to it. Where the end is in the first instance only ideal, as in laying out a place of operations, the steps are purely imaginary. In both of these cases the discovery of the means may form a new sort of end, of an entirely peculiar nature, an end, namely, which we intensely desire before we have attained it, but of the nature of which, even whilst most strongly craving for it, we have no distinct imagination whatever. Such an end is a problem.

The same state of things occurs whenever we seek to recall something forgotten, or to state the reason for a judgment which we have made intuitively. The desire strains and presses in a direction which it feels to be right but towards a point which it is unable to see. In short, the *absence of an item* is a determinant of our representations quite as positive as its presence can ever be. The gap becomes no mere void, but what is called an *aching void*. ... [I 584-585] If we first study *the mode of recalling a thing forgotten*, we can take up with better understanding the voluntary quest of the unknown.

The forgotten thing is felt by us as a gap in the midst of certain other things. If it is a thought, we possess a dim idea of where we were and what we were about when it occurred to us. We recollect the general subject to which it relates. But all these details refuse to shoot together into a solid whole ... [I 585-586] Now all these added associations *arise independently of the will*, by the spontaneous process we know so well. *All that the will does is to emphasize and linger over those which seem pertinent, and ignore the rest*. ... [I 586-590]

SIMILARITY NO ELEMENTARY LAW

Such is the analysis I propose, first of the three main types of spontaneous association, and then of voluntary association. It will be observed that the *object called up may bear any logical relation whatever to the one which suggested it*. ... [I 590-591] The similarity between the objects, or between the thoughts (if similarity there be between these latter), has no causal agency in carrying us from one to the other. ... [I 591] The similarity of two things does not exist till both things are there—it is meaningless to talk of it as an *agent of production* of anything. ... [I 591-598]

8. Association, the dynamics of mental life

The inexperienced reader may be glad of a brief indication of the manner in which all the different mental operations may be conceived to consist of images of sensation associated together.

Remembered recall (Memory) is the association of a present image with others known to belong to the past. ... [I 598]

Belief in anything *not* present to sense is the very lively, strong, and steadfast association of the image of that thing with some present sensation, so that as long as the sensation persists the image cannot be excluded from the mind.

Judgment is 'transferring the idea of *truth* by association from one proposition to another that resembles it.'

Reasoning is the perception that 'whatever has any mark has that which it is a mark of'; in the concrete case the mark or middle term being always *associated* with each of the other terms and so serving as a link by which which they are themselves indirectly associated together. ... [I 599-605]

9. Thinking of time and remembered recall (memory)

9.1 The experience of the specious present

The way the flow of time manifests itself in the stream of thought is by James (1890) described in his Chapters XV and XVI under the headings 'The perception of time' and 'Memory', with the additional opening remark:

'In the next two chapters I shall deal with what is sometimes called internal perception, or the perception of *time*, and of events as occupying a date therein, especially when the date is a past one, in which case the perception in question goes by the name of *memory*'.

In view of James's other, different uses of the word 'perception', explained in section 10 below, the use of the phrase 'perception of time' here is confusing, and will be avoided, as far as possible, and replaced by the phrase 'thinking of time'. Moreover, in view of the cognitivists' prominent and confusing use of the word 'memory', discussed in section 4.7 above, the word will here be avoided as far as possible and replaced by 'recall' or 'remembered recall'.

James writes:

... [I 605] To remember a thing as past, it is necessary that the notion of 'past' should be one of our 'ideas.' We shall see in the chapter on Remembered Recall (Memory) that many things come to be thought by us as past, not because of any intrinsic quality of their own, but rather because they are associated with other things which for us signify pastness. But how do these things get *their* pastness? What is the original of our experience of pastness, from whence we get the meaning of the term? It is this question which the reader is invited to consider in the present chapter. We shall see that we have a constant feeling *sui generis* of pastness, to which every one of our experiences in turn falls a prey. To think a thing as past is to think it

amongst the objects or in the direction of the objects which at the present moment appear affected by this quality. This is the original of our notion of past time, upon which remembered recall and history build their systems. ... [I 605-606]

... *The knowledge of some other part of the stream, past or future, near or remote, is always mixed in with our knowledge of the present thing.*

A simple sensation, as we shall hereafter see, is an abstraction, and all our concrete states of mind are representations of objects with some amount of complexity. Part of the complexity is the echo of the objects just past, and, in a less degree, perhaps, the foretaste of those just to arrive. Objects fade out of consciousness slowly. If the present thought is of A B C D E F G, the next one will be of B C D E F G H, and the one after that of C D E F G H I—the lingerings of the past dropping successively away, and the incomings of the future making up the loss. These lingerings of old objects, these incomings of new, are the germs of remembered recall and expectation, the retrospective and the prospective sense of time. They give that continuity without which it could not be called a stream.

THE SENSIBLE PRESENT HAS DURATION [I 608-609]

... The only fact of our immediate experience is what Mr. E. R. Clay has well called 'the *specious* present.' ... [I 609]

... the practically cognized present is no knife-edge, but a saddle-back, with a certain breath of its own on which we sit perched, and from which we look in two directions into time. The unit of composition of our thinking of time is a *duration*, with a bow and a stern, as it were—a rearward- and a forward-looking end.... [I 609-611]

ACCURACY OF OUR ESTIMATE OF SHORT DURATIONS [I 611-612]

Wundt and his pupil Dietze have both tried to determine experimentally the *maximal extent of our immediate distinct consciousness for successive impressions*. ... [I 612-613]

... This would make 40 times 0.3 second, or 12 seconds, to be the *maximum filled duration* of which we can be both *distinctly and immediately* aware. ... [I 613-618]

There is a certain emotional *feeling* accompanying the intervals of time, as is well known in music. *The sense of haste goes with one measure of rapidity, that of delay with another*; and these two feelings harmonize with different mental moods. ... [I 618-619]

WE HAVE NO SENSE FOR EMPTY TIME [I 619]

It takes but a small exertion of introspection to show ... [I 619-620] that *we can no more intuit a duration than we can intuit an extension, devoid of all sensible content*. ... [I 620] we are always inwardly immersed in what Wundt has somewhere called the twilight of our general consciousness. Our heart-beats, our breathing, the pulses of our attention, fragments of words or sentences that pass through our imagination, are what people this dim habitat. Now, all these processes are rhythmical, and are apprehended by us, as they occur, in their totality;... [I 620] Awareness of *change* is thus the condition on which our perception of time's flow depends; ... [I 620-22]

9.1 The experience of the specious present

After a small number of beats our impression of the amount we have told off becomes quite vague. Our only way of knowing it accurately is by counting, or noticing the clock, or through some other symbolic conception. When the times exceed hours or days, the conception is absolutely symbolic. We think of the amount we mean either solely as a *name*, or by running over a few salient *dates* therein, with no pretence of imagining the full durations that lie between them. ... [I 622-627]

THE FEELING OF PAST TIME IS A PRESENT FEELING [I 627-28]

... *A succession of feelings, in and of itself, is not a feeling of succession. And since, to our successive feelings, a feeling of their own succession is added, that must be treated as an additional fact requiring its own special elucidation* ... [I 629-630]

And since we saw a while ago that our maximum *intuition* of duration hardly covers more than a dozen seconds ... [I 630] we must suppose that *this amount of duration is pictured fairly steadily in each passing instant of consciousness* by virtue of some fairly constant feature in the brain-process to which the consciousness is tied. *This feature of the brain-process, whatever it be, must be the cause of our thinking the fact of time at all.* The duration thus steadily thought is hardly more than the 'specious present,' as it was called a few pages back. Its *content* is in constant flux, events dawning into its forward end as fast as they fade out of its rearward one, and each of them changing its time-coefficient from 'not yet,' or 'not quite yet,' to 'just gone' or 'gone,' as it passes by. Meanwhile, the specious present, the intuited duration, stands permanent, like the rainbow on the waterfall, with its own quality unchanged by the events that stream through it. Each of these, as it slips out, retains the power of being reproduced; and when reproduced, is reproduced with the duration and neighbors which it originally had. Please observe, however, that the reproduction of an event, *after* it has once completely dropped out of the rearward end of the specious present, is an entirely different psychic fact from its direct perception in the specious present as a thing immediately past. ... [I 630-31] Thus remembered recall gets strewn with *dated* things—dated in the sense of being before or after each other. The date of a thing is a mere relation of *before* or *after* the present thing or some past or future thing. ... [I 631]

The things and events thus vaguely or exactly dated become thenceforward those signs and symbols of longer time-spaces, of which we previously spoke. According as we think of a multitude of them, or of few, so we imagine the time they represent to be long or short. But *the original paragon and prototype of all thought time is the specious present, the short duration of which we are immediately and incessantly sensible.*

TO WHAT CEREBRAL PROCESS IS THE SENSE OF TIME DUE?

Now, to what element in the brain-process may this sensibility be due? ... [I 632-35]

... With the feeling of the present thing there must at all times mingle the fading echo of all those things which the previous few seconds have supplied. Or, to state it in neural terms, *there is at every moment a*

cumulation of brain-processes overlapping each other, of which the fainter ones are the dying phases of processes which but shortly previous were active in a maximal degree. The AMOUNT OF THE OVERLAPPING determines the feeling of the DURATION OCCUPIED. WHAT EVENTS shall appear to occupy the duration depends on just WHAT PROCESSES the overlapping processes are. ... [I 635-36] Duration and event together form our intuition of the specious present with its content.... [I 636]

I have assumed that the brain-processes are sensational ones. Processes of active attention ... [I 636] will leave similar fading brain-processes behind.... [I 636-38]

To pass, now, to conceptual processes: Suppose I think of the Creation, then of the Christian era, then of the battle of Waterloo, all within a few seconds. These matters have their dates far outside the specious present. The processes by which I think them, however, all overlap. What event, then does the specious present seem to contain? Simply my successive *acts of thinking* these long-past things, not the long-past things themselves. ... [I 638-41]

But whether our feeling of the time which immediately-past events have filled be of something long or of something short, it is not what it is because those events are past, but because they have left behind them processes which are present. To those processes, however caused, the mind would still respond by feeling a specious present, with one part of it just vanishing or vanished into the past. ... [I 641-42]

Let me sum up, now, by saying that we are constantly conscious of a certain duration—the specious present—varying in length from a few seconds to probably not more than a minute, and that this duration (with its content perceived as having one part earlier and the other part later) is the original intuition of time. Longer times are conceived by adding, shorter ones by dividing, portions of this vaguely bounded unit, and are habitually thought by us symbolically. Kant's notion of an *intuition* of objective time as an infinite necessary continuum has nothing to support it. The *cause* of the intuition which we really have cannot be the *duration* of our brain-processes or our mental changes. That duration is rather the *object* of the intuition which, being realized at every moment of such duration, must be due to a permanently present cause. This cause—probably the simultaneous presence of brain-processes of different phase—fluctuates; and hence a certain range of variation in the amount of the intuition, and in its subdivisibility, accrues.

9.2 Remembered recall (memory)

Chapter XVI - REMEMBERED RECALL (MEMORY) [I 643]

In the last chapter what concerned us was the direct *intuition* of time. We found it limited to intervals of considerably less than a minute. Beyond its borders extends the immense region of *conceived* time, past and future, into one direction or another of which we mentally project all the events which we think of as real, and form a systematic order of them by giving to each a date. The relation of conceived to intuited time is just like that of the fictitious space pictured on the flat back-scene of a theatre to the actual space of the stage. ... [I 643]

PRIMARY RECALL

The first point to be noticed is that *for a state of mind to survive in remembered recall it must have endured for a certain length of time*. In other words, it must be what I call a substantive state. ... [I 643-44]

... All the intellectual value for us of a state of mind depends on our after-recall of it. Only then is it combined in a system and knowingly made to contribute to a result. Only then does it *count* for us. So that *the EFFECTIVE consciousness we have of our states is the after-consciousness*; and the more of this there is, the more influence does the original state have, and the more permanent a factor is it of our world ... [I 644-45] As a rule sensations outlast for some little time the objective stimulus which occasioned them. This phenomenon is the ground of ... 'after-images' ... [I 645-46]

... What happens in the nerve-tissue is but an example of that plasticity or of semi-inertness, yielding to change, but not yielding instantly or wholly, and never quite recovering the original form, which, in Chapter V, we saw to be the groundwork of habit. ... [I 646-47]

When we have been exposed to an unusual stimulus for many minutes or hours, a nervous process is set up which results in the haunting of consciousness by the impression for a long time afterwards. The tactile and muscular feelings of a day of skating or riding, after long disuse of the exercise, will come back to us all through the night. ... [I 647-48]

ANALYSIS OF THE PHENOMENON OF REMEMBERED RECALL

Remembered recall (originally: memory proper), or secondary memory as it might be styled, is the knowledge of a former state of mind after it has already once dropped from consciousness; or rather *it is the knowledge of an event, or fact, of which meantime we have not been thinking, with the additional consciousness that we have thought or experienced it before*.

The first element which such a knowledge involves would seem to be the revival in the mind of an image or copy of the original event. ... [I 649-50] A farther condition is required before the present image can be held to stand for a *past original*.

That condition is that the fact imaged be *expressly referred to the past*, thought as *in the past*. But how can we think a thing as in the past, except by thinking of the past together with the thing, and of the relation of the two? ... [I 650] So that if we wish to think of a particular past epoch, we must think of a name or other symbol, or else of certain concrete events, associated therewithal. Both must be thought of, to think the past epoch adequately. And to 'refer' any special fact to the past epoch is to think that fact *with* the names and event which characterize its date, to think it, in short, with a lot of contiguous associates.

But even this would not be remembered recall (memory). Remembered recall requires more than mere dating of a fact in the past. It must be dated in *my* past. In other words, I must think that I directly experienced its occurrence. It must have that 'warmth and intimacy' which were so often spoken of in the chapter on the Self, as characterizing all experiences 'appropriated' by the thinker as his own.

A general feeling of the past direction in time, then, a particular date conceived as lying along that direction, and defined by its name or phenomenal contents, an event imagined as located therein, and owned as part of my experience,—such are the elements of every act of remembered recall.

It follows that what we began by calling the ‘image,’ or ‘copy,’ of the fact in the mind, is really not there at all in that simple shape, as a separate ‘idea.’ Or at least, if it be there as a separate idea, no remembered recall will go with it. What remembered recall goes with is, on the contrary, a very complex representation, that of the fact to be recalled *plus* its associates, the whole forming one ‘object’ (as explained on page 275, Chapter IX, quoted in section 5.2 above), known in one integral pulse of consciousness (as set forth on pp. 276ff.) and demanding probably a vastly more intricate brain-process than that on which any simple sensorial image depends. ... [I 651-52]

Remembered recall is then the feeling of belief in a peculiar complex object; but all the elements of this object may be known to other states of belief; ... [I 652] there is nothing unique in the *object* of remembered recall, and no special faculty is needed to account for its formation. It is a synthesis of parts thought of as related together, perception, imagination, comparison and reasoning being analogous syntheses of parts into complex objects. The objects of any of these faculties may awaken belief or fail to awaken it; *the object of remembered recall is only an object imagined in the past* (usually very completely imagined there) *to which the emotion of belief adheres.*

THE CAUSES OF REMEMBERED RECALL (MEMORY)

Such being the *phenomenon* of remembered recall, or the analysis of its object, can we see how it comes to pass? can we lay bare its causes?

Its complete exercise presupposes two things:

- 1) The *retention* of the remembered fact;
- 2) Its *reminiscence, recollection, reproduction, or recall.*

Now *the cause both of retention and of recollection is the law of habit in the nervous system, working as it does in the ‘association of ideas.’*

Associationists have long explained *recollection* by association. ... [I 653-54]

In short, we make search in our memory for a forgotten idea, just as we rummage our house for a lost object. In both cases we visit what seems to us the probable *neighborhood* of that which we miss. We turn over the things under which, or within which, or alongside of which, it may possibly be; and if it lies near them, it comes to view. But these matters, in the case of a mental object sought, are nothing but its *associates*. The machinery of recall is thus the same as the machinery of association, and the machinery of association, as we know, is nothing but the elementary law of habit in the nerve-centres.

9.2 Remembered recall (memory)

And this same law of habit is the machinery of retention also. Retention means *liability* to recall, and it means nothing more than such liability. The only proof of there being retention is that recall actually takes place. The retention of an experience is, in short, but another name for the *possibility* of thinking it again, or the *tendency* to think it again, with its past surroundings. Whatever accidental cue may turn this tendency into an actuality, the permanent *ground* of the tendency itself lies in the organized neural paths by which the cue calls up the experience on the proper occasion, together with its past associates, the sense that the self was there, the belief that it really happened, etc., etc., just as previously described. When the recollection is of the 'ready' sort, the resuscitation takes place the instant the occasion arises; when it is slow, resuscitation comes after delay. But be the recall prompt or slow, the condition which makes it possible at all (or in other words, the 'retention' of the experience) is neither more nor less than the brain-paths which *associate* the experience with the occasion and cue of the recall. *When slumbering, these paths are the condition of retention; when active, they are the condition of recall.* ... [I 655]

A simple scheme will now make the whole cause of remembered recall plain. Let *n* be a past event; *o* its 'setting' (concomitants, date, self present, warmth and intimacy, etc., etc., as already set forth); and *m* some present thought or fact which may appropriately become the occasion of its recall. Let the nerve-centres, active in the thought of *m*, *n*, and *o*, be represented by M, N, and O, respectively; then the existence of the paths M—N and N—O will be the fact indicated by the phrase 'retention of the event *n* in the memory,' and the excitement of the brain along these paths will be the condition of the event *n*'s actual recall. The *retention* of *n*, it will be observed, is no mysterious storing up of an 'idea' in an unconscious state. It is not a fact of the mental order at all. It is a purely physical phenomenon, a morphological feature, the presence of these 'paths,' namely, in the finest recesses of the brain's tissue. ... [I 655-57]

The only hypothesis, in short, to which the facts of inward experience give countenance is that *the brain-tracts excited by the event proper, and those excited in its recall, are in part different from each other.* ... [I 657-59]

THE CONDITIONS OF GOODNESS IN REMEMBERED RECALL (MEMORY)

The remembered fact being *n*, then, the path N—O is what arouses for *n* its setting *o* when it *is* recalled, and makes it other than a mere imagination. The path M—N from *m*, the present thought, on the other hand, gives the cue or occasion of its being recalled at all. *Remembered recall (memory) being thus altogether conditioned on brain-paths, its excellence in a given individual will depend partly on the number and partly on the persistence of these paths.* ... [I 659-62]

... the more other facts a fact is associated with in the mind, the better possession of it our memory retains. ... [I 662] The 'secret of a good

memory' is thus the secret of forming diverse and multiple associations with every fact we care to retain. But this forming of associations with a fact, what is it but *thinking about* the fact as much as possible? ... [I 662-63]

ONE'S NATIVE RETENTIVENESS IS UNCHANGEABLE

It will now appear clear that *all improvement of the memory lies in the line of* ELABORATING THE ASSOCIATES of each of the several things to be remembered. *No amount of culture would seem capable of modifying a man's* GENERAL *retentiveness.* ... [I 664-67]

All improvement of memory consists, then, in the improvement of one's habitual methods of recording facts. ... [I 667-76]

EXACT MEASUREMENTS OF RECALL (MEMORY)

have recently been made in Germany. Professor Ebbinghaus, in a really heroic series of daily observations of more than two years' duration, examined the powers of retention and reproduction. ... [I 676-89]

10. Sensation versus perception

As already noted in section 9.1 above, James's use of the word 'perception' is occasionally confusing. His principal use of the word is clarified in his following discussion of sensation.

Chapter XVII - SENSATION ... [II 1]

SENSATION AND PERCEPTION DISTINGUISHED [II 1]

The words Sensation and Perception do not carry very definitely discriminated meanings in popular speech, and in Psychology also their meanings run into each other. Both of them name processes in which we cognize an objective world; both (under normal conditions) need the stimulation of incoming nerves ere they can occur; Perception always involves Sensation as a portion of itself; and Sensation in turn never takes place in adult life without Perception also being there. They are therefore names for different cognitive *functions*, not for different sorts of mental *fact*. The nearer the object cognized comes to being a simple quality like 'hot,' 'cold,' 'red,' 'noise,' 'pain,' apprehended irrelatively to other things, the more the state of mind approaches pure sensation. The fuller of relations the object is, on the contrary; the more it is something classed, located, measured, compared, assigned to a function, etc., etc.; the more unreservedly do we call the state of a mind a perception, and the relatively smaller is the part in it which sensation plays.

Sensation, then, so long as we take the analytic point of view, differs from Perception only in the extreme simplicity of its object or content. Its function is that of mere *acquaintance* with a fact. Perception's function, on the other hand, is knowledge *about* (see above, I 221) a fact; and this knowledge admits of numberless degrees of complication. But in both sensation and perception we perceive the fact as an *immediately present outwardreality*, and this makes them differ from 'thought' and 'acquainting,' whose objects do not appear present in this immediate physical way.

10. Sensation versus perception

From the physiological point of view both sensations and perceptions differ from 'thoughts' (in the narrower sense of the word) in the fact that nerve-currents coming in from the periphery are involved in their production. In perception these nerve-currents arouse voluminous associative or reproductive processes in the cortex; but when sensation occurs alone, or with a minimum of perception, the accompanying reproductive processes are at a minimum too. ... [II 3]

This understanding of perception is confirmed in Chapter XIX, quoted in section 12.1 below. James continues ... [II 3]:

THE COGNITIVE FUNCTION OF SENSATION

A pure sensation is an abstraction; and when we adults talk of our 'sensations' we mean one of two things: either certain objects, namely simple qualities or attributes like hard, hot, pain; or else those of our thoughts in which acquaintance with these objects is least combined with knowledge about the relations of them to other things. As we can only think or talk about the relations of objects with which we have acquaintance already, we are forced to postulate a function in our thought whereby we first become aware of the bare immediate natures by which our several objects are distinguished. This function is sensation. ... [II 3-6]

Sensations, then, first make us acquainted with innumerable things, and then are replaced by thoughts which know the same things in altogether other ways. ... [II 6-7]

The brain is so made that all currents in it run one way. Consciousness of some sort goes with all the currents, but it is only when new currents are entering that it has the sensational *tang*. And it is only then that consciousness directly *encounters* (to use a word of Mr. Bradley's) a reality outside itself.

The difference between such encounter and all conceptual knowledge is very great. A blind man may know all about the sky's blueness, and I may know all *about* your toothache, conceptually; tracing their causes from primeval chaos, and their consequences to the crack of doom. But so long as he has not felt the blueness, nor I the toothache, our knowledge, wide as it is, of these realities, will be hollow and inadequate. Somebody must *feel* blueness, somebody must *have* toothache, to make human knowledge of these matters real. Conceptual systems which neither began nor left off in sensations would be like bridges without piers. Systems about fact must plunge themselves into sensation as bridges plunge their piers into the rock. Sensations are the stable rock, the *terminus a quo* and the *terminus ad quem* of thought. To find such termini is our aim with all our theories—to conceive first when and where a certain sensation may be had, and then to have it. Finding it stops discussion. Failure to find it kills the false conceit of knowledge. Only when you deduce a possible sensation for me from your theory, and give it to me when and where the theory requires, do I begin to be sure that your thought has anything to do with truth.

Pure sensations can only be realized in the earliest days of life. They are all but impossible to adults with memories and stores of associations acquired. ... [II 7-8]

The first sensation which an infant gets is for him the Universe. ... [II 8] In his dumb awakening to the consciousness of something there, a mere this as yet ... [II 8] the infant encounters an object in which (though it be given in a pure sensation) all the 'categories of the understanding' are contained. It has objectivity, unity, substantiality, causality, in the full sense in which any later object or system of objects has these things. Here the young knower meets and greets his world; and the miracle of knowledge bursts forth, as Voltaire says, as much in the infant's lowest sensation as in the highest achievement of a Newton's brain. ... [II 8-28]

... when two objects act together on us the sensation which either would give alone becomes a different sensation. ... [II 28-30]

... You cannot build up one thought or one sensation out of many; and only direct experiment can inform us of what we shall perceive when we get many stimuli at once. ... [II 31-39]

The objectivity with which each of our sensations originally comes to us, the roomy and spatial character which is a primitive part of its content, is not in the first instance relative to any other sensation. ... [II 39-44]

11. Perceptual discrimination of parts and perception of difference and likeness

In accordance with the discussion of section 10, by perception, by James sometimes called 'outer perception', we shall understand the mental activity of reacting to sense impressions. In perception sense impressions give rise to parts of thought objects in the stream of thought.

11.1 Perceptual discrimination of parts

Discrimination of parts of such objects that appear to our senses is described thus by James (1890):

[I 483] Chapter XIII

DISCRIMINATION AND COMPARISON [I 483-87]

... Experience, from the very first, presents us with concentered objects, vaguely continuous with the rest of the world which envelops them in space and time, and potentially divisible into inward elements and parts. These objects we break asunder and reunite. ... [I 487]

The noticing of any *part* whatever of our object is an act of discrimination. ... [I 487] Where the parts of an object have already been discerned, and each made the object of a special discriminative act, we can with difficulty feel the object again in its pristine unity; and so prominent may our consciousness of its composition be, that we may hardly believe that it ever could have appeared undivided. But this is an erroneous view, the undeniable fact being that *any number of impressions, from any number of sensory sources, falling simultaneously on a mind WHICH HAS NOT YET EXPERIENCED THEM SEPARATELY, will fuse into a single undivided object for that mind. ... [I 488]*

11.1 Perceptual discrimination of parts

The baby, assailed by eyes, ears, nose, skin, and entrails at once, feels it all as one great blooming, buzzing confusion; ... [I 488-89]

THE PRINCIPLE OF MEDIATE COMPARISON

When we discriminate an element, we may contrast it with the case of its own absence, of its simply not being there, without reference to what *is* there; or we may also take the latter into account. Let the first sort of discrimination be called *existential*, the latter *differential* discrimination. A peculiarity of differential discriminations is that they result in a perception of differences which are felt as *greater or less* one than the other. Entire groups of differences may be ranged in series: the musical scale, the color scale, are examples. ... [I 489-90] In passing from term to term in any such series we are conscious not only of each step of difference being equal to (or greater or less than) the last, but we are conscious of proceeding in a *uniform direction*, different from other possible directions. This *consciousness of serial increase of differences* is one of the fundamental facts of our intellectual life. ... [I 490] *the more than the more is more than the less*; such is *the great synthetic principle of mediate comparison which is involved in the possession by the human mind of the sense of serial increase*. ... [I 490-94]

11.2 Perception of difference

THE CONDITIONS OF DISCRIMINATION

What, then, are the conditions under which we discriminate things differing in a simple way?

First, *the things must BE different*, either in time, or place, or quality. If the difference in any of these regards is sufficiently great, then we cannot overlook it, except by not noticing the things at all. No one can help singling out a black stripe on a white ground, or feeling the contrast between a bass note and a high note sounded immediately after it. Discrimination is here *involuntary*. But where the objective difference is less, discrimination need not so inevitably occur, and may even require considerable effort of attention to be performed at all.

Another condition which then favors it is that the sensations excited by *the differing objects should not come to us simultaneously but fall in immediate SUCCESSION* upon the same organ.... [I 495] The reason why successive impressions so much favors the result seems to be that there is a real *sensation of difference*, aroused by the shock of transition from one perception to another which is unlike the first. This sensation of difference has its own peculiar quality, as difference, which remains sensible, no matter of what sort the terms may be, between which it obtains. It is, in short, one of those transitive feelings, or feelings of relation, of which I treated in a former place (pp. 245ff., quoted in 5.2 above); and, once aroused, its object

lingers in the memory along with the substantive terms which precede and follow, and enables our *judgments of comparison* to be made. ... [I 495-96]

The difference, thus immediately felt between two terms, is independent of our ability to identify either of the terms by itself. ... [I 496]

With such direct perceptions of difference as this, we must not confound those entirely unlike cases in which we *infer* that two things must differ because we know enough *about* each of them taken by itself to warrant our classing them under distinct heads. ... [I 497]

... But no matter how many may be the steps by which such inferential discriminations are made, *they all end in a direct intuition of differencesomewhere*. The *last* ground for inferring that A and B differ must be that, whilst A is an *m*, B is an *n*, and that *m* and *n* are *seen to differ*. [I 498]

I said that in their immediate succession the shock of their difference was *felt*. It is felt *repeatedly* when we go back and forth from *m* to *n*; ... [I 498] But in addition to being felt at the brief instant of transition, the difference also feels as if incorporated and taken up into the second term, which feels 'different-from-the-first' even while it lasts. It is obvious that the 'second term' of the mind in this case is not bald *n*, but a very complex object; and that the sequence is not simply first '*m*,' then '*difference*,' then '*n*'; but first '*m*,' then '*difference*,' then '*n-different-from-m*.' The several thoughts, however, to which these three several objects are revealed, are three ordinary 'segments' of the mental 'stream.' [I 498-501]

We may, then, conclude our examination of the manner in which simple involuntary discrimination comes about, by saying, 1) that its vehicle is a thought possessed of a knowledge of both terms compared and of their difference; 2) that the necessary and sufficient condition (as the human mind goes) for arousing this thought is that a thought or feeling of one of the terms discriminated should, as immediately as possible, precede that in which the other term is known; and 3) that the thought which knows the second term will then also know the difference (or in more difficult cases will be continuously succeeded by one which does know the difference) and both of the terms between which it holds. ... [I 501-02]

THE PROCESS OF ANALYSIS

And first, of the discrimination of simultaneously felt impressions! Our first way of looking at a reality is often to suppose it simple, but later we may learn to perceive it as compound. This new way of knowing the same reality may conveniently be called by the name of *Analysis*. It is manifestly one of the most incessantly performed of all our mental processes, so let us examine the conditions under which it occurs.

I think we may safely lay down at the outset this fundamental principle, that *any total impression made on the mind must be unanalyzable, whose elements are never experienced apart*. The components of an absolutely changeless group of not-elsewhere-occurring attributes could never be discriminated. ... [I 502-03]

11.2 Perception of difference

In general, then if an object affects us simultaneously in a number of ways, *abcd*, we get a peculiar integral impression, which hereafter characterizes to our mind the individuality of that object, and becomes the sign of its presence; and which is only resolved into *a*, *b*, *c*, *d*, respectively by the aid of farther experiences. These we now may turn to consider.

If any single quality or constituent, a, of such an object, have previously been known by us isolatedly, or have in any other manner already become an object of separate acquaintance on our part, so that we have an image of it, distinct or vague, in our mind, disconnected with bcd, then that constituent a may be analyzed out from the total impression. Analysis of a thing means separate attention to each of its parts.... [I 503] Attention being the condition of analysis, and separate imagination being the condition of attention, it follows also that separate imagination is the condition of analysis. *Only such elements as we are acquainted with, and can imagine, separately, can be discriminated within a total sense-impression.* The image seems to welcome its own mate from out of the compound, and to heighten the feeling thereof; whereas it dampens and opposes the feeling of the other constituents; and thus the compound becomes broken for our consciousness into parts.... [I 504-05]

THE PROCESS OF ABSTRACTION

Very few elements of reality are experienced by us in absolute isolation. The most that usually happens to a constituent *a*, of a compound phenomenon *abcd*, is that its *strength* relatively to *bcd* varies from a maximum to a minimum; or that it appears linked with other qualities, in other compounds, as *ae fg*, or *ah ik*. Either of these vicissitudes in the mode of our experiencing *a* may, under favorable circumstances, lead us to feel the difference between it and its concomitants, and to single it out—not absolutely, it is true, but approximately—and so to analyze the compound of which it is a part. The act of singling out is then called *abstraction*, and the element disengaged is an *abstract*.

Consider the case of fluctuations of relative strength or intensity first. Let there be three grades of the compound, as *Abcd*, *abcd*, and *abcD*. In passing between these compounds, the mind will feel shocks of difference. The differences, moreover, will serially increase, and their direction will be felt as of a distinct sort. The increase from *Abcd* to *abcd* is on the *a* side; that to *abcD* on the *d* side. And these two differences of direction are differently felt. I do not say that this discernment of the *a*-direction from the *d*-direction will give us an actual intuition either of *a* or of *d* in the abstract. But it leads us to *conceive* or *postulate* each of these qualities, and to define it as the *extreme* of a certain direction. ‘Dry’ wines and ‘sweet’ wines, for example, differ, and form a series. It happens that we have an experience of sweetness pure and simple in the taste of sugar, and this we can analyze out of the wine-taste. But no one knows what ‘dryness’ tastes like, all by itself.... [I 506]

But the fluctuation in a quality’s intensity is a less efficient aid to our abstracting of it than the diversity of the other qualities in whose company

it may appear. *What is associated now with one thing and now with another tends to become dissociated from either, and to grow into an object of abstract contemplation by the mind.* One might call this the *law of dissociation by varying concomitants.* The practical result of it will be to allow the mind which has thus dissociated and abstracted a character to analyze it out of a total, whenever it meets with it again.... [I 506-07]

This mode of abstraction is realized on a very wide scale, because the elements of the world in which we find ourselves appear, as a matter of fact, here, there, and everywhere, and are changing their concomitants all the while. But on the other hand the abstraction is, so to speak, never complete ... [I 508] in literal mathematical strictness *all* our abstracts must be confessed to be but imperfectly imaginable things. At bottom the process is one of *acquainting* (originally in James: *conception*), and is everywhere, even in the sphere of simple sensible qualities, the same as that by which we are usually understood to attain to the notions of abstract goodness, perfect felicity, absolute power, and the like: the direct perception of a difference between compounds, and the imaginary prolongation of the direction of the difference to an ideal terminus, the notion of which we fix and keep as one of our permanent subjects of discourse. ... [I 508-28]

11.3 Perception of likeness

THE PERCEPTION OF LIKENESS

The perception of likeness is practically very much bound up with that of difference. ... [I 528] To be found *different*, things must as a rule have some commensurability, some aspect in common ... [I 528]

The same things, then, which arouse the perception of difference usually arouse that of resemblance also. And the analysis of them, so as to define wherein the difference and wherein the resemblance consists, is called *comparison.* ... [I 528-29]

Much, then, of what I have said of difference in the course of this chapter will apply, with a simple change of language, to resemblance as well. ... [I 529] So that all that was said of the dependence of analysis upon a preliminary separate acquaintance with the character to be abstracted, and upon its having varied concomitants, finds a place in the psychology of resemblance as well as in that of difference. ... [I 529]

... the crude fact remains, that *some people are far more sensitive to resemblances, and far more ready to point out wherein they consist, than others are.* They are the wits, the poets, the inventors, the scientific men, the practical geniuses. *A native talent for perceiving analogies* is reckoned by Prof. Bain, and by others before and after him, as *the leading fact in genius of every order.* But as this chapter is already long, and as the question of genius had better wait till Chapter XXII, where its practical consequences can be discussed at the same time, I will say nothing more at present either about it or about the faculty of noting resemblances.

12. Perception of sensed objects

The perception of objects of sense-impression is a dominant experience in anybody's life, and the explanation of the way it is achieved by mental operations upon what we receive through our several sense organs is a central subject of descriptive psychology. James treats the subject mostly in the 207 pages of his Chapters XIX, *The Perception of Things*, and XX, *The Perception of Space*. The division of the subject into these two parts is confusing, however. Part of the confusion arises from the suggestion that 'space' is something specific that may be perceived. This suggestion is contradicted by James himself in his summary of Chapter XX [II 269]: 'The imagined aggregate of positions occupied by all the actual or possible, moving or stationary, things which we know, is our notion of 'real' space—a very incomplete and vague conception in all minds.'

Another part of the confusion is the suggestion that it makes sense to talk of perception of material things before, or independently, of the perceptual understanding of spaciousness. As a matter of fact most of James's explanation of the perception of material things will be found in his Chapter XX, while Chapter XIX is mostly concerned with explanations of illusions of perception.

Further confusion comes from the mixing into the discussion of perception of spacious things also other issues, such as perception of spoken verbal phrases sensed by hearing, in which spaciousness mostly is irrelevant to the perception.

For these reasons James's discussion has here been divided into the present section 12, which treats such perception that only incidentally relates to spaciousness, and section 13, in which the perceptual understanding of things and spaciousness is discussed.

12.1 Perception of objects of sense-impression

James writes:

'... [II 76] Any quality of a thing which affects our sense-organs does also more than that: it arouses processes in the hemispheres which are due to the organization of that organ by past experiences, and the result of which in consciousness are commonly described as ideas which the sensation suggests. The first of these ideas is that of the *thing* to which the sensible quality belongs. *The consciousness of particular material things present to sense* is nowadays called *perception*. The consciousness of such things may be more or less complete; it may be of the mere name of the thing and its other essential attributes, or it may be of the thing's various remoter relations. It is impossible to draw any sharp line of distinction between the barer and the richer consciousness, because the moment we get beyond the first crude sensation all our consciousness is a matter of suggestion, and the various suggestions shade gradually into each other, being one and all products of the same psychological machinery of association. In the directer consciousness fewer, in the remoter more, associative processes are brought into play.

Perception thus differs from sensation by the consciousness of farther facts associated with the object of the sensation. ... [II 77-78]

Sensational and reproductive brain-processes combined, then, are what give us the content of our perceptions. Every concrete particular material thing is a conflux of sensible qualities, with which we have become acquainted at various times.... [II 78]

... Reproduced sights and contacts tied together with the present sensation in the unity of a *thing* with a name, these are the complex objective stuff out of which my actually perceived table is made. Infants must go through a long education of the eye and ear before they can perceive the realities which adults perceive. *Every perception is an acquired perception.* ... [II 78-79]

... Cerebrally taken, these words mean no more than this, that the process aroused in the sense-organ has shot into various paths which habit has already organized in the hemispheres, and that instead of our having the sort of consciousness which would be correlated with the simple sensorial process, we have that which is correlated with this more complex process. ... [II 79-80]

In many cases it is easy to compare the psychic results of the sensational with those of the perceptive process. We then see a marked difference in the way in which the impressed portions of the object are felt, in consequence of being cognized along with the reproduced portion, in the higher state of mind. Their sensible quality changes under our very eye. Take the already-quoted catch, *Pas de lieu Rhône que nous*: one may read this over and over again without recognizing the sounds to be identical with those of the words *paddle your own canoe*. As we seize the English meaning the sound itself appears to change. Verbal sounds are usually perceived with their meaning at the moment of being heard. Sometimes, however, the associative irradiations are inhibited for a few moments (the mind being preoccupied with other thoughts) whilst the words linger on the ear as mere echoes of acoustic sensation. Then, usually, their interpretation suddenly occurs. But at that moment one may often surprise a change in the very *feel* of the word. Our own language would sound very different to us if we heard it without understanding, as we hear a foreign tongue. Rises and falls of voice, odd sibilants and other consonants, would fall on our ear in a way of which we can now form no notion. ... [II 80-81]

Another well-known change is when we look at a landscape with our head upside down. Perception is to a certain extent baffled by this manœuvre; gradations of distance and other space-determinations are made uncertain; the reproductive or associative processes, in short, decline; ... [II 81]

On a later page other instances will meet us. For the present these are enough to prove our point. Once more we find ourselves driven to admit that when qualities of an object impress our sense and we thereupon perceive the object, the sensation as such of those qualities does not still exist inside of the perception and form a constituent thereof. The sensation is one thing and the perception another, because their cerebral conditions are not the same. They may *resemble* each other, but in no respect are they identical states of mind.

12.1 Perception of objects of sense-impression

PERCEPTION IS OF DEFINITE AND PROBABLE THINGS

The chief cerebral conditions of perception are the paths of association irradiating from the sense-impressions, which may have been already formed. If a certain sensation be strongly associated with the attributes of a certain thing, that thing is almost sure to be perceived when we get the sensation. Examples of such things would be familiar people, places, etc., which we recognize and name at a glance. But *where the sensation is associated with more than one reality*, so that either of two discrepant sets of residual properties may arise, the perception is doubtful and vacillating, and *the most that can then be said of it is that it will be of a PROBABLE thing*, of the thing which would most usually have given us that sensation.

In these ambiguous cases it is interesting to note that perception is rarely abortive; *some* perception takes place. The two discrepant sets of associates do not neutralize each other or mix and make a blur. What we more commonly get is first one object in its completeness, and then the other in its completeness. In other words, *all brain-processes are such as give rise to what we call FIGURED consciousness*. If paths are irradiated at all, they are irradiated in consistent systems, and occasion thoughts of definite objects, not mere hodge-podges of elements. ... [II 82-83]

Thus the faintest sensations will give rise to the perception of definite things if only they resemble those which the things are wont to arouse.

12.2 Perceptual illusions

James writes:

... [II 86] *The so-called 'fallacy of the senses', of which the ancient sceptics made so much account, is not fallacy of the senses proper, but rather of the intellect, which interprets wrongly what the senses give.*

So much premised, let us look a little closer at these illusions. They are due to two main causes. *The wrong object is perceived either because*

1) *Although not on this occasion the real cause, it is yet the habitual, inveterate, or most probable cause of 'this;'* or because

2) *The mind is temporarily full of the thought of that object, and therefore 'this' is peculiarly prone to suggest it at this moment.* ... [II 86]

Illusions of the First Type ... [II 86-90]

There is an illusion of movement of the opposite sort, with which every one is familiar at *railway stations*. ... [II 90-91] ... when another train comes alongside of ours in a station, and fills the entire window, and, after standing still awhile, begins to glide away, we judge that it is *our* train which is moving, and that the other train is still. ... [II 91] This, again, is but making the usual and probable inference from our sensation. ... [II 91-92]

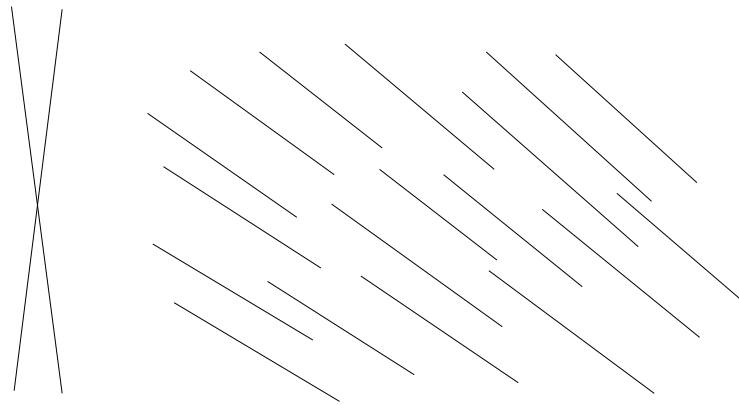
The size of the retinal image is a fruitful source of illusions. ... [II 92]

The well-known increased *apparent size of the moon on the horizon* is a result of association and probability. It is seen through vaporous air, and looks dimmer and duskier than when it rides on high; and it is seen over fields, trees, hedges, streams, and the like, which break up the intervening space and make us better realize the latter's extent. Both these causes make the moon seem more distant from us when it is low; and as its visual angle

grows no less, we deem that it must be a larger body, and we so perceive it. It looks particularly enormous when it comes up directly behind some well-known large object, as a house or tree, distant enough to subtend an angle no larger than that of the moon itself. ... [II 93-94]

... Take a single pair of crossed lines (the figure below, left), hold them in a horizontal plane before the eyes, and look along them, at such a distance that with the left eye shut, 1, and with the right eye shut, 2, looks like the projection of a vertical line. Look steadily now at the point of intersection of the lines with both eyes open, and you will see a third line sticking up like a pin through the paper at right angles to the plane of the two first lines. The explanation of this illusion is ... [II 94] that images of the two lines fall on 'corresponding' rows of retinal points, and that the illusory vertical line is the only object capable of throwing such images.

1. 2.



A variation of the experiment is this [reported by Mrs. C. L. Franklin]: In the figure to the right, the lines are all drawn so as to pass through a common point. With a little trouble one eye can be put into the position of this point—it is only necessary that the paper be held so that, with one eye shut, the other eye sees all the lines leaning neither to the right nor to the left. After a moment one can fancy the lines to be vertical staffs standing out of the plane of the paper. ... [II 94] This illusion I take to be of purely mental origin. When a line lies anywhere in a plane passing through the apparent vertical meridian of one eye, and is looked at with that eye only ... we have no very good means of knowing how it is directed in that plane. ... Now of the lines in nature which lie anywhere within such a plane, by far the greater number are vertical lines. Hence we are peculiarly inclined to think that a line which we perceive to be in such a plane is a vertical line. But to see a lot of lines at once, all ready to throw their images upon the vertical meridian, is a thing that has hardly ever happened to us, except when they all have been vertical lines. Hence when that happens we have a still stronger tendency to think that what we see before us is a group of vertical lines. [end of report]

In other words, we see, as always, the most probable object. ... [II 95]

12.2 Perceptual illusions

Illusions of the Second Type ... [II 95-96]

The Proof-reader's Illusion. I remember one night in Boston, whilst waiting for a 'Mount Auburn' car to bring me to Cambridge, reading most distinctly that name upon the signboard of a car on which (as I afterwards learned) 'North Avenue' was painted. The illusion was so vivid that I could hardly believe my eyes had deceived me. All reading is more or less performed in this way. ... [II 96-103]

THE PHYSIOLOGICAL PROCESS IN PERCEPTION

Enough has now been said to prove the general law of perception, which is this, that *whilst part of what we perceive comes through our senses from the object before us, another part* (and it may be the larger part) *always comes* (in Lazarus's phrase) *out of our own head.* ... [II 103-04]

But we can, I think, without danger of being too speculative, be a little more exact than this, and conceive of a physiological reason why the felt quality of an object changes when, instead of being apprehended in a mere sensation, the object is perceived as a thing. All consciousness seems to depend on a certain slowness of the process in the cortical cells. The rapider currents are, the less feeling they seem to awaken. ... [II 104] ... just in proportion as associations are habitual, will the qualities of the suggested thing tend to substitute themselves in consciousness for those of the thing immediately there; or, more briefly, *just in proportion as an experience is probable will it tend to be directly felt.* ... [II 104-14]

HALLUCINATIONS

... [II 114-15] *An hallucination is a strictly sensational form of consciousness, as good and true a sensation as if there were a real object there.* The object happens not to be there, that is all. ... [II 115-22]

THE NEURAL PROCESS IN HALLUCINATION

... [II 122-27] ... *When the normal paths of association between a centre and other centres are thrown out of gear, any activity which may exist in the first centre tends to increase in intensity until finally the point may be reached at which the last inward resistance is overcome, and the full sensational process explodes.* Thus it will happen that causes of an amount of activity in the brain-cells which would ordinarily result in a weak consciousness may produce a very strong consciousness when the overflow of these cells is stopped by the torpor of the rest of the brain. A slight peripheral irritation, then, if it reaches the centres of consciousness at all during sleep, will give rise to the dream of a violent sensation. All the books about dreaming are full of anecdotes which illustrate this.... [II 127-28]

... *Whenever the normal forward irradiation of intra-cortical excitement through association-paths is checked, any accidental spontaneous activity or any peripheral stimulation (however inadequate at other times) by which a brain-centre may be visited, sets up a process of full sensational intensity therein.*

13. Perceptual understanding of spaciousness

13.1 The development of space understanding

Spaciousness is a property of certain of the objects we experience, which is part of what comes to us when we perceive them. Our understanding of this property has been developed in each of us from our sensations early in life. How this development has been possible is described by James in his Chapter XX, of 149 pages, a *tour de force* of subtle argumentation, in which he discusses a vast amount of empirical observation, and clarifies a series of contributions to the subject, many of them controversial, from dozens of other, highly astute authors.

The subject is opened by James with the following empirical observation:

Chapter XX - THE PERCEPTION OF SPACE [II 134]

THE FEELING OF CRUDE EXTENSIVITY

In the sensation of hearing, touch, sight, and pain we are accustomed to distinguish from among the other elements the element of voluminousness. We call the reverberations of a thunderstorm more voluminous than the squeaking of a slate-pencil; the entrance into a warm bath gives our skin a more massive feeling than the prick of a pin; ... [II 134]

Before proceeding to James's own summary of the Chapter there are two points of the full text to note, first on the mental powers involved in developing our perceptual understanding of spaciousness:

... [II 202] let us cast a glance upon the results of the last pages, and ask ourselves once more whether the building up of orderly space-perceptions out of primitive incoherency requires any mental powers beyond those displayed in ordinary intellectual operations. I think it is obvious—granting the spacial *quale* to exist in the primitive sensations—that discrimination, association, addition, multiplication, and division, blending into generic images, substitutions of similars, selective emphasis, and abstracting from uninteresting details, are quite capable of giving us all the space-perceptions we have so far studied ...

Second on the importance of attention:

... [II 240] *Sensations which we Ignore.* ... [II 240] Reid expressed Berkeley's principle in yet clearer language: "The visible appearances of objects are intended by nature only as signs or indications, and the mind passes instantly to the things signified, without making the least reflection upon the sign, or even perceiving that there is any such thing. ... The mind has acquired a confirmed and inveterate habit of inattention to them (the signs). For they no sooner appear than, quick as lightening, the thing signified succeeds and engrosses all our regard. They have no name in language; and although we are conscious of them when they pass through the mind, yet their passage is so quick and familiar that it is absolutely unheeded; nor do they leave any footsteps of themselves, either in the memory or imagination."

13.1 The development of space understanding

If we review the facts we shall find every grade of non-attention between the extreme form of overlooking mentioned by Reid (or forms even more extreme still) and complete conscious perception of the sensation present. Sometimes it is literally impossible to become aware of the latter. Sometimes a little artifice or effort easily leads us to discern it together, or in alternation, with the 'object' it reveals. Sometimes the present sensation is held to *be* the object or to reproduce its features in undistorted shape, and *then*, of course, it receives the mind's full glare. ... [II 241-68]

And now to James's summary of his Chapter XX - THE PERCEPTION OF SPACE ... [II 268]:

GENERAL SUMMARY

With this we may end our long and, I fear to many readers, tediously minute survey. The facts of vision form a jungle of intricacy; and those who penetrate deeply into physiological optics will be more struck by our omissions than by our abundance of detail. But for students who may have lost sight of the forest for the trees, I will recapitulate briefly the points of our whole argument from the beginning, and then proceed to a short historical survey, which will set them in relief.

All our sensations are positively and inexplicably extensive wholes.

The sensations contributing to *space-perception* seem exclusively to be the surface of skin, retina, and joints. 'Muscular' feelings play no appreciable part in the generation of our feelings of form, direction, etc.

The total bigness of a cutaneous or retinal feeling soon becomes subdivided by discriminative attention.

Movements assist this discrimination by reason of the peculiarly exciting quality of the sensations which stimuli moving over surfaces arouse.

Subdivisions, once discriminated, acquire definite relations of position towards each other within the total space. The 'relations' are themselves feelings of the subdivisions that intervene. When these subdivisions are not the seat of stimuli, the relations are only reproduced in imaginary form.

The various sense-spaces are, in the first instance, incoherent with each other; and primitively both they and their subdivisions are but vaguely comparable in point of bulk and form.

The *education* of our space-perception consists largely of two processes—reducing the various sense-feelings to a common *measure*, and *adding them together* into the single all-including space of the real world.

Both the measuring and the adding are performed by the aid of *things*.

The imagined aggregate of positions occupied by all the actual or possible, moving or stationary, things which we know, is our notion of 'real' space—a very incomplete and vague conception in all minds.

The *measuring* of our space-feelings against each other mainly comes about through the successive arousal of different ones by the same *thing*, by our selection of certain ones as feelings of its *real size* and shape, and by the degradation of others to the status of being merely *signs* of these.

For the successive application of the same thing to different space-giving surfaces motion is indispensable, and hence plays a great part in our space-education, especially in that of the eye. Abstractly considered, the motion of the object over the sensitive surface would educate us quite as well as that of the surface over the object. But the self-mobility of the organ carrying the surface *accelerates* immensely the result.

In completely educated space-perception, the present sensation is usually just what Helmholtz (*Physiol. Optik*, p. 797) calls it, 'a sign, the interpretation of whose meaning is left to the understanding.' But the understanding is exclusively reproductive and never productive in the process; and its function is limited to the recall of previous space-sensations with which the present one has been associated and which may be judged more real than it.

Finally, the reproduction may in the case of certain visual forms be as vivid, or almost so, as the actual sensation is.

The third dimension forms an original element of all our space-sensations. In the eye it is subdivided by various discriminations. The more distant subdivisions are often shut out altogether, and, in being suppressed, have the effect of diminishing the absolute space-value of the total field of view.

13.2 Cognitive fallacies in describing perception

The discussion of perception in the *EncPsych* is entirely dominated by the cognitivist ideology. Already in sections 3.2, 3.3, and 3.4, above, the cognitivist approach in some of the relevant articles in the *EncPsych* has been shown to be flawed.

Other relevant articles are: **PATTERN RECOGNITION** [*EncPsych* 6, 66-71, Michael J. Tarr], **PERCEPTION AND ACTION** [*EncPsych* 6, 86-89, Melwyn A. Goodale], **PERCEPTUAL CONSTANCIES** [*EncPsych* 6, 89-93, Barbara Gillam], **PERCEPTUAL ORGANIZATION** [*EncPsych* 6, 93-97, Stephen E. Palmer], **SCENE PERCEPTION** [*EncPsych* 7, 151-55, Ronald A. Rensink].

None of these articles reveals any inkling of understanding that all perception is a matter of habitual association from sense impressions, as described in section 12.1. None of them gives any evidence of insight into the intricacies of psychological optics presented by James, reviewed in section 13.1. The issues of 'perceptual constancies' and 'perceptual organization' are pseudo-problems that were exhaustively cleared by James, as reviewed in section 13.1 above.

In the articles the defects of cognitivism are displayed both in the way of talking about mental organs and processes, and in what the activity called perception is assumed to achieve, as follows:

(1) The articles all postulate that the action of the human organism can be described in terms of a vocabulary inspired by computer data processing, centered around a memory container. Goodale specifically says that 'visual control of action requires computations ...' and Gillam asks 'How do we compute the real size of an object ...'.

13.2 Cognitive fallacies in describing perception

However, there is not in any of the articles the slightest indication how this postulated data processing and computation happens in a human organism, and no indication that the talk of a human memory containing data is senseless, as discussed in section 4.7. This basic flaw of cognitivism is admitted explicitly by Tarr: 'Fundamental to perception is the transformation of the light array that falls on the retinas into coherent surfaces and objects. How this is done is still a matter of some debate ...'.

(2) The articles all postulate that what is called perception takes place like input of data into a computer. Thus they all make the tacit assumption that a human being faced with some particular scenario, by what is called perception will receive into his 'memory' something definite, something called 'an internal representation of the external world', or 'perceptual constancies', given by the scenario. This postulate is false. What a person perceives when faced by a certain scenario depends entirely on the person's personal perception habits and direction of attention from moment to moment. One moment one item of the scenario is perceived, a moment later another one, while the first one lingers on for a few seconds. What is taken to be an item may change all the time. Looking at a bouquet of flowers the person typically will let the attention switch between perceiving the whole bouquet and any one of the flowers. The result of the perception is in any case that the person's attention is drawn to some part of the current thought object in his or her stream of thought, with its fringes.

The defects of the cognitivist view of perception are displayed abundantly in the start of the article by Gillam:

PERCEPTUAL CONSTANCIES [*EncPsych* 6, 89-93] refer to the organism's immediate awareness of the permanent properties of objects and surfaces in the surrounding environment, such as size, shape, lightness, and color. It is obviously very important that an organism be able to respond to these enduring properties of objects in order to recognize them and interact with them by reaching, avoiding, and so on. But how can this be accomplished given the great variety of distances, viewpoints, and conditions of illumination under which objects are viewed? ... How do we compute the real size of an object or the intrinsic reflectance properties of a surface in the face of huge changes in retinal size and retinal luminance? These questions are typical of the constancy problem, whose solution is one of the brain's greatest achievements. ... Broadly speaking ... almost all of perception could be regarded as concerned with the constancy problem.

By this description a person's interaction with things in his environment happens at any time like that of a newborn child. According to the cognitivist ideology spelled out here there is no such thing as acquired habit. The description assumes that the motion of the legs in every step a person takes when walking is a result of a computation of the relative position of the feet and the path before them, based on what the person will be able to determine about the position of the path from looking down at it. By this description it will be impossible for a person to walk along in darkness, even along a familiar flat ground. The description claims that the walker at all times has to look steadily down on the path. The description

is further absurd by also talking about *recognizing* an object, which means to know that the object is the same as the person has become acquainted with in previous experience, i.e. has the *habit of knowing as the same* as at earlier occasions.

A further defect of the cognitivist view of perception is displayed when Gillam writes:

‘... the zenith moon looks larger than the horizon moon (the moon illusion) and accordingly looks nearer. This makes it logically incoherent to use the greater apparent distance of the horizon moon as an explanation of the moon illusion.’

Here the confusion is total. ‘The moon illusion’ is *not* that the zenith moon looks larger than the horizon moon, but the opposite, that it looks smaller. And again the moon illusion is completely accounted for in James’s account of perception as a matter of habitual association, as reported above in section 12.2.

The article by Rensink starts:

SCENE PERCEPTION [*EncPsych* 7, 151-55] is the visual perception of an environment as viewed by an observer at a given time. It includes not only the perception of individual objects, but also such things as their relative locations and expectations about what other kind of objects might be encountered.

Given that scene perception is so effortless for most observers, it might be thought of as something easy to understand. However, the amount of effort required by a process often bears little relation to its underlying complexity. A closer look shows that scene perception is a highly complex activity and that any account of it must deal with several difficult issues: What exactly is a scene? What aspects of it do we represent? What are the processes involved? Finding the answers to these questions has proven to be extraordinarily difficult.

However, answers are being found, and a general understanding of scene perception is beginning to emerge. Interestingly, this emerging picture shows that much of our subjective experience as observers is highly misleading, at least in regards to the way that things are carried out. In particular, the impression of a stable picturelike representation somewhere in our heads turns out to be largely an illusion.

This story is highly revealing of the defects of the cognitive ideology. Briefly: there is not a single item of psychological sense in the whole story. Typical of the cognitive style, it is concerned merely with a computer application problem which is irrelevant to human mental life.

There are two central issues. The first one is presented in the first sentence of the story. By this sentence it is implied that it makes sense to talk of ‘the visual perception of an environment’ as a definite mental action that when taken by people at certain occasions happens in a definite way. All this is confusion. There is no such definite occasion as ‘viewing an environment at a given time’; we all have an environment in view at most of our waking moments of our lives. And the perception we do while viewing an environment follows no particular pattern or rule. While we are in a familiar room we usually only do visual perception of its furniture when we are looking for something.

13.2 Cognitive fallacies in describing perception

The second issue is the talk of ‘... picturelike representation somewhere in our heads’. Any such thing is merely a cognitive myth.

The article **PATTERN RECOGNITION** [*EncPsych* 6, 66-71, Michael J. Tarr] again is concerned merely with a computer application problem which is irrelevant to human mental life. The suggestions for specific ‘systems’ of the brain, such as ‘human pattern recognition system’, ‘visual recognition system’, and ‘face-specific recognition system’, have as little meaning in relation to mental life as the ‘biological devices’ discussed in section 4.8. The kind of ‘localization claims’ that are used to argue for them have already been shown to be invalid in section 4.7.

The defects of the Gestaltist ideology presented in the article by Palmer: **PERCEPTUAL ORGANIZATION** [*EncPsych* 6, 93-97], including the unresolved problems of figure-ground and other organization mentioned in the article, have been discussed in section 3.1 above.

14. Sign habits and language

14.1 The deliberate and habitual use of signs

As described in section 13.1 much perceptual experience is so dominated by the part activated by association that the sensational part of it acts merely as a sign. This is the case, for example, when we glance at things in our normal surroundings, where everything is familiar to us by long-established habit.

Saying that the sensational part acts merely as a sign refers to a notion of signs. We say that some S is, or acts as, a sign to a certain person when that S in that person’s stream of thought by habitual association (perception) invokes something else, which then is said to be signified or designated by S.

Signs in this sense are used deliberately by people, in many ways and for a variety of purposes. A prominent use is for intercourse in human communities. In this context each community typically commonly employs sets of signs that are distinctive of the community. The signs used most extensively in human intercourse have the form of series of spoken verbal sounds, called utterances, each utterance consisting of one word or a series of words taken from a certain vocabulary. Side by side with the spoken signs, signs in the form of many varieties of script are used, such that an approximate equivalence between spoken utterances and sequences of script signs is maintained, in the sense that each spoken word is given certain definite script forms.

What makes a particular set of signs useful for intercourse within a certain community is that part of the signification attached by the various members of the community to each sign is the same. Here it is important to stress the ‘part of’ in this explanation. Being a matter of thought objects in the individual persons’ stream of thought, the sameness of significations can only be partial.

The words and utterances used habitually in a certain community of persons, together with the common part of their significations, are called the language of the community. However, since the common significations attached to the utterances in the language can only be partial, and in addition the habits of any

individual are in continual change, *the language of a certain community can only indicate a small part of the significance of any particular utterance that the members of the community will experience.*

In the young child the habits of using a language in the intercourse with the parents originates in the powerful instincts of pointing, expressing desire by sound, crying, vocalization, and imitation, mentioned in section 4.5 above. Added to this comes what James (1890) in a comparison between man and brute describes thus:

... [II 356] Language is a system of *signs*, different from the things signified, but able to suggest them.

No doubt brutes have a number of such signs.... [II 356] ... In each of these separate cases the particular sign *may* be consciously noticed by the animal, as distinct from the particular thing signified, and will thus, so far as it goes, be a true manifestation of language. But when we come to man we find a great difference. *He has a deliberate intention to apply a sign to everything.* The linguistic impulse is with him generalized and systematic. For things hitherto unnoticed or unfelt, he *desires* a sign before he has one. Even though the dog should possess his 'yelp' for this thing, his 'beg' for that, and his auditory image 'rat' for a third thing, the matter with him rests there. If a fourth thing interests him for which no sign happens already to have been learned, he remains tranquilly without it and goes no further. But the man *postulates* it, its absence irritates him, and he ends by inventing it. *This GENERAL PURPOSE constitutes, I take it, the peculiarity of human speech, and explains its prodigious development.*

How, then, does the general purpose arise? It arises as soon as the notion of a *sign as such*, apart from any particular import, is born; and this notion is born by dissociation from the outstanding portions of a number of concrete cases of signification. The 'yelp', the 'beg', the 'rat', differ as to their several imports and natures. They agree only in so far as they have the same *use*—to *be signs*, to stand for something more important than themselves. The dog whom this similarity could strike would have grasped the sign *per se* as such, and would probably thereupon become a general sign-maker, or speaker in the human sense. But how can the similarity strike him? Not without the juxtaposition of the similars (in virtue of the law we have laid down (1890, I 506, quoted in section 11.2), that in order to be segregated an experience must be repeated with varying concomitants)—not unless the 'yelp' of the dog at the moment it occurs *recalls* to him his 'beg', by the delicate bond of their subtle similarity of use—not till then can this thought flash through his mind: 'Why, yelp and beg, in spite of all their unlikeness, are yet alike in this: that they are actions, signs, which lead to important boons. Other boons, *any* boons may then be got by other signs!' This reflection made, the gulf is passed. Animals probably never make it, because the bond of similarity is not delicate enough. Each sign is drowned in *its* import, and never awakens other signs and other imports in juxtaposition. The rat-hunt idea is too absorbingly interesting in itself to be interrupted by anything so uncontiguous to it as the idea of the 'beg for food', or of 'the door-open yelp', nor in their turn to these awaken the rat-hunt idea.

14.1 The deliberate and habitual use of signs

In the human child, however, these ruptures of contiguous association are very soon made; far off cases of sign-using arise when we make a sign now; and soon language is launched. The child in each case makes the discovery for himself. No one can help him except by furnishing him with the conditions. But as he is constituted, the conditions will sooner or later shoot together into the result.

14.2 Description of linguistic sign habits: dictionary and grammar

The extensive use of linguistic signs in human communities has occasioned an interest in descriptions of the relevant habits. In fact, this is the area of human activity in which description of habits has been pursued most extensively.

However, any description of human habits is problematic. Properly speaking, by the nature of habit the description task is endless. No two persons have the same habits, and the habits of each individual is a matter of action patterns that change from day to day, lifelong. Any description of human habits of any kind must always remain partial and approximate.

In a description of the language habits of a particular community it is possible to achieve a reasonably complete coverage in describing the signs used at a particular historical time. The description of the corresponding significations necessarily will be entirely incomplete, these significations being thought objects in persons' streams of thought, and therefore infinitely varied and rich. The best that can be done is to describe what is common to the significations of each word as it has been used at a number of particular occasions, typically in writing by some reputable author. Even this approach fails for many words that have been used with significations that have nothing in common, so-called homonymity. In these cases the description may at best give several significations side by side.

Descriptions of linguistic sign habits of particular communities traditionally have been divided into dictionaries and grammars. A dictionary is a catalogue of some of the words that have been used habitually in the community, explaining the commonly understood part of the significations habitually attached to each word, by other words.

A grammar is in the main a description of such habits that relate to many words in a similar manner, including such habits that relate to the stringing of words together into utterances, called phrases and sentences.

The relation between habits and language descriptions has been explained by Jespersen (1924, p. 29):

My chief object in writing this chapter has been to make the reader realize that language is not exactly what a one-sided occupation with dictionaries and the usual grammars might lead us to think, but a set of habits, of habitual action on the part of the speaker. The greater part of these actions are determined by what he has done previously in similar situations, and that again was determined chiefly by what he had habitually heard from others. But in each individual instance, apart from mere formulas, the speaker has to

turn these habits to account to meet a new situation, to express what has not been expressed previously in every minute detail; therefore he cannot be a mere slave to habits, but has to vary them to suit his varying needs—and this in course of time may lead to new turns and new habits; in other words, to new grammatical forms and usages.

A description of linguistic sign habits may be prescriptive or descriptive. This matter is explained by Jespersen in his *Introductory to Essentials of English Grammar* (1933):

‘... Language is nothing but a set of human habits, the purpose of which is to give expression to thoughts and feelings, and especially to impart them to others. As with other habits it is not to be expected that they should be perfectly consistent. No one can speak exactly as everybody else or speak exactly in the same way under all circumstances and at all moments, hence a good deal of vacillation here and there. ... The chief object in teaching grammar today—especially that of a foreign language—would appear to be to give rules which must be obeyed if one wants to speak and write the language correctly—rules which as often as not seem quite arbitrary. Of greater value, however, than this **prescriptive** grammar is a purely **descriptive** grammar which, instead of serving as a guide to what should be said or written, aims at finding out what is actually said and written by the speakers of the language investigated, and thus may lead to a scientific understanding of the rules followed instinctively by speakers and writers. ... This book aims at giving a descriptive and, to some extent, explanatory and appreciative account of the grammatical system of Modern English ...’

The form of description of linguistic sign habits has been particularly studied by Jespersen (1924, *The Philosophy of Grammar*). Jespersen stresses that the form of description has to be chosen with a view to the particular language being described. He rejects the historical attitude that classical Greek and Latin have to be taken as ideal models of language habits. For the purpose of his description of the habits of Modern English in his 7 volume *Modern English Grammar* and his *Essentials of English Grammar* (1933) he develops an original form of description.

These works place Jespersen’s contribution alongside those of Newton and William James, as they were discussed in section 2.6 above, as among the supreme scientific/scholarly achievements of humanity.

14.3 Perception of linguistic signs versus rules of grammar

The description of sign habits in grammars has given rise to a prominent fallacy to the effect that perception of linguistic signs is in some sense guided by or dependent on rules of grammar. This fallacy is even suggested in the passage from Jespersen quoted above where, in direct contradiction to his main thesis that language is habits, he also mentions ‘the rules followed instinctively by speakers and writers’. The fallacy has its origin in certain of the practices of describing linguistic habits and in the prescriptive use of grammars in the teaching of language habits, as discussed below.

14.3 Perception of linguistic signs versus rules of grammar

Anyone who works out a description of language habits will, for economy and expediency, exploit whatever regularities there may be in the habits under study. One kind of regularity which is found very commonly in language habits is a matter of certain groupings of the words. For example, English people habitually use certain words that may be described as coming in groups of four as shown in a few examples:

fit	fits	fitted	fitting
love	loves	loved	loving
jump	jumps	jumped	jumping

Thousands of further words used by English people may be grouped in this way. Now the linguistic habits of many English people are such that part of the significations given to the four words of each group have a certain regularity, similar for all the groups. So for expediency the dictionary maker does not list all these words, but lists only one out of each group of four, and leaves it to one general explanation how the others are also used habitually. In this way the maker of the dictionary saves to make a separate entry in his dictionary for three words out of the four in every group. This kind of descriptive economy then gives occasion to an entry in the grammar part of the description of the language, which explains the regularities in the way the four words are used that are found commonly in all the groups. The grammar may for example explain that a common feature of the habits of use of all the words in the second column above is that these words are used when the speaker desires to express something done, not by the speaker and not by the hearer, but by a third person or thing.

This form of description of speech habits not only allows economy of description, but also of learning effort for a foreigner, who will only have to learn the words in one of the four columns and then three rules telling how the remaining columns are formed and used. Thus to tell what the fox does in order to come over the fence, the foreigner who knows the words in the first column and the rules in the grammar can argue like this: the action to come over the fence, that is 'jump'. But the fox is not me, not you, so by the rules it must be 'the fox jumps'.

But this understanding of the rules of grammar as matters of descriptive convenience has traditionally been entirely distorted by ideological views, of two different kinds. One kind of ideologists claim that rules of grammar are not really descriptions of habits at all. Indeed, these ideologists reject the description of linguistic sign activity as being a matter of habits. Instead, these ideologists say, while talking humans perform what is called 'language processing' controlled by rules. This claim is made even though no one can tell what these 'language processing rules' are. For example, which rule told the person that the word to use above was 'jump', and not one of the thousands of other words?

The other kind of ideologists are those who claim the prescriptive significance of language habit rules. They are the people who insist that only certain sign habits are socially acceptable, 'correct', while others are socially degrading. Such ideological attitudes may be given concrete expression in prescriptive grammars. The reason for this ideological interest in linguistic habits is that such habits are highly revealing of the person's social background and education, more so than any other characteristic of the person that may readily be observed and which does not change with age.

The ideology of the prescriptive significance of language habit rules was again given credence in the academic concern for Latin and Greek during the many centuries when these languages were dead, only known through written texts, and only to be mastered through study of descriptions, not through imitation and training of speech habits.

However, the claim of the role of rules in human speech activity is false. The mechanism of a person's perception of utterances is not different from that of perceptions of other sense-impressions. They are all matters of acquired habits. Examples of such perception are given by James, as quoted above in sections 12.1 and 12.2. James gives more explicit expression to the way the perception of a word depends on the total mental state of person at the moment the perception takes place, beyond any rules, when he writes (1890, I 472):

'When I use the word *man* in two different sentences, I may have both times exactly the same sound upon my lips and the same picture in my mental eye, but I may mean, and at the very moment of uttering the word and imagining the picture, know that I mean, two entirely different things. Thus when I say: 'What a wonderful man Jones is!' I am perfectly aware that I mean by man to exclude Napoleon Bonaparte or Smith. But when I say: 'What a wonderful thing Man is!' I am equally well aware that I mean to include not only Jones, but Napoleon and Smith as well. This added consciousness is an absolutely positive sort of feeling, transforming what would otherwise be mere noise or vision into something *understood*; and determining the sequel of my thinking, the later words and images, in a perfectly definite way. We saw in Chapter IX that the image *per se*, the nucleus, is *functionally* the least important part of the thought. ...'

That rules of grammar are merely descriptive has been confirmed in a study of the rules in (Jespersen, 1933) presented in (Naur, 1995c).

14.4 Structuralist (Chomskyst) fallacies of language

A particular language-rule ideology, known as structuralism, was launched by Saussure in 1910. This was commented on by Jespersen (1941) as follows, in translation from Danish:

'In the thinking about language of the latest twenty years one regularly encounters a distinction that usually is taken to refer to Ferdinand de Saussure's *Cours de linguistique générale* (1916). His expression is *parole* and *langue*; ... Saussure insisted on establishing an abyss between the two and maintained with great exaggeration, that the individual was unconditional master over his *parole*, while he was quite powerless towards his *langue*. ... But remember that language always denotes habit; no matter how often it is said by several linguists, language will never be a 'substance'; if it is a 'system', it is a system of habits.'

Since about 1960 the structuralist ideology has been best known in the form promoted by Chomsky. Chomsky presents his view thus (1972, p. 115):

Competence and Performance. At the crudest level of description, we may say that a language associates sound and meaning in a particular way; to have command of a language is to be able, in principle, to understand what is said and to produce a signal with an intended semantic inteaTj the form

14.4 Structuralist (Chomskyist) fallacies of language

... It is quite obvious that sentences have an intrinsic meaning determined by linguistic rule and that a person with command of a language has in some way internalized the system of rules that determine both the phonetic shape of the sentence and its intrinsic semantic content—that he has developed what we will refer to as a specific *linguistic competence*. However, it is equally clear that the actual observed use of language—actual *performance*—does not simply reflect the intrinsic sound-meaning connections established by the system of linguistic rules.

Elsewhere we find (Chomsky, 1971, p. 73):

... A grammar, in the traditional view, is an account of competence. It describes and attempts to account for the ability of a speaker to understand an arbitrary sentence of his language and to produce an appropriate sentence on a given occasion. ... The competence of the speaker-hearer can, ideally, be expressed as a system of rules that relate signals to semantic interpretations of these signals. The problem for the grammarian is to discover this system of rules. ...

The most striking aspect of linguistic competence is what we may call the ‘creativity of language’, that is, the speaker’s ability to produce new sentences, sentences that are immediately understood by other speakers although they bear no physical resemblance to sentences that are ‘familiar’. ... In fact, even to speak of the hearer’s ‘familiarity with sentences’ is an absurdity. Normal use of language involves the production and interpretation of sentences that are similar to sentences that have been heard before only in that they are generated by the rules of the same grammar, and thus the only sentences that can in any serious sense be called ‘familiar’ are clichés or fixed formulas of one sort or another. The extent to which this is true has been seriously underestimated even by those linguists (e.g. O. Jespersen) who have given some attention to the problem of creativity. This is evident from the common description of language use as a matter of ‘grammatical habit’ (e.g. O. Jespersen, *Philosophy of Grammar* (London, 1924)). It is important to recognize that there is no sense of ‘habit’ known to psychology in which this characterization of language use is true ...

... a *generative grammar* ... is a system of rules that relate signals to semantic interpretations of these signals. It is *descriptively adequate* to the extent that this pairing corresponds to the competence of the idealized speaker-hearer. The idealization is (in particular) that in the study of grammar we abstract away from the many other factors (e.g. memory limitations, distractions, changes of intention in the course of speaking, etc.) that interact with the underlying competence to produce actual performance.

If a generative grammar is to pair signals with semantic interpretations, then the theory of generative grammar must provide a general, language-independent means for representing the signals and semantic interpretations that are interrelated by the grammars of particular languages. This fact has been recognized since the origins of linguistic theory, and traditional linguistics made various attempts to develop theories of universal phonetics and universal semantics that might meet this

requirement. Without going into any detail, I think it would be widely agreed that the general problem of universal phonetics is fairly well understood (and has been, in fact, for several centuries), whereas the problems of universal semantics still remain veiled in their traditional obscurity.

Chomsky further writes (1972, p. 158):

The child must acquire a generative grammar of his language on the basis of a fairly restricted amount of evidence. (Footnote: Furthermore, evidence of a highly degraded sort. For example, the child's conclusions about the rules of sentence formation must be based on evidence that consists, to a large extent, of utterances that break rules, since a good deal of normal speech consists of false starts, disconnected phrases, and other deviations from idealized competence. The issue here is not one of 'normative grammar.' The point is that a person's normal speech departs from the rules of his own internalized grammar in innumerable ways, because of the many factors that interact with underlying competence to determine performance. Correspondingly, as a language learner, he acquires a grammar that characterizes much of the evidence on which it was based as deviant and anomalous.)

This whole story by Chomsky is such a collection of ideological absurdities that it is unbelievable that anybody has accepted it for publication and that it has been able to secure an academic reputation for its author. The ideological character is displayed typically in the aggressive manner in which the absurdities are presented as though they were obvious truths, first of all in the central pronouncement:

'It is quite obvious that sentences have an intrinsic meaning determined by linguistic rule and that a person with command of a language has in some way internalized the system of rules that determine both the phonetic shape of the sentence and its intrinsic semantic content'.

In this statement it is claimed that the sign habits of speakers and hearers are not sign habits at all, but are matters of several mysterious items: 'intrinsic meaning', 'linguistic rule', and 'semantic content'.

The absurdity of the pronouncement is immediately confirmed when it is followed by its own contradiction:

'it is equally clear that the actual observed use of language—actual *performance*—does not simply reflect the intrinsic sound-meaning connections established by the system of linguistic rules'.

In other words, what the absurd ideological pronouncement talks about is *not* the activity of speakers and hearers. What it does talk about Chomsky does not tell us, however.

The mystery around 'intrinsic meaning' and 'semantic content' is turned into total darkness in the pronouncement: '... the problems of universal semantics still remain veiled in their traditional obscurity'.

The talk about the 'creativity of language' argues from the claim that:

'Normal use of language involves the production and interpretation of sentences that are similar to sentences that have been heard before only in that they are generated by the rules of the same grammar'.

14.4 Structuralist (Chomskyist) fallacies of language

This claim is false. Such sentences are similar by consisting of familiar signs (words and phrases).

Further aggressive ideology is found in the statement: 'It is important to recognize that there is no sense of 'habit' known to psychology in which this characterization of language use is true ...'. The absurdity of this pronouncement is displayed most strikingly in Chomsky (1972, p. 158, footnote, quoted above), which makes evident the impossibility of any child picking up those grammatical rules that Chomsky postulates must be in the possession of any speaker. On the other hand, the way every child picks up speech as habit is evident to anyone who has lived with small children.

The structuralist ideology of language has been characterized in Naur (2001) in terms of five language fallacies:

Language-as-something-fallacy: This is the notion that linguistic phenomena may be described as properties of specific languages, for example English or Danish, each of which is supposed to be clearly delimited.

Language-rule-fallacy: This fallacy has been expressed, for example, by Einstein in *The Common Language of Science*: 'If language is to lead at all to understanding, there must be rules concerning the relations between the signs on the one hand and on the other hand there must a stable correspondence between signs and impressions.'

Thinking-as-language-fallacy: Thus is denoted here the notion that our mental activity mainly consists of a processing of verbal expressions. The fallacy goes with the talk of 'knowledge' in the form of verbal statements.

Understand-fallacy: This is the mistaken notion that people have the same understanding of the words they habitually share.

Word-as-code-of-meaning-fallacy: By this will here be denoted a notion which is prominent with both laymen and philosophers, to the effect that each word is a *code of a meaning which is known by and common to those who talk with each other*.

14.5 Language in *EncPsych*

Issues of language are treated in the *EncPsych* under the headings **LANGUAGE** and **PSYCHOLINGUISTICS**. As reported below not a single article presents a sound view of language as a matter of individual habits, as established by William James and Otto Jespersen. With only one exception all the articles are meaningless by being committed to the ideologies of behaviorism, cognitivism, and Chomskyism.

The article **LANGUAGE - An Overview** [*EncPsych* 4, 473-76, Jean Berko Gleason] without saying so is a pious expression of Chomskyism. This is clear from the talk about 'language is a means of communication that consists of the words used by a community and the rules for varying and combining them. ... the human brain has unique characteristics that make symbolic thought and grammatical structures possible ...'. In the section **LANGUAGE - An Overview - Psycholinguistics - Historical Approaches** it becomes clear that the author's historical perspective reaches no further back than the works of Skinner and Chomsky from 1957.

The article **LANGUAGE - Language Acquisition** [*EncPsych* 4, 476-79, Eve V. Clark] is exceptional in the context, in that it is not made entirely meaningless by its ideological bias. The bulk of the text presents empirical observations on the way in which normal children adopt their linguistic sign habits in the course of their first years of life, until, as it is said, 'they may have between 50,000 and 100,000 words by the time they reach adulthood.' Although it is not said so in the article, these observations represent a solid confirmation of James's and Jespersen's understanding that language acquisition is a matter of the individual's training of habits. However, the presentation is marred throughout by talking of language as a definite thing. Even so the article also includes a remark that, although timid, displays the meaninglessness of the Chomskyist claim about the innateness of syntax rules: 'From the 1960s on, researchers made strong claims about the innateness of language (actually the innateness of syntax) and about human specialization for language. At the same time, there has been remarkably little evidence put forward to support claims of either innateness or specialization, so the approach offered has remained highly programmatic [misprint for problematic?].'

The article **LANGUAGE - Language and Brain Systems** [*EncPsych* 4, 479-82, Paula Tallal and Michael Patterson] is expressed throughout in terms of 'different components of language functioning' that supposedly are localized in definite parts of the brain. The whole article is a repeated reiteration of how always new sets of postulated language functioning localizations are later found not to work, and replaced by other sets, until the conclusion says: 'we know far less about the neural substrates for language than other areas of cognitive neuroscience'. There is no recognition that this total debacle of the field is a result of the failure to realize that linguistic activity, like any other human activity, is a matter of individual habits, and that any habitual human action is a matter of the total organism.

The article **LANGUAGE - Language Development, Syntax, and Communication** [*EncPsych* 4, 482-88, Susan Goldin-Meadow] is confusion throughout. The first part at great length describes observations of the acquisition of linguistic habits in a few young children. These observations are merely a confirmation in a very limited number of cases that children pick up their habits by imitation of their elders, with such variety from one child to the other that the variety of the personalities of the children and their situations entail. However, in the article these observations are presented in terms of an elaborate apparatus of descriptive categories, producing a false, confusing impression that these categories in some sense are active in each person's speech activity. In the later part of the article the observations are confronted with four different, so-called 'theoretical explanations': behaviorist accounts, nativist (Chomskyist) accounts, social/cognitive accounts, and connectionist accounts. In every case the discussion peters out into unclear confusion. A following section describes acquisition of language habits by blind and deaf children, presenting nothing remarkable. The final section titled Language and Thought is again merely confusion.

14.5 Language in *EncPsych*

The article **PSYCHOLINGUISTICS - An Overview** [*EncPsych* 6, 361-64, Michael Garman] opens: 'Psycholinguistics is the study of human language processing, involving a range of abilities, from cognition to sensorimotor activity, that are recruited to the service of a complex set of communicative functions.' This opening sets the style of the whole article, which throughout is expressed in terms, first of all 'language', that are given no clear meaning in the context, with constant reference to activities, such as 'human language processing', that have no clear relation to human mental life. With this all-pervading obscurity of its central formulations the article is beyond what shall be considered any further here.

The article **PSYCHOLINGUISTICS - Syntax and Grammar** [*EncPsych* 6, 364-67, Charles Clifton, Jr.] opens: 'People have the remarkable ability to produce sentences that convey novel messages and to extract those messages from sentences they read or hear. The systematic knowledge of their language that permits them to do such things is called grammar.' This pronouncement is a sea of obscurity and unwarranted assumptions. It is unclear what exactly is meant by the 'remarkable ability' mentioned. The pronouncement continues to talk about such obscure items as 'their language' and their 'systematic knowledge' of it. It then makes the assumption that it makes sense to claim that people's doing certain things depends on their being 'permitted' to do them by 'systematic knowledge'. There is no understanding of people's linguistic activity as being a matter of acquired habit. With this confused point of departure the article is of no interest to the study of human mental life.

The article **PSYCHOLINGUISTICS - Semantics** [*EncPsych* 6, 367-69, A. J. Sanford] opens: 'Semantics is the study of meaning in language. In psycholinguistics semantics can refer to meaning at the lexical (or morphemic), sentence, and discourse levels. From a processing perspective, the questions include how the meanings of words and sentences are represented in the cognitive system, and how the meanings of sentences and words are arrived at or used during comprehension.' This is expressed in terms of a series of phrases that have no clear meaning in the context: 'meaning in language', 'meaning at the lexical ... levels', 'the meanings of words and sentences', 'the cognitive system', 'during comprehension'. It will therefore be considered no further here.

The article **PSYCHOLINGUISTICS - Discourse Comprehension** [*EncPsych* 6, 369-72, Murray Singer] in its first few lines is expressed in terms of phrases that in the given context have no clear relevance to human mental life: 'comprehension problems', 'the meaning of each word', '... retrieved from memory', 'complex grammatical constructions must be unravelled', 'the pronouns *he* and *his* must be related ...'. The article will be considered no further here.

The article **PSYCHOLINGUISTICS - Linguistic Determinism** [*EncPsych* 6, 372-74, Maria D. Sera] is concerned with what is stated in the first line as 'the view that language determines thought'. There is no recognition in the article that with its talk of 'language' and 'thought' without any further

explanation this phrase is obscure. Further obscurity is added when a few lines later the article states 'that languages differ greatly in how they code experience' and 'differences among speakers of different languages in how they perceived and categorized the world'. In view of this obscurity of the subject matter it can be no source for surprise that the author's final conclusion '... language has been shown to influence cognition and its development in important ways' is obviously false. No such thing has been shown.

14.6 Description, definition, category, and the confusions around concept

In descriptions signs are used to signify properties of things. Many words are habitually used descriptively, and descriptive signs commonly occur in ordinary verbal intercourse.

Scientific work has production of descriptions as a primary aim. For the sake of clarity, scientific descriptions are commonly expressed in terms of signs that have been given special significance. Such special significance is often assigned to certain signs by definition. A definition is a verbal phrase that tells that certain signs in a certain context will be used with a particular significance.

The special signification of certain signs is sometimes related to the use of categories for description. Describing by categories means that each of a certain set of elements for purpose of description is assigned to just one of a given set of mutually exclusive categories. The categories will then conveniently be signified by a set of distinct signs, for example a, b, c, d. A property of some element may then be signified by saying, for example, that the element is c, meaning that the element is assigned to the third category.

The word 'concept' gives rise to confusions that are closely related to cognitivist fallacies concerning mental activity and linguistic habits. Such confusions are presented at length in five articles in the *EncPsych*:

CONCEPTS - An Overview [*EncPsych* 2, 242-45, Douglas L. Medin, Julia Beth Proffitt, and Hillarie C. Schwartz], **CONCEPTS - Structure** [*EncPsych* 2, 245-48, Lawrence W. Barsalou], **CONCEPTS - Learning** [*EncPsych* 2, 248-51, Brian H. Ross], **CONCEPTS - Combinations** [*EncPsych* 2, 251-53, Edward Wisniewski], **THINKING: An Overview** [*EncPsych* 8, 68-71, Robert J. Sternberg].

The first four of these articles are all patterned in the same way:

1) A presentation of 'concept' as denoting something supposedly important and central in human mental activity. However, the four articles are not able to agree what this 'concept' is.

2) A few illustrations of a simple, everyday character that supposedly clarify the thing signified by 'concept'.

3) Presentation of 'concept' in general terms or in a definition. These presentations in all articles are phrased in cognitivist, element psychological terms: 'a mental representation of a category', 'knowledge about a category', 'accumulated knowledge', 'a mental representation of a class', 'how the brain represents concepts'. These phrases are all meaningless; there are no such things as mental representations or knowledge.

4) Discussion of research work supposedly concerned with something denoted 'concept', published during the years 1956 to 1997.

14.6 Description, definition, category, and the confusions around concept

5) A summary of the results of the research work discussed, invariably concluding in statements that indicate that no solid results whatever have been obtained:

‘Since most (though not all) of our concepts have corresponding lexical terms, communication and language are closely linked; however, their precise relationship is still unclear.’ - ‘An important question is what determines privileged status. Is it inherent to the objects that make up the category? Or is it dependent on the relationship between the category and the user?’ - ‘There is currently no consensus about which model has the greatest capability to explain the conceptual structure.’ - ‘Characterizing this structure, its role in active cognitive processes, and its representation, constitute important and formidable scientific challenges essential to understanding many other psychological phenomena.’ - ‘Current models have taken some important steps toward specifying exactly how people combine concepts. However, conceptual combination remains a challenging and important area of research.’

What is called research here is churning out a lot of words that signify nothing. Every one of the questions discussed is merely a pseudo-question, expressed in terms that have no meaning and consequently having no answer.

The article **THINKING: An Overview** [*EncPsych* 8, 68-71, Robert J. Sternberg] from the start displays its fallacious cognitivist orientation by a presentation of unclear confusion: ‘Thinking involves the mental representation and processing of information’, ‘... thinking involves so many different kind of mental processes’, ‘... there is no one categorical taxonomy that everyone would accept ...’.

The confusion around ‘concept’ is presented in the subsection **THINKING: An Overview - Concept Formation**: ‘At one time it was believed that people think about concepts in componential terms ...’, ‘But do people really think about concepts in this way? An alternative view ... is that meaning is derived not from the defining features of a word, but from characteristic features that describe the prototypical model of the concept’, ‘According to some theorists ... we do not think in terms of prototypes of concepts, but rather in terms of exemplars ...’.

The confusions around ‘concept’ arise from an unclear mixing up of four different matters:

(1) Acquainting and acquaintance objects, that by James are called conception and concepts, as discussed in section 6.1.

(2) The definition of a class of things by indicating the common properties of the members of the class.

(3) Use of categories as a form of description.

(4) Words and phrases that by certain persons habitually are used in such places of verbal phrases and sentences that are habitually occupied by designations.

As concerning (4), words that in modern societies habitually are used as designations come in several groups. Certain words are used commonly to designate one thing. This is the case among most communities of the world of for example 'Napoleon' and 'Europe'.

Other words are habitually used within certain communities to designate something that in ordinary conversational situations is clear from the context of the conversation. This is the case for most names and for a number of words that are used as designations of concrete things.

Yet other words are habitually used within certain communities to designate intangible matters. Observations of the habits show that with many of these words the tendency is to use them unclearly, i.e. that people habitually use them as designations without it being clear what they designate, even so crudely that what the words must be assumed to designate, changes within one and the same sentence. Obviously such habits frequently entail inanity of those verbal phrases in which the words are used, as it is demonstrated abundantly in large parts of texts that are made public in such media as newspapers, as well as in many of the articles of the *EncPsych* that have been discussed in this book, for example in the articles discussed above, the words 'concept', 'mental representation of a category', 'knowledge', and 'how the brain represents concepts'.

As a further source of confusion around designational words come ideological distortions, to wit, the arbitrary use of such words as designations far outside their so far established, habitual use. Such distortion is a prominent feature of behaviorism, cognitivism, and Chomskyism, in the use of such words as 'psychology', 'memory', and 'language'.

William James in his *Principles* (1890) has significant considerations of the importance of the choice of designations in the discussion of the subjects of psychology. He says ... [I 194]

THE SOURCES OF ERROR IN PSYCHOLOGY - *The first of them arises from the Misleading Influence of Speech.* Language was originally made by men who were not psychologists, and most men to-day employ almost exclusively the vocabulary of outward things. The cardinal passions of our life, anger, love, fear, hate, hope, and the most comprehensive divisions of our intellectual activity, to remember, expect, think, know, dream, with the broadest genera of æsthetic feeling, joy, sorrow, pleasure, pain, are the only facts of a subjective order which this vocabulary deigns to note by special words. ... [I 195] This absence of a special vocabulary for subjective facts hinders the study of all but the very coarsest of them. Empiricist writers are very fond of emphasizing one great set of delusions which language inflicts on the mind. Whenever we have made a word, they say, to denote a certain group of phenomena, we are prone to suppose a substantive entity existing beyond the phenomenon, of which the word shall be the name. But the *lack* of a word quite as often leads to the directly opposite error. We are then prone to suppose that no entity can be there; ... [I 195]

14.6 Description, definition, category, and the confusions around concept

But a worse defect than vacuousness comes from the dependence of psychology on common speech. Naming our thought by its own objects, we almost all of us assume that as the objects are, so the thought must be. The thought of several distinct things can only consist of several distinct bits of thought, or 'ideas'; that of an abstract or universal object can only be an abstract or universal idea. As each object may come and go, be forgotten and then thought of again, it is held that the thought of it has a precisely similar independence, self-identify, and mobility. The thought of the object's recurrent identity is regarded as the identity of its recurrent thought; and the perceptions of multiplicity, of coexistence, of succession, are severally conceived to be brought about only through a multiplicity, a coexistence, a succession, of perceptions. The continuous flow of the mental stream is sacrificed, and in its place an atomism, a brickbat plan of construction, is preached, for the existence of which no good introspective grounds can be brought forward, and out of which presently grow all sorts of paradoxes and contradictions, the heritage of woe of students of the mind.

As conclusion with regard to 'concept': as this word is used by authors in psychology it denotes nothing clearly, but rather gives rise to confusion. For this reason James's terms 'conception' and 'concept' have in this book been replaced by, respectively, 'acquainting' and 'acquaintance object'.

15. Creative thinking, discovery, invention, and description

15.1 Creative thinking

The associative succession of thought objects in our stream of thought is influenced partly by external influences coming to us by our several sense organs, partly by the internal emphasis upon certain parts of it that is brought about by our shifting attention. When our attention becomes to be directed at a part that in the first instance is in the faint fringe of the thought object, that part merely by being brought forward by our attention is felt to be novel in the thought. This is the mechanism of creative thinking. The feeling of the novelty of an item coming forth in the stream of thought is a matter of its initial faintness, and thus a matter of degree.

As an example of a creative act, any ordinary act of spontaneous speech involves the creative choice of the verbal signs that we wish to signify the thought we wish to express. This choice emerges by association from the total situation of the speaker. In so far as the verbal signs chosen are not surprising in the situation this act is merely weakly creative.

The creativity of the ordinary speech act is confirmed in such situations in which the speaking person is challenged to repeat an utterance, for example by the conversational partner's response: 'I beg your pardon.' In such a situation the speaking person will tend to create a different formulation of the thought, confirming that each formulation is created anew from the total instantaneous situation.

Weakly creative thinking in a relatively passive form is probably pursued by many people at certain times, as daydreaming and reverie. Such thinking depends

strongly upon the imagery the person is capable of experiencing, cf. section 7.1, and upon such perceptual discrimination of parts that was described in section 11.1. For example, we may be able to imagine a horse with two heads, even if we have never before seen one, or heard of one. This creation in our stream of thought comes about by our first thinking of an ordinary horse; then by discriminating its head, as a part of it; and then by imagining a horse having two such parts, instead of just one.

In more active forms, the creative direction of the attention is activated by a more specific feeling that something is lacking in our thought object, that there is a void which we desire to fill in, a feeling of desire to change the thought object by modifying it in a certain direction, described by William James in section 5.2 as a feeling of tendency. In such a situation the attentive emergence of an item gives rise to the question whether the item brought forward fills the void adequately. This question may be taken up immediately or at a later time.

Creative thinking at work (can be seen) may be observed (introspectively) by introspection (of writing) of the process of writing a text, and may be (demonstrated) displayed as in the present text where (tentative formulations) tentative phrases that (have been rejected) have been considered but rejected, are shown within parentheses. In the process of writing the author deliberately puts himself or herself into a series of states of feelings of aching void, each arising from the desire to find or create the next phrase to be added to the incomplete text. Each such state of aching void gives rise to an alternation between several other mental states. As the preparation for the creative discovery of the next phrase of the text the writer will read some of what has already been written, so as to form an acute feeling of the lack that now has to be filled by the phrase to be created. This state is one of hopeful waiting for a suitable phrase associated with the last part of the text to come to attention. If and when such a phrase comes to the attention, the mental state immediately changes into considering the associations of that phrase critically, for its suitability in the context. This critical consideration may conclude that the phrase is not suitable, in which case the state returns to the acute feeling of lack, and a renewed waiting for a usable phrase to come to attention. Or the critical consideration may accept the phrase found, which releases the mental states in which the phrase is converted into such motions of the fingers that will record the phrase in writing.

A similar alternation of mental states will take place over longer spans of time when an author engages in revisions of a text. It is sometimes displayed publicly, as for example by Henry Miller in a revised edition of one of his books (1965), in which is reproduced parts of an earlier version with the author's hand written corrections added. Here may be found the following two versions of a passage in the book:

Henry Miller: *The World of Sex*, first printed version of 1940:

'Sex, then, like everything, is largely a mystery, that is what I am trying to say. I don't pretend to be a great explorer in this realm. My own personal adventures are as nothing compared to those of any ordinary Don Juan. For a city man I think my record is comparatively normal. For an artist it is in no way singular or remarkable.'

15.1 Creative thinking

Henry Miller: *The World of Sex*, revised version of 1959:

‘Sex, then, like everything else, is largely a mystery. That is what I am trying to say. I do not pretend to be a great explorer in this realm. My own adventures are as nothing compared to those of the ordinary Don Juan. For a man of the big cities I think my exploits are modest and altogether normal. As an artist, my adventures seem in no way singular or remarkable.’

Similar evidence of the author’s alternation between states of creation and states of critical examination is had in the autograph sketches and manuscripts of Beethoven’s works, which by their numerous corrections and additions show how the works have come into being by a long series of creative actions and subsequent critical revisions of them. In the case of his sonata for piano opus 53, Waldstein, it has been recorded that Beethoven’s correction went so far as to replace a whole movement by an entirely different one. The movement rejected by Beethoven for the sonata was published independently as *Andante in F*, or *Andante Favori*.

In summary it is clear that creative activity depends on three things:

- (1) *The creator’s opportunity and feeling of urge to do it,*
- (2) *the amplitude of the creator’s arsenal of ideas habitually associated with the matter of concern, and*
- (3) *the acuteness of the creator’s discriminations of the significations associated with the relevant ideas.*

The core activity of creative thinking is a pair: (1) find by direction of attention and (2) evaluate the finding by comparison with the void. In other words, the creative activity takes place as an alternation between mental states of waiting for an item to come to attention and mental states of critical examination of the item found. Active creative thinking is a trial and error process.

15.2 Signs of creative thinking in communicating discovery, invention, and construction

The creative thought may be about anything. When it is concerned with an image of something, the thought may be of some way in which that something may become different from what it is, by being changed in a definite way. That change is then something beyond the initial creative thought, a productive outcome of the thought. As such the change may be perceived as a sign of the creative thought by other persons, who may thus experience a thought which is in some sense similar or corresponding to the original creative thought. This is how results of creative thinking become to be communicated between people.

When creating signs related to some given issue a creator may have many different kinds of purposes in mind, and the signs may be intended to be perceived by any particular person or circle of persons. Certain signs of creative thought

creative thinking, first formulated the idea that there was land to be discovered by sailing west from Europe. His discovery happened when he found this formulation to be coherent with the findings of his actual journey. The discovery was established scientifically when he reported the experiences of his journey.

A discovery depends on two acts of creative thinking. The first one establishes the kind of thing to be discovered. By this act the discoverer's thinking gets oriented in a definite direction, it is the setting up of an aching void. In this state the discoverer feels urged to engage in the creation of possible answers that may fill the void. The discovery is made when this search meets with success.

As one example, the active creative thinking involved in discovery of the structure of DNA by James Watson and Francis Crick, as this happened over the years 1951 to 53, has been described by James Watson (1968). The creative acts entering into this discovery have been singled out in section 4.1, *The Structure of DNA*, in (Naur, 1995c).

As a second example, in section 4.4 above is described the discovery of the synapse-state theory of mental life. Here the principal initial issue of creative thinking was the realization that the seat of plasticity of the organism seen by William James was there in the synapses described by Sherrington.

As a third example, a description of a process of discovery as it took place over a period of many months is given in Appendix 4. As reported there, this process of discovery was initiated by a pronouncement from Joseph Haydn that he in his symphonies most often described 'moral character'. The process was an exploration of the music, involving a long series of creations of hypotheses concerning the symphonies and subsequent confirmations of them. By this process the meaning of each of 82 symphonies, as this was present to Haydn when he wrote each symphony, was discovered.

Discoveries are a regular part of the maintenance of complicated constructions such as buildings and automobiles. Such constructions tend to develop defects, such as cracks and leaks, that sometimes make themselves noticed only by indirect effects, such as noises or defective operation. The maintenance man must discover the defect that gives rise to the effect.

Invention is similar to discovery, with the difference that the initial void, the circumstance driving the search, is not something given for exploration, but is merely imagined. Thus Thomas Alva Edison's invention of electric light was driven by the idea that a source of artificial light might be achieved by having a thin thread of material heated to glowing by passing a current of electricity through it. This idea sent him searching for suitable substances of the thin thread, and for the circumstances of its surroundings. Only after a long series of experiments, by trial and error, did he arrive at his invention of an incandescent lamp, in the form of a wire of carbon held in an evacuated glass bulb.

In creative thinking leading to construction the thinking is concerned with constructions out of physical materials, typically in architecture. Constructive creative thinking depends essentially upon the imagery of the creator. The primary creative thinking is a matter of the creator forming an image of the thing to be constructed.

Constructive thinking often becomes involved with description, such as an architect's drawings. However, a description produced in constructive thinking is considered to be merely an intermediate step.

15.3 The works of science/scholarship and art

In science/scholarship and in the activity of art the creative activity is concerned with descriptions. As already discussed in section 14.6 a description is a representation in some form of certain properties of the matter being described. The descriptions produced in science/scholarship and art have the form of works.

The intent of a creator in creating a work is that the description will be perceived by other people and thus influence their thoughts and habits. This influence may be of several kinds. Some descriptions are intended to *invoke certain images and feelings in other people*. Such descriptions are characteristic of the activity of art, to be discussed in section 17 below.

With descriptions in science/scholarship the creator intends to *present*

The creative thinking may to a large extent be concerned with the forms of description of certain matters. This is displayed strikingly in poetry, which may be taken to be description of certain aspects of the poet's state of mind. The works of an artist bear the stamp of the artist in the form of the description he has created.

In some cases the creator will use signs and forms that have already previously been used for similar tasks of description, and the use of them will have been trained as a habit by persons of a certain community.

When using a particular form in creating a description of certain matter the creator will assume the signs to have certain significations. These significations may be part of the common habits of a certain community, or they may be newly adopted by the creator. As an example of the use of commonly established forms and significations, writers of novels typically will describe their characters using as signs the words of the common language of some community, put together in such forms as *directdescription*, *dialog*, and

15.4 Description forms

This technique is particularly well known from its use by Richard Wagner in his operas. In order to appreciate his work, a listener has to develop similar sign habits. For this reason a full appreciation of an artistic work will in many cases require repeated perception of the work.

A composer's sign habits may remain unappreciated by his public even when his work is well known. Thus as reported in the Appendix 4 the present writer has discovered Joseph Haydn's sign habits in music that has been well known for two hundred years. For example it has been found that Joseph Haydn when writing his symphonies used two particular musical signs, by Robbins Landon (1980) called fingerprints. In the present writer's exploration of the symphonies the significations of these signs have been discovered to be, respectively, *Laude deo (God be praised)* and *Joseph Haydn*.

The reasoning behind these discoveries was that these significations are coherent with a number of other characteristics of the music. Thus, it makes coherent sense to understand most of those symphonies in which the sign for *Joseph Haydn* occurs as Haydn's self-portraits. Further, at the very beginning of his symphony no. 1, Haydn offers his tribute, his ovation, to the Holy Virgin by music that rises gradually in loudness until at the climax it announces the fanfare that is used by Haydn in all his works to signify *Laude Deo, praised be God*:

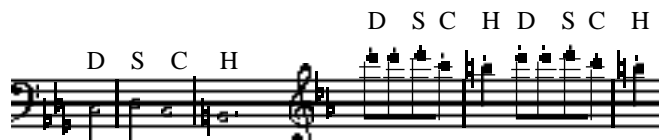


Joseph Haydn's sign for *Laude Deo*

This fanfare is a rhythmic figure, the rhythm of speaking the phrase: cat kitty cat cat cow. A similar development of the music is found also in symphony no. 4, one of Haydn's self-portraits.

As a further example of a newly created signification, Joseph Haydn in some of his symphonies used a musical sign consisting of a musical phrase that is first played loudly and then immediately repeated softly. This sign, which appears prominently in some of Haydn's symphonic self-portraits, is clearly meant to signify *modesty*, a personal characteristic that was very pronounced in Haydn himself.

Similar discoveries have been made by Ian MacDonald (1991) in the music of Dmitry Shostakovich. Shostakovich throughout his works uses musical figures with a special signification. A prominent one is the tone sequence D, E flat, C, B. This undoubtedly is the composer's personal signature, formed from the first four letters of his name as transliterated into German: D. Schostakowitsch, taken to be names of tones as used in German: D, Es, C, H. This musical sign is very prominent in several of Shostakovich's works, such as the 8th string quartet. The signature comes in many forms, such as at the beginning of the quartet and in movement 3, 8 minutes 5 seconds into the quartet:



In the 3rd movement the figure is repeated quickly and comes altogether 30 times. It is like stabbing pains.

In his choice of the signs and description forms the creator will obviously have regard to what he wishes to describe. The importance of this choice differs according to the particular creative activity. Many examples that the signs and form of description adopted have been decisive in the creative activity may be mentioned:

- In Columbus's discovery of America it was decisive that he described the surface of the Earth as a sphere, not flat as most of his contemporaries did.
- The synapse-state theory depends on describing mental life in terms of the stream of thought, rejecting the cognitive notion of memory.
- Watson and Crick's discovery of the structure of DNA depended decisively on their use of molecular models resembling the toys of preschool children.
- Niels Bohr's initial contribution to atomic physics was his description of the hydrogen atom, from 1913. An essential part of this contribution was Bohr's replacement of the form of description, rejecting a description in terms of two particles in motion by a description in terms of a number of stationary states of the atom.
- Jane Austen, wishing to describe people in a social world, with its customs, values, and mores, created the *novel of manners*.

Two further examples of the importance of the description form have already been discussed in section 2.6 above:

- Newton's description of motion in terms of velocities, accelerations, and forces.
- William James's description of mental life in terms of habits, the stream of thought, associations, and acquaintings.

In summary, description depends on creativity in two ways, first in the choice of the signs and forms of description, second in establishing the actual description of the matter of concern, as expressed in these forms.

15.5 Coherence as a matter of the perception of descriptions

The perception of a description is a unique, personal experience, like any other perception. In the act of perception the person by association from the items of the description achieves an activation in his or her stream of thought of certain properties of the thing described. Exactly what these properties are is entirely a matter of the further associations activated in the act of perception. These further associations usually are associated in the person's thinking with other items of description. In this way such further items of description become related to the description being perceived in *relations of coherence*. Thus the coherence of descriptions is a matter of the thought habits of particular persons.

15.5 Coherence as a matter of the perception of descriptions

For example, what is called likeness in a painted portrait is a matter of the coherence of the properties of the person portrayed evoked by the painted signs with such properties of that person that are invoked in the viewer by association from the name of the person.

Coherence makes a description useful to certain persons. An incoherent description is confusing. Coherence is a matter of clarity. The way it is useful depends on what it describes. Coherence is what makes scientific and scholarly descriptions valuable in reasoning about our surroundings.

A novel such as Jane Austen's *Pride and Prejudice* derives part of its excellence from the coherence of its descriptions. The work introduces a certain number of different characters and consists of a large number of descriptions of their personalities, situations, and actions. Jane Austen's mastery is the way in which she has been able to create these descriptions to form a whole in which all the descriptions of each character, in whatever form they are, are coherent with one another and with what is generally known about human beings and the conditions in the social world of the characters. As a whole the work is one of sublime clarity.

15.6 Creativity displayed in a description of the stream of thought

In *Pride and Prejudice*, chapter 57, we find an eloquent description of the stream of thought of a person who finds herself in a situation of high personal tension and concern, immediately after having been exposed to a powerful challenge of her interests. The description makes explicit several cases of associations and creative discoveries:

'The discomposure of spirits which this extraordinary visit threw Elizabeth into could not be easily overcome, nor could she for many hours learn to think of it less than incessantly. Lady Catherine, it appeared, had actually taken the trouble of this journey from Rosings for the sole purpose of breaking off her supposed engagement with Mr. Darcy. It was a rational scheme, to be sure; but from what the report of their engagement could originate, Elizabeth was at a loss to imagine; till she recollected that *his* being the intimate friend of Bingley, and *her* being the sister of Jane, was enough, at a time when the expectation of one wedding made everybody eager for another, to supply the idea. She had not herself forgotten to feel that the marriage of her sister must bring them more frequently together. And her neighbours at Lucas Lodge, therefore (for through their communication with the Collinses the report, she concluded, had reached Lady Catherine), had only set *that* down as almost certain and immediate, which *she* had looked forward to as possible, at some future time.

In revolving Lady Catherine's expressions, however, she could not help feeling some uneasiness as to the possible consequences of her persisting in this interference. From what she had said of her resolution to prevent their marriage, it occurred to Elizabeth that she must meditate an application to her nephew; and how *he* might take a similar representation of the evils attached to a connection with her, she dared not pronounce. She knew not the exact degree of his affection for his aunt, or his dependence on

her judgment, but it was natural to suppose that he thought much higher of her ladyship than *she* could do; and it was certain that, in enumerating the miseries of a marriage with *one* whose immediate connections were so unequal to his own, his aunt would address him on his weakest side. With his notions of dignity, he would probably feel that the arguments which to Elizabeth had appeared weak and ridiculous, contained much good sense and solid reasoning.

If he had been wavering before as to what he should do, which had often seemed likely, the advice and entreaty of so near a relation might settle every doubt, and determine him at once to be as happy as dignity unblemished could make him. In that case, he would return no more. Lady Catherine might see him in her way through town, and his engagement to Bingley of coming again to Netherfield must give way.

“If, therefore, an excuse for not keeping his promise should come to his friend within a few days,” she added, “I shall know how to understand it. I shall then give over every expectation, every wish of his constancy. If he is satisfied with only regretting me, when he might have obtained my affections and hand, I shall soon cease to regret him at all.”

This quotation displays creative thinking in several ways. First, the whole passage, like the rest of the book, is a product of Jane Austen’s creative thinking. Second, the stream of thought of the character described in the passage displays three instances of creative thinking:

1) ‘but from what the report of their engagement could originate, Elizabeth was at a loss to imagine; till she recollected that *his* being the intimate friend of Bingley, and *her* being the sister of Jane, was enough, at a time when the expectation of one wedding made everybody eager for another, to supply the idea’.

2) ‘From what she had said of her resolution to prevent their marriage, it occurred to Elizabeth that she must meditate an application to her nephew’.

3) ‘If, therefore, an excuse for not keeping his promise should come to his friend within a few days,’ she added, “I shall know how to understand it. I shall then give over every expectation, every wish of his constancy.’

15.7 Reasoning: the invention of argument

Reasoning is creative thinking in which we try to fill a specific breach in the associative connection between a given situation of certain matters and a desired answer concerning them. The purpose is to invent an argument. William James writes (1890, II 325):

Chapter XXII - REASONING

We talk of man being the rational animal; and the traditional intellectualist philosophy has always made a great point of treating the brutes as wholly irrational creatures. Nevertheless, it is by no means easy to decide just what is meant by reason, or how the peculiar thinking process called reasoning differs from other thought-processes which may lead to similar results.

Much of our thinking consists of trains of images suggested one by another, of a sort of spontaneous reverie of which it seems likely enough that the higher brutes should be capable. ... [II 325-326]

15.7 Reasoning: the invention of argument

There are other shorter flights of thought, single couplings of terms which suggest one another by association, which approach more to what would commonly be classed as acts of reasoning proper. Those are where a present sign suggests an unseen, distant, or future reality. ... [II 326] Our 'perceptions', or recognitions of what objects are before us, are inferences of this kind. ... [II 326-327]

'RECEPTS'

In these first and simplest inferences the conclusion may follow so continuously upon the 'sign' that the latter is not discriminated or attended to as a separate object by the mind. Even now we can seldom define the optical signs which lead us to infer the shapes and distances of the objects which by their aid we so unhesitatingly perceive. The objects, too, when thus inferred, are *general* objects. The dog crossing a scent thinks of a deer in general, or of another dog in general, not of a particular deer or dog. To these most primitive abstract objects Dr. G. J. Romanes gives the name of *recepts* or *generic* ideas, to distinguish them from concepts and general ideas properly so called. They are not analyzed or defined, but only imagined. ... [II 327-328]. [Quotation from Romanes: *Mental Evolution in Man* (1889):] Water-fowl adopt a somewhat different mode of alighting upon land, or even upon ice, from that which they adopt when alighting upon water; and those kinds which dive from a height (such as terns and gannets) never do so upon land or upon ice. These facts prove that the animals have one receipt answering to a solid surface, and another answering to a fluid. Similarly a man will not dive from a height over hard ground or over ice, nor will he jump into water in the same way as he jumps upon dry land. In other words, like the water-fowl he has two distinct receipts, one of which answers to solid ground, and the other to an unresisting fluid. But unlike the water-fowl he is able to bestow upon each of these receipts a name, and thus to raise them both to the level of concepts. So far as the practical purposes of locomotion are concerned, it is of course immaterial whether or not he thus raises his receipts into concepts; but ... for many other purposes it is of the highest importance that he is able to do this.

IN REASONING, WE PICK OUT ESSENTIAL QUALITIES

The chief of these purposes is *predication*, a theoretic function which, though it always leads eventually to some kind of action, yet tends as often as not to inhibit the immediate motor response to which the simple inferences of which we have been speaking give rise. In reasoning, A may suggest B; but B, instead of being an idea which is simply *obeyed* by us, is an idea which suggests the distinct additional idea C. And where the train of suggestion is one of reasoning distinctively so called as contrasted with mere revery or 'associative' sequence, the ideas bear certain inward relations to each other which we must proceed to examine with some care.

The result C yielded by a true act of reasoning is apt to be a thing voluntarily *sought*, such as the means to a proposed end, the ground for an observed effect, or the effect of an assumed cause. All these results may be thought of as concrete things, but they are *not suggested immediately by other concrete things*, as in the trains of simply associative thought. They

are linked to the concretes which precede them by intermediate steps, and these steps are formed by *generalcharacters* articulately denoted and expressly analyzed out. A thing inferred by reasoning need neither have been an habitual associate of the datum from which we infer it, nor need it be similar to it. It may be a thing entirely unknown to our previous experience, something which no simple association of concretes could ever have evoked. The great difference, in fact, between that simpler kind of rational thinking which consists in the concrete objects of past experience merely suggesting each other, and reasoning distinctly so called, is this, that whilst the empirical thinking is only reproductive, reasoning is productive. An empirical, or 'rule-of-thumb', thinker can deduce nothing from data with whose behaviour and associates in the concrete he is unfamiliar. But put a reasoner amongst a set of concrete objects which he has neither seen nor heard of before, and with a little time, if he is a good reasoner, he will make such inferences from them as will quite atone for his ignorance. Reasoning helps us out of unprecedented situations—situations for which all our common associative wisdom, all the 'education' which we share in common with the beasts, leaves us without resource.

Let us make this ability to deal with NOVEL data the technical differentia of reasoning. This will sufficiently mark it out from common associative thinking, and will immediately enable us to say just what peculiarity it contains.

It contains analysis and abstraction. Whereas the merely empirical thinker stares at a fact in its entirety, and remains helpless, or gets 'stuck', if it suggests no concomitant or similar, the reasoner breaks it up and notices some one of its separate attributes. This attribute he takes to be the essential part of the whole fact before him. This attribute has properties or consequences which the fact until then was not known to have, but which, now that it is noticed to contain the attribute, it must have.

Call the fact or concrete datum S;
the essential attribute M;
the attribute's property P.

Then the reasoned inference of P from S cannot be made without M's intermediation. The 'essence' M is thus that third or middle term in the reasoning which a moment ago was pronounced essential. *For his original concrete S the reasoner substitutes its abstract property, M.* What is true of M, what is coupled with M, then holds true of S, is coupled with S. As M is properly one of the *parts* of the entire S, *reasoning may then be very well defined as the substitution of parts and their implications or consequences for wholes.* And the art of the reasoner will consist of two stages:

First, *sagacity*, or the ability to discover what part, M, lies embedded in the whole S which is before him;

Second, *learning*, or the ability to recall promptly M's consequences, concomitants, or implications.

15.7 Reasoning: the invention of argument

If we glance at the ordinary syllogism—

M is P;

S is M;

S is P

—we see that the second or minor premise, the ‘subsumption’ as it is sometimes called, is the one requiring the sagacity; the first or major the one requiring the fertility, or fulness of learning. ... [II 332]

The perception that S is M is a *mode of conceiving S*. The statement that M is P is an *abstract or general proposition*. A word about both is necessary.

WHAT IS MEANT BY A MODE OF CONCEIVING

When we conceive of S merely as M (of vermilion merely as a mercury-compound, for example), we neglect all the other attributes which it may have, and attend exclusively to this one. We mutilate the fulness of S’s reality. Every reality has an infinity of aspects or properties. ... [II 332] Vermilion is not only a mercury-compound, it is vividly red, heavy, and expensive, it comes from China, and so on, *in infinitum*. ... [II 332-333]

All ways of conceiving a concrete fact, if they are true ways at all, are equally true ways. *There is no property ABSOLUTELY essential to any one thing*. The same property which figures as the essence of a thing on one occasion becomes a very inessential feature upon another. Now that I am writing, it is essential that I conceive my paper as a surface for inscription. If I failed to do that, I should have to stop my work. But if I wished to light a fire, and no other materials were by, the essential way of conceiving the paper would be as combustible material; and I need then have no thought of any of its other destinations. It is really *all* that it is: a combustible, a writing surface, a thin thing, a hydrocarbonaceous thing, a thing eight inches one way and ten another, a thing just one furlong east of a certain stone in my neighbor’s field, an American thing, etc., etc., *ad infinitum*. Whichever one of these aspects of its being I temporarily class it under, makes me unjust to the other aspects. But as I always am classing it under one aspect or another, I am always unjust, always partial, always exclusive. My excuse is necessity—the necessity which my finite and practical nature lays upon me. My thinking is first and last and always for the sake of my doing, and I can only do one thing at a time. ... [II 333-334]

Men are so ingrainedly partial that, for common-sense and scholasticism (which is only common-sense grown articulate), the notion that there is no one quality genuinely, absolutely, and exclusively essential to anything is almost unthinkable. ... [II 334-335]

Locke undermined the fallacy. But none of his successors, so far as I know, have radically escaped it, or seen that *the only meaning of essence is teleological, and that classification and conception are purely teleological weapons of the mind*. The essence of a thing is that one of its properties which is so *important for my interests* that in comparison with it I may neglect the rest. Amongst those other things which have this important property I class it, after this property I name it, as a thing endowed with this property I conceive it; and whilst so classing, naming, and conceiving it, all

other truth about it becomes to me as naught. The properties which are important vary from man to man and from hour to hour. ... [II 335-337]

So much for what is implied, when the reasoner conceives of the fact S before him as a case of which the essence is to be M. One word now as to what is involved in M's having properties, consequences, or implications, and we can go back to the study of the reasoning process again.

WHAT IS INVOLVED IN GENERAL PROPOSITIONS

M is not a concrete ... [II 337]. It is an abstract character which may exist, embedded with other characteristics, in many concretes. ... [II 337] Though many general characters seem indifferent to each other, there remain a number of them which affect constant habits of mutual concomitance or repugnance. They involve or imply each other. One of them is a sign to us that the other will be found. They hunt in couples, as it were; and such a proposition as that M is P, or includes P, or precedes or accompanies P, if it prove to be true in one instance, may very likely be true in every other instance which we meet. This is, in fact, a world in which general laws obtain, in which universal propositions *are* true, and in which reasoning therefore possible. ... [II 337-338]

To revert now to our symbolic representation of the reasoning process:

M is P
S is M
S is P

M is discerned and picked out for the time being to be the essence of the concrete fact, phenomenon, or reality, S. But M in this world of ours is inevitably conjoined with P; so that P is the next thing that we may expect to find conjoined with the fact S. We may conclude or infer P, through the intermediation of the M which our sagacity began by discerning, when S came before it, to be the essence of the case.

Now note that if P have any value or importance for us, M was a very good character for our sagacity to pounce upon and abstract. If, on the contrary, P were of no importance, some other character than M would have been a better essence for us to conceive of S by. Psychologically, as a rule, P overshadows the process from the start. We are *seeking* P, or something like P. But the bare totality of S does not yield it to our gaze; and casting about for some point in S to take hold of, which will lead us to P, we hit, if we are sagacious, upon M, because M happens to be just the character which is knit up with P. Had we wished Q instead of P, and were N a property of S conjoined with Q, we ought to have ignored M, noticed N, and conceived of S as a sort of N exclusively.

Reasoning is always for a subjective interest, to attain some particular conclusion, or to gratify some special curiosity. It not only breaks up the datum placed before it and conceives it abstractly; it must conceive it *rightly* too; and conceiving it rightly means conceiving it by that one particular character which leads to the one sort of conclusion which it is the reasoner's temporary interest to attain.

The *results* of reasoning may be hit upon by accident. The stereoscope was actually a result of reasoning; it is conceivable, however, that a man playing with pictures and mirrors might accidentally have hit upon it. ... [II 339-340]

15.7 Reasoning: the invention of argument

THUS, THERE ARE TWO GREAT POINTS IN REASONING

First, an extracted character is taken as equivalent to the entire datum from which it comes; and,

Second, the character thus taken suggests a certain consequence more obviously than it was suggested by the total datum as it originally came. ... [II 340-341]

Why are the couplings, consequences, and implications of extracts more evident and obvious than those of entire phenomena? For two reasons.

First, the extracted characters are more general than the concretes, and the connections they may have are, therefore, more familiar to us, having been more often met in our experience. ... [II 342]

The other reason why the relations of the extracted characters are so evident is that their properties are so *few*, compared with the properties of the whole, from which we derived them. ... [II 342-343]

Sagacity; or the Perception of the Essence

To reason, then, we must be able to extract characters,—not any characters, but the right characters for our conclusion. If we extract the wrong character, it will not lead to that conclusion. Here, then is the difficulty: *How are characters extracted, and why does it require the advent of a genius in many cases before the fitting character is brought to light?* Why cannot anybody reason as well as anybody else? Why does it need a Newton to notice the law of the squares, a Darwin to notice the survival of the fittest? To answer these questions we must begin a new research, and see how our insight into facts naturally grows.

All our knowledge at first is vague. When we say that a thing is vague, we mean that it has no subdivision *ab intra*, nor precise limitations *ab extra*; but still all the forms of thought may apply to it. ... [II 343-344] A layman present at a shipwreck, a battle, or a fire is helpless. Discrimination has been so little awakened in him by experience that his consciousness leaves no single point of the complex situation accented and standing out for him to begin to act upon. But the sailor, the fireman, and the general know directly at what corner to take up business. They ‘see into the situation’—that is, they analyze it—with their first glance. ... [II 344]

How this power of analysis was brought about we saw in our chapters on Discrimination and Attention [quoted in section 11.1 above]. We dissociate the elements of originally vague totals by attending to them or noticing them alternately, of course. But what determines which element we shall attend to first? There are two immediate and obvious answers: first, our practical or instinctive interests; and, second, our æsthetic interests. ... [II 344-345] These æsthetic and practical interests, then, are the weightiest factors in making particular ingredients stand out in high relief. What they lay their accent on, that we notice; but what they are in themselves, we cannot say. We must content ourselves here with simply accepting them as irreducible ultimate factors in determining the way our knowledge grows.

Now, a creature which has few instinctive impulses, or interests, practical or æsthetic, will dissociate few characters, and will, at best, have limited reasoning powers; whilst one whose interests are very varied will

reason much better. Man, by his immensely varied instincts, practical wants, and æsthetic feelings, to which every sense contributes, would by dint of these alone, be sure to dissociate vastly more characters than any other animal; and accordingly we find that the lowest savages reason incomparably better than the highest brutes. The diverse interests lead, too, to a diversification of experiences, whose accumulation becomes a condition for the play of the *law of dissociation by varying concomitants* of which I treated in a former chapter (see Vol. I, p. 506, quoted in section 11.1 above).

The Help given by Association by Similarity

It is probable, also, that man's *superior association by similarity* has much to do with those discriminations of character on which his higher flights of reasoning are based.... [II 345]

What does the reader do when he wishes to see in what the precise likeness or difference of two objects lies? He transfers his attention as rapidly as possible, backwards and forwards, from one to the other. ... [II 346] These examples show that the mere general fact of having occurred at some time in one's experience, with varying concomitants, is not by itself a sufficient reason for a character to be dissociated now. We need something more; we need that the varying concomitants should in all their variety be brought into consciousness *at once*. Not till then will the character in question escape from its adhesion to each and all of them and stand alone.... [II 346]

... [II 346-47] ... our chief help towards noticing those special characters of phenomena, which, when once possessed and named, are used as reasons, class names, essences, or middle terms, *is this association by similarity*. Without it, indeed, the deliberate procedure of the scientific man would be impossible: he would never collect his analogous instances.

It may be added that James's account of reasoning explains the value of descriptions, including in particular such descriptions that are established in scientific activity. Descriptions are collections of presentations in some form of properties of certain matters of the world. They are the kinds of things that are needed by anyone who wishes to reason about those matters. For example, a map of the streets of a city is a presentation of that property of the city that may be called the network of the streets. This is useful to anyone who wishes to find the way to go from the place given by one address to another place given by an address.

15.8 Creative thinking unknown in the *EncPsych*

Two articles in *EncPsych* refer by their titles to creative thinking: **CREATIVITY** [*EncPsych* 2, 337-42, Mihaly Csikszentmihalyi] talks about 'creativity in the stricter sense, as an idea or product that changes the culture'. **CREATIVITY: Research on the Process of Creativity** [*EncPsych* 2, 342-46, Mark A. Runco] starts by saying that 'creativity is like pornography: easy to identify but difficult to define' and concludes after four pages that 'The varied definitions can be viewed as a virtue. This is because there is little consensus about creativity ...'. Creative thinking as a matter of the stream of thought, thought objects and their fringes, and attention, is nowhere discussed in these articles.

15.8 Creative thinking unknown in the EncPsych

Reasoning is discussed in *EncPsych* in three articles under the general heading of **THINKING**. The opening sections of **THINKING: An Overview** [*EncPsych* 8, 68-71, Robert J. Sternberg] dealing with ‘concept’ have already been discussed in section 14.6 above. The remaining sections, headed **Problem Solving, Judgment and Decision Making** and **Reasoning** are brief summaries of altogether 18 different works published over the years 1957-96. In these summaries the cognitivist ideology finds expression in the postulation that people’s mental activity is controlled by such things as ‘schemas containing a great deal of declarative knowledge’, ‘knowledge they possess’, ‘utility’, ‘decisional heuristics’. Throughout there is a confusion of items of description and the mental issues that are described. James (1890, I 196) singles out this confusion as *The Psychologist’s Fallacy*: The great snare of the psychologist is the *confusion of his own standpoint with that of the mental fact* about which he is making his report. As an overview of these summaries the final, concluding remarks say: ‘... there are few models of thinking that try to incorporate thinking in all its different aspects ...’. In other words, as a matter of fact these works fail to contribute any clear insight into those aspects of human mental activity that are perfectly well understood in William James’s *Principles* as presented above in section 15.1. The whole effort of the works reviewed, an expression of cognitivism, is a total failure.

The article **THINKING: Problem Solving** [*EncPsych* 8, 71-75, Stephen K. Reed] summarizes 28 different works published over the years 1925-92. The style of presentation throughout is one of a first, superficial orientation. To judge by this orientation no solid insight into human mental life has been obtained by any of the works presented.

The article **THINKING: Reasoning** [*EncPsych* 8, 75-79, Philip N. Johnson-Laird] opens in the first paragraph with an explanation of what the author calls reasoning. However, this explanation raises a host of questions.

First, reasoning is said to be ‘the mental process of deriving consequences from given information’. However, taken to be items of mental activity, what kinds of things are consequences? What is information? What does it mean to say that it is ‘given’? What does it mean ‘to derive consequences’?

The explanation continues to talk in terms of logic, of premises and conclusions. What does this have to do with mental activity? It then says that the premises may be perceptions, descriptions, or memories. What are perceptions? memories? What does it mean to say that the premise of a logical deduction is either a perception, a description, or a memory? Throughout the explanation is a confused cocktail of items that belong to several entirely different subject areas.

It continues to say: ‘But some systematic relation in content or form must govern the derivation of the conclusion from the premises if the process is reasoning, as opposed to an association of ideas.’ What does it mean to say that some systematic relation in content or form ‘governs’ the derivation of the conclusion? By talking about ‘association of ideas’ the phrase brings in a further, different subject area. Association of ideas was a lively issue in British psychology in the nineteenth century, until William James made it clear that the talk of ‘ideas’ as items of mental life is senseless, as discussed in section 8 above. So in this explanation the author argues in terms that have been obsolete in psychology since 1890.

The explanation continues: ‘One such relation is that the conclusion must be true given that the premises are true ...’. What does it mean to say that premises, said above to be perceptions, descriptions, or memories, are true?

What does it mean to say that the conclusion, said above to be a statement, a thought, or a decision, is true?

Johnson-Laird opens the following section **THINKING: Reasoning - The Psychology of Deduction**: ‘The nature of deduction is highly controversial’, and continues over four columns to discuss a series of puzzles. This discussion is to a large extent expressed in terms of the vocabulary of formal logic, such as ‘if ... is ... then ... is ...’, or ‘Only one of ... is true ...’, or ‘If ... is ... then ... is ... or else if ... is ... then ...’.

This use of the vocabulary of formal logic gives rise to confusion in several ways. In several places the confusion is that what is called a fallacy arises merely from a difference of habits of sign usage between logicians and other people. One example of such confusion given in the article is this:

If Viv is here, then Pat is here, or else if Viv isn’t here, the Pat is here.

Viv is here. What follows?

Nearly everyone, experts and novices alike, infers that Pat is here. But this is a fallacy. Granted a disjunction between the two conditionals, one or the other could be false. That is the force of “or else” between the two assertions. If the first conditional were false, for instance, then even though Viv is here, Pat may not be.

This argument rests entirely upon the habits of understanding “or else” adopted by logicians. To ordinary, sensible people the argument is void. The first two lines of the text simply make no sense.

Another example of the same kind is given in the article as the opening phrase of a problem: ‘Only one of the following premises is true about a particular hand of cards: There is a king in the hand or there is an ace, or both...’. The fallacy in the reasoners’s response to this problem lies entirely in their overlooking the first word ‘Only’ in this phrase.

Another source of confusion related to the use of formal logic is that such notation is used in the article for several different purposes, including operating instructions and description of factual states, with no attention given to the difference between these purposes. An example of an operating instruction and a description of a factual state in the article is found in this formulation:

If the test is to continue, then the turbine should be producing emergency electricity. The turbine is not producing emergency electricity.

The engineers at Chernobyl knew these facts, but they went ahead with the test anyway. Tragically, they failed to draw the valid deduction that the experiment should not continue.

This explanation of the tragedy is just silly. The engineers simply neglected to follow their operating instructions.

Another example in the article of the use of formal logic for description of factual states relates to a claim that ‘logically untrained reasoners construct mental models of the premises.’ The example is:

15.8 Creative thinking unknown in the EncPsych

‘Given an assertion for describing some shapes on a blackboard: There is a circle or there is a triangle, but not both’.

Understanding this assertion is claimed to require ‘reasoners to construct two alternative models ...’. However, the assertion just makes ordinary sense as a description of a certain collection of blackboards on which different shapes are drawn. As a description it may of course be invalid for certain of these blackboards. Calling in mysterious ‘mental models’ as the necessary requisite for a person’s understanding this is merely confused.

The discussion in the article of the use by the mind, in deduction, of formal rules of inference and of mental models of the premises shows that these notions, whatever they are, fail to account for the phenomena of the experience of people solving problems. The article nowhere suggests that all the phenomena of reasoning are explained by William James (1890) in terms of the stream of thought and association, as quoted above in section 15.7. As an example, take the last problem presented in the article:

In the ‘selection’ task invented by the English psychologist Peter Wason ..., the experimenter lays down four cards:

A B 2 3

Each card has a number on one side and a letter on the other. The participants have to choose which cards to turn over to determine whether the following conditional is true or false: If a card has an A on one side, then it has a 2 on the other side. Most people correctly choose the A card, but some choose the innocuous 2 card too. However, few realize the need to choose the 3 card, though if it has an A on its other side, then the conditional is false.

By James’s account, reasoning is what persons have to apply when an answer to a query does not appear by direct association from the situation at hand. In reasoning the sagacious reasoner manages to extract from what is given, a character such that the desired answer follows directly from it. In Wason’s task sagacity may suggest to find the following character of the given situation: The property of a card for which the conditional is false. This property can be found by direct association from the terms of the task: the conditional is false for a card having A on one side and not-2 (i.e. any number except 2) on the other. It follows by direct association that as judged from only one side of cards, those cards that perhaps violate the conditional are those that show either A or not-2, i.e. among the four given, by direct association, A and 3. That some people fail to arrive at this answer can readily be explained by their lazy negligence when facing a dull problem.

The final major section in Johnson-Laird’s article: **THINKING: Reasoning - The Psychology of Induction**, continues the opening of the article by discussing a series of claims about what ‘reasoners’ or ‘people’ do, or what happens ‘in science’, or about the importance of ‘logic’ and ‘truth’, every one of them questionable. The whole presentation is superficial beyond repair, and fails to present any insight into mental life.

16. Signs and descriptions of individual persons

16.1 Common and individual qualities of persons of the human species

Humans are a biological species. By this is meant that each individual human being is an organism that has come into being by sexual reproduction from other such beings and is similar to other such organisms with respect to certain of their anatomical and physiological features, certain features of their experience, and certain features of a life cycle of birth, growth, aging, and death. These common features of human beings are described in such fields as anatomy, physiology, psychology, and ontogeny.

No two individuals of a biological species are the same, however. Even with regard to their most characteristic features any description of their common qualities will be found to be invalid in some cases. Thus human beings are commonly known to have one head, but as a matter of fact some humans are born with two heads. Again each individual is known to belong to one of two different sexes, but some humans known as hermaphrodites are born having genital organs of both sexes.

Any description of the *common features of humans* therefore has to refer to the features of the individuals of some *population*, that is a number of human individuals who together have lived through their life cycles.

Certain of the qualities of individuals of such a population may be described in terms of the qualities of two fictitious, *normal individuals*, one female, the other male, and the *distribution of the variations from the normals of the qualities within the population*. Any such description of the individuals of a population must confine itself to a selection of the infinity of qualities of the individuals. Thereby the description gets oriented to some particular purpose. For example, a description of the bodily sizes of a population is useful to makers of garments intended for some unspecified customers of that population.

A description of a population in terms of normal individuals and their variations defines normality and pathology. An individual is normal that has qualities within the normal variations from the normal. An individual is abnormal or pathological who in some respect falls outside the normal variations. Such deviations are described in terms of the common language, as explained and exemplified in Webster's Encyclopedic Unabridged Dictionary (WEUD):

sick: 1. afflicted with ill health or disease. 2. affected with nausea; inclined to vomit. 3. deeply affected with some unpleasant feeling, as of sorrow, disgust, boredom, longing, weariness, etc.: *sick at heart, to be sick of parties*. 4. mentally, morally, or emotionally deranged, corrupt, or unsound: *a sick mind; wild statements that made him sick*.

Individual qualities of a person are such qualities that cannot be described in terms of variations from a normal individual of the population of which the person is one. The field of individual qualities consists only to a small degree of anatomical and physiological qualities. A far larger field is that of mental qualities, partly *habits*, particularly perception habits, and partly *the states of consciousness*.

16.1 Common and individual qualities of persons of the human species

That individuals experience a stream of thought which is inaccessible to other people and has certain characteristics described by William James is a common quality. This is expressed in the poem from Des Knaben Wunderhorn:

Die Gedanken sind frei,	The thoughts are free,
wer kann sie erraten,	who can guess them,
Sie rauschen vorbei	they rush along
wie nächtliche Schatten,	like nightly shadows,
Kein Mensch kann sie wissen,	no man can know them,
kein Jäger sie schiessen,	no hunter can shoot them,
Es bleibt dabei:	it firmly stands there:
die Gedanken sind frei!	the thoughts are free!

Part of our direct experience of the stream of thought and of its being personal to each of us is that at any moment our stream of thought is colored by feelings. The feelings direct our incessantly shifting attention.

What comes in the individual's stream of thought at any moment is an individual quality.

16.2 Common designations of individuals' qualities

The common language has a large number of designations of various aspects of individuals' qualities, showing that such qualities are recognized generally. Below some of these designations are listed, in alphabetic order, with some explanations and examples of them taken, when not specially marked, from Webster's Encyclopedic Unabridged Dictionary (WEUD). In some cases explanations from Concise Oxford Dictionary, marked (COD), are added.

ability: 1. power or capacity to do or act physically, mentally, legally, morally, financially, etc. 2. competence in an activity or occupation because of one's skill, capacity, means, or other qualification: *the ability to write well*.
COD: Sufficient power, capacity (*to do something*); legal competency (*to act*); financial competency to meet a demand; cleverness; mental faculty.

absent-minded: so lost in thought that one does not realise what one is doing, what is happening, etc.; preoccupied to the extent of being unaware of one's immediate surroundings.

abstracted: lost in thought; deeply engrossed or preoccupied; absent-minded.

acumen: superior mental acuteness and discernment; keen and penetrating insight: *remarkable acumen in business matters*.

admiration: 1. a feeling of wonder, pleasure, and approbation.

adroit: 1. expert or nimble in the use of the hands. 2. cleverly skillful, resourceful, or ingenious: *an adroit debater*.

affection: fond attachment, devotion, or love: *the affection of a parent for his child*. 2. emotion; feeling; sentiment: *over and above our reason and affections*.

aggressive: 2. vigorously energetic, esp. in the use of initiative and forcefulness; boldly assertive and forward: *an aggressive salesman*.

agitate: 4. to disturb or excite emotionally; arouse; perturb: *a crowd agitated to a frenzy by impassioned oratory; a man agitated by disquieting news.*

agitation: 1. act or process of agitating; state of being agitated: *She left in great agitation.*

alert: 1. vigilantly attentive; wide awake; keen: *an alert mind.*

anger: 1. a strong feeling of displeasure and belligerence aroused by a real or supposed wrong; wrath; ire.

angry: 1. feeling or showing anger or resentment: *to be angry at the dean; to be angry about the snub.*

animosity: a feeling of ill will or enmity that determines conduct or tends to display itself in action: *a deep-seated animosity between two sisters; animosity against one's neighbor.*

anxiety: 1. distress or uneasiness of mind caused by apprehension of danger or misfortune: *He felt anxiety about the loss of income.*

apathy: 1. absence or suppression of passion, emotion, or excitement.

aphasia: *Pathol.* impairment or loss of the faculty of using or understanding spoken or written language.

apprehension: 1. anticipation of adversity; dread or fear of coming evil.

aptitude: capability; ability; innate or acquired capacity for something; talent: *he has a special aptitude for mathematics.* COD: Fitness; natural propensity (*for*); ability.

attention: 1. act or faculty of attending, esp. by directing the mind to an object. 2. *Psychol.* **a.** a concentration of the mind on a single object or thought, esp. one preferentially selected from a complex, with a view to limiting or clarifying receptivity by narrowing the range of stimuli.

attitude: manner, disposition, feeling, disposition, etc., with regard to a person or thing: *mental attitude; group attitudes.*

auditory: 2. perceived through or resulting from the sense of hearing: *auditory hallucinations.*

autism: *Psychol.* the tendency to view life in terms of one's own needs and desires, as by daydreams or fantasies, unmindful of objective reality.

belief: confidence in the truth of existence of something not immediately susceptible to rigorous proof: *the belief that the earth is flat.* COD: Trust or confidence (in).

bent: direction taken, as by one's interests; inclination; leaning; bias: a bent for painting.

bore: to weary by dullness, tedious repetition, unwelcome attentions, etc.: *The game bored me.*

boredom: the state or an instance of being bored; tedium; ennui. COD: Being bored, ennui.

bright: 7. quickwitted or intelligent: *They gave promotions to bright employees.*
8. clever or witty, as a remark: *bright remarks enlivened the conversation.*

brilliant: 3. having or showing great intelligence, talent, quality, etc.: *a brilliant technician.*

capacity: 3. power of receiving impressions, knowledge, etc.; mental ability; capability: *That book was written for those with the capacity of scholars.*
4. actual or potential ability to perform, yield, or withstand: *He has a capacity for hard work. She has the capacity to go two days without sleep.* (COD: mental power, faculty; capability, opportunity.)

16.2 Common designations of individuals' qualities

- caution: 1. alertness and prudence in a hazardous situation; care; wariness: *Landslides ahead—proceed with caution.*
- cautious: manifesting or characterized by caution: *a cautious man; To be cautious is often to show wisdom.*
- character: moral or ethical quality; qualities of honesty, courage and the like: *they knew he was a man of fine, honorable character.* (COD: moral strength, backbone; reputation; good reputation; description of person's qualities; testimonial; status.)
- charm: a power of pleasing or attracting, as through personality or beauty: *charm of manner; the charm of a mountain lake.* (COD: quality, feature, exciting love or admiration; attractiveness, indefinable power of delighting.)
- clever: 1. mentally bright; having quick intelligence; able. 2. superficially skillful, witty or original in character or construction; facile: *it was an amusing, clever play of no lasting value.* 3. adroit with the hands or body; dexterous or nimble: *The shortstop made a clever play and ended the inning.* 4. showing inventiveness or originality; ingenious: *His clever device was the first to solve the problem.*
- competence: 1. the quality of being competent; adequacy; possession of required skill, knowledge, qualification, or capacity: *He hired her because of her skill as a secretary.* (COD: ability.)
- conceited: 1. having an exaggerated opinion of one's own abilities, importance, etc.: *Many performers become conceited after only modest success.*
- conceive: 1. to form (a notion, opinion, purpose, etc.): *he conceived the project while he gazed into the distance.* 2. to form a notion or idea of; imagine. 3. to hold as an opinion; think; believe: *I conceive that you are entirely right.* 4. to experience or form (a feeling): *to conceive a great love for music.*
- conscious: 1. aware of one's own existence, sensations, thoughts, surroundings, etc.; cognizant. 2. fully aware of or sensitive to something (often fol. by *of*): *conscious of one's own faults.* 3. having the mental faculties fully active: *he was conscious during the operation.* 4. known to oneself; felt: *conscious guilt.* 5. aware of what one is doing: *a conscious liar.*
- contempt: 1. the feeling with which one regards anything considered mean, vile, or worthless; disdain; scorn.
- create: 2. to evolve from one's own thought or imagination, as a work of art, an invention, etc.
- creative: 1. having the quality or power of creating.
- credulity: willingness to believe or trust too readily, esp. without proper or adequate evidence, gullibility.
- credulous: willing to believe or trust too readily, esp. without proper or adequate evidence, gullible. (COD: too ready to believe; (of things) showing such readiness.)
- deceive: 1. to mislead by a false appearance or statement; delude: *They deceived the enemy by disguising their destroyer as a whaler.*
- delight: 1. a high degree of pleasure or enjoyment; joy; rapture: *We accepted with delight.*

desire: to wish or long for; crave; want. 3. a longing or craving, as for something that brings satisfaction or enjoyment: *a desire for fame*.

dexterous: 1. skill or adroitness in using the hands or body. 2. mental adroitness or skill; cleverness.

disappoint: 1. to fail to fulfil the expectations or wishes of (a person): *His conduct disappointed us*.

disappointment: 2. the state or feeling of being disappointed: *His disappointment was very great when the job failed to come through*.

disposition: the predominant or prevailing tendency of one's spirits; mental outlook or mood: *a girl with a pleasant disposition*.

distress: 1. great pain, anxiety, or sorrow; acute physical or mental suffering; affliction; trouble.

dream: 1. a succession of images, thoughts, or emotions passing through the mind during sleep. 4. an involuntary vision occurring to one awake. 5. a vision voluntarily indulged in while awake; daydream; reverie.

dull: 1. mentally slow: lacking brightness of mind; obtuse; somewhat stupid.

ear: 4. keen or sensitive perception of the differences of sound, esp. sensitiveness to the quality and correctness of musical sounds: *an ear for music; a violinist with a good ear*.

easy: 2. free from pain, discomfort, worry, or care: *easy in one's mind*.

ecstasy: 1. an overpowering emotion or exaltation; a state of sudden, intense feeling.

emotion: 2. any of the feelings of joy, sorrow, fear, hate, love, etc. 3. any strong agitations of the feelings actuated by experiencing love, hate, fear, etc. and usually accompanied by certain physiological changes, as increased heartbeat, respiration, or the like, and often overt manifestations, as crying, shaking, etc.. (COD: Agitation of mind, feeling; excited mental state.)

envy: 1. a feeling of discontent or jealousy, usually with ill will, at seeing another's superiority, advantages, or success.

excite: 1. to arouse or stir up the emotions or feelings of: *to excite a person to anger; His actions excite his father's wrath*. 2. to arouse or stir up (emotions or feelings): *to excite jealousy or hatred*.

exhilarate: 1. to make cheerful or merry.

exhilaration: 1. exhilarated condition or feeling.

fear: 1. a distressing emotion aroused by impending pain, danger, evil, etc. whether real or imagined; the feeling or condition of being afraid. 2. a specific instance of such a feeling: *a fear of heights*.

feeling: 1. the function or the power of perceiving by touch; physical sensation not connected with sight, hearing, taste, or smell. 2. a particular sensation of this kind: *a feeling of warmth; a feeling of pain*. 3. *Psychol.* consciousness taken as a state in itself and independent of any reference in a specific thought or perception. 4. a consciousness or vague awareness: *a feeling of inferiority*. 5. an emotion or emotional perception or attitude: *a feeling of joy; a feeling of sorrow*. (COD: In verbal senses; esp.: sense of touch; physical sensation; emotion (often of hope, fear, etc.))

fool: 1. a silly or stupid person; one who lacks sense.

glad: 1. feeling joy or pleasure; delighted; pleased: *glad about the good news; glad that you are here*.

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gloom: 2. state of melancholy or depression; low spirits.

gregarious: 3. fond of the company of others, sociable.

grief: 1. keen mental suffering or distress over affliction or loss; sharp sorrow; painful regret.

hallucination: 1. an apparent sensory experience of something that does not exist outside the mind; sense perception not caused by external stimuli: *to suffer from hallucinations*. (COD: Illusion; apparent perception of external object not actually present.)

happiness: 1. the quality or state of being happy. (Not explained separately in COD).

happy: delighted, pleased, or glad, as over a particular thing: *to be happy to see a person*.

hate: 4. intense dislike; extreme aversion or hostility.

honest: honorable in principles, intentions, and actions; upright: *an honest person*.

honesty: the quality or fact of being honest. (COD: uprightness; truthfulness).

hope: 1. the feeling that what is desired is also possible, or that events may turn out for the best: *to give up hope*.

humor: 9. *Old physiol*: one of the four elemental fluids of the body, blood, phlegm, black bile, and yellow bile, regarded as determining, by their relative proportions, a person's physical and mental constitution.

ignorant: lacking in knowledge or training; unlearned.

illusion: 1. something that deceives by producing a false impression.

image: 3. a mental representation; idea, conception. 4. *Psychol*. a mental representation of something previously perceived, in the absence of the original stimulus. (COD: Artificial imitation of the external form of an object, e.g. statue.)

imagination: the action of imagining, or of forming mental images or concepts of what is not actually present to the senses. (COD: Imagining; mental faculty forming images of external objects not present to the senses; fancy; creative faculty of the mind.)

imagine: 1. to form a mental image of (something not actually present to the senses). (COD: Form mental image of; conceive (thing *to be* or do, *that* it is, *how*, *what*, etc.)

inclination: a set or bent esp. of the mind or will; a liking or preference: *much against his inclination, he was forced to resign*.

insight: faculty of seeing into inner character or underlying truth: *an insight into the life of the village*. (COD: penetration (*into* character, circumstances, etc.) with the understanding).

intelligence: 1. capacity for reasoning, understanding, and for similar forms of mental activity, aptitude in grasping truths, facts, meanings, etc. 2. manifestation of such capacity: *he writes with intelligence and wit*. 3. the faculty of understanding. (COD: intellect, understanding; quickness of understanding, sagacity.)

intelligent: 1. having good understanding, or a high mental capacity; quick to comprehend, as persons or animals: *an intelligent student of law*. 2. displaying or characterized by quickness of understanding, sound thought, or good judgment: *an intelligent reply*. 3. having the faculty of reasoning and understanding; possessing intelligence: *an intelligent being*.

intend: 1. to have in mind as something to be done or brought about: *We intend to leave in a month*.

interest: 1. the feeling of one whose attention, concern, or curiosity is particularly engaged by something: *She has a great interest in the poetry of Donne*.

inventive: 1. apt at inventing, devising, or contriving. 2. apt at creating with the imagination.

jealous: 1. feeling resentment against a person because of his rivalry, success, or advantages: *He was jealous of his rich brother*.

joy: 1. the emotion of great delight or happiness caused by something good or satisfying; keen pleasure: *She felt the joy of seeing her son's success*. (COD: vivid emotion of pleasure, gladness.)

keen: 3. characterized by strength and distinctness of perception; extremely sensitive or responsive: *keen eyes; keen ears*. 4. having or showing great mental penetration or acumen: *keen reasoning*.

learned: 1. having much knowledge; scholarly: *a group of learned men*.

literate: 1. able to read and write. 2. having an education; educated. 3. having or showing knowledge of literature, writing, etc.; literary; well-read.

love: 1. the profoundly tender or passionate affection for a person of the opposite sex. 2. a feeling of warm personal attachment or deep affection, as for a parent, child, or friend.

melancholy: 1. a gloomy state of mind, esp. when habitual or prolonged; depression.

mendacious: 1. false or untrue: *a mendacious report*. 2. lying; untruthful; dishonest: *a mendacious person*.

mental: 1. of or pertaining to the mind: *a mental weakness; a mental state*. 4. performed by or existing in the mind: *mental arithmetic*.

mind: 1. (in a human or other conscious being) the element, part, substance, or process that reasons, thinks, feels, wills, perceives, judges, etc.: *the processes of the mind*.

modest: 1. having or showing a moderate or humble estimate of one's merits, importance, etc.; free from vanity, egotism, boastfulness, or great pretensions.

modesty: 1. the quality of being modest; freedom from vanity, boastfulness, etc.

mood: 1. a state or quality of feeling at a particular time: *He certainly was in a mellow mood today*. 2. a distinctive emotional quality or character: *The mood of the piece was gay and light*.

motive: 1. something that prompts a person to act in a certain way or that determines volition; incentive. 2. the goal or object of one's actions: *His motive was revenge*.

motor: 10. *Psychol.; Physiol.* of, pertaining to, or involving muscular movement: *a motor response; motor images*.

musical: 3. fond of or skilled in music.

musings: 1. absorbed in thought; meditative.

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- need: 2. urgent want, as of something requisite: *He has no need of your charity.*
- nervous: 1. highly excitable; unnaturally or acutely uneasy or apprehensive: *to become nervous under stress.*
- obsession: 1. the domination of one's thoughts or feelings by a persistent idea, image, desire, etc.
- opinion: 1. a belief or judgment that rests on grounds insufficient to produce certainty. 2. a personal view, attitude, or appraisal: public opinion.
- outlook: mental view: one's outlook on life.
- pain: 1. bodily suffering or distress, as due to injury, illness, etc.
- passion: 1. any emotion or feeling, as love, desire, anger, hate, grief, joy, hope, etc. esp. when of a powerful or compelling nature. 2. strong amorous feeling or desire, love.
- patience: 1. the bearing of provocation, annoyance, misfortune, pain, etc. without complaint, loss of temper, irritation, or the like. 2. an ability or willingness to suppress restlessness or annoyance in waiting: *to have patience with a slow learner.*
- penetration: 4. mental acuteness, discernment, or insight: *a scholar of rare penetration.*
- perceptive: 3. having or showing keenness of insight, understanding, or intuition: *a perceptive analysis of the problems involved.*
- personality: the visible aspects of one's character, as it impresses others: *he has a pleasant personality.*
- perspicacity: keenness of mental perception; discernment; penetration: *a man of acute perspicacity.*
- pleasure: 1. state or feeling of being pleased. 2. enjoyment or satisfaction derived from what is to one's liking; gratification; delight.
- possession: 10. domination, actuation, or obsession by a feeling, idea, etc. 11. the feeling or idea itself.
- power: 1. ability to do or act; capability of doing or accomplishing something. 2. Usually, powers, particular faculties or capabilities of body or mind: *creative powers; the power of speech.*
- prejudice: 1. an unfavorable opinion, or feeling, formed beforehand or without knowledge, thought, or reason.
- prestige: 2. distinction or reputation attaching to a person or thing and dominating the mind of others or of the public: *The new discothèque has great prestige with the jet set.*
- pride: 1. a high or inordinate opinion of one's own dignity, importance, merit, or superiority, whether as cherished in the mind or displayed as bearing, conduct, etc.: *one.*
- promiscuous: 1. characterized by or involving indiscriminate mingling or association, esp. having sexual relations with a number of partners on an informal or casual basis.
- propensity: a natural inclination or tendency, often toward something not considered admirable: *his propensity for drinking too much was his major problem.*
- proud: 1. feeling pleasure or satisfaction over something regarded as highly honorable or creditable to oneself.

prudent: 1. wise, judicious, or wisely cautious in practical affairs; sagacious; discreet or circumspect; sober.

psyche: 2. the human soul, spirit, or mind.

regret: to feel sorrow or remorse for (an act, fault, disappointment, etc.): *to regret the decline in good manners; He no sooner spoke than he regretted it.*

represent: 1. to serve to express, designate, stand for, or denote, as a word, symbol, or the like does; symbolize: *In this painting the cat represents evil and the bird, good.*

resourcefulness: from resourceful: able to deal skillfully and promptly with new situations, difficulties, etc.

sad: 1. depressed by unhappiness or grief; sorrowful or mournful: *to feel sad because of a close friend's death.*

sadness: 1. the quality of being sad; unhappiness.

sagacity: acuteness of mental discernment and soundness of judgment: *a sagacious patriarch of the tribe.*

science: 4. knowledge as of facts or principles; knowledge gained by systematic study. 5. a particular branch of knowledge.

sensation: 1. the operation or function of the senses; perception or awareness of stimuli through the senses. (COD: 1. Consciousness of perceiving or seeming to perceive some state or affection of one's body or its parts or senses or of one's mind or its emotions, contents of such consciousness.)

sense: 1. any of the faculties, as sight, hearing, smell, taste, or touch, by which man and animals perceive stimuli originating from outside or inside the body (COD: 1. Any of the special bodily faculties by which sensation is roused.)

sensory: 1. of or pertaining to the senses or sensation.

shame: 1. the painful feeling arising from the consciousness of something dishonorable, improper, ridiculous, etc., done by oneself or another: *He was overcome with shame.*

silly: 1. weak-minded; lacking good sense; stupid or foolish: *a silly writer.*

skill: 1. the ability, coming from one's knowledge, practice, aptitude, etc. to do something well: *Carpentry was one of his many skills.*

sorrow: 1. distress caused by loss, affliction, disappointment, etc.; grief, sadness, or regret.

stubborn: 1. unreasonably obstinate; obstinately perverse: *a stubborn child.*

stupid: 1. lacking ordinary activity and keenness of mind; slow-thinking; dull. 2. characterized by, indicative of, or proceeding from mental dullness; foolish; senseless: *a stupid act.*

stupidity: the state, quality, or fact of being stupid.

sympathy: 1. harmony of or agreement in feeling, as between persons or on the part of one person with respect to another. 2. the harmony of feeling naturally existing between persons of like tastes or opinion or of congenial dispositions.

talent: 1. a special natural ability or aptitude: *a talent for drawing.*

tantrum: a violent demonstration of rage or frustration; a sudden burst of ill temper.

taste: 18. a relish, liking, or partiality for something: *a taste for music.*

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- temper: 1. a particular state of mind or feelings. 2. habit of mind, esp. with respect to irritability or patience, outbursts of anger, or the like; disposition: *an even temper*. 3. heat of mind or passion, shown in outbursts of anger, resentment, etc. 4. calm disposition or state of mind: *to be out of temper*.
- temperament: 1. the individual peculiarity of physical organization by which the manner of thinking, feeling and acting of every person is permanently affected; natural disposition. 2. unusual personal make-up manifested by peculiarities of feeling, temper, action, etc. with disinclination to submit to conventional rules or restraints. 3. the combination of the four cardinal humors, the relative proportions of which were supposed to determine physical and mental constitution.
- temperamental: 1. having or exhibiting a strongly marked, individual temperament. 2. moody, irritable, or sensitive: *atemperamental actress*. 3. given to erratic behavior. 4. of or pertaining to temperament; constitutional: *temperamental differences*.
- tenacious: 1. holding fast; characterized by keeping a firm hold: *a tenacious grip on my arm; tenacious of old habits*.
- tendency: 2. an inclination, bent, or predisposition to something: *a tendency to talk too much*.
- tense: 2. in a state of mental or nervous strain; high-strung; taut: *a tense person*.
- tired: 1. exhausted, as by exertion; fatigued or sleepy: *a tired runner*.
- train: 18. to develop or form the habits, thoughts, or behavior of (a child or other person) by discipline and instruction: *to train an unruly boy*.
- unconscious: 1. not conscious; without awareness, sensation, or cognition. 2. temporarily devoid of consciousness. 3. not endowed with mental faculties: *the unconscious stones*. 4. not perceived at the level of awareness; occurring below the level of conscious thought: *an unconscious impulse*.
- unwise: not wise; foolish; imprudent; injudicious; lacking in good sense.
- visual 1. of or pertaining to seeing or sight: *a visual image*.
- volition: 1. the act of willing, choosing, or resolving; exercise of willing: *He offered to help us of his own volition*.
- voluntary: 1. done, made, brought about, undertaken, etc., of one's own accord or by free choice: *a voluntary contribution*.
- want: 1. to feel a need or a desire for; wish for: *to want one's dinner; always wanting something*.
- weary: 1. physically or mentally exhausted by hard work, exertion, strain, etc.; fatigued; tired: *weary eyes; a weary brain*. COD: 1. Tired, with energy abated, dispirited; sick or impatient of; tiring, tedious, irksome.
- will: 1. the faculty of conscious and especially of deliberate action; the power of control the mind has over its own actions: *the freedom of the will*. 2. power of choosing one's own actions: *to have a strong or a weak will*. 3. the act or process of using or asserting one's choice; volition: *My hands are obedient to my will*. 4. wish or desire: *to submit against one's will*. 5. purpose or determination, often hearty or stubborn determination; wilfulness: *to have the will to succeed*. 6. the wish or purpose as carried out, or to be carried out: *to work one's will*. 7. disposition, whether good or ill, toward another.

- willful: 1. deliberate, voluntary, or intentional: *the coroner ruled it willful murder*. 2. perversely obstinate; unreasonably stubborn or headstrong: *He castigated his willful son*.
- wise: 1. having the power of discerning and judging properly as to what is true or right; possessing judgment, or discretion. 2. characterized by or showing such power; judicious or prudent: *a wise decision*. (COD: 1. (Of persons) having, (of action, course, speech, opinion, etc.) dictated by or in harmony with or showing, experience and knowledge judicially applied, sagacious, prudent, sensible, discreet.)
- wisdom: 1. quality or state of being wise; knowledge of what is true or right, coupled with just judgment as to action; sagacity, discernment, or insight. (COD: Being wise, (possession of) experience and knowledge together with the power of applying them critically or practically, sagacity, prudence, common sense.)
- wish: 10. a distinct mental inclination toward the doing, obtaining, attaining, etc., of something; a desire felt or expressed: *to disregard the wishes of others*.
- wit: the keen perception and cleverly apt expression of those connections between ideas which awaken amusement and pleasure: *he doesn't have wit enough to come in out of the rain*.
- worry: 1. to feel uneasy or anxious; fret; torment oneself with or suffer from disturbing thoughts.

The reason why so many terms have been included in this listing is that taken as a whole the commonly understood explanations of them present a significant part of the anatomy of mental life. Thus a number of the terms and their explanations in several ways confirms William James's description of the stream of thought in section 5 above. The 33 dictionary words that are explained to be feelings or emotions and the 12 words that are explained in terms of thinking or thoughts, confirm that we all experience a stream of thought that we may examine by introspection, and that what we experience are thoughts and feelings of many different kinds and shades. The explanations of the words *attention*, *absent-minded*, *abstracted*, and *musings* confirm the attentive selection in the stream of thought that happens at any moment.

However, the acceptance of the dictionary explanations must be tempered with certain reservations that are discussed below.

As one reservation, some of the dictionary explanations are defect. The treatments in WEUD of *auditory*, *dream*, *hallucination*, *image*, *imagination*, and *motor*, are inconsistent among themselves and unclear. Thus the explanation of *auditory* is inconsistent with the example: *auditoryhallucinations*; and the talk of image as a 'mental representation' contradicts the example of a *motor image* and is not found in COD. Further the claim that what appears in a dream is an image of *something* does not conform to common experience. Most of us have in a dream had visual experience, but mostly such visions have no counterparts in what we see when we are awake. This defect stems from the dictionary author's wish to describe imagery as mental representation.

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Any claim that our stream of thought contains 'mental representations' is a matter of ideology, not of the experience expressed in the common language and described by William James. A similar defect understanding is found when explaining *hallucination* in terms of 'something that does not exist outside the mind' or 'not caused by external stimuli'.

The explanations in WEUD of several of the words suggest in the first instance that each of them denotes something that a person may possess, such that it would make sense to say that a person may have *ability*, *acumen*, *aptitude*, *capacity*, *charm*, etc. With this understanding it would make sense to say that each person is composed of certain elements such as capabilities, faculties, and capacities. In other words, such explanations take element psychology for granted.

However, if examined more closely one will find that this support to element psychology from the common locutions is spurious. It comes about merely from the dictionary maker's propensity for explaining nouns rather than adjectives, thus for example explaining *intelligence* as a capacity and *character* and *happiness* as qualities. As shown in the explanations of *aptitude*, *character*, *charm*, *credulous*, *honesty*, *insight*, *intelligence*, *sense*, and *wisdom*, this propensity is not shared by the author of the COD. It may further be noted that a number of the words: *proud*, *silly*, *tired*, are *not* explained by their nouns: *pride*, *silliness*, *tiredness*.

As further illustrations of this point, the dictionary explanation suggests that *charm* denotes a power a person may be in possession of. That, however, is obviously invalid. The word *charm* talks about a quality of something. *Charm of manner* says the same as *charmingmanner*. However, the dictionary maker prefers to explain *charm* rather than *charming*. Again, to say that *he has a pleasant personality* does not imply that the person is in possession of a mental element that may be denoted personality. This is clear when the phrase is reworded as *he is a pleasant person*.

The point is that each of the words discussed here is merely *descriptive of persons in a particular kind of situation and context in which the persons may be found*. Thus to ask whether a person is musical makes sense only if that person is sometimes found dealing with musical matters. Again pronouncing such a word to apply to a person only makes sense if the person comes in that situation and context habitually.

The dictionary explanations of *humor*, *temperament*, and *temperamental* indicate the confusion around the common use of these words. On the one hand there is a survival of the ancient notion that each person's 'physical and mental constitution' is determined merely by the relative proportions of four cardinal fluids of the body. This notion is yet another example of a theory of human beings that is maintained by the learned world for centuries although having no empirical support whatsoever. On the other hand the explanations present the use of 'temperamental' descriptively to signify moody, irritable, or sensitive habits of reaction.

A description of an individual can at best be vaguely suggestive of a person's habits or state of consciousness. Take just some of the words that are commonly used to denote positive aspects of a person's activity: *alert, bright, brilliant, cautious, clever, creative, dexterous, intelligent, inventive, judicious, learned, literate, musical, perspicacious, resourceful, skillful, wise, witty*. In each case it remains unclear to what extent the word as commonly used denotes an overall, constant quality of a person or a quality that pertains merely to some particular action done by a person.

Each of these words is relevant only to a certain limited aspect of a person's activity. For example, being *creative* is relevant only if the person is engaged in creation, being *dexterous* is only relevant to persons who handle things, and, as said in the dictionary, *caution* is a matter of persons in hazardous situations. These words do not denote general qualities of persons, only qualities related to special situations or activities in which persons may be habitually engaged.

In this context the words *intelligence* and *intelligent* are of particular interest, in view of the activity of so-called intelligence testing that has been pursued on a large scale for a century (cf. section 2.7 above). The dictionary explanations of *intelligence* show that in the way this word is commonly used it denotes no overall quality of a person. The examples: *he writes with intelligence and wit, an intelligent student of law, and an intelligent reply*, indicate that *intelligence* is used here to denote, not a characteristic of a person as a whole, but unclearly as a characteristic of some limited aspect of a person, done in special capacity. Thus the pronouncement *he writes with intelligence and wit* cannot be taken to be about a person or a person's writing activity, but must be about the writing produced by some person. But what it says about this writing is unclear. Again the phrase *an intelligent student of law* talks about a particular aspect of a person, as being a student of law, but it remains unclear what is said by using the word *intelligent*.

Thus the persistent claim that 'intelligence' may be taken to denote a specific measurable quality of human individuals has no ground in the common habits of speech. Put in another way: if it makes sense to have a measure of intelligence, why not also measures of *cleverness*, of *credulity*, of *stupidity*, of *resourcefulness*, etc. etc.

The example *An intelligent being* is explained in WEUD in terms of: having the faculty of reasoning and understanding. This conforms to the way William James talks of intelligence (1890, I 8):

'The pursuance of future ends and the choice of means for their attainment are thus the mark and criterion of the presence of mentality in a phenomenon. We all use this test to discriminate between an intelligent and a mechanical performance. We impute no mentality to sticks and stones, because they never seem to move for the sake of anything, but always when pushed, and then indifferently and with no sign of choice. So we unhesitatingly call them senseless. [... I 8]

In the lengthy discussions which psychologists have carried on about the amount of intelligence displayed by lower animals, or the amount of consciousness involved in the functions of the nerve-centres of reptiles, the same test has always been applied: Is the character of the actions such that we must believe them to be performed *for the sake* of their result?'

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The uses of *will* and *willful* given in the quotations from WEUD display the common confusions attached to these words. The meaningful use of the words is brought out in *the coroner ruled it willful murder*. The use of the word *willful* here indicates the claim that at the moment of the murder the stream of thought of the murderer included the notion 'I want to and I will kill that person'. In other words, the use of the word *willful* is descriptive of the state of consciousness of a person at a particular moment. A similar use of the word *will* is displayed in *to submit against one's will* and *to work one's will*. In other of the quotations: *to have a strong or a weak will*, *to have the will to succeed*, and *He castigated his willful son*, the words *will* and *willful* are descriptive of certain habits had by certain persons.

The remaining two quotations: *the freedom of the will* and *My hands are obedient to my will* assume element psychology, the notion that mental life can be described in terms of elements, such as 'the will'. This notion has no support in the uses of the words *will* and *willful* for description. The issue of 'the freedom of the will' is one of a misguided, philosophical notion of mental life. Saying that 'My hands are obedient to my will' is merely a pompous, confusing way of stating the fact that the thinking going on is a matter of the whole organism, and so also of the muscles of the hands.

As a summary of the discussion of this section: in actual use each of the words discussed above is merely *descriptive of certain characteristics of certain particular habits that a person may have or of the momentary state of consciousness of a person*. In the way the words are commonly used they give no support to describing persons as being composed of or possessing particular mental elements other than habits. Any specific performance of a human individual, of any kind, involves a great number of different habitual actions, as described by an example in section 4.2. Any claim that such performances can be understood to be the result of a certain definite number of mental elements, such as intelligence, lacks empirical support.

16.3 Emotional feelings and moods

As described in William James's account of the stream of thought (see section 5.2 above) and confirmed by such locutions of the common language that were quoted from the WEUD above, an individual's state of consciousness at any moment, as it is experienced and may be the target of attention by introspection, is colored by feelings. There are feelings in every thought object. The feelings influence how the attention changes direction from moment to moment.

Feelings come in all sorts of kinds and differ with respect to the strength with which they are experienced and may be observed in the individual's behavior. Such feelings that are experienced and influence behavior strongly are called emotions. Being parts of the individual's state of consciousness, an emotional feeling will only make itself felt by the person, and noticeable in the person's behavior, at such moments when the person's attention is directed to that acquaintance object with which it is associated. The emotional feeling is part of the person's habits.

Thus for example a person A may be said to have the feeling of hate toward person B. This is the same as saying that when person A comes to think of person B that thought will habitually have strong feelings of hostility towards B in it. Thus an emotional feeling will only become evident in the person at such moments when the person is agitated by the feeling.

A person's attention during a particular period of the person's life will tend to switch between each of a certain group of acquaintance objects, the group typically containing certain persons, certain places, certain things, and certain activities. The person's attention will usually switch between these acquaintance objects every few seconds. Some of them are concerned with the necessities of maintaining the continued life of the organism, such as the intake of food.

What comes in this group will usually undergo changes from time to time. Certain events that come to the person's notice may give rise to certain thoughts attracting the person's attention and other thoughts to attract less attention. A person's mood at any time is the feelings that come with those thoughts that at the time attract much attention. Thus when we say that a person is grieving over the loss of a close relative we refer to a dominant emotion of that person during a certain period, dominant because the person will frequently turn the attention to the thought of the loss.

A mood is a feeling that is associated, not with any particular acquaintance object but with conditions that change slowly, such as the weather.

The common language has designations of certain emotional feelings, such as *distress, fear, glad, grief, happiness, hate, joy, love, pain, sad, sorrow*. However, such designations are merely vaguely suggestive of the infinite variability of human feelings and emotions. As said by William James [II 448], after having on six pages of his book quoted lengthy descriptions of grief, fear, and hatred:

'... the merely descriptive literature of the emotions is one of the most tedious parts of psychology. And not only is it tedious, but you feel that its subdivisions are to a great extent either fictitious or unimportant, and that its pretences to accuracy are a sham.'

As an example, consider *pain*. We use one word to denote it, but what we denote *pain* is infinitely varied; there are headaches and toothaches and pains in each separate location of the body, and they may have different character, be stabbing, or piercing, etc. There are no elements of feeling or emotion.

Any feeling manifests itself in the entire organism. This is noticeable particularly with the coarser emotions. As said by William James [II 449]:

'My theory, on the contrary, is that the bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur IS the emotion.'

This is known as the James-Lange theory of the emotions.

Consequently if the manifestation of an emotion is deliberately changed, even merely by a change of the attention, the feeling as experienced immediately changes.

16.4 Mutual perception of signs of individual qualities: social contact and privacy

Gregariousness is common to all human individuals. In the individual the gregariousness takes the form of a variety of habits concerned with social contact and privacy. These habits develop from the newborn baby's first day from a number of different instincts (see section 4.5) related to the mutual interchange of signs with other persons, such as *pointing at objects seen at a distance, making sound expressive of desire, crying at bodily discomfort, smiling at being noticed, protrusion of the lips as expression of concentrated attention, turning the head aside as a gesture of rejection, vocalization, imitation, emulation or rivalry, pugnacity, anger, resentment, sympathy, appropriation or acquisitiveness, envy, jealousy, play, curiosity, sociability and shyness, secretiveness, and love.*

These instincts immediately develop into habits of perception of signs of fellow beings. These signs are of several kinds, first bodily expressions, such as the facial expressions of the mother. Later spoken sounds and script. Years later, as part of this activity, description of individual persons in permanent, for example literary, form is pursued. People mostly develop acute sensitivity to some of the signs, such as smiles.

Hand in hand with the training of perception habits each person will train habits of self-expression, by such signs as gestures, speech, and hair and dress style.

This training of habits of social contact and privacy continues throughout life. Much of the upbringing of the young consists in imparting to them some of the habits of their closest relatives. The culture of a community is maintained by intensive social contacts.

Through this training of habits of social contact every person, each in a personal manner, will become habitually concerned about the qualities of some of their fellow beings, and perception of the signs of the individual qualities of fellow beings is pursued intensively and constantly as a primary activity of many, perhaps most, people. Thus in any ordinary gathering of people, whether privately or in public places, a constant buzzing of talk is going on. There is no doubt that by far most of this enormous amount of talk is perceived by the participants as signs of people, of themselves or of others.

The principal qualities of an individual that may be perceived from their signs are partly the habits, partly the momentary state of consciousness. In the social contacts those personal qualities of a person that are most actively being perceived are those that are specific to the person and the current situation and that tend to change rapidly.

16.5 Signs of individuals' habits

For a habit of a person A to be perceived by another person, B, it is required (1) that A is in such a situation that he or she acts by the habit, (2) that the habit is one which has effects in A's behavior that are observable as signs, and (3) that B is present as observer. These conditions tend to be satisfied only to a very limited extent, partly because a large part of any person's habits are habits of mental association that have only very slight observable effects, partly because any

particular habit of a person may become effective only rarely and briefly. For this reason most habits of most people are very private affairs. This holds particularly about such habits that are socially reprehensible and that therefore will be indulged in by the person when he or she is not observed by anyone.

The visibility to other persons in social contacts of a person's habits differs greatly from one habit to another.

Certain habits are so stable and ingrained in a person that they seem to be unalterable. Such habits tend to be ignored in informal social contacts, in the same way that a constant peculiarity of a person's sense perception, such as colorblindness, may remain ignored, even by the person himself.

As described in section 7.1 above, the kind of imagery a person tends to or is able to experience enters as a constant characteristic of that person's stream of thought. This fact is so all pervading in human intercourse that it tends to be ignored. The general tendency is to assume that one's own imagery is like that of other persons. For example, Anne Roe (1953) was surprised to find that her husband, whom she had known well for forty-five years, experienced and was dependent on clear visual imagery.

An important invisible quality of certain habits is honesty. A person's honesty in certain activities can only be judged from the person's behavior over a prolonged period of time, and never with certainty. Assuring that a particular transaction between people only involves honest persons will require supervision of the activity of persons in similar transactions over long periods. This is impractical, and as a matter of fact, fraud is a regular feature of human activities.

The most visible of a person's habits are those that manifest themselves in the person's way of reaction in social contacts, such as manners of address, of politeness, etc. However, these habits for most people indicate very little of the person's association and perception habits. In particular they may indicate nothing of the person's openness, the person's habitual manner of giving expression to his or her state of consciousness. Habits of hiding any signs of one's state will obviously tend to develop in societies where openness about the personal state is socially reprehensible, where one is supposed to 'keep a stiff upper lip'.

Some of a person's habits make up what is known as the person's fields of interest. The fields of interest normally comprise of a number of separate areas, centered around areas of activity, such as professional, family concerns, and recreational. Such habits are perceived by others from the person's actions. Some such habits may be socially reprehensible, and the person will obviously tend to suppress any signs of them.

The range of persons' perception habits is enormous. Of these habits only those that involve the persons' speech manifest themselves directly by signs. Qualities of certain of a person's perception habits are known under such names as attitudes, tastes, and insight.

It will therefore require prolonged contact, such as close friendship, for two persons to achieve even a very partial awareness of each other's perception habits, in other words to understand one another. This is the sense in which one may claim that each person is alone in the world.

16.5 Signs of individuals' habits

An important part of the perception habits is the feelings associated with things perceived. Some habits may be such that the perception of some item may be dominated by the feeling of the stream of thought aroused. This is typically the case for signs, such as words, used in political and religious contexts. Even a seemingly neutral word like 'habit' may in some people associate to so strong feelings that with these persons the use of the word descriptively is paralyzed. For political demagogues the feelings aroused by the words they use are the main thing.

Some of the perception habits concern general aspects of the person's manners of reacting to text and other media. In modern media dominated societies the habit is very common to accept certain media uncritically. This habit is kept trained by superficial, uncritical perception of the masses of text, sound, and images presented in news media.

16.6 Signs of the momentary, individual state of consciousness

Human social contact consists to a large extent in mutual perception of signs of the participating persons' momentary, individual states of consciousness. This state is the quality of each person that most of all asserts itself in the person's interaction with fellow beings, and therefore the quality which is of primary interest to the fellow beings in direct contact with the person.

The state of any person is constantly changing. The aspect of the state that changes most rapidly is that with which the person is currently most actively concerned. The most rapid change is found in the shift of the attention.

Social contact happens through a mutual perception of all kinds of signs of the state. Some of the signs are of bodily positions, facial expressions, tones of voice, and motions of the limbs. These indicate only a small part of the state, and the signs may be distorted at will by the person (poker face).

Other such signs are verbal. Much of the conversation between people consists of exchange of descriptive signs of the findings of their perceptions. In fact, in a large part of what is said in most ordinary conversation, the persons participating present descriptions in some form of themselves and of certain other persons who are the subject of the conversation. Here the signs used are words of the common language. However, speech is an uncertain sign of a person's state. No one can force a person to speak his mind, and in any case whatever may be spoken will be a sign of merely a small part of the stream of thought.

Anything said by one person about another one inherently is a sign both of the momentary state of the person speaking and of the person spoken about. The kind of quality that is spoken about, and the tone of voice in which it is spoken, usually indicates as much about the speaking person as about the person spoken about.

17. The activity of art

17.1 Sign perception habits in the activity of art

The exchange of signs of individual qualities by social contacts is supplemented in an activity in which certain persons, *artists*, create signs in more permanent form, *works of art*, which are then perceived by other persons, *the artists' public*. The activity further includes that some members of the public produce *commentaries* on the activity and works of art.

As a central issue of the activity of art, by presenting highly idiosyncratic signs of some subject to the public, the artist may succeed in arousing the feelings of the members of that public very strongly. Typically, in describing human characters in his work, the artist may succeed in presenting such signs of the feelings that color these characters' state, whether these feelings be of happiness, of anguish, of fear, or whatever, that appeal strongly to the public's feelings. In this way a work of art may make the perceiving public feel that they are in intimate contact with the character described by the artist.

This aspect of the activity of art has been presented explicitly by William James in connection with his discussion of the emotions. After the quotation on emotions quoted in section 16.3 above James continues [II 448]:

'... unfortunately there is little psychological writing about the emotions which is not merely descriptive. As emotions are described in novels, they interest us, for we are made to share them. We have grown acquainted with the concrete objects and emergencies which call them forth, and any knowing touch of introspection which may grace the page meets with a quick and feeling response.'

The activity of art includes a continued *development of habits of sign perception* of the artists and their public. In this part of the activity each artist usually acts as a member of the public of other artists. The activity is characteristic by the prominence of groupings of artists who are each other's public and who adopt some of each other's sign perception habits, 'get influenced by another' as it is usually expressed.

Typically each artist will in the course of his or her career develop certain habits of perception of certain signs. These habits manifest themselves in the artist's works, which the artist has created from those signs. At the same time each member of the artist's public, being presented with the works, will develop individual habits of perception of their signs.

17.2 The signs of works of art

The signs employed by artists in their works are mostly the words of a common language in written or spoken form, certain shapes and surfaces of solid things upon which color patches have been painted, and certain gestures and sounds developing in time as produced by human performers.

17.2 The signs of works of art

Commonly works of art are created in a collaborative effort of several artists. This is necessarily the case for such works that are made for several performers. With works of elaborate performance including many performers there is usually an author who creates a text of certain aspects of the work in permanent form which then acts as a guide to the actual performers. With media of signs in permanent form, such as text or painting, the artist may create a permanent version of the work. With media of performed signs the creation of the work must be done anew at each performance. Even when the work of art as a whole is a collection of signs never seen before, some of the signs of which it is composed may be habitual to the artist, having occurred in other works of the artist, and some may be matters of the common habits of the artists and their public. Some such signs are shared commonly in certain communities. For example, in Western communities the feeling of mourning for the recently dead is signified by black cloth and by music that moves as a slow march in heavy tones. Composers will put the cue 'marcia funebre' over pieces that they intend to be perceived as signifying mourning (e.g. Beethoven: 3rd symphony movement 2, Chopin: sonata op. 35 movement 3). That such habits are acquired, not instinctive, is apparent from the fact that other communities have other habits of signifying mourning. Chinese, for example, signify mourning with white, not black, and in Arab communities mourning is signified by loud wailing.

However, to a large extent the signs put into their works by artists are the results of the artists' invention in creating the works.

Most artists specialize in the medium of expression, i.e. make use of the same medium for a number of works. Most artists mix signs that have already been used by other artists with signs of their own invention, and mix signs that recur in several of their works with signs that they have invented for use only in one work. Those signs that the artist uses in several works make up the artist's personal style.

Even when using words as signs, artists often use them in their works in manners that go beyond their habitual use in social contact. For example in dramatic works artists will use words spoken by actors in monologues or sung by singers in arias, to signify part of an individual's stream of thought. As an example in another direction, Janacek in his operas has the singers sing musical phrases that he has composed to have similar tones of voice as phrases spoken in his native Czech.

In works that are presented by human performers, creative contributions to the work are made both by an author who selects the subject of the work and creates the intrigue, and the performers, who in each performance create the actual gestures and signs from the suggestions made by the author.

The gestures prescribed by authors as signs in their works to a large extent are such that can only be executed by performers, such as ballet dancers, at a high level of athletic training. In the same way, the musical sounds prescribed as signs by composers can only be produced by highly trained musicians.

The human voice sounds commonly prescribed by authors as signs go beyond the sounds of common speech in the range of the tone volume, by the use of sustained, singing tones of various durations, and by the use of sounds in

definite rhythmic patterns. These modes of use make the human voice of gifted performers an artistic medium of unique expressiveness.

17.3 Media and subjects in works of art

Creation of a work of art requires that the artist (1) has chosen a medium of expression, such as for example drawing, painting, music, dance, or script, (2) adopts and invents certain signs and their significations, (3) forms a notion (acquaintance object) of the work, and (4) creates the collection of signs that together constitute the work.

In the artist's notion probably most works of art are perceived to be about, describe, or present aspects of something else, in other words, to have a definite *subject* that may be indicated outside of the work itself.

However, as a characteristic feature of the activity of art, the artist's notion of the subject of a particular work is for many works not made explicitly clear by the artist, and the subject of some works is left to be perceived by the appreciating public in the same way as the various parts of the work itself. Thereby the subject of a work of art may give rise to commentary. In other words: the artist may or may not indicate the subject as perceived by himself or herself, but the work must speak for itself. This is the basic value of works of art: they give expression to things that cannot be expressed in any other way.

It may probably be argued that historically all the activities of art originated in the artists' endeavors to describe individual human beings. At any rate, such description remains a dominating subject of the arts.

In the choice of the subject of a work that describes individual human beings the artist has to be oriented towards the medium in which he or she intends to create, each medium putting restrictions on the kind of subject the artist may choose. Media that are perceived statically, without any dependence on a development in time, such as sculpture and painting, clearly can only with difficulty describe anything developing in time. As applied to description of individuals, such media are suited to describing either lasting moods such as joy and sorrow or a momentary emotional state of a person.

For some media such as poetry and vocal song with accompaniment the most suitable subject is an individual's stream of thought in a certain situation.

Dramatic presentation, such as plays, ballet, and opera, is suitable for description of the human interactions in episodes, developing over a fairly short span of time, typically a few days. What is important to the creative artist in such a subject is not what is called the plot, but the occasion it presents for describing individuals confronting each other in states of emotional tension.

Extended literary presentation such as biography and novel is suitable for description of individuals in interaction during a substantial part of their lifetime in a particular society.

To some extent artists produce works with subjects that have no individual persons in them. Examples of this are painters who paint landscape, flowers and *naturamorte*. Again Hanns Eisler has composed a piece titled: *Vierzehn Arten den Regen zu Beschreiben*, Fourteen Ways to Describe Rain, and by the present writer's studies Haydn's symphony no. 57 describes rain, and his symphonies no.s 10, 33, A, and 20, describe autumn, winter, spring, and summer. It may be found, however, that in the artistic description of impersonal subjects, what the artist brings forth in his work is some side of how a human may perceive the subject.

17.3 Media and subjects in works of art

The choice of subject is a difficult phase in the work of many artists, particularly those who create in such large scale media as opera. The pains of the artists' choice of subject has been particularly documented with the composers Verdi, Puccini, and Richard Strauss, who went through yearlong deliberations and discussions with their text authors before settling on the subject of a new work.

In such works that are provided by an indication of their subject by the artist, that indication tends to be rather different for different media and forms. Some literary works of art, for example some of the plays by Shakespeare, have names of historical figures as titles, thus inviting the public to perceive the works as describing some of the individuals living in certain particular historical situations.

For a literary form such as the novel, which is used primarily as a means of describing incidents of the life in a particular society at a particular epoch of certain related individuals, the artist will usually identify the main characters and the historical situation clearly in the title and in the very first part of the text. For example, Charles Dickens gave a novel the title: 'A Tale of Two Cities', and on the very first page includes the phrases: 'There were a king with a large jaw and a queen with a plain face, on the throne of England; there were a king with a large jaw and a queen with a fair face, on the throne of France. ... It was the year of Our Lord one thousand seven hundred and seventy-five.' On the first two pages of the book the names of the cities London and Paris appear. These signs invite the reader to perceive the rest of the text as describing persons living in a definite historical situation in the two cities named.

The subject of a painting is often suggested by the artist in a brief verbal title of the work. The subject indicated by such a title obviously is whatever is perceived by the artist by the title in the context of the situation of the artist when he or she created the work. For example when Picasso titled one of his paintings 'Guernica' he clearly indicated that the painted signs of the work signify issues that at the time when he painted it in his own perception associated to that word. To make sense of the title the viewer must be aware that in April 1937 the Spanish city of Guernica had been attacked in an air raid by German bombers. Thus the title indicates that the painting presents signs of the cruelty and horrors of that attack, depicted in the painting by human faces expressing fear and anguish. Thus in the perception of a member of the public the signs of the work will only make proper sense when perceived in the context of the European political situation of the year 1937.

With some pieces of music the subject is also given by a title. For example, Tchaikovsky has titled a piece of music 'The year 1812'. Thus he clearly intends that the listener from that title associates to the invasion of Napoleon's army into Russia in the year 1812. Accordingly the music quotes several national anthems of the warring powers.

Many works of art are auto-biographical or self-portraits. This is particularly well known from the paintings of Rembrandt. Likewise many musical compositions are self-portraits. Thus Smetana titled his first string quartet *From My Life*. This music at a definite point arrives at a painful sound, clearly a sign of the moment when the composer lost his hearing.

With certain works of art the subject is given by the context in which they are presented. This is the case for art employed in the liturgy, such as the texts of

hymns, the paintings decorating churches, and the music of masses, for music used in ceremonial activities, and for music used in certain social activities such as ballroom dancing.

Commonly the subject of a work of art is taken over by the artist from other works of art. Thus the works of Shakespeare have been a rich source of subjects for other artists. For example the subject of *Romeo and Juliet* has been used by numerous other artists as the subject of works in several different media: by Hector Berlioz in a large scale symphony with vocal soloist and choruses, by Pjotr Tchaikovsky in a fantasy-overture for orchestra, by Bellini, Gounod, and nine other composers in operas, and by Constant Lambert and Sergei Prokofiev in ballet music, the ballet for Prokofiev's music having been produced by several different choreographers.

However, for many works of art, particularly works of music, no particular subject is indicated by their creator. Some such works are made from signs that at the time when they were created were habitually perceived by a certain public to associate with certain feelings, predominantly signs that are perceived to signify qualities of individuals in concrete situations of their life. Such works appeal to that public just by again arousing similar feelings. For such works one may say that the subject is there in the work itself. This is so particularly for short literary works, poems, and for musical works of short performance duration, typically pieces for piano and songs with piano accompaniment.

For example, a poem without a title by Grafir Galina has this text, in a translation from the original Russian version by Philip Taylor:

*How fair this spot!
See, in the distance the river shimmering,
the meadows are covered with flowers,
white clouds in the sky ...
Here there are no people ...
Here it is quiet ...
Here there is only God and me,
flowers, the old pine,
and you, my dream!*

This poem has been composed as a song with piano accompaniment by Sergei Rachmaninov, his opus 21 no. 7 from 1902. In this form it has been recorded as performed by Inessa Galante, soprano, and Inta Villerusa, piano, in 1986. When heard by a listener having certain music perception habits, this recording of the work may arouse an extraordinarily strong feeling of delight, even though the text of the poem, sung in Russian, may be incomprehensible to the listener. This arousal of the listener's feeling is a matter of the work as a whole. The poem arouses the reader's feeling gradually, by the successive mention of further items of delight. With the perception of each item immediately following those before the intensity of the feeling is increased up to a final climax.

When performed as a song the work may arouse a similar growth of intensity of the listener's feeling, merely by the quality of the successive musical phrases, even without the associations from the items mentioned in the poem.

17.3 Media and subjects in works of art

For many extended musical works that are given no title there can be little doubt that they derived in the composer's imagination from some quite specific subject which the composer for some reason did not see fit to make public with the work. One reason for this reticence may be that with the subject made public the work would provoke some opinion against the composer, to the extent of putting him in personal danger. A striking example is Dmitri Shostakovich's Fifth Symphony, composed in 1937. At the time of its composition the Soviet society was in the grips of a terror under which tens of millions of citizens were sent to camps where most of them died. When Shostakovich wrote the symphony he had already been denounced publicly as 'an enemy of the people' and lived in constant fear of being executed, as had been many of his artist friends.

The Fifth Symphony attracted enormous attention from its very first performance, has been performed many times all over the world, and is established as one of the most significant symphonies written in the twentieth century. However, even so from the very first the question of the subject of the symphony has given rise to extensive controversy. This controversy is discussed at length by Ian MacDonald (1991), who says: 'The Soviet theory of the Fifth, developed to accommodate it within the framework of Socialist Realism, is that it expresses the progress of an intellectual from a state of "individualist illusion" to triumphant self-transcendence in solidarity with the people and recognition of the inevitable apotheosis of Communism.'

As a counter to this, MacDonald claims the subject of the symphony to be aspects of the Soviet society in the grip of Stalinist terror. In support of this MacDonald presents a description of how each section of the music of the symphony makes sense as describing an aspect of the Soviet society. For example, MacDonald describes the music starting 8 minutes 48 seconds into the first movement in these words:

'With the thrumming accompaniment tossed from trumpets to high strings and back again, the 'menace' theme drives to an agitated climax—whereupon a startling cinematic cut sends us tumbling out of the world of abstraction and into representation of the most coarsely literal kind. We are at a political rally, the leader making his entrance through the audience like a boxer flanked by a phalanx of thugs. This passage (the menace theme dissonantly harmonised on grotesquely smirking low brass to the two-note goosetstep of timpani and basses) is a shocking intrusion of cartoon satire. Given the time and place in which it was written, the target can only be Stalin—an amazingly bold stroke.

The appearance of the *Vozhd* evokes an extraordinary musical image of obeisance, the orchestra thrumming the one-note motto in excited unison before bowing down to the symphony's keynote D (figures 29-31). Suddenly the vaulting theme from the movement's beginning is there amidst the mob, desperately trying to find a way out through the grinning brass. At the peak of a wildly struggling crescendo, its basic two-note component abruptly, and with vertiginous ambiguity, turn into a flourish of colossal might on drums and brass, punctuating a frenzied unison declamation of the motto rhythm. Here the Fifth connects with the oratorical world of the Third. There can be absolutely no doubt that introspection plays no part in this, that it is

objective description—Shostakovichian, as opposed to Socialist, realism.

As this declamatory passage ends, the brass and drums decrescendo in triumph on the three-note pattern from bar 4, as if grimly satisfied with their brutalisation of the rest of the orchestra and of the symphony's earnestly questing opening bars, all elements of which have been deformed during the convulsion. Over the thrumming rhythm, flute and horn now converse in a major-key transposition of the second subject: two dazed delegates agreeing that the rally had been splendid and the Leader marvellous. (A typical stroke of black comedy here has the horn doggedly copying everything the flute says, to the point of reaching for a B clearly too high for it.) A wry conversation for departing woodwind merges into evening in a curfewed city, the menace theme inverted on the flute, the second subject on solo violin, and a nine-note valediction on celesta ... bringing the movement to rest.'

Shostakovich's own pronouncements about the subject of his Fifth Symphony at the time of its first performance seem to confirm the Soviet theory. However a very different story comes out in his talks with Volkov (Shostakovich, 1979) shortly before he died in 1975, talks that Shostakovich himself insisted must not be published before his death. While talking about his Seventh Symphony he says:

'Naturally, fascism is repugnant to me, but not only German fascism, any form of it is repugnant. Nowadays, people like to recall the prewar period as an idyllic time, saying that everything was fine until Hitler bothered us. Hitler is a criminal, that's clear, but so is Stalin. I feel eternal pain for those who were killed by Hitler, but I feel no less pain for those killed on Stalin's orders. I suffer for everyone who was tortured, shot, or starved to death. There were millions of them in our country before the war with Hitler began.

The war brought much new sorrow and much new destruction, but I haven't forgotten the terrible prewar years. That is what all my symphonies, beginning with the Fourth, are about ...'

About the final passage of the Fifth Symphony, in which the tone A is screamed out by the entire orchestra 252 times in a regular quaver row, Shostakovich said:

'What exultation could there be? I think it is clear to everyone what happens in the Fifth. The rejoicing is forced, created under threat, as in *Boris Godunov*. It's as if someone were beating you with a stick and saying, "Your business is rejoicing, your business is rejoicing", and you rise, shaky, and go marching off, muttering, "Our business is rejoicing, our business is rejoicing". What kind of apotheosis is that?'

Even many works of the classical period that for two centuries have been played and in commentary generally taken to be without any descriptive association, may upon careful analysis be found to originate in an extramusical theme adopted by the composer. As reported in Appendix 4, this is the case of Joseph Haydn's 107 symphonies for orchestra. The meaning of his music as descriptive of persons has been indicated by Haydn himself when he says that most of them describe 'moral character'. As to their subjects, these works are similar to the works of such an artist as Rembrandt. Many of them are Haydn's self-portraits.

17.4 The public's perception of works of art

The perceptions of a work of art by members of the public are shown in an example by Shakespeare in a passage of Hamlet. In act 2, scene 2, Hamlet has invited the First Player to perform a passage from a play in which Æneas describes the slaughter of Priam. Aspects of their perceptions of this performance are presented in the comments by, first, Polonius and, then, Hamlet. Polonius makes three remarks while the performance is under way:

'This is too long. - That's good; "mobled queen" is good. - Look! where he has not turned his colour and has tears in 's eyes. Prithee, no more.'

Hamlet describes his very different perception of the First Player's performance in a following soliloquy:

'Is it not monstrous that this player here,
but in a fiction, in a dream of passion,
could force his soul so to his own conceit
that from her working all his visage wann'd,
tears in his eyes, distraction in 's aspect,
A broken voice, and his whole function suiting
With forms to his conceit?'

As displayed in this example the perception of a work of art by a member of the public happens in a definite situation, such as the perceiver's reading a novel or being present at an exhibition or a performance. What is perceived are not only signs that have been created by the author and the performer as being the work, but additionally signs that are a necessary part of the presentation or the performance, although not created for it.

As in any perception, what is experienced is entirely a matter of the perceiver's perception habits and attention from moment to moment. The habits of perception of works of art are personal, and moreover, change with time within the same person. Even with art forms that make use of permanent signs, such as written literature, there can be no sameness of anyone's two different perceptions of it. A person's experience at any reading of a book, or at any attendance of a performance, is unique, never to be repeated. There are no 'correct' significations of the signs of a work of art to be perceived.

Several circumstances tend to make the situations of perception of works of art different from other situations of perception:

- 1) The perceiver's awareness that at the moment of perception what is perceived is the creative product of the artist.
- 2) The possibility of repeated perception of the same work.
- 3) Awareness by previous perception of commentary concerning the particular work.

Some consequences of these circumstances are discussed below.

By the perceiver's awareness that the thing perceived is a work of art the perceiver's attention may switch rapidly between several different habits of

perception. This is presented as the example by Shakespeare, the person Hamlet when experiencing the First Player's performance perceiving both certain feelings of horror invoked by the act of slaughter of the person Priam, and also the feeling of wonder at the First Player's creation of the signs of that horror.

While reading a novel the reader's attention may shift between perceiving the words as descriptive of the actions of the fictitious characters and as the results of the author's creative effort of formulation. When exposed to a moment of a performance of a performed work of art, such as an opera, the listener may shift between attending to a number of different aspects and qualities of the performance, such as • the singer seen as a fellow human being with a certain appearance, gestures, etc., • the quality of the singing voice of the singer, • the meaning in the dramatic context of the words sung, • the singer's rendering of that meaning in terms of singing and gestures, • similar aspects of the performance of the musicians in the orchestra, • the present moment of the performance seen in the dramatic context of the work as a whole, • etc. All these various aspects of the performance will at any moment enter into forming the listener's feeling at that moment, in a manner that is entirely a personal matter.

Because of this multiple direction of the attention, the perception of the signs of the work as being about some subject is only part of the total experience of the work. Thus while listening to a singer singing a song with a text that presumably presents the subject that the composer of the song presents with the music of the song, the listener may have a powerful experience even without becoming aware of the text, by giving most attention to the singer's creative contribution to the performance. For this reason the public interest in the activity of art derives both from what the works express about their subjects and from the creative contributions of the artists. Accordingly the persons of creative artists, whether authors or performers, become the subject of a high degree of public interest.

By repeated perceptions of the same work of art members of the public develop their habits of perception of the signs put into his works by the artist, including such that are newly invented. This is particularly important with media of signs that mostly have no commonly established significations, such as painting and music. It is typically so that a new work of art has to be presented to the public a certain number of times, or over a certain length of time, before the members of the public arrive at some kind of stable perception of it. Even so, it also happens that a work of art is taken up for reappraisal, with a corresponding change of certain members' habits of perception. Such a reappraisal may be brought about by someone's commentary to the work. For example, the present author's notes on Haydn's symphonies in Appendix 4 may change someone's habit of perception of his symphony no. 4, so as to come to perceive particular passages of this work as signifying particular sides of Haydn's personality.

In this development of habits of perception an important clue is the coherence in the way the signs are used by the artist. Coherence here is a matter of the artist's work as a whole and of other related works of art. Expecting coherence in the way an artist uses the same sign in different places of his works, is the same as saying that the artist's sign use is habitual. For this reason, the best way to develop one's habits of perception of an artist's signs is to make oneself familiar with the artist's works as a whole. This is the way usually adopted by commentators.

17.4 The public's perception of works of art

Because of the free choice and arbitrariness of the significations of the signs used by an artist, the activity of creation by artists has inspired a copious literature in which other persons than the artists themselves try to explain their works by words of the common language. This production of verbal commentary matches a considerable demand created by the general respect for the printed word. It explains the stream of program notes about performed works that is such a prominent feature of their performances in theatres and concert halls. A particular issue in this context is what the artist may want to indicate about the subject of the work, and of what the work expresses about its subject.

The importance of commentary concerning the particular work in any person's perception of the work is a personal matter. While some lovers of art are content to let the works of art present themselves to their perception in relative isolation, many like to have their perception be influenced by what others experience when perceiving them.

Another prominent kind of commentary about works of art consists of art criticism, that is someone's evaluation of works of art, further discussed below.

17.5 Ideological issues related to the activity of art

The activity of art raises several ideological issues: • Criticism, • What is art? - The subjects of works of art, • Influence of works of art on social attitudes. These issues will be briefly discussed below.

Criticism is commentary on individual works of art, evaluating each work or performance. Even though any such evaluation can only be as personal as is anyone's perception of the work, criticism enjoys high prestige among many members of the public who seem to be unwilling to perceive a work that they have not been told by a critic what to think about. Accordingly the presentation of works by publication or performance is strongly influenced by the writings of critics.

This influence is such that the work of a particular artist may for a long period be ignored by the public at large, and then 'discovered'. An example is the works of Gustav Mahler that for fifty years after the composer's death remained virtually unperformed and unknown to the general public, until around 1960 they were taken up all over the world and became very popular.

Another part of the published commentary is concerned with the activity of art as a whole. Most every aspect of this activity has been the subject of ideological commentary. Ideological claims are made about such questions as: What is art? What is quality in works of art? What signs are proper to use in works of art? What may be the subject of a work of art?

Ideological questions concerning the subject of works of art have been raised particularly in commentaries on purely instrumental music, which composers often publish without any title. An ideology has become prominent that it is inadmissible to perceive such music as having a definite subject. When combined with an ideology that the subject is there in the work, independently of any person's perception of it, the ideology says that music cannot have a subject.

Sometimes the claim is modified such that pieces that do not have a subject are said to be 'absolute music', with the additional ideological claim that such music is superior to such music that may be perceived to be descriptive.

With this ideology a great stress is then put on purely formal characteristics of the works, for example the way certain parts of the music, so-called themes or subjects, recur according to certain formal patterns, typically in the talk of so-called sonata form. The critical commentaries then put great stress on whether a work conforms to some such formal scheme. At the same time the questions of the subject of the music and the way the music gives expression to the subject are entirely ignored.

By this sort of ideology the public appreciation of certain works of art have in certain cases become entirely distorted. A striking case is that of Joseph Haydn's music, by all accounts one of the greatest contributions to Western music ever created. Even though Haydn himself has pronounced himself clearly on the subject, musical commentary on his symphonies has for two hundred year ignored the question what to the composer was the subject of each of these works.

As discovered by the present writer in 2002 and reported in the Appendix 4 it makes coherent sense to assume that Joseph Haydn created each of his 107 symphonies as an expression of an extramusical subject. Many of these works are self-portraits. For example, at the beginning of symphony no. 4 Haydn presents musical descriptions of three sides of himself, first as brilliantly resourceful and humorous but modest, second in a hail to God, third as the tender lover. These significations were perceived from the tones of voice of various parts of Haydn's music. Thus one movement has the tone of Haydn's intimate soliloquy, expressing his modesty and gratefulness, another is an impersonal description of melancholy. Dialogs of two voices in one movement is a double portrait of a man and his beautiful wife, in another it is the tender caresses of two lovers, in yet another it is God speaking to an unrepentant sinner.

In the case of Dmitri Shostakovich questions of what to him were the subjects of his works became ominous, in view of the constant threat of execution under which the composer lived. The question of the subject of his Fifth Symphony was discussed in section 17.3 above. His 8. string quartet from 1960 has the dedication: 'In memory of victims of fascism and war.' This dedication undoubtedly has been formulated so as to mislead the Soviet authorities. As told by the composer himself to Volkov (Shostakovic, 1979) the quartet is a self-portrait, describing the composer's painful life under Stalinist terror. As shown in section 15.4 above the work opens with the tones D, E flat (Es), C, B flat (H), the first four letters of the composer's signature, as spelled in German: D. Schostakowitsch. This musical signature is presented many times throughout the quartet, which also brings several quotations from the composer's earlier works. In the 4th movement a distorted form of the signature is immediately followed by the melody of a song that is well known in Russia, a prisoner's lament with the text 'Exhausted by the hardships of prison'.

By presenting certain issues in a striking manner, works of art may exert a significant influence on what may be called people's social attitudes, understood as the individuals' habits of thinking about their relations to other individuals with whom they come in contact.

17.5 Ideological issues related to the activity of art

Each individual's social attitudes are first formed and trained in childhood and adolescence. Predominantly each individual will come to share the social attitudes of his or her closest relatives and such other persons with whom they come into personal contact. Into this circle of influence, works of art may enter as an additional, external influence, simply by lively presentation of social attitudes that are not shared in the individual's immediate circle of relations. In this way works of art may exert a strong influence on the attitudes of the perceiving public.

In this way works of art have influenced attitudes to controversial issues such as religion, anticlericalism, anti-Semitism, racism, fascism, Marxism, republicanism, homosexuality, censorship.

The history of the activity of art presents a large number of works of art that have been influential ideologically, and a long series of ideological controversies over works of art. As just one example of a work of literature giving rise to controversy which attracted world-wide attention: the novel *Doctor Zhivago* by Boris Pasternak (1890-1960). As reported in Encyclopædia Britannica:

‘Russian poet whose novel *Doctor Zhivago* helped win him the Nobel Prize for Literature in 1958 but aroused so much opposition in the Soviet Union that he declined the honour. An epic of wandering, spiritual isolation, and love amid the harshness of the Russian Revolution and its aftermath, the novel became an international best-seller but circulated only in secrecy and translation in his own land. ...

Although Pasternak hoped for the best when he submitted *Doctor Zhivago* to a leading Moscow monthly in 1956, it was rejected with the accusation that “it represented in a libelous manner the October Revolution, the people who made it, and social reconstruction in the Soviet Union.”

Appendix 1

Invited keynote speech at NordiCHI 2000, Stockholm, 2000 October 22. It presents concrete examples of the importance of the insight presented in chapters 5, 6, and 15.

CHI and Human Thinking

Abstract

Descriptions of the human mental activity found in current CHI literature are found to suffer from defects derived from behaviorist psychology. A case of alternative description, building on classical, introspective psychology, is shown to present insight highly relevant to the design of human-computer interfaces. The view of introspective psychology is characterized by the jumping-octopus metaphor of the state of consciousness, the site-of-buildings metaphor of a person's insights, and the splashes-over-the-waves metaphor of a person's verbal utterances. Introspective psychology indicates the importance to CHI of habit, of inattentive operation of equipment, of individuality of imagery, and of individuality of perception of description forms.

1. Introduction

It is argued that a dominating part of the argumentation around computer-human-interaction, CHI, is based on shallow and defective notions about human thinking. More specifically, in discussions of problems of CHI, human thinking tends to be described in terms of behaviourist psychology, as an activity within a black box described in terms of mental models or a human information processor. It is suggested that the description of human thinking of introspective psychology, as presented in the classical work of William James (James, 1890), offers insights of decisive value to CHI.

2. Descriptions of the human mental activity in the context of CHI

As a concrete basis for the claims concerning the argumentation around CHI of the present article, the 68 articles presented in the CHI 96 Conference Proceedings have been reviewed for items that are relevant to human mental activities. The findings may be summarized as follows:

1) Of the 68 articles, only 20 make use of any kind of description of the human mental activity.

2) The dominating form of description of the human mental activity found in the articles is in terms of something had or held by persons. That something is called mental models in 7 articles, knowledge in 7 articles, cognitive maps and meanings of words each in 1 article.

3) The place or container where the something is held is called a working memory in 1 article, long-term memory in 1 article, but is not mentioned in the remaining articles.

4) The few remaining descriptions of the mental activity given in the articles refer briefly to users' feelings, one article talking about a 'feeling of "natural" dialogue', one about 'a system ... can feel mechanical and unfriendly'.

5) The 'mental models' and 'knowledge' of 2) are presented merely as labels, without any further detail that might make them specific and meaningful.

6) Apart from the few references to feelings, the descriptions of the mental activity in the articles include no mention, neither of the experience had by people, nor of their acquaintance objects (concepts) and images, nor of the dynamics of peoples' thought, i.e. the way a person's experience at one moment leads to the experience of the next. In terms of classical psychology, what is absent from the descriptions in the articles are such items as the stream of thought, the objects of thought and their fringes, the habitual associations of the objects, and acquaintance objects (concepts).

2.1 Processing natural languages as people do

What has been found here in the CHI oriented literature is found similarly in the writings of psychologists. As one notable example take the article (Miller, 1995), describing a project to build a 'system that hopes to process natural languages as people do'. Miller describes language in terms of words, word senses, and linguistic contexts. By Miller's description meanings and senses are verbal, and linguistic contexts form a definite set, which may be used as the basis of word definitions in dictionaries.

Miller describes a difficulty of his system: 'Polysemy [words having more than one sense] is a major barrier for many systems that accept natural language input. ... Choosing between alternative senses of a polysemous word is a matter of distinguishing between different sets of linguistic contexts in which the word form can be used to express the word sense. People are quite skillful in making such distinctions ... How people make such distinctions is not well understood.'

With these words Miller displays an entirely misguided view of the human mental activity. With his notion of linguistic contexts that form a definite set Miller is blind to the fact that word meanings are personal images and feelings, and that linguistic contexts are personal and that they continue to be formed and developed by every person engaged in linguistic activity, by the millions every day. A person's understanding of a word depends in no way on 'distinguishing between different sets of linguistic contexts'. That understanding develops by the mental mechanism of association from the person's total situation. The context is that total situation. The variants recorded in dictionaries merely describe some limited aspects of the way words have been used in selected literary styles. These dictionary descriptions are entirely inadequate in accounting for the understanding achieved in actual conversations. The word 'he', for example, is described in Webster's Dictionary by four variants. In actual conversation it denotes one out of several billions of male persons.

Thus Miller's difficulty of polysemy reveals his approach to 'processing natural languages as people do' to be invalid.

3. Sample description of book writing activity

In order to make the present objections to the descriptions offered by behaviouristic psychology specific, let me consider a concrete situation related to computer-human interaction: the work I am engaged in daily, of composing the text of a book, sitting in my workroom before the screen of my computer, using an ordinary text processor.

3.1 Behavioristic description

First, behaviourist psychology: Described by a behaviorist psychologist sitting next to me, my activity consists mostly of a succession of pauses during which nothing much is seen to happen, interrupted by bursts of activity of my fingers dancing on the keyboard and the corresponding characters appearing on the screen. Once in a while I may be seen to grab the mouse and have the cursor move about and select text on the screen.

What does this tell us that might help to design the interface? Nothing.

3.2 Mental models

Next, mental models: What are these mental models supposedly at work while I am composing the text? Who can tell? Certainly not I myself; I have no idea what these people are talking about with their mental models.

3.3 Information processing model

Next, the information processing model, for example the GOMS model (Card, Moran, Newell, 1983). According to this model the core of the activity is the contents, called my 'knowledge', of a container called memory, these contents coming in four forms, called physical, acoustical, visual, semantic. Now this might at first sight appear to be appropriate, since what I am doing is to produce a text. And so by this description my activity with the text processor is a copying of text held in acoustical or visual form in my memory, with the aid of my finger movements on the keys.

But this description misses the whole point of my activity, which is that *I want to produce a text, but I do not have it anywhere*. Claiming that the text I want to see is hidden somewhere in a memory within me is nonsense. Even the text I am engaged in developing, that which I have produced today, I cannot recall word by word.

And so the information processing model also misses telling us how the interface with the computer should be designed so as best to support my activity. This model does not even begin to suggest how to make sense of the succession of pauses and finger activity that the behaviourist psychologist will see, and is equally hopeless in making sense of the actual text that gradually appears on the screen.

A designer of a text editor interface who would start from imagining users in terms of an information processor would never arrive at the interfaces that are in successful common use today. With the information processor description there is just 'knowledge' in the form of text. So the task would be just to copy that text from one end to the other.

What is missing, more than anything, in any of these descriptions, is any mention of what it is that drives me forward in my activity. Why do I do anything at all? Why do I do one thing rather than another? These descriptions give no hint at how to relate my being active to the total situation in which I find myself.

4. Description in terms of the stream of thought

The objections to the description of my writing activity set forth above are merely samples of the discussion of human thinking, knowing, perception, and language, presented much more fully in earlier papers (Naur, 1992) and in two books (Naur, 1995c and 1999).

Likewise, the following alternative description of the activity is based on the discussions of these books. This is a description according to classical psychology (James, 1890). It builds on a *description of my experience*, my stream of thought, as it is known to me through introspection. I experience my being situated on my chair, surrounded by the things of my room, seeing the complicated panorama of my workplace, with papers lying around and the screen and the keyboard, hearing faint noises coming and going, feeling slight tickles and pressures in various parts of my body. Every aspect of this mental state has a fringe around it, consisting of thoughts of innumerable issues that relate to it and feelings that it arouses in me. This whole state at any moment is immensely complicated, entirely beyond complete description, and is yet experienced as a whole, in a single pulse of consciousness. The state changes from one moment to the next, being never the same twice.

In this total situation in which I find myself I am able to turn my attention to my current book-writing-activity. This activity, which in James's manner of speaking is an acquaintance object (concept) in my stream of thought, has been the permanent anchor of many of my thoughts and activities over the last many months. My activity at the present moment derives its attendant *positive feeling of significance* from its meaningful relation to that permanent acquaintance object (concept).

4.1 Feelings of aching void

My mental activity during a pause of finger activity, such as it may be observed by the behaviourist psychologist, has at the center of my attention the meaning of a particular point in the text I am in the process of composing. My mental state is in incessant change, mostly in transitive parts of the stream of thought, the feelings that are part of it undergoing a cycle. During the first part of a pause of my finger work my states are dominated by the *feeling of the aching void* corresponding to the place in the text on the screen to which I wish to add text. This feeling of aching void is highly specific, characterized by my understanding of the text I am in the middle of composing, and of the still missing portion of it that I wish to enter. While this feeling of void prevails, my state will make rapid transitions, my attention wandering between inarticulate notions of the kind of thing I wish to say and my reading of bits of the text that I have already written. During these rapid transitional states of my thought, far too rapid and numerous to be described in detail, my attention is turned in succession to a number of notions and verbal phrases that share close similarities to that which may fill my aching void. By this direction of my attention I try to activate such habits of mine that tend to call forth such verbal phrases that are associated to the inarticulate notions that engage my attention.

4.2 Fringe meanings of verbal phrases

These transitional mental states of mine suddenly change to a substantive state, in which a *word or a verbal phrase* in spoken form appears to my mental ear. With this substantive state my feeling of void changes to feelings related to the new mental phrase and its fringe of meanings. These feelings accompany new transitive states in which I introspectively examine the verbal phrase. These feelings may be of several kinds. They may be of uncertainty and doubt whether

the phrase fills the place of void adequately, in view of the *fringe meanings of the verbal phrase*. Such a feeling may give rise to a new feeling of void and to new transitional states, possibly leading to a new association, giving an alternative verbal phrase, and a decision to reject the first one obtained. Or the feeling may be one of satisfaction with the way the newfound phrase fills my aching void, and if so the mental state may by association lead to the *sequence of rapid transitional mental states in which my fingers press the keys*.

4.3 Helping creative associations

In terms of this description of the process, it is important to note that the

newly discovered phrase is not a random guess, but a result of the process of creative association.

These images are the substance out of which my writing activity grows. At any odd moment of the day or night I may let them pass in review, activating my accompanying feelings of void, all the time seeking to achieve, by association, new relevant verbal formulations. Whenever such a phrase comes to me I have to record it in writing, as a note, since otherwise it may again slip from my mind. As soon as possible I then enter these new formulations into the text in progress. Then I sometimes find that they are not really new, that they repeat an idea already recorded in the text, usually in other words.

In my formulation activity I can rely on no extended text in my 'memory', such as the advocates of the human information processor would claim there is. Not even the text that I am actively engaged in composing, that to which I come back in daily work sessions, is present to me. If it were lost my reconstruction of it would require a substantial new effort.

Knowing a text by heart is a special situation, having acquired the dispositions to rattle off a particular sequence of associations, like a musician playing a piece by heart. This does not imply any special insight into the matter. Facility in memorizing text is highly personal, some have it, some don't.

In presenting this description of my own experience I do not wish to insist that other people experience the analogous situation in precisely this way. Even so it seems quite obvious that the people who have designed the interface to the text editor which I am using, like those of many of similar editors, have had in mind a user experiencing his or her situation more or less in the way I have just described. This is clear from the way the process is set up, from the presentation before my eyes in a convenient format of a long stretch of the text I have already composed and the availability of convenient ways of making additions and changes at any point of that text.

5. Metaphors of the mental activity

Most of today's thinking about human mental life is guided by the notion of the human information processor. The statement is met with, for example in books on cognitive science, that the mind *is* an information processor. It seems to be overlooked that such a statement at best is no more than a description. The honest way of putting it is to say that the mind may be described as an information processor and leave the metaphysics of the matter to the Aristotelian philosopher. It then becomes clear that there may be other relevant descriptions of the mind. To stir your imagination I would like to present you with a few other such descriptions.

5.1 Jumping octopus: metaphor of the state of consciousness

The mental activity is like a jumping octopus in a pile of rags. This metaphor is meant to indicate the way in which the state of consciousness at any moment has a field of central awareness, that part of the rag pile in which the body of the octopus is located. The arms of the octopus stretch out into others parts of the rag pile, those parts presenting themselves vaguely, as the fringe of the central field. The rags of the pile are the mental objects that may come to the conscious awareness. They are of all colors and shapes. The jumping about of the octopus indicates how the state of consciousness changes from one moment to the next.

5.2 Building site: metaphor of a person's insights

A person's insight is like a site of buildings in incomplete state of construction. This metaphor is meant to indicate the mixture of order and inconsistency characterizing any person's insights. These insights group themselves in many ways, the groups being mutually dependent by many degrees, some closely, some slightly. As an incomplete building may be employed as shelter, so the insights had by a person in any particular field may be useful even if restricted in scope. And as the unfinished buildings of a site may conform to no plan, so a person may go through life having incoherent insights.

5.3 Splashes over the waves: metaphor of a person's utterances

A person's utterances relate to the person's insights as the splashes over the waves to the rolling sea below. This metaphor is meant to indicate the ephemeral character of our verbal utterances, their being formed, not as a copy of insight already in verbal form, but as a result of an activity of formulation taking place at the moment of the utterance.

As this metaphor suggests, the widespread notion that a person's language activity involves 'meanings' of words held in 'memory' is misguided. That this notion continues to be perpetrated is perhaps the most astounding case of current psychological misconceptions, considering the unreasonableness of its implications. Thus by the notion every one of us has in our 'memory' the complete set of possible 'meanings' of each word. Take for example one of the words 'he' or 'she'. By the notion we have in 'memory' 'meanings' corresponding to each of the few billion persons in the world, live or dead, that these words might designate, and every time someone talks to us and uses one of these two words our mental machinery supposedly is faced with the choice between these billions of persons. This does not make sense. As every one of us knows, when someone talks to us about a 'he' or a 'she', what is meant is that one person, male or female, who is being talked about in the context of the conversation. The whole story of meanings of words held in a 'memory' is a myth.

5.4 Mental objects

All of linguistic activity, speaking and understanding, may be described entirely in terms of habitual associations, precisely as any other actions and perceptions. But as established by William James, what enters into associations is not simple ideas, but the mental objects that appear to us in our stream of thought, each of which is a complicated whole, with a fringe of relations and feelings.

By way of contrast to these metaphors, that of the human mind as an information processor, is highly misleading. This will be clear as soon as the ability of humans to act as or simulate machines is considered. As just one example, a human being trying to act as a machine performing that sort of action in which machines excel, to wit, indefinite repetition of a short pattern of operations, will soon be found to fail. There is significant insight expressed in the stock phrase: mindless repetition.

6. Psychological misguidance of CHI

The failings of the prevailing notions of psychology make these notions misleading as guides to the design of CHI interfaces. Five areas of harmful influences may be mentioned:

6.1 Designing for artificial people

Current psychology tends to adopt the ideas of artificial intelligence, as a description of people. Designing CHI interfaces upon such ideas is tantamount to designing, not for real people, but for artificial people.

6.2 Habit

Describing people in terms of 'knowledge' or 'mental models' has the consequence that the dynamics of thought, the ways thoughts develop, tend to be ignored. In particular the all-pervading importance of *habit* on all human activity is lost from sight. Thus in the context of CHI the stress tends to be on the users' first contact with the interfaces, not on the way the interfaces work for users who have well developed habits in their use. Also the need for acquiring habits tends to be ignored. A habit must be acquired by training, by doing the proper actions in their correct order and manner many times. 'Many' means of the order of hundreds. Habits have to be trained and maintained.

6.3 Inattentive use of equipment

The importance of habit displays itself particularly in *inattentive use of equipment*. Inattentive use is undoubtedly the dominating mode of using computers by anyone who is not a mere beginner. However, as found by Stroem (Stroem, 1996), the inattentive user has to be described as being aware of a certain activity without paying attention to it. This state makes no sense in terms of a human information processor. The development of interface design principles for inattentive operation must build on describing the mental activity in terms of the stream of thought, its objects and their fringes.

6.4 Individuality of imagery

Descriptions of people in terms of 'knowledge' or 'mental models' leave no place for the importance of people's *imagery* in their activity. More particularly, the great *differences of forms of imagery* experienced by various people is lost from sight. The fact that individuals differ greatly in what forms of imagery they experience is a major result of classical psychology which by its very nature is difficult to grasp and to accept. We all tend to assume that as we ourselves experience our stream of thought, so do all other people also.

However, as first found in classical studies by Galton (James, 1890), the imagery that people experience differs enormously from one person to another. For example, some people, notable many scientific persons, have feeble powers of visual imaging.

Galton distinguished between visual, auditory, or motoric images. In an investigation of many scientists from several different fields (Roe, 1953) it is found that they experience images of the following kinds:

- Concrete visual, usually 3-dimensional
- Visual diagram, geometrical, etc.
- Visualized symbols
- Verbalized formulae etc.
- Verbal imagery
- Imageless thought
- Kinesthetic experience

Undoubtedly, a person's imagery enters as a decisive part of that person's activities. In particular, the person's planning of an activity depends on the images of the coming situations the person will have. This is relevant to the design of interfaces to such computer applications that try to help users in their planning.

6.5 Individuality of perception of description forms

The *perception of various forms of description* differs greatly from one person to another. Such individual differences have been demonstrated empirically, in the perception of certain kinds of formal description used as descriptions of computer programs, see (Naur, 1993a).

The individuality of the perception of description forms means that a form of description that one person finds highly effective, to another person may be worthless. This is highly relevant to the design of man-computer interfaces that are intended for use by any one other than the designer.

7. Conclusions

The defects of the behavioristic descriptions of human thinking that currently tend to be adopted by workers in CHI have been displayed. By basing the work on the descriptions of classical empirical psychology, benefits to the field of CHI may be reaped concerning habits, inattentive use of equipment, individuality of imagery, and individuality of perception of description forms.

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Appendix 2

Revised translation from *Datalogi som videnskab* (Naur, 1995b), presented at the 25 year celebration of Datalogisk Institut, Københavns Universitet, 1995 March 31. It elaborates on issues presented in chapter 15.

Computing as science

Abstract

As the basis for discussing computing, problems of the scientific status of several other fields of enquiry are first examined. It is concluded that understanding science in terms of logic, rules, or philosophy, is misguided. Next several current notions of science, including those of Popper and Kuhn, are rejected on the grounds that each of them fails, both to describe the actual scientific activity properly and to explain the cultural significance of science. A new notion is proposed: The core of science and scholarship is coherent description. Computing is scientifically significant in so far as it is concerned with data structures and data processes used in descriptions. Thus the subject and object oriented properties of data structures and data processes are scientifically equally important.

Computing versus computer science

Raising a question about the issue given as the title may appear to be idle. Computing as science, that is computer science, isn't it! One of the points of the present discussion is that this notion is misguided, in several ways. For one thing it will be argued that being scientific is not an attribute of fields of inquiry. For another, since the word 'science' and its derivatives, such as 'scientific', have strong positive associations, putting this word into the name of your activity is a way of declaring the high merit of it. Unfortunately just choosing a name does not add solidity to anything, and may even foster the suspicion that your concern has as little substance as the Emperor's New Clothes. After all, the established scientific fields, such as physics, chemistry, and biology, have been pursued without needing flags to announce their respectability. Thus there are good reasons to reconsider the relation between computing and science.

The problems of being scientific

In discussing what is scientific about computing I shall take an empirical approach and start by considering what is scientific in other fields of learning. As particularly relevant I shall consider such cases in which the scientific issue has given occasion to debate of direct importance to the pursuit of a field. Many such cases have been discussed actively during the past century.

One of these cases concerns psychology, i.e. the study of human mental life. From about 1910 psychology has been entirely dominated by ideological attitudes, first behaviorism and more recently cognitivism. According to behaviorism scientific psychology cannot concern itself with the immediate human experience, the thoughts people have, the images they experience, or the feelings that infuse their state. According to behaviorism psychologists can only be concerned with such aspects of the mental activity of a person that can be observed by others than the person himself. A prominent justification for this attitude is the desire that psychology shall be like the natural sciences, physics in particular, and therefore shall build on measurements. Physics is chosen as the

model because it is assumed that this field is in some manner based on logic and truth.

Around the same time as the behaviorists have taken the natural sciences to be the ideal scientific fields, the same natural sciences, physics in particular, have been in a state of perplexity. This perplexity arose from the unprecedented discoveries in physics during the first half of the 20th century, first Einstein's theory of relativity, then Bohr's theory of the atom, and quantum mechanics. These discoveries forced the physicists to employ descriptions of the phenomena that escape logical categories. A well known example is the electron, which in some situations behaves like a particle having a definite, very small size, while in other situations it has to be described as an advancing wave motion. Thus the question: 'Is the electron a particle?' can be answered neither yes nor no.

A third case which is relevant to the discussion of computing is the change of attitude to their field that during the past century has taken effect among mathematicians. This change has two sides, the one being the splitting of mathematical topics into two kinds, applied mathematics and pure mathematics. The other side is a turning of the attention of the mathematicians, away from the applied, toward the pure kind. There appears to be a strong opinion among mathematicians that only pure mathematics is scientifically respectable.

As the fourth relevant circumstance comes the discussion about the scientific activity itself. It goes back to the nineteenth century when the question what has to be understood as scientific validity was discussed by such philosophers as John Stuart Mill. This discussion established logical criteria for what was called scientific method, proof, and truth. In the 20th century the discussion has continued, with ever new notions. Among the best known are Popper's replacement of the earlier requirement of logical truth by a requirement that it should be possible to falsify scientific theories and Kuhn's talk about scientific paradigms and crises.

A fifth relevant matter has been the talk about the so-called foundations of various sciences. This discussion has its origin in the situation of mathematics. Since antiquity mathematics has been regarded as the realization of the notion of absolute truth. Euclid's geometry, with its proofs of properties of geometrical figures, has for two thousand years been considered as the ideal of mental activity. During the nineteenth century many mathematicians tried to find a so-called foundation of all the mathematics which is used in fields such as physics and astronomy. This endeavor reached a climax during the first decades of our century. It collapsed in 1931 when Gödel showed that a satisfactory foundation of arithmetic cannot be found.

A sixth relevant matter is the understanding of human thought. An influential tradition will have it that the activity of thought consists in reasoning, where elements of the contents of thought are combined by logical rules. Thus David Hume maintained that thought is composed of distinct ideas, and Boole's famous work from 1854, in which he expressed logical connections by means of formulae, has the telling title: *An Investigation of the Laws of Thought, on Which Are Founded the Mathematical Theories of Logic and Probability*.

A seventh relevant matter is the way the human linguistic activity is described. Since about 1920 linguistics has become dominated by ideologies: saussurism and chomskyism.

Appendix 2: Computing as science

An eighth circumstance is the influence from computers on how human mental activity is described. During the last 40 years many psychologists seem to talk about human beings as being information processors as a matter of course.

In the present context it is significant to note a common feature of the issues presented above: they all depend decisively on logic or rules.

The mystique of logic, rules, and philosophy

In the perspective of this series of relevant circumstances it should be clear that the clarification of the scientific aspect in a new field such as computing raises a host of questions. Looking more closely into the matter one may soon perceive that much of the talk about science that builds on logic and rules is problematic. If one wants to investigate the questions more closely one has to enter into a more comprehensive study of the place of logic and rules, not only in a scientific context, but in human understanding and insight as a whole, and in language. I have therefore made such a study, which has been published as a book (Naur, 1995c): *Knowing and the Mystique of Logic and Rules*. In this human knowing is examined as it emerges from classical empirical psychology, with its ramifications into language, computing, science, and scholarship. While the discussion takes empirical support from a wide range, claims for the significance of logic and rules are challenged throughout. Highlights of the discussion:

- knowing is a matter of habits or dispositions that guide the person's stream of consciousness;
- rules of language are descriptions of linguistic styles and have no significance in language production and understanding;
- statements that may be true or false enter into ordinary linguistic activity, not as elements of messages, but merely as summaries of situations, with a view to action;
- in computer programming the significance of logic, proof, and formalized description, is incidental and subject to the programmer's personality;
- analysis of computer modelling of the mental activity shows that in describing human knowing the computer is irrelevant;
- in accounting for the scholarly/scientific activity, logic and rules are impotent;
- a novel theory: scholarship and science have coherent descriptions as their core.

Besides logic and rules another pervasive influence upon discussions of issues of science comes from philosophy, more specifically from the notion that there are people, called philosophers, who possess insight into scientific matters which is superior to that of those who actually pursue it. This matter I have examined in a recent study (Naur, 2001). This displays the misleading influence of the writings of several prominent philosophers upon the understanding of matters of human thinking and linguistic and scientific activity. As related more specifically to computing the matter is discussed in (Naur, 2000, in Appendix 1).

Taking these discussions and results as the point of departure we shall now consider what to understand by science and what is the place of computing therein.

Science: a range of notions

There is no shortage of notions of what science is. The question has been discussed eagerly during the past hundred years or more, but no wide agreement has been arrived at. I myself have not among the many notions found any that I can accept. I have therefore felt urged to present yet another one. Before discussing this I shall sketch several other notions and give my reasons for rejecting them.

Since the middle of the 20th century the discussion of what science is has been dominated by Popper's notion. A characteristic property of this notion appears from the title of the work in which Popper has presented it: *The Logic of Scientific Discovery* (Popper, 1959, first published in German in 1934). Popper insists that anything deserving the name of science must be a matter of logic. He starts from the claim that all science proceeds by the scientist putting forward statements, or systems of statements, and testing them step by step. However, the earlier notion that the scientific theories about nature are true he rejects. Instead he talks about theories that may be falsified, may be shown not to be true.

As discussed in chapter 4.5 of (Naur, 1995c) the whole of Popper's construction is defect. It does not match the way actual scientific work proceeds. In Watson and Crick's work on the structure of DNA one finds neither statements that are tested nor theories that may be true or false. Their epoch-making discovery, a model of the structure of the DNA molecule, cannot be called a theory, and it cannot be claimed to be either true or false.

After Popper the most prominent science theoretician is Kuhn. His main thesis is the claim that the development of each scientific field takes place as an alternation between periods of so-called normal science and crises (Kuhn, 1970). During periods of normal science the work within the field builds on what Kuhn calls a paradigm. During a crisis one paradigm is replaced by another one.

As discussed in detail in chapter 4.5 of (Naur, 1995c) Kuhn's thesis fails by its dependence on the notion of paradigms. If the difference between normal science and crises shall make sense the paradigms of each field must be strictly delimited concepts. But actual science does not happen in such a way, not even the episodes that Kuhn describes in support of his notion.

But Kuhn has had great success. Everybody talks about paradigms, although what is meant thereby often has no similarity to the way the word is used by Kuhn. Thus the ACM Task Force on the Core of Computer Science (Denning, Comer, et al. 1989), characterizes computing in terms of 'three major paradigms, or cultural styles', denoted theory, abstraction (modelling), and design. Each of these three paradigms is described by the Task Force in terms of four steps that supposedly are taken by such persons who work at a problem within the corresponding cultural style.

However, this characterization of computing has no support in scientific practice. It evidently has been thought out by people who are versed in mathematics and logic, but without first hand insight into how scientists and engineers proceed. How such work takes place I have experienced through my activity in astronomy, perhaps the field having the longest scientific traditions, discussed in detail in chapter 4.2 of (Naur, 1995c). Another source of insight into scientific practice is James Watson's book *The Double Helix* about how the epoch-making discovery of the structure of DNA took place (Watson, 1968). This is discussed in detail in chapter 4.1 of (Naur, 1995c).

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A comparison of my objections to the above notions about science will show that they can all be viewed in the same perspective. My objection is in each case that the notion fails as a description. In other words, these notions do not cohere with other well established facts about the activities we like to call scientific.

Added to this comes another objection of a more profound kind. This objection is that none of the notions explains why science should be of special significance to human culture more generally. Thus if, as Popper will have it, science is a matter of logic, then science will be important to such persons who are greatly concerned about issues of logic. But science will be of no importance to the large majority of humanity, to whom matters of logic as such are of little interest. In my opinion any notion that explains science merely as a subordinate detail of human culture is a failure.

Scholarship and science as centered in coherent descriptions

From these considerations I have developed a new notion, or if you will, theory, of scholarship and science. This notion is that the common core of such activities we call scholarly/scientific is the concern with *descriptions of a certain character of aspects of the world*. The most important feature of this character is that the descriptions should be *coherent* with other descriptions. This notion is presented in terms of a wide range of fields of inquiry in chapter 4.6 of (Naur, 1995c).

With descriptions as the core, the cultural significance of scholarship and science becomes evident. The point is that descriptions are the necessary precondition of exogenetic heredity, that is the form of heredity which is passed on through the upbringing and teaching of new generations. An important difference between the human culture and all other biological cultures is that humanity is the only biological species that promulgates exogenetic heredity through descriptions. As said by Medawar (1982): 'it was not so much the devising of a wheel that was distinctively human ... as the communication to others, particularly in the succeeding generation, of the know-how to make a wheel.'

This notion of scholarship and science as tied to descriptions I shall start by applying to scholarship and science themselves. Thus I shall demand of a discussion of the phenomena of scholarship and science which calls itself scholarly/scientific, that its central issue is to *describe how scholarship and science are in fact pursued*.

As applied to other areas of life, it is immediately clear that any description, whether scholarly/scientific or not, involves a *choice of an aspect of the world*. A complete description of the world is unthinkable, for that the world is too rich and multifarious. What distinguishes different scholarly/scientific fields is in the first instance what aspect of the world each field describes. Thus the division into scholarly/scientific fields is given by the division of the world into aspects, as they appear to our immediate experience as human beings in the world.

This notion of scholarship/science includes all that is called theories and causal explanations, for example as they are developed in physics. The point is that such theories and causal explanations are nothing more than special forms of description. Such matters are discussed in chapter 4.4 of (Naur, 1995c).

In this way we have evaded the mystique of logic. Indeed, descriptions are

neither true nor false, neither can they be complete, they are merely more or less adequate. What distinguishes scholarly/scientific descriptions before others is that *taken as a whole across fields they cohere* and that they cohere with descriptions of such matters that have been ascertained by the evidence of many persons. But coherence is a relation which is found in many degrees and shades and can be ascertained only through human insight.

The coherence which is the present concern only makes sense in relation to such other descriptions that are available at a definite time. Thus scholarship and science become dependent upon a certain *historical situation of the human society*, including in particular the scholarly/scientific descriptions established at the time.

Forms of scholarly/scientific descriptions

Viewing scholarship and science as a matter of coherent descriptions leads directly to another important aspect of scholarship and science, viz. *the forms of scholarly/scientific descriptions*, discussed in chapter 4.6 of (Naur, 1995c)

Descriptions in the present sense are inherently matters of communicating the understanding of human beings about the world in which we find ourselves. Any aspect of the world can usually be described in many ways and in terms of many different forms of description. For example, the aspect given immediately to a person at a given moment, the person's instantaneous state of experience, may be described with pictures, sounds, and words. Each of these modes may be used in descriptions of many different forms. Thus any description implies a choice of a form of description.

But formulation and use of descriptions is a human activity, and the reactions to forms of description differ greatly from one person to another. What is an advantageous choice of form of description depends greatly on individual characteristics of the person who wishes to produce and understand the description.

Scholarship and science are not bound to any definite form of description, such as use of formalized modes. On the contrary, it must be considered an important part of any scholarly/scientific description that a conscious *choice of form of description* is made. A form of description in the first instance is determined by a choice of notions and terms. However, to this comes an unlimited range in the choice of further descriptive elements. They may be graphical forms, pictures, figures, formulae, etc. But they may also be three-dimensional models, mechanisms, and processes. The most advantageous choice depends entirely on what is described and will normally be entirely different from one aspect of the world to another.

According to this notion part of what Kuhn calls a paradigm shift within a field may be understood as a changed choice of description form for the aspects of the world described in the field. As examples of such new forms of description that have been revolutionary in physics may be mentioned Heisenberg's matrix mechanics and Schrödinger's wave mechanics.

The scholarly/scientific activity

With coherent descriptions as the core of scholarship and science, the task of the scholarly/scientific activity is to produce new coherent descriptions. 'New' in this context means something that advances beyond what is already available in coherent descriptions at the time of the activity.

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A description may advance further either by describing more objects, or by describing more properties of objects that have already been described, or by using other forms of description.

With this understanding what makes an activity scholarly/scientific is a property of the result, not of the way the activity has been carried out. In this I believe I am coherent with the common understanding. The point is that we only exceptionally have information about how the scholars and scientists made their discoveries, and the little we know has no importance for our evaluation of the quality of their discoveries. Scientific method, understood as a prescription for a way of proceeding, becomes void of sense.

Scholarly/scientific fields

When scholarship and science is a matter of coherent descriptions, what can be pursued in a scholarly/scientific manner will readily embrace the full range of academic fields, from the humanities to natural science, as discussed in chapter 4.6 of (Naur, 1995c). But by the decisive demand that the descriptions must be broadly coherent, there is no basis for talking about distinctly separate sciences. The division into fields and disciplines becomes merely an organizational matter which has no clear significance for scholarship and science. The question whether a field of activity that may give occasion for description, such as for example physics, psychology, or computing, is a science, loses sense.

Likewise the distinction between descriptions that are scholarly/scientific and such that are not becomes blurred. As illustration one may consider descriptions of the aspect of the world that may broadly be called the mental activity of human beings. Such descriptions may aim at the features of this activity which may be found similarly with many persons. They belong in psychology. Other descriptions may take as their topic the mental activity of selected individuals. They are known as biography. As a still further possibility a description may aim at the mental activity of fictitious persons. Such are found in novels. The scholarly/scientific weight in each case depends on the degree of coherence with other descriptions which is achieved. This coherence can clearly become most extensive in the descriptions of psychology, it will be more restricted in biography, and narrowest in novels.

Concerning the so-called foundations of sciences I refer to an earlier discussion (Naur, 1990). Here it is found that the claim for the importance of logical foundations of scientific fields lacks coherent justification.

Computing, descriptions, and forms of description

Adopting the notion of scholarly/scientific activity described above, we shall now consider computing as science. The question is what it is in the activity of computing that may be pursued in a scholarly/scientific manner.

Our point of departure is that computing is the active human concern with data structures and data processes. This activity may be pursued in many ways, many of which raise no scholarly/scientific issue. Scholarship and science come to the fore when the activity gives rise to description.

From the point of departure just given it is clear that *description in computing is a matter of accounting for properties of data structures and data processes*. This is relevant, first of all, in the case of new inventions. According

to the present notion the making of an invention, for example of a new algorithm or a new manner of structuring data, is not by itself an activity that may be pursued in a scientific manner. Scholarship and science come in only when the invention is described. The description is scholarly/scientifically sound in so far as it accounts for the properties of the invention in broad coherence with other descriptions, in particular such that deal with other relevant data structures and data processes.

Up to this point the scope for description in computing is the same as may be found with regard to any aspect of the world whatsoever. The scholar/scientist in computing describes data structures and data processes in a like manner as the botanist describes plants.

But upon closer look the various fields of insight will be found to differ, by properties of the aspect of the world with which they are concerned. The aspect of computing is data structures and data processes. These are matters that have arisen and are found merely as human mental imagery. But this imagery is not arbitrary. Within the unlimited panorama of images and other mental objects that are born by human imagination, data structures and data processes belong to a very special part, namely such that are suitable as *elements of descriptions of other aspects of the world*. This indicates some properties of data structures and data processes that are specific for computing and a few other fields, but are not found generally in the other fields of activity. These are *the properties of data structures and data processes as elements of descriptions of other aspects of the world*.

A detailed characterization of the use of data structures and data processes as elements of description would have to cover most of the spectrum of computer applications and might lead very far. Potentially the topics that may be described comprise anything human beings want to deal with in a systematic manner. Here we shall merely indicate that such topics range from publicly accessible matters, some of which may be described by constructed models, to private notions, such as plans of activity, which may be described by pictures and texts.

The subject matter of computing by its nature is something that may be used as part of descriptions. It follows that among the properties of data structures and data processes that come up for concern and description in computing there are such that relate to such use. But descriptions by their nature have two sides, on the one side something which is described, on the other persons who formulate and understand the description. Therefore the properties of particular data structures and data processes used as parts of descriptions will be of two categories. One category is *object-oriented properties*, i.e. such that are oriented toward what is described. The other category is *subject-oriented properties*, such that are oriented toward the persons who will formulate and understand the descriptions.

The relation between object-oriented and subject-oriented properties in computing corresponds roughly to the relation between the study of data structures and algorithms on the one side, and the study of human-computer interactions on the other.

The importance of descriptions, forms of description, and subject-oriented properties in computing, is confirmed from another direction by the prominent place in computing of programming languages. A programming language serves to describe data processes. Thus it specifies a form of description at a metalevel in relation to the data processes. The fact that many programming languages have been developed, many of which have quite similar object-oriented properties, confirms the importance of subject-oriented properties of objects of computing.

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However, as a consequence of the individual variety of human beings the determination and description of subject-oriented properties in computing is difficult and complicated, and poses the greatest problems of the field. For this reason there is in computing a definite tendency that such problems are treated superficially, or are ignored.

Coherence beyond computing

According to the present point of view scholarship and science are matters of the broad coherence of descriptions. In computing the coherence across the fields of insight is reflected particularly in the way the scholar/scientist uses such descriptive notions and designations that are shared with other fields.

The matter may be illustrated by a consideration of the numerous cases where scholar/scientists of computing have used descriptive notions and designations with poor coherence across the fields and the level of scholarship and science thereby becomes low. One group of such cases is concerned with a vocabulary that mostly is taken to belong to logic in some sense. It is a question of words such as proof, correctness, and truth. As discussed in more detail in (Naur, 1990) there is in computing a widespread tendency to adopt tacitly some primitive notions about logic and its significance in scholarship and science which is incoherent with the practice in the better established scholarly/scientific fields.

Other examples of poor coherence in the use of descriptive denotations in computing is found in the description of subject-oriented properties of programming notations. As shown in an earlier discussion (Naur, 1989b), a typical pattern in published descriptions of such notations is that the description starts by stating that for some purpose there is a need for a more convenient or understandable notation. Then a new notation is presented, with a detailed description of its object-oriented properties. In the conclusion it is then claimed that the notation is as convenient or understandable as desired, without support from any evidence. In such a presentation it is ignored that the use of such descriptive designations as 'convenient' or 'understandable' in itself is an appeal to coherence with descriptions of human experience.

The talk about automatic programming, which has been a regular feature of the literature of computing over the last 40 years, is incoherent with the talk about automatism in other contexts. Misunderstandings in this area may have far reaching political implications, as pointed out in (Parnas, 1985) in relation to strategic defense systems

Yet another prominent group of cases of this kind goes back to the pioneering era of computers, starting from the description of such machines as 'giant brains'. A few years later this line continued with the talk about 'artificial intelligence' and more recently about 'intelligent user interfaces'. As discussed in more detail elsewhere (Naur, 1986, and chapter 3.4 of Naur, 1995c), this manner of describing matters of computing accords poorly with the established notions of other fields.

The designation 'knowledge-based' applied to programs suggests that the programs function in the same manner as insightful persons (Hayes-Roth and Jacobstein, 1994). The designation is incoherent with the talk about knowing in psychology. Upon closer examination it will be found that the designation covers a certain manner of organizing such programs that include descriptions of certain kinds of human imagery.

The label 'expert system' used about certain programs suggests that these programs work in the same way as the mental activity of human experts. This suggestion lacks support in the description of human mental activity in psychology.

For most of the above cases of use of descriptive designations having poor coherence across fields it holds that the designations have been chosen primarily as being promotional for the data structures and data processes they have been applied to, not as coherently descriptive. The designations are evidence of a standing conflict in computing between scholarship and science on one side and commercialism, typically expressed in sales talk in applications for public funding of research projects, on the other.

Conclusion

Scholarship and science are primarily matters of coherent descriptions, but neither is a matter of fields of human activity or of modes or methods of work.

Computing is concerned with data structures and data processes, which are objects of imagery suitable as elements of certain forms of description of certain aspects of the world. A description of data structures and data processes in computing is scholarly/scientific in so far as it is coherent with other descriptions of relevant issues within or outside of computing.

By being suitable as elements of description, data structures and data processes have *partly* object-oriented properties, i.e. such that are oriented toward that which in an application of them is the object of the description, *partly* subject-oriented properties, i.e. such that are oriented toward the persons who in the application of the data structures and data processes formulate and understand the descriptions. In order to achieve the widest coherence, and thereby to become scholarly and scientifically most ample, the description of data structures and data processes in computing have to be concerned with both object-oriented and subject-oriented properties.

I am indebted to Erik Frøkjær for his perceptive and constructive remarks to earlier versions of this discussion.

Appendix 3

2000 November 4, published on the internet at www.naur.com. The investigation supports the argumentation in sections 2 and 3.

Philosophical Locutions in Scientific and Scholarly Activity

Peter Naur and Erik Frøkjær

Abstract

In the investigation, the first of its kind, information on the importance of philosophical locutions in their work has been obtained by inquiry from 80 active scientists/scholars. The responses show that only a minority of the respondents attach any positive value to philosophical locutions. In a further analysis the philosophical locutions have been seen in relation to several aspects of the scientific/scholarly activity: forms of description employed, thinking going on, manners or methods of proceeding, ideology, and consequences to human welfare. In each case the understanding of the philosophical locutions displayed in the responses is found to be unclear, misleading, or contradictory. As a contrast, Naur's antiphilosophical theory of science/scholarship, coherent description, is shown to establish a clear description of the scientific/scholarly activity. In the conclusion it is shown how the confusions and contradictions around the philosophical locutions arise from dogmatic, presumptuous philosophical ideology.

1. Introduction

The report describes an investigation in which 80 active scientists and scholars have answered questions about the importance of philosophical locutions for their scientific and scholarly activity. Following an account of the background of the investigation, the questions posed to the scientists and scholars are given. This is followed by an account, with quotations, of the answers received. The following analysis of the answers is centered around several different aspects of the scientific/scholarly activity. In a final conclusion the importance of philosophical locutions in scientific/scholarly activity is dismissed.

2. Filosofikum in the Danish university education

The background of the present investigation is a debate in Danish public media concerning a course given at Danish universities known as Filosofikum. Filosofikum was a compulsory course for any student, usually taken during the first year of the studies, given by a professor of philosophy, on selected topics of psychology, logic, and philosophy. It was a fixed part of the university curriculum for centuries until it was discontinued in 1971.

The recent debate concerning Filosofikum was initiated by a feature article in the daily newspaper Politiken on 2000 Febr. 12, titled The Necessity of Filosofikum, by Claus Emmeche, Simo Køppe and Frederik Stjernfelt. They wrote here among other things: 'The most important reason to introduce a new Filosofikum is to us in the last resort a question of science/scholarship. There are important connections between philosophy and science/scholarship, and a new

Filosofikum in the longer run would be able to strengthen research.’ And later: ‘The question of reductionism and of the relation between scientific/scholarly descriptions and complex phenomena as a whole is in itself a philosophical problem of which philosophy and the theory of science/scholarship may supply fundamental analyses.’

A notable contribution to this debate was published in *Universitetsavisen* on 2000 May 4: *Deliver Us From Philosophy*, by Peter Naur. Here it is said: ‘The philosophers’ claim that their theories of science/scholarship are important to the work of scholar/scientists is pure nonsense, originating in the presumptuous imaginations of philosophers.’ And later: ‘It may be testified both by myself and by most other active scholar/scientists that the philosophers’ talk neither has nor has had the slightest value to what we are doing in our ongoing work. ... The understanding of how creative scientific/scholarly work takes place can only come from those who are able to do it, that is from active scholar/scientists.’ This contribution gave rise to a heated debate in *Universitetsavisen* on 2000 May 18, June 2 and 15.

In this debate none of the contributors argued in terms of their experience as active scholars/scientists. In a wider context it is remarkable that the importance for scientific/scholarly activity of something that may be called philosophy never seems to have been investigated empirically. The closest to such an investigation of which we are aware is Anne Roe’s book *The Making of a Scientist* from 1953. In this the author, who is a psychologist, tells of her extended conversations with 64 outstanding American scholar/scientists from biology, physics, and social science. The conversations are concerned with anything that may have been of importance to the scientific/scholarly activity of these men in their early life, their manner of work, and their thinking. In these conversations there occur no philosophical locutions, nothing about logic or method.

For this reason we have undertaken to investigate the importance of philosophical locutions to scientific/scholarly activity by direct addresses to those who have been active in such activity. As evidence that a person has been scientifically/scholarly active we have chosen to take that the person’s activity is manifest in written scientific/scholarly contributions.

3. The questionnaire

The investigation was centered around a questionnaire titled: *Investigation of the importance of philosophical locutions in scientific/scholarly activity, by direct addresses to scientists and scholars*. In translation from the original Danish version, with the addition, within sharp brackets, of some notes, mostly on the translation into English, this read as follows:

To [name of scientist/scholar] Date of reply: _____

We, Erik Frøkjær and Peter Naur, address you with an invitation to contribute to an investigation of philosophical locutions [talemåder] in scientific-/scholarly [videnskabelig] activity. The background of the investigation is briefly outlined on the back side of this sheet [giving an account similar to the one in section 2 above]. In principle we address anyone who has been actively productive in scientific/scholarly [videnskabelig] activity. In practice we have sent this address to a random selection of full professors at Copenhagen University.

Appendix 3: Philosophical Locutions in Scientific and Scholarly Activity

We ask you to give information about your personal experience of the importance of philosophical locutions [talemåder] for your scientific/scholarly [videnskabelige] work. We ask you to reply by insertions in the form below, or in any other form you might prefer.

Information on the submission is given on the back side [asking for reply as soon as possible, and stating Erik Frøkjær's mail, email, and fax addresses].

In case you do not otherwise wish to contribute information in this context, we would be grateful to have your reasons for this:

My year of birth: _____ I have been scientifically/scholarly [videnskabeligt] active during the years: _____

My scientific/scholarly [videnskabelige] activity has led to the production of written scientific/scholarly [videnskabelige] contributions to the following extent: appr. _____ articles/papers in scientific/scholarly [videnskabelige] journals and/or congress proceedings, appr. _____ books, and additionally:

My scientific/scholarly [videnskabelige] contributions primarily lie within the following fields: _____

About the importance of philosophical locutions [talemåder] (such as *deductive method* [deduktiv metode], *(theory of) knowledge* [erkendelse(steori)], *falsification* [falsifikation], *formal logic* [formel logik], *phenomenology* [fænomenologi], *paradigm* [paradigme], *reductionism* [reduktionisme], *relativism* [relativisme], *structuralism* [strukturealisme], *(theory of) science/scholarship* [videnskab(steori)], *scientific method* [videnskabelig metode], *scientific truth* [videnskabelig sandhed], *scientific proof* [videnskabeligt bevis]) for my scientific-/scholarly [videnskabelige] activity, and of the sources of my familiarity with these locutions [talemåder], I can say as follows:

Name, address, phone no. and email: _____

In addition to describing the background of the investigation the back side of the questionnaire also said:

We are interested in any form of accounts that may contribute to indicating the importance of philosophical locutions to scientific/scholarly [videnskabelig] activity. The form on the other side merely serves to show what information we primarily are looking for. Accounts submitted directly to us with this form, or in other forms, we will regard as public statements, which we may edit for publication. In this there may be a need for bringing examples and quotations from the accounts received. Such material we will publish in anonymous form, unless agreed otherwise with the particular respondent.

4. Answers received from 80 scientists and scholars

The questionnaire was sent individually to each of the 240 full professors of the Copenhagen University on 2000 July 18. Answers started coming in immediately and by 2000 Sept. 21 we had received altogether 80 answers to our query.

Of the 80 respondents, 73 gave a number of their published scientific-/scholarly articles/papers. The average of these numbers for the 73 respondents is

140. The lowest figure is 25, for a respondent who in addition has been the author of 4 books. In the following description of the responses we shall pay no more attention to these figures; they give us ample reason to trust that practically all of our respondents are speaking from a background of solid first hand experience of scientific/scholarly activity.

The substance of the 80 answers to our query is given below, in the form of an account, mostly a quotation, of each. These accounts have in most cases been made by extracting from the response the answer to our main question about the importance of philosophical locutions to the respondent's activity. The identity of each respondent is given at the end of each account by one of the numbers #10 to #89, followed by the respondent's name and field of scientific/scholarly activity, in so far as each respondent has granted us the permission to make his or her identity public. These permissions were obtained in a second address to the respondents, in October 2000, in which each respondent was asked to accept our quotation from his or her answer.

According to the tenor of the answer in relation to our main question about the importance of philosophical locutions, the accounts of the answers have been divided into the following 7 groups:

- A. Refusal to answer the question posed
- B. Answer unclear in relation to scientific/scholarly activity
- C. Indications of positive importance of specific philosophical locutions
- D. Indication of positive importance of unspecific philosophical notions
- E. Of philosophical issues only formal matters of logic etc. important
- F. Philosophical locutions are of only marginal importance
- G. Philosophical locutions of no importance

Within each of the groups the answers of the respondents are given in a random order.

A. Refusal to answer the question posed, 4 responses.

Four respondents explicitly refused to answer the question posed in our investigation, and also did not give any evidence of their personal scientific-/scholarly activity. Their responses may be summarized thus:

'I have received your somewhat peculiar letter ... Even just the demagogic formulation of the title, in the style of "Have you stopped beating your wife?" contrasts strangely to the critical mention of the lack of scientific-/scholarly investigations of the importance of philosophy to scientific-/scholarly activity. You cannot seriously consider that your questionnaire letter represents such? ... My own field biostatistics ... is in daily confrontation with epistemological [erkendelsesteoretiske] problems ... activity concerning possible formalizations of causality considerations ...' #10, biostatistics.

'I do not think that answers to a questionnaire concerning locutions may contribute to clarifying the importance of philosophy to my scientific-/scholarly activity.' #11, Allan Krasnik, public health.

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One respondent presents a diatribe against our investigation:

‘This is an absurd initiative, which is executed in an entirely unacceptable way. The response form is clumsy. Of course philosophy and theory of science/scholarship [videnskabsteori] are entirely central to science/scholarship—reflection and understanding of how knowledge is produced cannot be distinguished in this way. I wish to advise you against concluding anything upon this “empirical” basis.’ #12, public health.

Another respondent presents a lengthy description of the development of courses in medical theory of science/scholarship (medicinsk videnskabsteori) at Danish universities and then continues:

‘One should not, as you say, consider whether philosophy may contribute to scientific/scholarly activity. As a matter of fact any scientific/scholarly activity (whether the scientist/scholar is aware of it or not) takes place within a theoretical frame of thought, which one ought to make as explicit as possible. And this activity must be termed philosophical. When I first saw your letter I decided not to answer it, since it (excuse me for saying so) quite simply was too naïve.’ #13, Henrik R. Wulff, clinical decision theory and ethics.

B. Answer unclear in relation to scientific/scholarly activity, 7 responses.

Seven respondents failed to give a clear answer to the question about their personal experience. The substance of their responses is given by the following summaries:

‘In the medical education of today some time is spent on theory of science/scholarship [videnskabsteori], scientific method, etc. This is not unimportant to the daily work after graduation.’ #14, Henrik S. Thomsen, radiology.

One respondent merely mentions the sources of his knowledge of philosophical issues:

‘filosofikum; course of the basic subjects of medical science/scholarship: theory of science/scholarship, clinical decision theory, statistics, medical ethics; reading and discussions.’ #15, Henrik E. Poulsen, medicine, pharmacology, clinical investigations.

One respondent merely describes some of the contents of his archive of articles:

‘science generally, creativity, serendipity, honesty, persistence, falsification. Theory of science/scholarship one may learn in one hour, practice is harder. Additionally: mathematics, statistics, language, computing, isotope techniques, and others. I do not think philosophy belongs here, with a few exceptions: Popper ...’ #16, Niels Juel Christensen, physiology-/patophysiology.

‘My field has a long tradition of systematic work with methodology and theory. This inevitably leads to theory of science/scholarship [videnskabsteori], to history of philosophy, and, not the least, to logic.’ #17, Niels Lund, mediaeval history, historical methodology.

‘All students of medicine are given a course of topics of the theory of science/scholarship [videnskabsteori] ... regular scientific methods are entirely decisive in “coordinating” infections with symptoms of disease.’ #18, experimental and patient-oriented (clinical) virology.

‘Evidence-based medicine is a “hit”. The truth of diagnostic methods. Theory of science/scholarship [videnskabsteori] is part of the education—and knowledge of basic scientific method is a prerequisite of part of science/scholarship.’ #19, Torben Veith Schroeder, medicine, surgery, vessel surgery.

‘Philosophy ... is indispensable for theology. I have for a period of several years been professor of philosophy ...’ #20, theology, history, philosophy.

C. Indications of positive importance of specific philosophical locutions, 15 responses.

Fifteen respondents expressed positive importance for their scientific/scholarly work of one or more of the locutions mentioned in the questionnaire: *deductive method* [deduktiv metode], *(theory of) knowledge* [erkendelse(steori)], *falsification* [falsifikation], *formal logic* [formel logik], *phenomenology* [fænomenologi], *paradigm* [paradigme], *reductionism* [reduktionisme], *relativism* [relativisme], *structuralism* [strukturealisme], *(theory of) science/scholarship* [videnskab(steori)], *scientific method* [videnskabelig metode], *scientific truth* [videnskabelig sandhed], *scientific proof* [videnskabeligt bevis]. Their responses may be summarized as follows.

‘Most of these philosophical locutions have been central to my scientific-/scholarly work, which concerns the philosophy of science/scholarship.’ #21, philosophy of science/scholarship, of language.

‘In my works in basic science/scholarship (including the thesis) *knowledge* [erkendelse] and/or *falsification of hypotheses* have always been the methods of work ... Recognized *scientific methods* and *scientific truth* have a natural place ...’ #22, Poul Bretlau, medicine (cancer)—basic scientific and clinical research.

‘The locutions are used regularly—particularly orally.’ #23, Ralf Peter Hemmingsen, clinical psychiatry, neurobiology.

‘I have used most of the concepts—except *phenomenology* and *scientific truth*.’ #24, linguistics.

‘Particularly in my work in phylogenetics and biogeography ... philosophical locutions play an important role ... of the terms you mention first and foremost *falsification*, but also *paradigm* and *epistemology* ...’ #25, Henrik Enghoff, biology, zoology, systematics, phylogenetics, biogeography.

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‘... particularly in the doctoral thesis I have made use of ways of thinking and terminology from the domains of knowledge that presumably are covered by several of your headings, including *deductive method*, *theory of knowledge*, *structuralism*, *videnskabsteori*, *scientific method*, and *scientific truth*, ...’ #26, Mads Bryde Andersen, jurisprudence of indenture.

‘... in my research I have used *deductive method*, *falsification*, *formal logic*, (*theory of*) *science/scholarship*.’ #27, Jens Henrik Henriksen, health, patophysiology, nuclear medicine.

‘Popper’s concept of *falsification* has been useful for me in selecting good questions (hypotheses).’ #28, Gorm Greisen, circulation of the brain, diseases of the newborn.

‘All of the concepts referred to above enter quite naturally in my work activity. Kuhn’s contribution about theory of science/scholarship was a bible to me. Marxist nonsense the bugbear. Statistical method is my daily concern.’ #29, Christian Wichmann Matthiesen, geography, regional development, planning, system analysis.

‘*falsification*, *formal logic*, *phenomenology*, *paradigm*, (*theory of*) *science/scholarship*, *scientific method*, *scientific truth*, *scientific proof* enter as necessary elements in most of my works.’ #30, Jan Ulrik Prause, ophthalmology, pathology, oncology.

‘I have profited greatly from having learned *formal logic* ... I have studied Marxist economy ... This has been very profitable in my epidemiological work.’ #31, epidemiology.

‘Philosophical locutions (concepts, problems, etc.), as well as philosophical investigations (analytic and methodological approaches) are entirely indispensable in my work. ...’ #32, Ove Kaj Pedersen, political science.

‘I used philosophic phrases in my work: *deductive method*, *formal logic*, etc.’ #33, Igor Dmitrevich Novikov, gravitational physics, astrophysics, cosmology.

‘Would I have managed in my work without philosophical knowledge? I don’t know. I use expressions such as *knowledge*, *falsification*, *phenomenology*, *paradigm*, *scientific method*, etc. and I feel that I have an idea what these locutions signify.’ #34, Elisabeth Bock, neurobiology.

‘... filosofikum ... course of *scientific method* ... Particularly of importance to the understanding of causality in epidemiological research ...’ #35, Marianne Schroll, epidemiology, geriatry.

D. Indication of positive importance of unspecific philosophical notions, 8 responses.

Positive importance of philosophical notions without attachment to specific locutions was expressed in 8 responses, summarized below.

‘These words I use extremely rarely in scientific/scholarly publications. ... As concepts the words have been of great importance in my scientific-/scholarly work.’ #36, Finn Gyntelberg, epidemiology, cardiovascular risk factors, room climate.

‘I have used Plato’s allegory of the cave directly ... H. R. Wulff’s “Videnskabsteori” og “Den samaritanske Pligt” are highly profitable to me in teaching and research ... like also K. E. Løgstrup’s “Den etiske Fordring”.’ #37, Ib Christian Bygbjerg, international health, tropical medicine, infection diseases.

‘For my own research of the environment the philosophical dimension may be highly useful ...’ #38, environmental jurisprudence, Danish, EU, and international.

‘... my thinking has not been tied to specific philosophical concepts. But I use, unconsciously, and even consciously, logic in producing science/scholarship (e.g. method, “truth” and proof).’ #39, Anders Larsson, respiration physiology under anaesthesia and intensive therapy.

‘In a strict sense I use epistemological concepts only to a slight extent. But in a wider sense my work in the history of science, history of ideas, and history of medicine is much influenced by certain directions within epistemology and moral philosophy.’ #40, Thomas Söderqvist, history of science, of medicine.

‘... in my research ... philosophical locutions and methods have been secondary, but increasingly used in relating the research to the past, the present, and the future.’ #41, Niels Tommerup, genetics and diseases.

‘... I have always been interested in philosophy, but I find it difficult to state concretely its importance in my research. The importance lies not so much in the analysis of concrete problems, but at a higher level. It is, for example, difficult to do clinical research, in which human beings are used as “guinea pigs”, without having engaged in certain philosophical queries. ... the Helsinki declaration ... builds predominantly upon principles of the ethics of duty first formulated clearly by the German philosopher Kant ...’ #42, Asger Dirksen, medical science.

‘Philosophical “locutions”—concepts, arguments, considerations—have always been an integral part of my work in anthropology, which has always included probing the limits of understanding.’ #43, anthropology.

E. Of philosophical issues only formal matters of logic etc. important, 6 responses.

Positive importance of formal logic and other formal matters, but of no other philosophical locutions, was expressed in 6 responses:

‘Mathematical proofs—and thus formal logic—play an essential role in large parts of my scientific/scholarly activity. Apart from that philosophical locutions and concerns have had no importance whatever.’ #44, Michael Sørensen, theoretical statistics and applied probability theory.

‘Formal logic is important in many branches of mathematics ... The remaining philosophical locutions have been without interest to my research.’ #45, Christian Ulrik Jensen, mathematics (algebra, theory of numbers, logic).

‘The deductive method and formal logic have a certain importance ... The rest are to me of no importance whatever.’ #46, Christian Berg, mathematics.

‘I use formal logic in mathematics and theoretical physics. I believe I use the scientific method, including scientific proof and, hopefully, truth, in all my scientific/scholarly activity. I see no direct connection between my day to day scientific/scholarly work and the philosophical importance of modern physics.’ #47, Jørn Dines Hansen, experimental particle physics.

‘Physics, mathematics and formal logic have been of importance. Philosophical “locutions” have no importance in my scientific/scholarly activity ...’ #48, O. Siggaard-Andersen, clinical biochemistry.

‘From the formal mathematical approaches I best remember the following fields and their mutual relations: set theory, group theory, Boolean algebra, theory of mappings, formal logic, falsification, and proof. These theoretically-abstract, and in themselves philosophical, modes of thought have been to me an invaluable source of argumentation in my publications. ... It would seem to me highly desirable if all students of science in a suitable way would be introduced to at least the most basic aspects of logical thinking, as well as to the gathering of knowledge as mapping processes in the brain in relation to an external world.’ #49, Richard Egel, classical and molecular genetics.

F. Philosophical locutions are of only marginal importance, 7 responses.

Slight or marginal importance of philosophical locutions, was expressed in 7 responses:

‘The importance of philosophical locutions, such as those you mention, has largely been marginal to my scientific/scholarly activity. The exceptions are *falsification* and to some extent *scientific method* ...’ #50, N. P. Kristensen, insect anatomy, systematics/evolution.

Concerning the importance of philosophical locutions:

‘Very modest—while I have had profited considerably from reading theory of science/scholarship.’ #51, Tim Knudsen, politology and history.

‘I do not think these “philosophical locutions” have had significant importance for my scientific activity—but I cannot entirely exclude it.’ #52, Jørgen Viby Mogensen, anaesthesiology.

‘As far as possible I do not use these locutions. But I have liked and profited from theory of science/scholarship.’ #53, social medicine, paediatrics.

‘Even though some of the subjects you mention, such as *deductive method*, *scientific method/proof* and logical thinking, of course enter as natural elements in research activity, it would be an exaggeration to claim that these concepts were presented in the former filosofikum in such a way that they might be used, much less form the basis of methods in my field of research. These methods, which often are specific to the field, rather are acquired through work in the field in the course of many years.’ #54, Gert Due Billing, theoretical chemistry, molecular dynamics.

‘This was an interesting question to be asked ... Philosophical locutions play no visible role in my daily activity as scientist, but I do believe that some notions play an indirect role. Of those mentioned, the locution that appeals most strongly to me is *scientific truth* ... Philosophical locutions sometimes play a negative role. They may act as strategies by which to floor colleagues or poor students (“Are you a structuralist?” Or still worse: “Are you a functionalist?”). And they may be inflated so as to form essential barriers to doing any sensible work at all.’ #55, public administration, organization theory.

‘In my opinion locutions have no special importance, what is hidden in the locutions may perhaps have it.’ #56, gastroenology, endocrinology, surgery.

G. Philosophical locutions of no importance, 33 responses.

Importance of philosophical locutions for their scientific/scholarly work was entirely dismissed by 33 respondents:

‘In summary I can say: 1) philosophy has played no role in my scientific-/scholarly production, 2) I am a convinced positivist—in spite of the contempt in which the concept is held by some people, 3) philosophy as such interests me.’ #57, Jørgen Rygaard, immunology, pathology, cancer.

‘Generally I can say that the philosophical terms you list as examples have been of no importance to my scholarly work.’ #58, Christopher Toll, Semitic philology.

‘[The locutions] have no value and no importance for my research.’ #59, Mirko Tos, otorhinolaryngology.

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'I have not a single example that any of the terms mentioned have had any significant importance to my research in 40 years.' #60, solid state physics, X-ray physics, diffraction methods.

On the locutions quoted: 'No importance.' #61, scientific computing, numerical analysis.

On the locutions quoted: 'minimal/no importance.' #62, jurisprudence.

'Philosophy and the vocabulary of the theory of science/scholarship has in practice no importance in my research and I find that in many ways philosophers' description of scientific/scholarly activity and motivation is not in accord with my experience. ... I do not believe philosophy is of any importance to natural scientific/scholarly research activity—neither for theoretical nor experimental work.' #63, Tom Fenchel, marine biology, esp. microorganisms.

'Long ago I took filosofikum, but it has had very slight influence upon my scientific/scholarly work.' #64, Christian Hjort-Andersen, economics.

'Philosophical locutions have no importance for my scientific/scholarly activity.' #65, geography, environment/agriculture, archeology.

'I do not believe I have used the above mentioned concepts in my articles.' #66, Gudrun Margrethe Boyesen, neurology, cerebrovascular diseases.

'No importance. The word "paradigm" is used sporadically, although not strictly in its philosophical meaning (was it introduced by Kuhn?). Within my field the word is some sort of slang meaning "the things the scientific community currently believe is correct". I have only seen the word used once in the title of a paper from 1981. The paper proposed a new way to interpret the quantitative role of bacteria in the oceans and incorporate bacteria into "the classical paradigm of the plankton food web". #67, Morten Søndergaard, freshwater biology, microbial ecology.

'So far philosophy has been of no importance to my research.' #68, Øjvind Moestrup, cytology and ultrastructure, phylogeny.

'I was forced to "learn" theory of science through Uffe Juul Jensen's "Videnskabsteori 1+2" ... It builds upon Marxism and dialectics—and represents pure waste of time. ... it is hard to see how it should be possible to revive "Filosofikum"—it is unnecessary and plays no role in the daily science/scholarship.' #69, medicine.

'They [the locutions quoted] are of no importance.... The only word that tells me something in this context is method, understood as a consistent application of—in my case—the tools of mathematics.' #70.

On the locutions quoted: 'Mostly words—do not entirely disagree with the second paragraph of the back side notes [remarks by P. Naur quoted in section 2 above].' #71, health, diseases of uterus etc.

'... concepts such as "*scientific truth*" ... have played no role in my medical research.' #72, Flemming Skovby, clinical genetics, paediatrics.

'Apart from formal logic, which by the nature of the matter I am somewhat familiar with, these words play no role in my work.' #73, Gert Kjærgård Pedersen, mathematics, linear operators in Hilbert space.

'... "philosophical locutions" and philosophy as such have been of no importance whatever in my research ...' #74, Morten Møller, neuroanatomy.

On the locutions quoted: 'I never use them! But: deduction, induction, but they rather are mathematical concepts of proof theory. For the rest I quite agree with Peter Naur!' #75 C. C. Tscherning, geodesy.

On the locutions quoted: 'Do not belong to my vocabulary.' #76, human physiology, temperature control, circulation, environmental physiology.

'Philosophical locutions have had no importance to my works.' #77, Poul Olesen, theoretical particle physics.

'None of these locutions have been of importance to my scientific/scholarly activity.' #78, protein chemistry, molecular and structural biology.

'I do not consider that the locutions mentioned have been of any importance to my scientific/scholarly activity.' #79, chemistry of atmosphere, reaction kinetics.

'I cannot say that these "locutions" or any philosophical considerations whatever have been of any importance to my scientific/scholarly activity—and besides I do not know much about these locutions.' #80.

'In do not consider that the locutions mentioned have been of any importance.' #81, Niels Borregaard, cell biology in relation to the function of leucocytes.

'These locutions and concepts have not had any direct influence on my scientific/scholarly production or form of work. But I have read with interest various books by Kuhn, Popper, Ziman, and others.' #82, Nils O. Andersen, atomic physics.

'My work has been very concrete, with well defined problems, and thus has not involved properly philosophical locutions.' #83, medical decision theory and radiology.

'The philosophical locutions quoted, and others, have not been of any importance to my scientific/scholarly activity.' #84, plastics, adhesion.

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‘While a student I took part in several initiatives concerning theory of science/scholarship and philosophy ... but there is exceeding little of this that I can use in my scientific/scholarly work.’ #85, ecology, genetics, microbiology.

On the locutions quoted:

‘I do not use them’ #86, physiology.

‘Most of the -isms you mention I have no opinion about.’ #87.

‘My speciality is in eskimology, and it goes (almost) without saying that the philosophical locutions you inquire into have had no particular relevance to my research until now.’ #88, eskimology.

‘... my works do indeed carry the stamp of “scientific method” but “philosophical locutions” (if I understand them correctly) have had entirely no importance to my scientific activity.’ #89, Jakob Krarup, operational research, combinatorial optimization.

5. The answers to the main question

In a first crude analysis of the responses to our query we may consider the philosophical claim: that philosophy is important to the scientific and scholarly activity. We may try a simple count, based on the groupings of the responses, leaving out groups A and B that are not grounded in personal experience of scientific activity, but including group E of responses that refer merely to formal logic:

Responses in groups C, D, and E: 29 yes, it is important.

Responses in groups F and G: 40 no, it is not important.

We might leave it at that. Clearly the philosophers’ general claim about the importance of philosophy to the scientific/scholarly activity cannot be sustained.

However, a result in this vein cannot be accepted as more than a suggestion. The issues at hand cannot be taken to be merely matters of personal opinion; the differences of opinion displayed in the figures indicate that there are misunderstandings of some kind involved. As it has happened the responses to our query offer ample material for clarifying these matters. This will be pursued in the following sections.

6. What the philosophical locutions are taken to denote

The present section will consider the use of certain terms, particularly those said to be ‘philosophical’, in the responses to our query. In the way the query has been conducted the issue of the use of these terms has deliberately been left open; we have not by definition or otherwise committed ourselves to their use. This has been achieved in our query by talking about, not ‘philosophy’, but ‘philosophical locutions’, made definite by giving a sample of them.

In dealing with this issue we explicitly dismiss the common (philosophical) notion that each word means or denotes something definite. Instead we adhere to the notion, discussed more fully in (Naur, 2001), that the meaning of each word generally makes sense only as an experience had by a person in a certain context

and situation. It then makes sense to use the responses to our query as *empirical data in clarifying what the philosophical locutions are taken to denote by our respondents in the context of their scientific/scholarly activity.*

As the first issue in a clarification along this line, even just saying that the sample locutions given in our query are ‘philosophical’ is problematic. However, this problem is resolved by the response from #21, in which our sample of locutions has been accepted to be philosophical by a scholar whose work lies in philosophy of science/scholarship, of language.

This, however, still leaves the main question of what the philosophical locutions are taken to denote by our respondents, if anything. It may here be noted first that respondent #80 effectively says that he attaches no meaning to them, while #89 suggests that he may not understand them correctly.

In analyzing the remaining responses to our query from the point of view of what the philosophical locutions are taken to denote, we have found it appropriate to distinguish between a number of different concerns displayed in the notes from our respondents, as follows:

- 1) Forms of description employed in the scientific/scholarly activity,
- 2) Thinking going on in the scientific/scholarly activity,
- 3) Manners or methods of proceeding in the scientific/scholarly activity,
- 4) Ideology influencing the scientific/scholarly activity,
- 5) Consequences to human sensibility and welfare of the scientific/scholarly activity.

1) *Forms of description employed in the scientific/scholarly activity.* Any scientific/scholarly activity makes use of descriptions of the matters of concern. Such descriptions come in an unlimited variety of *forms* which may be, for example, verbal, pictorial, graphic, tabular, quantitative, or formal. In any particular description various forms most often are used together, side by side. This matter is commonly taken to be philosophically relevant, in that certain forms of description, notably *formal logic*, are said to be matters of philosophy. This is brought out by several respondents who mention formal logic as the only philosophical locution of those listed in our query that is of importance to their scientific/scholarly activity: #31, #44, #45, #47, #73, and #75.

However, which forms of description are philosophical and what makes them so? On this there is no agreement. Several respondents mention other forms of description side by side with formal logic: #29: statistical method; #33, #46: deductive method; #48: physics, mathematics. However, #16 in his response appears to exclude mathematics, statistics, language, and computing, from philosophy.

Taken together, these respondents’ pronouncements about forms of description being philosophical are unclear and contradictory. The source of this confusion is brought to light in the discussion of human thinking of the following section.

2) *Thinking going on in the scientific/scholarly activity.* The issue of philosophical forms of expression is taken up more fully in the response from #49:

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‘... set theory, group theory, Boolean algebra, theory of mappings, formal logic, falsification, and proof. These theoretically-abstract and in themselves philosophical, modes of thought have been to me an invaluable source of argumentation in my publications ... all students of science in a suitable way should be introduced to at least the most basic aspects of logical thinking, as well as to the gathering of knowledge as mapping processes in the brain in relation to an external world.’

These statements imply an understanding of formal matters of logic and others as indicating aspects of human thought. They imply that it makes sense to talk of each of the locutions quoted as denoting a ‘theoretically-abstract and in itself philosophical, mode of thought’. However, describing human thinking in terms of modes of thought such as set theory, theory of mappings, or formal logic, is merely a philosophers’ conceit. It makes no psychological sense, being contradictory to the very first principle of descriptive psychology (William James, 1890; cf. also Naur, 2000; Naur, 2001), a principle that may be confirmed introspectively by anyone at any moment, to wit that *thinking is something going on*, not something done by something or someone. The issue might be tested empirically just by asking any person who claims to be able to ‘think logically’ such questions as: ‘How can you be sure you are thinking logically when you think you are doing it?’, and by testing the performance of such persons in doing things that involve merely formal manipulation, such as copying of text, or arithmetic operations. Such a test would undoubtedly show that ‘logical thinking’ is a myth. However, such a test is never carried out, and the myth continues to corrupt the understanding of the scientific/scholarly activity. In other words, descriptive psychology has no place for such locutions as ‘logical thinking’.

Thus the source of the confusion in the respondents’ pronouncements about such matters as formal logic, statistical method, and deductive method, is here traced to the fallacious philosophical notion that it makes sense to distinguish ‘modes of human thinking’.

Properly speaking, matters such as set theory, theory of mappings, and formal logic, are of interest to the scientific/scholarly activity merely as forms of descriptions that the scientist/scholar may decide to use, while issues such as falsification and proof relate only to properties of some of these forms.

3) *Manners or methods of proceeding in the scientific/scholarly activity.* This issue is a central one in an investigation of the importance of philosophical locutions in scientific/scholarly activity. Indeed, it is commonly stated or implied, e.g. in the quotation from #13, that the distinctive characteristic of scientific-/scholarly activity, that characteristic which makes it worthy of the name, is that it is done according to a particular manner of proceeding, the scientific method. With this in mind it is remarkable that of the 80 respondents only 13 wish to indicate that the locution ‘scientific method’ is of any importance to their activity.

This indication is given as merely a brief mention by 7 respondents: #22, #26, #30, #34, #35, #50, #54.

Three other respondents use the locutions ‘scientific method’ or ‘method’, not in referring to their activity generally, but about something else: #18: ‘... regular scientific methods are entirely decisive in “coordinating” infections with

symptoms of disease.’; #22: ‘In my works in basic science/scholarship (including the thesis) *knowledge [erkendelse]* and/or *falsification of hypotheses* have always been the methods of work ... ’; #70: ‘... method, understood as a consistent application of—in my case—the tools of mathematics.’

Still other respondents talk of scientific method, not as a guide to their activity, but as a *descriptive characterization of their habitual manner of proceeding*, thus #47: ‘I believe I use the scientific method, including scientific proof and, hopefully, truth, in all my scientific/scholarly activity’, and #89: ‘... my works do indeed carry the stamp of “scientific method” but “philosophical locutions” (if I understand them correctly) have had entirely no importance to my scientific activity.’ Understood in this way as merely a descriptive characterization of work habits, scientific method of course has no active importance to the activity.

Respondent #39 talks of logic rather than method as a guide:

‘... I use, unconsciously, and even consciously, logic in producing science/scholarship (e.g. method, “truth” and proof)’.

In this pronouncement the phrase ‘I use, unconsciously, ... logic’ is particularly telling. It suggests that #39 adheres to the notion that human mental activity takes place according to rules. This notion is the one behind the talk of ‘artificial intelligence’. The psychological impossibility of this notion has long been established (see e.g. Naur, 1986, 2001). The notion is yet another example of the fallacious notions about human thought commonly adhered to by philosophers.

In this context we find it relevant to comment on the remarks on the present investigation from #10:

‘Even just the demagogic formulation of the title, in the style of “Have you stopped beating your wife?” contrasts strangely to the critical mention of the lack of scientific/scholarly investigations of the importance of philosophy to scientific/scholarly activity. You cannot seriously consider that your questionnaire letter represents such?’

In reply to this we wish to say, first, that the initial remark on our title fails to make sense to us. Second, concerning our letter: no, we do not take our letter to represent a scientific/scholarly investigation, it is merely a part of such an investigation. And in the way we have conducted our investigation we have adhered to no given method; we have, as we always do, proceeded at each step in what has seemed to us the way best suited to our purpose. The main activity of the investigation has been, partly, a collection of relevant information on our issue of concern, and partly the formulation of texts, first the questionnaire letter and then the present description of the responses. This formulation activity has consisted in a series of sketchings and revisions of the texts, guided by one single goal: clarity.

Accordingly we suggest that the scientific/scholarly quality of our investigation is judged from the result, the present report: primarily the clarity with which it identifies the matters described, the clarity with which it describes them, and the coherence of what it says with other relevant descriptions (in particular the notes from our respondents).

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In addition, we suggest that our investigation is judged from the relation of our report to the existing scientific/scholarly literature. We suggest that our investigation is an original contribution, in that the matters of concern seem not to have been described in this or a similar manner before.

As a summary of the present section: there is no agreement among the respondents on what methods are or on their importance for their scientific-/scholarly activity. The issue is confused.

4) *Ideology influencing the scientific/scholarly activity*: Eight of the respondents mention ideological concerns among the philosophical issues of their scientific-/scholarly activity. Two of them mention ‘causality’: #10: ‘My own field biostatistics ... is in daily confrontation with epistemological [erkendelsesteoretiske] problems ... activity concerning possible formalizations of causality considerations ...’. #35: ‘... course of *scientific method* ... Particularly of importance to the understanding of causality in epidemiological research ...’.

‘Truth’ is taken to be of positive importance to one respondent, #19: ‘... The truth of diagnostic methods. ...’. Respondent #55 stresses the mixed value to the scientific/scholarly activity of philosophical/ideological locutions, including ‘truth’:

‘Philosophical locutions play no visible role in my daily activity as scientist, but I do believe that some notions play an indirect role. Of those mentioned, the locution that appeals most strongly to me is *scientific truth* ... Philosophical locutions sometimes play a negative role. They may act as strategies by which to floor colleagues or poor students (“Are you a structuralist?” Or still worse: “Are you a functionalist?”). And they may be inflated so as to form essential barriers to doing any sensible work at all.’

Similar mixed reactions to certain ideological locutions are expressed by three other respondents: #29: ‘Kuhn’s contribution about theory of science/scholarship was a bible to me. Marxist nonsense the bugbear....’. #31: ‘I have studied Marxist economy ... This has been very profitable in my epidemiological work.’ #67:

‘The word “paradigm” is used sporadically, although not strictly in its philosophical meaning (was it introduced by Kuhn?). Within my field the word is some sort of slang meaning “the things the scientific community currently believe is correct”. I have only seen the word used once in the title of a paper from 1981. The paper proposed a new way to interpret the quantitative role of bacteria in the oceans and incorporate bacteria into “the classical paradigm of the plankton food web”.’

One respondent accepts a particular ideology, but does not grant it any importance: #57: ‘In summary I can say: 1) philosophy has played no role in my scientific/scholarly production, 2) I am a convinced positivist—in spite of the contempt in which the concept is held by some people, ...’

One respondent explicitly rejects ideology: #69: ‘I was forced to “learn” theory of science through Uffe Juul Jensen’s “Videnskabsteori 1+2” ... It builds upon Marxism and dialectics—and represents pure waste of time.’

In summary it appears that the importance to the respondents of philosophical-/ideological notions is slight and mixed.

5) Three respondents refer among philosophical issues of their scientific-/scholarly activity to *consequences to human sensibility and welfare of the scientific/scholarly activity*: #15: ‘... medical ethics ...’; #40: ‘... in a wider sense my work in the history of science, history of ideas, and history of medicine is much influenced by certain directions within epistemology and moral philosophy.’; #42 writes:

‘... I have always been interested in philosophy, but I find it difficult to state concretely its importance in my research. The importance lies not so much in the analysis of concrete problems, but at a higher level. It is, for example, difficult to do clinical research, in which human beings are used as “guinea pigs”, without having engaged in certain philosophical queries. ... the Helsinki declaration ... builds predominantly upon principles of the ethics of duty first formulated clearly by the German philosopher Kant ...’

Considering that most scientific/scholarly activities involve consequences to human sensibility and welfare, the small number of responses in this group is remarkable. The explanation must be that the issue is not commonly regarded to be one of philosophy. It again confirms that there is no common understanding of so-called philosophical issues.

7. Philosophical attitudes

Our query was directed explicitly at clarifying the importance of philosophical locutions. However, to our surprise the query has also brought out significant evidence concerning *attitudes held to be philosophical by certain people*. This evidence is found in the responses from #12 and #13 who refused to answer our query, group A. In these responses the respondents’ refusal to answer our query is explained as the query being unnecessary, the answer is already known: #12: ‘Of course philosophy and theory of science/scholarship [videnskabsteori] are entirely central to science/scholarship’; and #13: ‘As a matter of fact any scientific-/scholarly activity (whether the scientist is aware of it or not) takes place within a theoretical frame of thought, which one ought to make as explicit as possible. And this activity must be termed philosophical.’. In these responses we may note, first of all, the explicit dismissal of an empirical investigation of the question at hand.

Let us consider the statement made by #13 a bit further. It says that ‘any scientific/scholarly activity ... takes place within a theoretical frame of thought.’ But what is ‘a frame of thought’? And what makes it theoretical? And what does it mean that an ‘activity ... takes place within a (theoretical) frame of thought’?

None of these questions has an answer. By their reference to thought any answer to them would lie within the province of psychology, which is the science of mental activity, of thinking. But nothing in psychology gives any meaning to talking about frames of thought within which some kind of activity may take place.

And so the allegedly philosophical activity of making ‘a theoretical frame of thought ... as explicit as possible’ at closer analysis has turned out to refer to nothing. The ‘matter of fact’ stated by #13 at closer look has turned out to be (excuse us for saying so) merely pretentious nonsense.

Appendix 3: Philosophical Locutions in Scientific and Scholarly Activity

The statement is yet another case of the philosophers' misguided understanding of human thinking and displays what we have denoted the *philosophers' presumption*, in this case the dismissal of an empirical investigation in favor of 'matters of fact (known to the philosopher)', issues we have discussed in much fuller detail elsewhere (Naur, 2001).

And so by our query, said by #13 to be naive, we have succeeded, beyond our expectation, in bringing out a striking expression of the philosophical presumption.

8. Coherent description as the core of the scientific/scholarly activity

As an additional perspective on the observations of sections 6 and 7 we shall here present an overview of a form of description, or theory, of the scientific/scholarly activity that explicitly rejects the philosophical locutions. This theory is presented more fully elsewhere (Naur, 1995c). According to this theory the core of scientific/scholarly activity is *coherentdescription*. A description is here taken to denote an expression in some form of certain properties of some aspect of the world. By the coherence of scientific/scholarly descriptions is meant the way various descriptions support one another. What distinguishes a field of inquiry is what aspect of the world is taken up for description in the field. Any one description will make use of certain *forms of description*, selected or invented by the scientist/scholar.

As the first issue, the present view of the scientific/scholarly activity is firmly based upon the description of human thinking presented in classical, introspective psychology (William James, 1890). According to this description an aspect of the world may be singled out for consideration by a person through the mental function of *acquainting* (by James denoted *conception*). Once singled out as an acquaintance object (concept), the aspect may, in the person's mind, become associated with any number of *properties*. Any such property may, in the person's mind, become further associated to one or more elements of some form of description. In a description such elements are given concrete expression, for example in writing.

According to this form of description of the mental activity of description, the issues of the scientific/scholarly activity considered in section 6 are understood in the following way.

First, the forms of description employed in the scientific/scholarly activity are selected or invented by the scholar/scientist as an important part of the scientific-/scholarly activity. No particular form, such as formal logic, is accorded any special status. Certain particular description forms depend in their use on special techniques to such an extent that they form the subject matter of scientific-/scholarly fields of their own, e.g. mathematics, computing, spectroscopy, and X-ray crystallography.

Second, the thinking going on in the scientific/scholarly activity is not different from that going on in any other activity.

Third, no manners or methods of proceeding are specific to the scientific/scholarly activity; the activity is similar to any other human activity oriented towards a constructive goal. What distinguishes the scientific/scholarly activity is the character of the goal: formulation of coherent descriptions. In other words, in the present view what makes an activity scientific/scholarly is neither the way it is pursued, nor the forms of description employed, but that it is concerned with descriptions of a certain character.

The word theory may be used, and is thus commonly used, to denote a description of an aspect of the world that comprises classes of similar items.

Formal matters, such as deduction and proof, belong to certain particular forms of descriptions, those building upon elements taken from mathematics and formal logic. These forms of description are advantageous for describing certain aspects of the world, but are not more characteristic of the scientific/scholarly activity than any other forms.

Fourth, in the present view ideology is alien to the scientific/scholarly activity. This holds both for such philosophical ideas as truth and causality, and for political and religious ideologies. More particularly, a description is a representation, usually approximate, of merely certain properties of the matter described, so no issue of its truth or completeness comes up, and the coherence of the description with other relevant descriptions is not a matter of any formal relation. Thus the 'crucial test of a theory', prominent among Popper's notions of science, does not apply. The relevant issue is that one description (theory) may be better than another one in some particular respects.

Fifth, consequences to human sensibility and welfare of the scientific/scholarly activity are related, neither to the descriptions produced in the activity, nor to the form of the descriptions, but to the aspect of the world selected for description.

Viewing the scientific/scholarly activity to be a matter of description makes clear that the primary quality of a valid contribution is not that it is 'true', but that it is clearly descriptive, in other words that it makes clear what is talked about and is clear in what it says about that. Further important qualities of scientific-/scholarly contributions are their descriptive coherence with other relevant descriptions and their originality. A contribution may be original by describing aspects of the world that have not been described before, or by making use of a new form of description.

Viewing the scientific/scholarly activity to be a matter of description further indicates how the validity of a scientific/scholarly description is a matter of a context of human understanding in a certain scientific/scholarly community. The choice of descriptive elements must be made such that, for the most part, they are part of the habitual understanding of the members of that community. When a description makes use of new descriptive elements, these must be introduced explicitly, for example by definition, as part of the description.

9. The dogmatic, presumptuous philosophical ideology

In summary of the responses to our query we have found that only a minority of our respondents attach any importance for their scientific/scholarly activity to philosophical locutions. Further, that those respondents who do consider the locutions to be important are uncertain and in disagreement about what the locutions denote, whether they refer to the human thought activity or to the scientific/scholarly activity itself. In other words, within a highly competent group of 80 scientists and scholars there is no common understanding of philosophical locutions, neither of what they denote, nor of their importance to their activity.

As the conclusion of our discussion we suggest that this unclarity and confusion in the understanding of the locutions derive from philosophical misconceptions and dogma, from philosophical fallacies.

The central philosophical fallacy is the dogmatic claim, attitude, or ideology, that there are certain particular persons, philosophers, who possess insight into matters of the world without needing empirical support of it, thus eliminating the need to investigate the matters. This dogma is directly antithetic to the scientific-/scholarly attitude of open inquiry. It finds direct expression in the present context, both by the fact that the kind of evidence presented in our investigation never seems to have been collected and considered before, and by the denunciation of our investigation by certain respondents to our query.

In relation to the scientific/scholarly activity the philosophical dogma is particularly obnoxious in the way it claims that the human activity of dealing with the matters encountered in the world may be described in terms of such locutions as 'knowledge', 'truth', and 'logical thinking'. These locutions display fallacious notions about human thinking, such as the claim that it makes sense to talk of different modes of thinking, such as logical thinking, and the claim that thinking can be described as a rule-controlled activity. These fallacious notions lead to a form of description of the scientific/scholarly activity that builds upon mythical elements of description, such as 'scientific method'.

The philosophical fallacies appear in strong relief if viewed on a background of a description, or theory, of the scientific/scholarly activity that is centered around coherent description. In this perspective the misleading philosophical locutions are replaced by (coherent) description(s), and forms and elements of description.

As our final conclusion we suggest that philosophical locutions should be eliminated from any discussion of scientific/scholarly activities, being confused and misleading, and replaced by carefully chosen locutions that are descriptive of the scientific/scholarly activities, as derived from the insight of those people who actually pursue them.

Acknowledgement

We wish to express our gratitude to each of the 80 scientists and scholars, some named, some left anonymous, who, by letting us share their expression of important aspects of their experience, have made the present investigation possible.

Appendix 4

First version: 2002 March to May. Extended and revised until 2004 July.

The article gives concrete illustrations of matters of discovery and the activity of art discussed above in sections 15 and 17.

The Meaning of Joseph Haydn's Early Symphonies *Dedicated to H. C. Robbins Landon*

Introduction

Es wäre sehr interessant, die Veranlassungen zu kennen, aus welchen Haydn seine Kompositionen dichtete, so wie die Empfindungen und Ideen, welche dabey seinem Gemüthe vorschwebten, und die er durch die Tonsprache auszudrücken strebte. Um es zu erfahren, hätte man ihm aber eines seiner Werke nach dem andern vorlegen müssen, und das fiel dem betagten Manne lästig. Er erzählte jedoch, dass er in seinen Symphonieen öfters - moralische Charaktere geschildert habe. In einer seiner ältesten, die er aber nicht genau anzugeben wusste, ist 'die Idee herrschend, wie Gott mit einem verstockten Sünder spricht, ihn bittet sich zu bessern, der Sünder aber in seinem Leichtsinne den Ermahnungen nicht Gehör giebt.'

Translation:

It would be very interesting to know the occasions from which Haydn created his compositions, as also the feelings and ideas, that meanwhile were before his mind, and which he endeavoured to express in the language of tones. However, in order to learn this one would have to place his works before him, one after the other, and that would be tedious to the old man. He did tell, however, that he in his symphonies most often described—moral character. In one of his oldest, which, however, he was not able to identify precisely, 'the idea governs how God speaks with a stubborn sinner, asking him to improve himself, but the sinner in his superficiality does not listen to the exhortations.'

So writes G. A. Griesinger in his *Biographische Notizen über Joseph Haydn* from 1810. The present study pursues the implications of this statement from Joseph Haydn, by suggesting extramusical meanings for a number of his symphonies.

A particular reason for assuming each symphony to have an extramusical meaning is the enormous, bewildering differences between the works. This difference already baffled Haydn's contemporary commentators, as quoted by Robbins Landon (1978-80).

Listening for the meaning of the individual symphonies seems to have been done only sporadically in the past. Robbins Landon very successfully finds rich documentation for asserting the meaning of Symphony No. 26, Lamentatione, to be that 'the first and second movements illustrate some drama played during the Holy Week' (1978-80, vol. 2, p. 291). Beyond that Robbins Landon suggests a clue to the mood of some individual movements of other symphonies.

The exploration described below was undertaken with the hope of discovering, in some way, such extramusical clues to at least some of the works that might help the listeners to a richer appreciation of the treasury of Haydn's early symphonies.

Human utterance in the symphonies

This doubt sent me into listening to all of Haydn's early symphonies, so as to locate a more convincing dialogue. This exploration turned out to be rewarding. Only a few of the movements, namely 4/2, 5/1, 11/1, 12/2, 15/1, 17/2, 21/1, 22/1, 28/2, 43/1, and 54/2, have some of the quality of human utterance and dialogue. But only just one of them, 28/2, qualifies as the God-sinner dialogue. This is the beginning of 28/2:



Symphony 28/2

As this movement continues the violins in their low range present a sequence of earnest utterances, no two of them the same, each utterance being answered by the same kind of what Robbins Landon calls a 'spiky little answer'. What is particularly significant is the way Haydn achieves an appropriate tone of voice in the way the earnest utterances gradually expand in their eloquence. As the way Haydn will have God speaking to the unrepentant sinner this seems to me entirely convincing.

This finding was highly suggestive in my exploration of the symphonies. It made me listen to those few other movements that have the quality of human utterance, with close attention to the tone of voice of each of them. Thus I found:

4/2, Andante. Over a steady, syncopated accompaniment a sequence of personally expressive phrases develop themselves.

5/1, Adagio ma non troppo. An interchange between phrases in the strings and phrases in the horns. In their tone of voice the phrases are personally descriptive.

11/1, Adagio cantabile. This is a single voice, carried by long phrases in the violins, of rare eloquence. The tone of voice is one of pure, joyous rapture.

12/2, Adagio, is a dialogue. The two voices are similarly earnest. One voice speaks at length, *pianissimo*, timidly. This is answered by shorter phrases, *forte*, all strings in unison, sternly.

15/1, Adagio - Presto - Adagio. The two Adagio sections are the same music. They are dialogues between phrases in the violins and answers in the horns. Throughout the tone of voice is one of loving tenderness.

17/2, Andante ma non troppo, is one long, eloquent melodic line, as an expression of modesty and gratitude.

21/1, Adagio. The first three bars present in the violins a slow theme of sublime dignity and beauty, answered, in bars 4 to 6, 12 seconds into the movement, by a phrase in the two oboes. This is immediately repeated. The rest of the movement has expansions of the same music.

22/1, Adagio, dialogue between short phrases in the horns and the cors anglais, as shown in music above. The tone of voice is dry and factual.

43/2, Adagio, a single voice expressing reminiscence in long phrases.

54/2, Adagio assai: the full orchestra in long, slow phrases expressing humble gratitude.

In summary of this stage of the exploration: listening to those movements of the symphonies that have some of the character of human utterance has shown that Haydn in these movements displays a mastery of expressing a wide range of human concerns by musical tones of voice, and also conveys clearly the difference between human utterance and description of human character. This result of the listening suggests that a concentrated attention to each of these movements, aiming at finding an expression in extramusical terms of the message of each of them, might be a constructive way to unravelling the feelings and ideas that were Haydn's when he composed the music.

As the first step in this direction, I asked myself, what is the extramusical meaning of movement 11/1? As stated above the tone of voice is one of pure, joyous rapture. From this formulation, my train of associations was short: Pure, joyous rapture, that is religious fervour; joyous, religious fervour, that is Haydn himself! And then just one step further: perhaps this music is a portrait of Haydn himself? And further: perhaps the whole Symphony No. 11 is a self-portrait? Still further: perhaps other of the symphonies are also self-portraits?

Symphony No. 34: The Four Temperaments

Before pursuing this idea further my attention was attracted by Symphony No. 34, dated c. 1765. As stated by Robbins Landon (1978-80) this has the distinction of being Haydn's first symphony in a minor key. It opens with an expansive Adagio in d minor, said by Robbins Landon to introduce suddenly 'into Haydn's already varied language that of tragedy'. As described by Robbins Landon the three remaining movements of the Symphony, in D major, are a fiery Allegro, a slow-moving Menuet with a leisurely Trio, and a racy (Presto assai) Finale, which sounds like a perpetuum mobile.

When I listened to the Symphony, while certainly finding Robbins Landon's description valid, I could not help feeling that something was amiss. For one thing, the description makes no sense of putting these four movements together to form one work. For another, I felt uneasy about describing 34/1, Adagio, as tragedy. The character of this movement is entirely different from any of those described above. In spite of its length—11 minutes—34/1 has no development, no drama, and it has not the quality of a personal utterance. When putting it into words I could not use tragedy. As I hear it, 34/1 describes a state of oppressive sadness, melancholy.

And this was what triggered my discovery: To me the word melancholy by association suggests a clue to the Symphony. Melancholy is one of the four humours that according to mediaeval medicine enter into forming a person's temperament. They are also known as the Four Temperaments. As stated in a modern dictionary they are: *melancholic*: gloomy; *choleric*: irascible, irritable, impatient, touchy; *phlegmatic*: not easily excited to action or display of emotions, cool, cold, dull, torpid; *sanguine*: cheerful, hopeful, buoyant, lively. (The Four Temperaments have inspired other composers; both Carl Nielsen and Paul Hindemith have works under this title).

An initial quick survey of the music of Haydn's Symphony No. 34 suggests that the Four Temperaments, when taken in the order given here, might fit the four movements.

Let us examine this first impression in more detail. The melancholy of 34/1 has already been noted. 34/2, Allegro, starts with a theme of wide skips up and down, irascible, six half notes in bars 1 to



Symphony 34/2

The poor quality of the music examples is due to the Adobe™ pdf generator

Bars 4-5, 5 seconds into the movement, have the same theme in six quarter notes, and bars 6-7, at 10 seconds, the theme again, but in eighth. These repetitions in shorter notes express impatience. Come on, quicker, they say.

Bars 8-11 of 34/2, 14 seconds into the movement, present a one-bar theme, first twice repeated, in the time of four quarter notes, then once in the time of two and a half. This is followed by two phrases, both in the time of two quarter notes. These bars are then repeated, *piano*, in bars 12-15, at 21 seconds. All this again expresses impatience.

In bars 16-21 of 34/2, at 28 seconds, we hear the oboes play five times a short phrase, *piano*, each phrase being answered immediately by a short *forte* phrase in the horns and strings. This expresses touchiness, anger.

In bars 22-35 of 34/2, at 38 to 63 seconds, the music rises from *piano* to a climax on bars 32-35, at 60 seconds. The climax consists of the violins playing a downward seventh, first twice in the time of a half note, then three times in the time of a quarter notes. Again this expresses impatience.

The remaining section of 34/2 continues to play on these impatient, angry, and touchy themes, to form an exciting description of the choleric temperament.

34/3, Menuetto moderato, opens with a short, lazy, falling scale run, and continues with a tired three-note motive: d-e-d:



Symphony 34/3

This tired motive is found in bars 1-2, 5-6, 12-13, 13-14, 14-15, 15-16, and 17-18, at 1, 8, 35, 37, 38, and 40 seconds and when these sections are repeated. In the Trio both the *Ländler* theme in the oboes, at 82 seconds, and the way the accompaniment in the horns in bars 34-35 at 92 seconds slides lazily from syncopations into notes on the beat are entirely phlegmatic.

34/4, Presto assai, consists of flimsy triplet scale runs, perfectly sanguine, starting:



Symphony 34/4

Appendix 4: The Meaning of Joseph Haydn's Early Symphonies

The identification of The Four Temperaments as the extramusical subject of Symphony No. 34, considered by the evidence of the music itself to be incontestable, was a decisive result of the present exploration. It confirmed the importance, for discovering the meaning of the music, of listening to the character, the tone of voice, of each part of the music.

It further suggests that as conceived by Haydn *the several movements of each symphony share one common extramusical idea, which would be the idea of the symphony as a whole*. This extramusical idea might for example be a human situation of a certain kind, a 'moral character', or the character of a particular person. Thus as the approach to each symphony in the further explorations, we will be justified in starting from an identification of the character of any one movement of a symphony and then seek confirmations of that identification in the remaining movements, in the same way as in Symphony No. 34 the identification of one of the four temperaments in 34/1 was confirmed in the remaining movements.

The fanfare and the syncopation fingerprints

At this stage of my exploration I returned to the question: Is the whole Symphony No. 11 a self-portrait? This sent me listening to the remaining movements of Symphony No. 11.

In this listening my attention was particularly attracted by the two different 'fingerprints' that Robbins Landon points out occur in many of Haydn's works. I shall continue to refer to them as the *fanfare fingerprint* and the *syncopation fingerprint*. The fanfare fingerprint is a rhythmic figure of six tones, all the same. In music it looks like this:



Fanfare fingerprint: * *Laude Deo*

It may be heard as played as a fanfare by four horns eight times right at the beginning of Symphony no. 31. The rhythm is the one marked by the syllables when speaking the phrase: cat kitty cat cat cow.

The syncopation fingerprint is music in which the bass moves steadily in equal beats while a voice above it moves in similar beats, but shifted half a beat in syncopation. It may be heard all through movement 4/2 as accompaniment, starting:

Musical notation for two staves. The top staff is labeled 'Violino II' and the bottom staff is labeled 'Violoncello'. Both staves show a series of notes with stems pointing upwards, illustrating the syncopation fingerprint. The Violino II part is in treble clef and the Violoncello part is in bass clef. The notes are arranged in a way that shows the syncopation between the two parts.

Syncopation fingerprint: + *Joseph Haydn*

In 11/2, Allegro, the fanfare fingerprint occurs 9 times in bars 9 to 17 (at 6 to 13 and when repeated at 58 to 65 seconds), 18 times in bars 78 to 95 (at 120 to 138 seconds), and 4 times in bars 122 to 125 (at 159 to 163 seconds). The

syncopation fingerprint occurs in bars 45 to 47, at 38 and in the repeat at 150 seconds, and in bars 149 to 151, at 182 seconds. It further forms the accompaniment of most of the Trio of 11/3 at 112 seconds. Again it is the main theme of 11/4, Finale - Presto.

Combining the suggestion that Symphony No. 11 is a self-portrait with the unusually numerous occurrences of the two fingerprints in this Symphony it occurred to me that the fingerprints might have a special, personal significance to Haydn, such that he would put them into his music only as a mark of his personal involvement in that music. I had noticed that the fingerprints occur nowhere in Symphony No. 34, discussed above. In my further exploration of the symphonies I found steadily more corroboration of this idea of the two fingerprints. I soon found evidence for a further refinement of it: the fanfare fingerprint is Haydn's musical expression of *laude deo* (praised be God); the syncopation fingerprint is his expression of *JosephHaydn*. In the following notes their occurrences in movements will be marked with * for the fanfare and + for the syncopation.

Salve Regina Symphonies

And then, listening to the opening of Symphony No. 1/1, I asked myself, what does this music say?



Symphony 1/1, opening: *Salve Regina*

No sooner did I formulate this question before my answer was there: This music says Hail! It is an ovation. And what does it hail? It lands in bars 6 to 9 in firm assertions of the fanfare fingerprint.

What does Haydn want to hail, which he marks out so emphatically with his fanfare? In view of Haydn's well known strong religious orientation (described by Griesinger as quoted in the section on self-portraits below) the answer must be that his hail is directed to some aspect of God. More particularly, the idea lies close at hand that what Haydn hails here is the Holy Virgin. Haydn's special affinity for the Holy Virgin was displayed in his lifelong fascination with the *Salve Regina* poem. In one of Haydn's very earliest attempts at composition, mentioned in the biographical notes by Dies and dating from his time as choir-boy at St. Stephen's in Vienna when he was from 7 to 16 years old, he was trying a setting of *Salve Regina* for twelve voices. A major achievement of his early manhood was his *Salve Regina* in E, Hob. XXIIIb:1, written in 1756, just before he wrote his first symphonies. His *Salve Regina* from 1771 is a major contribution of his maturity.

Continuing from this idea it occurred to me that the music of Haydn's Symphony No. 1/1 might be a symphonic setting of the first stanza of the *Salve Regina* poem:

Salve Regina, mater misericordiae! Hail to thee, Queen, mother of mercy!

Appendix 4: The Meaning of Joseph Haydn's Early Symphonies

Continuing along this line of inquiry, I asked myself whether perhaps other parts of the *Salve Regina* poem might be found in other of the symphonies. Therefore I listened to each of the early symphonies, with this idea in mind.

As the result of this inquiry my attention was drawn to Symphonies No.s 2 in C, 9 in C, 18 in G, 19 in D, 32 in C, and 37 in C, all known from Robbins Landon's researches to be among the very first symphonies Haydn wrote around 1759. In each of these symphonies one may notice, first of all, the all pervading seriousness in their tone of voice, their tone of reverent devotion. In addition, they all have Haydn's fanfare fingerprint. In view of our identification of Symphony No. 1/1 above, the idea presents itself that these symphonies might be settings of other parts of the *Salve Regina* poem.

Repeated listening to these symphonies with constant regard to the text of *Salve Regina* then yielded plentiful evidence, presented below, that it makes sense to consider these symphonies together to form a setting of the poem in the following manner:

Symphony No. 1 D		
1/1 Presto*	Salve Regina, mater misericordiae!	Hail to thee, Queen, mother of mercy!
1/2 Andante+	Vita, dulcedo, et spes nostra,	Our life, our consolation, and our hope,
1/3 Finale - Presto*	salve!	hail to thee!
Symphony No. 37 C		
37/1 Presto*+	Ad te clamamus	To thee we cry, we,
37/2 Menuet* e trio	exules filii Evae.	the banished children of Eve
37/3 Andante		
37/4 Presto*		
Symphony No. 19 D		
19/1 Allegro molto*	Ad te suspiramus,	To thee we sigh,
19/2 Andante+	gementes et flentes,	sorrowing and weeping,
19/3 Presto	in hac lacrimarum valle.	in this vale of tears.
Symphony No. 18 G		
18/1 Andante moderato*	Eja ergo, advocata nostra,	Oh thou, our advocate,
18/2 Allegro molto*+	illos tuos misericordes oculos ad nos converte	turn upon us thine eyes so full of mercy.
18/3 Tempo di Menuet*		
Symphony No. 9 C		
9/1 Allegro molto*+	Et Jesum,	And Jesus,
9/2 Andante	benedictum fructum ventris tui	the blessed fruit of thy womb,
9/3 Menuetto - Trio	nobis post hoc exilium ostende!	show to us after our exile!
Symphony No. 2 C		
2/1 Allegro*+	Jesum ostende nobis!	Show Jesus to us!
2/2 Andante		
2/3 Finale - Presto		

Symphony No. 32 C

32/1 Allegro molto*	O clemens,	Oh compassionate,
32/2 Minuet* - Trio	o pia,	Oh pious,
32/3 Adagio ma non troppo	o dulcis	Oh sweet
32/4 Presto	virgo Maria!	virgin Mary!

Here * indicates the occurrence of Haydn's fanfare fingerprint, + the occurrence of his syncopation fingerprint.

This interpretation of the symphonies finds support in numerous details of the music as follows.

Overall common features of all 7 Symphonies: no music in a personal tone of voice (as is found in the contemporary works such as Symphonies No.s 17, 15, 4, and 5). The only long themes are in 9/2 in the flutes and 9/3. The syncopation fingerprint occurs in the Symphonies that express text in which 'we' or 'us' occurs, not in No. 32.

1/2 expresses 'Vita, dulcedo, et spes nostra' by the opening figure of a semiquaver triplet followed by three quavers. This figure, in several variations, is heard throughout the movement. The 'we' includes Haydn himself, as expressed discreetly by his syncopation fingerprint in bars 12-13, at 24 seconds, and elsewhere. The tone of voice is one of gentle piety. 1/3 expresses 'Regina, mater misericordiae' by just one energetic theme in three eighths.

37/1 expresses 'To thee we cry' by the theme of two semiquavers and three quavers presented in bars 1-2, which in numerous variations forms the main substance of the music. The 'we' here includes Haydn himself, as expressed by his syncopation fingerprint in bars 5-8, at 4 seconds, and elsewhere. 37/2 and 37/3, both in c minor, express 'we, the banished children of Eve' movingly in forlorn phrases, including what Robbins Landon has described so well when, in talking of 37/3, he mentions 'A passage of haunting beauty and so typical, even now, of Haydn: bars 15 (at 37 seconds) (2nd half)ff., long dominant pedal point (bass line, repeated semiquavers), violins tentatively thrusting their phrases at us.'

19/1 expresses 'this vale of tears' through the omnipresent falling scale, semiquaver phrases, signifying rolling tears. 19/2, in d minor, with the prominent accompaniment of Haydn's syncopation fingerprint, has 'we sigh, sorrowing and weeping' expressed in the short opening figure and in *forte* sighing phrases. In 19/3, Presto, distress is expressed by the falling phrase, *forte*, coming first in bar 5, at 4 seconds, after the *piano* opening.

The appeal of 'Oh thou, our advocate', is expressed in 18/1 in three times repeated phrases of *forte* followed by *piano* in bars 20-22 and 57-59 at 50 and 231 seconds, and similarly in 18/3 bars 33-36 and 43-48 at 95, 110, 148 and 183 seconds. The inclusion of Haydn himself in 'our' is expressed in his syncopation fingerprint in 18/1 bars 9-12 at 20 seconds and elsewhere. Both 18/1 and 18/3 from bar 29 at 89 seconds have the sweetness and appeal of '... so full of mercy'.

'Turn upon us thine eyes' is expressed in 18/2. First the pair of eyes is presented in bars 1-2 by an extremely lively phrase which is repeated in bars 3-4 at 3 seconds. This is immediately followed in bar 5 at 6 seconds by the fanfare fingerprint, also given twice. Then follows, in bars 6-7 at 10 seconds, a phrase more like a lingering gaze, repeated in bars 8-9 at 13 seconds one tone lower. And so the movement continues with phrases that are immediately repeated, like pairs of eyes. In bar 23 at 39 seconds we have the syncopation fingerprint showing that Haydn himself is among the 'us'.

Appendix 4: The Meaning of Joseph Haydn's Early Symphonies

In 9/1 the birth of Jesus is expressed in the opening rush up to the strong assertion of the fanfare fingerprint in bars 20-23 at 16 and repeated at 60 seconds. Immediately following, in bars 24-25 at 20 and repeated at 63 seconds, comes a figure of a rising triad which may be taken to represent 'ostende' ('show'). This figure is played twice and then in bars 28-30, at 24 and repeated at 67 seconds, played in a modified form which includes the syncopation fingerprint. This fingerprint comes again in bars 56-57 at 92 seconds. All this indicates that the 'nobis' (us) in 'ostende nobis' includes Haydn himself. Jesus is described in the mild sweetness of the melodies in 9/2 and 9/3. In the part for flutes in 9/2 there is nothing soloistic or personal, made explicit by Haydn by the use of two flutes mostly in unison, rather than just one flute.

2/1 opens with a rising figure, 'ostende' ('show'). This figure appears in much of the music of the movement. It has several soft, devoted passages, and in bars 34-38 and 146-52 at 34 and 149 seconds the fanfare fingerprint in a soft form. 2/2, with the sweet childishness of its musical figures, is a devoted tribute to the child Jesus, as shown to us.

No. 32 fully qualifies as the final tribute to the Holy Virgin. 32/1 opens with a noble, friendly theme, repeated at 59 seconds. From bar 19 at 16 and 75 seconds a second long theme adds richness to the character. The third theme, from bar 46 at 38 and 97 seconds rises from soft intimacy to magnificent assertions of the fanfare fingerprint in bar 61 at 54 and 113 seconds. The menuet theme of 32/2 is firm, friendly, dependable. The trio, at 84 seconds is pure compassion. 32/3 is a long, beautiful, touching expression the piety of Virgin Mary. Finally the theme of 32/4 presents 'virgo Maria' as the compassionate listener, each phrase *forte* immediately continued by a phrase *piano*, as in listening.

The Four Seasons

In several of the remaining very early symphonies the music has a non-devotional, impersonal, descriptive tone of voice. At this stage of my exploration it occurred to me that some of them might describe the four seasons, and so I examined all of the symphonies in which I had so far not heard any particular message, listening for characters suggesting one of the four seasons. This search was successful:

Symphony No. 10 in D, Autumn: 10/1, Allegro, opens with stormy music, leading first from bar 8 at 12 and 73 seconds and then in bar 22 at 35 and 96 seconds into rapid downward scales suggesting the falling leaves. A new theme, *piano*, starts with two downward triad phrases, followed immediately by another theme of two bars, the first being a downward skip of a sixth, the theme being immediately repeated. This leads in bars 32 to 36 at 50 and 112 seconds to a sequence of rapid downward scale motions. All this suggests an autumnal storm in the forest. 10/2, Andante, depicts a quiet scene of autumnal sadness, all downward melodic motions, the leaves are falling. 10/3, Finale - Presto, has a recurrent, fine theme with several downward scale motions. The interludes have soft passages suggesting the rich colors of autumn.

Symphony No. 33 in C, Winter: 33/1, Vivace, has several themes having strong contrasts, suggesting the severity of winter. 33/2, Andante, has no themes. It moves slowly, in long held phrases, *piano*, with an occasional sigh, *forte*. It suggests a frozen, wintry landscape. 33/3, Minuet, has themes made out of large

skips up and down, like a frozen world. 33/3, Trio, by contrast, slides along, *pianissimo*, with no themes at all, like wintry mist. 33/4, Finale - Allegro, is made out of short, contrasting themes, like crystals of ice.

Symphony 'A' in B flat, Spring: The sound of the Symphony, with prominent high horns, has the freshness of spring. Both 'A'/1, Allegro, and 'A'/3, Allegro molto, start from short rising phrases and are all made up from quick short phrases, suggesting the budding life of spring. 'A'/2, Andante, presents a pretty tune, like a flower of spring.

Symphony No. 20 in C, Summer: The orchestral sound in 20/1, 20/3, and 20/4 is bright throughout, with trumpets. All movements by their richly developed themes convey the fertility of summer. 20/1, Allegro molto, has three well developed themes. 20/2, Andante cantabile, for strings only, has a long, beautifully developed theme, like a ripe flower. 20/3, Minuet and Trio, has themes that cover the full dynamic range from *forte* to *piano*, conveying the fullness of summer. 20/4, Presto, is in ABA form. The A section has a theme that continues to develop itself, with ever further new parts, over 87 bars. The B section, in g minor, from bar 88 at 60 seconds, similarly, has a theme of 66 bars. From bar 154 at 109 seconds the first theme is repeated in its full length.

From this stage of my exploration I listened to each of the remaining early symphonies many times, always asking myself what might be the meaning of each work. I listened for clues to the meaning of several kinds. A clue might originally be suggested by the tone of voice in one movement. Or it might be suggested by a characteristic of the music found in several of the movements. The presence of Haydn's fingerprints was always suggestive. At the same time I kept my mind open to meanings of any kind.

By this process the symphonies one by one gradually revealed a meaning to me, as reported below. In presenting the results of my exploration the Symphonies have been grouped as follows:

Group	Symphonies No.s
Salve Regina Symphonies	1, 2, 9, 18, 19, 32, 37
The Four Seasons	10, 33, 'A', 20
Self-portraits	4, 11, 12, 15, 17, 21, 27, 29, 42, 54, (74), 76
Portraits of others	3, 5, 13, 24, 25, 36, 39, 41, 46, 50, 55, 69, 72, (77), (79)
Le Matin, Le Midi, Le Soir	6, 7, 8
Landscape and nature	'B', 14, 38, 40, 57
Types and fates of men	22, 23, 28, 34, 35, 43, 51, 56, 58, 59, 61, 62, 64, 65, 66, 67, 68, 70, 71, (78), 80, 81
Polzelli Symphonies	74, 77, 78, 79
Church Symphonies	16, 26, 30, 31, 44, 47, 48, 49, 52, 75

In the description of each group below the works have been ordered by the chronology established by Robbins Landon.

Self-portraits

As background of the following account of what is taken to be self-portraits, here are some notes on Haydn's character, as presented by Griesinger (1810, p. 96ff, translated from the German):

Appendix 4: The Meaning of Joseph Haydn's Early Symphonies

In his youth and maturity Haydn was fond of spiced dishes, and always rose early; from his seventieth year he adhered strictly to a life style which in his experience had proved itself the most bearable. ... At any talk of his diet he would usually add: "I am of no more use to the world, I must let myself be served and nursed as a child: it is time that God called me!" -

Haydn spoke in a broad Austrian dialect, and his conversation was amply provided with those comic and naïve expressions that are specifically Austrian. ...

Haydn was very *religiously* minded, and faithfully devoted to the belief in which he grew up. He was most vividly convinced that all human destiny is guided by God's hand, that God judges good and evil, that all talent comes from above. All his scores begin with the words: In nomine Domini, and end with: Laus Deo or Soli Deo gloria. "When the composing does not come along, I heard him say, I go up and down in the room, with the rosary in the hand, pray a few Ave, and then the ideas come to me again." In the religion he also found the most powerful consolation for his bodily weakness; he was in the last years wholly conversant with his death and prepared himself for it every day. Without pondering on the issues of belief he adopted what and how the Catholic Church preached, and that gave him peace. ... [p. 100] A proposal for a Will, written in his own hand in 1809, begins as follows: In the name of the Holy Trinity. The uncertainty when it will please my creator in His boundless mercy to claim me from the temporal, has moved me, still at complete sanity, to declare my last Will over my slight remaining property. My soul I deliver to my creator; my body shall be buried after Roman Catholic custom in consecrated ground of first class.

But one must not from these passages assume intolerant attitudes. Haydn left anyone at his convictions, and saw them all as brothers. Altogether his devotion was not of the gloomy, always sin-conscious kind, but glad, trusting, and this is also the character of his church music. His patriarchal pious mind is particularly expressed in *The Creation*, and therefore this composition would succeed him better than a hundred other masters. "Not until I had reached into half of my composition, I felt that they were right; I was also never so pious as during the time when I worked on *The Creation*; daily I fell on my knees and prayed to God that he would grant me the power to the happy execution of this work." ... [p. 101-02]

A natural adjunct of Haydn's religiousness was his *modesty*; to him his talent was not his own work, but a generous gift from Heaven, for which he thought he had to be grateful.

Once he had a visit of the pianist ... from P. You are Haydn, the great Haydn, he started with theatrical gestures; one should kneel before you! one should approach you only as a being of a higher kind! - Oh, my dear mr. ..., answered Haydn, do not talk so with me; look at me as a man upon whom God has bestowed a talent and a good heart; that is as high as my assumptions reach. - Do you know what bothers me? continued ..., when he had looked around in the room. You should live in a magnificent palace, your garden should be ten times as large, you should have six horses before your carriage, live in the world of the great. - "All this, answered Haydn,

does not suit my wishes; in my youth I had hard times, and already then I made an effort to earn so much so as in my old days to have no subsistence worries. Thanks to God this has been achieved; I have my convenient house, three or four dishes for lunch, a good glass of wine, I can dress in fine cloth, and when I want to go a hire carriage is good enough; I have had intercourse with emperors, kings, and many great personages, and have been said many flattering words by them: but I will not have intimate relations with such persons, I will rather consort with people of my own class.

Of his lowly origin, his poor relatives, some of whom were shoemakers, peasants and other common workers, Haydn was so little ashamed that he would often himself speak of them. About his own works he said: "Sunt mala mixta bonis; they are good and bad children, and here and there a changeling has slipped in."

No one could be more inclined to give justice to the merit of others than Haydn. From Emanuel Bach, he would declare loudly, he had learned most of what he knew; likewise he would speak of Gluck, of Händel, and of his earlier teachers with thankful tribute. "Where Mozart is, Haydn cannot present himself!" he wrote, when he was invited to Prag to the coronation of Emperor Leopold II at the same time as Mozart, and deeply moved with tearful eyes he repeated: "The loss of Mozart is irreplaceable; his piano playing I shall not forget as long as I live; it went to the heart!" ... [p. 104]

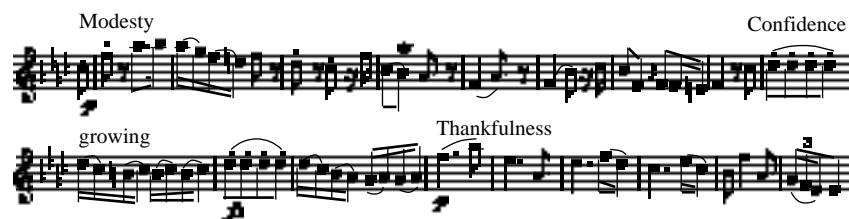
Even with his modesty, Haydn was aware of his own worth. "I know, he would say, that God has granted me a gift, and I recognize it gratefully; I also think I have done my duty to it, and have been useful to the world through my works; may others do the same!" At another occasion he said: "when a master has produced one or two excellent works, his fame is well grounded; his Creation will stand, and the Seasons will stand there as well." ... [p. 105] He also told me that once in the presence of K. and Mozart one of his new quartets was performed in which certain bold transitions occurred. "That sounds strange, said K. to Mozart, would you have written that?" Hardly, answered Mozart; but do you know why? because neither you nor I would ever hit on this idea. ... [p. 105-07]

That which the British call *humour* was a main trait in Haydn's character. He would easily and preferably discover the comical side of anything, and whoever had spent even just one hour with him must become aware that the spirit of the Austrian national gaiety breathed in him. In his compositions this spirit is quite pronounced, and particularly his Allegros and Rondeaux are often entirely oriented towards provoking the listener by frivolous turns of phrase, so as to turn the apparently serious into the highest degree of comicality, and so to move him to playful gaiety. In this way the Farewell Symphony, which was mentioned above, is a musical joke throughout.

Even corporal suffering would only rarely entirely discourage Haydn's gay spirit, and when one found him to begin with discontented, and took leave from him with a heavy heart, he would at least as the final greeting cry: "many greeting to all pretty women!" or some such droll phrase in contrast to his state. To women he always had something gallant to say; it amused the old man to play the lovesick role with them, and then he would add "that is already part of my profession!" ... [p. 108]

Appendix 4: The Meaning of Joseph Haydn's Early Symphonies

Symphony No. 17 in F, c. 1760, is the earliest self-portrait. 17/1, Allegro+, starts in the first four bars with a joyful theme, which then immediately is given again, *piano*, an octave lower, modestly. The movement continues to develop into new delights, singing along in ever new ideas, but the tone of voice remains throughout one of modesty, brought out by the recurrent *piano* passages. In the middle of it, bars 26-28, comes Haydn's syncopation fingerprint. This music is a portrait of himself. 17/2, Andante, ma non troppo, is an extended, eloquent melodic line in an intimate tone of voice. It starts timidly expressing itself in short tones. Then in bar 9 the tones grow longer, gaining confidence, until in bar 13 the melody sings, in tones full of gratitude.



Symphony 17/2: Andante non troppo

This music is an eloquent expression of Haydn's personal development. 17/3, Finale - Allegro molto, spins out a long lively theme, with ever more delightful and humorous extensions, displaying Haydn's inventiveness, and at the same time pictures our man as of a friendly, merry temper:



Symphony 17/3: Finale, Allegro molto

This symphony is a self-portrait: Modest Gratitude.

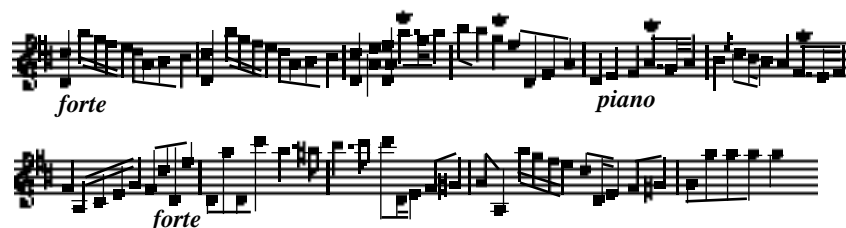
Symphony No. 15 in D, c. 1760, starts with 15/1, of a unique structure: Adagio* - Presto* - Adagio* repeated. The Adagio is a kind of dialogue between the strings and the horns:



Symphony 15/1, Adagio, opening

But it is not a spoken dialogue, it is an exchange of utterances of exquisite tenderness. It is an exchange of caresses between two lovers, a blissful situation. The Presto at 133 seconds drives forward, with ever new excited themes, without repetitions, up to a climax. What may this describe, other than the lovers' intercourse? All along at several places, at 54, 106, 124, 193, and at the climax at 265 seconds comes the fanfare fingerprint: the lovers' union is a gift from God! And then at 270 seconds, a return of the tender bliss of the Adagio. 15/2, Menuet, by the sudden shift from a noisy theme, *forte*, to a gentle whisper, *pianissimo*, at 13, 33, 43, 47, 79, and 88 seconds describes the sweetness of love in a harsh world. 15/2, Trio at 115 seconds, describes the lovers' tender conversations, as a dialogue between viola sola and violoncello solo together as the one part and the violins as the other. 15/3, Andante+, is the lovers' small talk. Haydn marks his presence by his syncopation fingerprint, *pianissimo*, in bars 22-24 and 68-70 at 57, 131, and 256 seconds. 15/4, Finale - Presto, in ABA form, describes the lovers' relation as the oasis of light intimate gentleness of the B section, at 37 seconds, embedded in the noisy activity of the A section. This Symphony is a self-portrait: The Lover.

Symphony No. 4 in D, c. 1760. The understanding of this symphony as a self-portrait is suggested first by 4/2, Andante+. What is characteristic of the Symphony as a whole are the beautifully developed, expressive themes, and the cheerful character, alternating between gentle activity and tenderness. 4/1, Presto*+, opens and repeats at 64 seconds with a phrase of 11 bars:



Symphony 4/1, Presto, opening

As a whole this is brilliantly active and inventive. It opens in the first four bars, repeated at 64 seconds, with a splendid, self-confident phrase. However, this is immediately followed, in bars 5-7, of a softer version of bars 3-4, as an expression of modesty. The theme is then continued in bars 7-11 with a brilliant and humorous development of the opening active phrase. As a whole these opening 11 bars present one side of Haydn's personality, as brilliantly resourceful and humorous, but modest.

From bar 12 at 19 and 84 seconds a new phrase comes in:



Symphony 4/1, bars 12 - 20 at 19 and 84 seconds

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It opens in bars 12-13 with a twice repeated phrase starting with a falling octave, as a gesture of reverent respect. It continues in bars 14-18 at 24 and 89 seconds with a gradual rise, coming to a climax in bars 19-20 at 34 and 99 seconds with the fanfare fingerprint twice repeated. The whole of the passage in bars 12-20 is an expression of Haydn's reverent hail to God.

Bars 23-31 at 39 and 104 seconds bring in a third theme, in two voices:



Symphony 4/1, bars 23 to 26 at 39 and 104 seconds

The tone of voice is as the tenderness of two lovers, thus Haydn presenting a third side of himself, his joy in women.

The first part of the movement is rounded off, in bars 32-37, with the opening phrase of bar 1 alternating with the syncopation fingerprint in bars 33-34 at 57 and 123 seconds, as Haydn's signature under the music.

4/2, Andante+, is one continued, eloquent theme of 82 bars, over the constant accompaniment throughout the movement of the syncopation fingerprint. Over this accompaniment long drawn, rapturous phrases, in a personally intimate tone of voice, like a heart overflowing with thankfulness, float along. In the opening we hear a phrase of four bars which is immediately repeated one octave lower, modestly:



Symphony 4/2, Andante+, beginning

This is unlike any other music, a sublime expression of Haydn's creative genius.

4/3, Tempo di Menuetto, opens in bars 1-8 with a fine, confident theme. In bars 9-17 at 10 seconds this theme is immediately given in a soft, modest version. The remaining part of the movement continues to enrich this menuetto theme with ever new melodic phrases into 52 bars.

Conclusion: Symphony No. 4 is a self-portrait: Thankfulness.

Symphony No. 11 in E flat, c. 1760: Many features of this symphony were described above in the section on the Fanfare and the Syncopation Fingerprints. 11/1, Adagio cantabile, is a song of joy in the Highest, expressed in phrases of the utmost sweetness and gentleness, enhanced by the addition of horn tones to the strings. In 11/2, Allegro*+, the opening modest theme leads to 9 statements

of the fanfare fingerprint, in bars 9 to 17 at 6 seconds. This is the music that by development forms the movement, throughout in a tone of joyous enthusiasm. 11/3, Minuet, expands a theme full of confidence and gratitude by ever new phrases in bars 1-24. After 7 bars *forte* come two bars *piano* at 10 and 28 seconds, as a modest comment. 11/3, Trio at 111 seconds, has the syncopation fingerprint as the steady accompaniment under a gentle, modest theme. The music of 11/4, Finale-Presto+, is made from the opening, in which the syncopation fingerprint is developed from the initial *piano*, into a climatic expression of thrilling joy, *forte*, in bars 16 to 28 at 13 and 51 seconds. I conclude that Symphony No. 11 is a self-portrait: Joy in God.

Symphony No. 27 in G, c. 1760, is a self-portrait. In 27/1, Allegro molto+, describes Haydn's character in three themes. The first one, repeated at 69 seconds, has broad-minded, warm dignity. The second at 28 and 98 seconds, incorporating the syncopation fingerprint, shows his lightness of manner. The third at 44 and 115 seconds his gentle kindness. In 27/2 we meet our man as the wooer, singing a serenade. 27/3 presents him as the leader, with firmness and gentle helpfulness side by side. Conclusion: Symphony No. 27 is a self-portrait: The Friend.

Symphony No. 12 in E, c. 1763: The meaning of this Symphony as a self-portrait of Haydn as The Confessor, is suggested by the dialogue of 12/2, Adagio. Here both voices sound in the strings, with similarly reverend tones of voice. One voice speaks at length, *pianissimo*, timidly. This is answered by shorter phrases, *forte*, *tutti archi unisoni*, sternly. In this dialogue it seems that Haydn describes the confessional. We witness the confessor, timidly acknowledging his or her sins, and the priest responding with suitable rebuke. The whole Symphony is sin-conscious. The tone of voice in 12/1, Allegro+, is subdued, pensive, throughout. The opening theme, *piano*, repeated at 69 seconds, hesitant. Long passages from bars 38, 65, and 131, at 40, 110, 139, 214, 247, and 322 seconds, are brooding. At the climax at bar 93f, at 272 seconds, just before the return of the first theme, we hear Haydn's syncopation fingerprint. Again 12/3, Presto, is intensely serious, concentrated around the motion of the opening theme. I conclude that the confessor in 12/2 is Haydn himself. Symphony No. 12 is a self-portrait: The Confessor.

Symphony No. 21 in A, 1764, starts with 21/1, Adagio. The first three bars present in the violins a slow theme of sublime dignity and beauty. This is answered, in bars 4 to 6 at 12 seconds, by a beautiful phrase in the two oboes. This may suggest, at the first moment, that this may be a dialogue. However, from bar 7 at 24 seconds the violins repeat their slow theme, leading in bars 10 to 12 at 37 seconds to a new answer in the oboes. This is not a dialogue, it is music making. It continues from bar 13 at 49 seconds, unfolding the three-note theme of the first bar into longer and longer phrases, from bar 16 at 62 seconds a phrase of 6 bars, from bar 29 at 115 seconds a phrase of 13 bars. This is Haydn the music maker at work, a demonstration of his technique as he has described it to Griesinger (1810, p. 114):

Haydn always created his works at the clavier. 'I sat down, let my fantasy have a free rein, accordingly as my mood was sad or joyous, serious or light. When I had brought forth an idea, my entire endeavor was directed towards working it out and supporting it according to the rules of the art. In this way I tried to proceed ...'

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21/2, Presto, is another display of the composers art: the construction of an expansive, exciting movement out of a minimum of musical phrases. In 21/3, Menuet, the same technique is applied in writing a neat, stylish Menuet. Here each four-bar phrase of the theme, played *forte*, is immediately answered by a phrase played *piano*, modestly. The Trio at 88 seconds is gently contrasting. 21/4, Finale - Allegro molto+, again uses the phrases of 21/2, to form an effective Finale. The syncopation fingerprint comes at 36, 94, and 168 seconds. Conclusion: Symphony No. 21 is a self-portrait: The Composer at Work.

Symphony 29 in E, 1765, is a portrait. In 29/1, Allegro ma non troppo, we meet our man, friendly, warm-hearted, light on his feet. In 29/2, Andante+, he walks along, whistling a folksy tune, a feather in his hat. He is a man of the people. And then in bar 30 at 64 and 158 seconds, discretely, the gait changes into syncopations, into Haydn's syncopation fingerprint: the man in the portrait is Haydn himself. The Menuet, 29/3, Allegretto, shows our man happily conforming to the strict form, by having it support a grand, noble theme. And yet, he has a gentle surprise in store for us for us: The Trio at 104 seconds has no tune at all, only long held tones in the horns, over the three-four rhythm in the strings, *piano*, like a chuckling laughter. The contrast to the surrounding Menuet is ravishing. The Finale, 29/4, Presto, shows our man in glorious, magnificent music, growing out a long theme, rich in its rhythmic variety. The growth is similarly rich in its harmonic variety. From the initial E major the dominant B major is reached at bar 42. But then at bar 54 at 45 and 110 seconds the color changes, lingering softly in minor keys, before the final glorious release in B major from bar 66 at 53 and 118 seconds. Conclusion: Symphony No. 29 is a self-portrait: The Man of the People.

Symphony No. 42 in D, 1771: A self-portrait. 42/1, Moderato e maestoso, describes our man as gentle and warm-hearted, with a tendency for slipping off into beautiful dreams. 42/2, Andantino e cantabile+, all beautifully melodious with rich orchestral sound, including the syncopation fingerprint at 138, 306, 375, 493, and 553 seconds, has him as steady and reliable. 42/3, Menuetto e Trio - Allegretto, is gently humorous. 42/4, Finale - Scherzando e presto, is a set of variation on a theme as light as a feather. The variations abound with humorous surprises. Conclusion: Symphony No. 42 is a self-portrait: The Dreamer.

Symphony No. 54 in G, 1774: 54/1, Adagio maestoso - Presto*: After the solemn introduction the quiet theme in fagotto and horn of the Presto at 92 and 150 seconds, under the motto In Nomine Domini, includes in the strings a modification of the fanfare fingerprint as accompaniment:



Symphonys 54/1, bar 18, Presto, at 92 and 150 seconds

Throughout the movement this music unfolds in splendid dignity, everywhere dominated by assertions of the fanfare fingerprint and its modification. As already

stated above, 54/2, Adagio assai+, has the full orchestra develop long, slow phrases expressing humble gratitude. The syncopation fingerprint makes discrete entries in bars 35-37 and 102-04 at 157 and 481 seconds. 54/3, Menuet - Allegretto, expresses gratitude by four bars *piano* after the opening four bars of a noble theme, and again by the quiet nobility of the melody of the Trio at 132 seconds, played by the fagotto. 54/4, Finale - Presto+*, very similarly opens with a beautiful theme in four bars, *forte*, which is immediately answered gratefully by two bars of *piano*. The theme has the syncopation fingerprint as accompaniment. This theme sets the tone of the whole movement. The fanfare fingerprint comes in the bass from bar 18 at 24 and 118 seconds. One may suggest that this Symphony is Haydn's thanks to the Highest for his recovery from a severe illness in 1770 (mentioned by Robbins Landon, vol. 2 p. 168). Conclusion: Symphony No. 54 is a self-portrait: Thanks to God from a Recovered.

Symphony No. 74 in E flat, c. 1780, is described in the section on the Polzelli Symphonies.

Symphony No. 76 in E flat, c. 1780, is a self-portrait of the composer at work, like No. 21. Throughout the Symphony we are presented with motives that are immediately modified and extended. 76/1, Allegro+, starts and repeats at 108 seconds with a one-bar call to action, merely a fanfare on the E flat triad for the full orchestra, *forte*. In bars 2-3 at 3 and 111 seconds the violins, *piano*, present a three-note rhythm, which is immediately repeated and extended in bars 3-7. In bars 8 to 18 at 10 and 118 seconds the initial call to action is repeated and extended. Bars 19-25 at 24 and 133 seconds repeat bars 1-7. Bars 26-27 at 34 and 143 seconds present a new melodic motive of four notes, *pianissimo*, which is extended in bars 28-34. In bars 35-47 at 46 and 155 seconds the initial bars 1-7 are presented in an extended and modified form. Bars 48-55 at 64 and 173 seconds bring the three-note rhythm of bars 2-3 provided with accompanying sixteenth-note figures. Bars 56-65 at 75 and 183 seconds present the melodic motive of bars 26-27 in an extended form. From bar 66 at 88 and 197 seconds a further modified form of the initial call to action leads, in bars 73 and 76 at 97 and 206 seconds, to Haydn's syncopation fingerprint.

76/2, Adagio ma non troppo, demonstrates Haydn's technique as applied to three different kinds of music. The movement is arranged in an ABA'CA" form. In the A parts at 0 and 77 seconds the music is a graceful melodic theme of 4 bars which is developed by melodic extensions. The B part at 154 and 178 seconds part has music of long held notes accompanied by semiquaver repeated chords. The C part at 328 seconds has music of demisemiquaver runs accompanied by semiquaver staccato repeated chords.

76/3, Menuet - Allegretto, and Trio show Haydn applying his technique to a number of different phrases, each just a few bars long, the music becoming a brilliant mosaic.

76/4, Allegro, ma non troppo, is a charming fantasy on the characteristic effect of a note having two short notes gliding up into it, a kind of double snap.

Portraits

Symphony No. 5 in A, c. 1760: As already noted above, 5/1, Adagio ma non troppo, is a kind of dialogue:

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Symphony 5/1 opening

The two voices distinguish themselves as shown in this opening as a softer, milder, more eloquent, feminine one played by the violins against a firmer, conciser, masculine one played by the horns. It may be noted that tone of voice here is descriptive, presenting feminine beauty and masculine firmness. This is quite different from the tone of voice of the opening of Symphony 15 presented above, where the phrases are like caresses, not descriptive. This pattern of two alternating characters is found throughout the remaining three movements of the Symphony. The mood throughout is one of beauty, nobility, and peace. All this suggests that Symphony No. 5 is a double portrait of a man and his wife. In 5/1 we meet them side by side, the wife as gentle music in the strings, the husband as phrases in the high horns. 5/2, *Allegro*, describes their relation in a kind of dialogue. It opens with the man's utterance, firm and decided. In later passages we hear the wife expressing herself in extended, fanciful passages, each passage being answered by a brief assent from the husband.

From this suggestion it is not far to guess that Symphony No. 5 is a portrait of the Count and Countess Morzin, with whom Haydn was engaged as Music Director from 1759 to 60. In this capacity Haydn would give daily music lessons to the members of the family. About this activity Griesinger quotes Haydn's own account of an incident that had obviously impressed him:

He [Haydn] liked to relate, in later years, how one day he was sitting at the harpsichord, and the beautiful Countess Morzin leaned over him in order to see the notes, when her neckerchief came undone. 'It was the first time I had seen such a sight; it confused me, my playing got stuck, my fingers stayed resting on the keys. - What is it, Haydn, what are you doing?' cried the Countess; most respectfully I answered: But, Countess, your grace, who would not here lose his composure?'

So I hear Haydn's Symphony No. 5 as a portrait of Count Morzin and his beautiful Countess.

Symphony No. 3 in G, c. 1760, seems to be a portrait of man of powerful intellect. In 3/1, *Allegro*, 3/3, Menuet, and 3/4, Finale - *Alla breve*, the thematic material is made out of several voices in counterpoint, 3/3 being a canon, and 3/4 being written in fugue. In 3/2, *Andante moderato*, we hear his pondering over serious issues. Perhaps this is a portrait of Count Morzin *père*, 1693-1763.

Symphony No. 25 in C, c. 1761: 25/1 opens with an *Adagio+* introduction, in an intimate, personal tone of voice, with beautiful music, as a portrait of a beloved elderly person. Throughout it builds upon the syncopation fingerprint. This suggests that the Symphony is Haydn's portrait of his father, Mathias Haydn, 1699-1763. 25/1, *Allegro molto+*, opens in bars 24-57 at 135 and 186 seconds with a splendid, powerful theme that continues into a continued sequence of different phrases, all of them active and powerful. A short, softer transition in bars 57-62 at 162 and 214 seconds retains the activity and leads to still further, powerful and active phrases in bars 63-85 at 169 and 219 seconds. The second part

of the movement continues to play on these active phrases, including the syncopation fingerprint in bars 102-105 at 253 seconds. 25/2, Menuet, presents an active theme of great rhythmic variety. The Trio at 72 seconds has the oboes and the horns singing over pizzicato strings, as an echo of Haydn's father playing the harp to the singing in the family in Haydn's early childhood. 25/3, Presto+, opens and repeats at 35 seconds with two phrases, the first having four soft tones, the second a single rising arch of quick tones, *forte*. In the further development these phrases lead to an active passage in bars 15-28 at 12 and 45 seconds, dominated by the syncopation fingerprint. From bar 29 at 21 and 57 seconds still further active themes are presented, as a picture of a active man of fine character and spirit.

Symphony No. 36 in E flat, c. 1762: 36/1, Vivace*, sounds like a portrait of princely person, of grandiose magnanimity. The fanfare fingerprint in bars 18 and 20 at 23 and 104 seconds and at bar 59 at 78 and 160 seconds indicate the grace of God. In 36/2, Adagio, the princely character is displayed in chamber music, with contributions from a solo violin and a solo cello. 36/3, Menuetto e Trio, and 36/4, Allegro, display a firm, but not inflexible character. Most likely the Symphony is a portrait of Prince Nicolaus Esterházy, who was a keen chamber music player on the baryton.

Symphony No. 13 in D, 1763: 13/1 is a fine Allegro molto displaying the orchestra with flute, four horns, and timpani, to its advantage. 13/2, Adagio cantabile, is a beautiful solo for cello. 13/3, Menuet e Trio, displays the flute prominently in the Trio. 13/4, Finale - Allegro molto, is a noble development for the full orchestra based upon a theme in two-part counterpoint. The Symphony has Haydn's syncopation fingerprint in both 13/1 and 13/4. (The timpani part in 13/1, with several fanfare fingerprints, is not in Haydn's hand in the autograph). The meaning seems obvious: Symphony No. 13 is a portrait of Haydn amidst his friends, the musicians.

Symphony No. 72 in D, c. 1763, displays the orchestra prominently in all movements. 72/1, Allegro, makes a spectacular display of the four horns. 72/2, Andante, is a dialogue between a solo violin and the flute. In 72/3, Menuet e Trio, the Trio is scored for wind instruments alone. 72/4, Andante, is set of variations on a simple tune presented by the strings. The variations are given successively to the flute, a solo cello, a solo violin, the double bass, the two oboes, and the full orchestra. Obviously Symphony No. 72 is a portrait of the orchestra. (The recordings of Symphony No. 72 by the Philharmonia Hungarica and the Austro-Hungarian Haydn Orchestra both include the timpani part given in the Philharmonia score, and there marked as 'Only from Gesellschaft der Musikfreunde, Wien'. In this part the timpani play the fanfare fingerprint as pure accompaniment at 14 places in 72/1 and at 2 places in 72/3. This is wholly contradictory to Haydn's use of his fanfare fingerprint. Undoubtedly this unsatisfactory timpani part is unauthentic).

Symphony No. 24 in D, 1764, sounds like a portrait of a grandiose lady of a wilful and irascible temperament. In 24/1, Allegro, she sails forth. When countered she responds with a four times repeated outburst. In 24/2, Adagio, with solo flute, we see her in her magnificence. The theme of 24/3, Menuet, has her firm statement with a weak response twice repeated. 24/4, Finale - Allegro, consists of passages that rise gradually from whispered beginning into long sequences of repeated insistence.

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Symphony No. 39 in g minor, c. 1766, sounds like a portrait of a person of nervous sensitivity. Throughout the Symphony the music displays this character. Right from the beginning of 39/1, *Allegro assai, piano*, the music has a nervous quality. It unexpectedly comes to a stop after four bars. And then just as unexpectedly continues the nervous motion for another 6 bars and then stops again. In 39/2, *Andante*, a gentle marching motion, *piano*, is suddenly interrupted by bars 10 and 12 of *forte*. In 39/3, *Menuet*, the nervous motion of the theme gets further agitated by bars 15 and 16 marked *forz*. In the Trio the first two bars of *piano* are followed by sudden *forte* in bars 3 and 5. In 39/4, *Finale - Allegro di molto*, the nervous quality is displayed in large skips in the theme and in frequent alternations of bars of *forte* and *piano*. The character displayed in the Symphony is such that one tends to associate with artists. Perhaps the Symphony is a portrait of the painter Johann Basilius Grundmann, who painted Haydn's portrait in 1762.

Symphony No. 41 in C, c. 1769, sounds like a portrait of an exalted being. Throughout the sound is brilliant, with trumpets. The tone impersonal, reverent. 41/1, *Allegro con spirito*, presents the magnificent figure in music of great dignity. When the fanfare fingerprint is heard in bars 72, 74, and 76, it is clear that the figure is of divine nature. In 41/2, *Un Poco Andante*, the flute weaves a halo around the figure. 41/3, *Menuetto e Trio*, displays a gentle and friendly character. In 41/4, *Finale - Presto*, the figure is seen flying in the air. Perhaps the figure is the angel Raphael, presented by Haydn in his oratorio *Il Ritorno di Tobia* from 1775.

Symphony No. 46 in B, 1772, is a portrait of a warm-hearted, imaginative person. The very first music of 46/1, *Vivace*, shows his character by the range of expression between the first four tones, stern, *forte tutti unisoni*, and the following gentle phrase, *piano*, in the strings. 46/1 continues to unfold this pair of expressions by ever richer expansions of the gentle phrase. 46/2, *Poco Adagio*, is a rich fantasy over a theme having one bar of *siciliano, legato*, and one bar of sixteenths, *staccato*. 46/3, *Menuet e Trio*, shows our man in the glorious, ever expanding *Menuet* theme, and in the warm harmony and the gentle rhythm of the Trio. In 46/4, *Finale - Presto e scherzando*, embarks on an exciting adventurous tale, full of surprises, until it comes to a stop on a question mark. And then the *Minuet* theme comes back, gloriously expansive; don't worry, it says, it was just a tale. And yet? The *Minuet* stops; the tale begins again, but soon hesitates. A long tone in the deep horns sets in; and then again, quickly, the theme of the tale, and two final chords: a final joke.

Symphony No. 50 in C, 1773, is an official portrait of a person in high office. This is announced right from the pompous beginning, 50/1, *Adagio e maestoso*. Throughout the Symphony the music describes the person in flattering splendour, with blazing trumpets, without any personal touches. This character accords well with the recent understanding, reported by Robbins Landon, that this was the Symphony performed for the Empress Maria Theresa upon her visit to *Eszterháza*. Conclusion: Symphony No. 50 is a portrait: The Empress.

Symphony No. 55 in E flat, 1774, 'Schulmeister': According to a message from Haydn himself a fuller title is: *Der verliebte Schulmeister*, The Schoolmaster in Love. 55/1, *Allegro di molto*, describes his character in the

opening, which has a short, strict phrase immediately followed by a gentle one. A second, extended theme is entirely gentle. 55/2, Adagio, ma semplice, is a set of variations. The theme, which is played by the violins, *staccato con sordini*, is wistful, as describing a person who is lost in fantasies of love. The theme of 55/3, Menuetto, again has a theme in two parts, the first strict, the second gentle. The Trio is wistful throughout. 55/4, Finale Presto, is a set of variations on a wistful theme, *piano*.

Symphony No. 69 in C, 1774, was titled 'Laudon' by Haydn himself. It is clearly a portrait of General Laudon, the Austrian Field-Marshal, to whom it is dedicated. Throughout the tone of voice is respectful and decorous. The opening phrase of 69/1, Vivace, has a military ring and also includes the fanfare fingerprint, indicating the grace of God. Later extended sections of the movement are gentle and warm. 69/2, Un poco adagio più tosto andante, breathes grateful respect. 69/3, Menuetto e Trio, has great dignity. 69/4, Presto, develops a theme of splendid, firm determination.

Symphonies No. 77 in B flat, c. 1781, and No. 79 in F, c. 1783, are described in the section on the Polzelli Symphonies.

Le Matin, Le Midi, Le Soir

The titles of Symphonies No.s 6, 7, and 8, Le Matin, Le Midi, and Le Soir, 1761, are known to have been proposed to Haydn from his patron. Judging from the music of the Symphonies it seems plausible that what Prince Esterházy proposed was not merely the three words, but rather a more specific representation of them in some form, perhaps as pictorial allegories. As long as this source of Haydn's inspiration is unknown to us it is only possible to guess at the outline of the meaning of the very expressive music.

Symphony No. 6 in D, Le Matin: 6/1, Adagio - Allegro, starts in nature with the sunrise and continues with the sounds of birds and insects. 6/2, Adagio - Andante - Adagio, seems to describe a beautiful dream. With 6/3, Menuetto e Trio, and 6/4, Finale - Allegro, we are back to some scene in active life.

Symphony No. 7 in C, Le Midi: 7/1, Adagio - Allegro, seems to describe the grandeur of the midday Sun. 7/2, Recitativo Adagio - Allegro - Adagio - Adagio - Ferma (Cadenza) - Allegro - Adagio, presents some dramatic scene. 7/3, Menuetto e Trio, has a descriptive character. The Menuetto in bars 17-18 has the syncopation fingerprint. 7/4, Finale - Allegro, seems to describe some busy activity, perhaps the flight of birds and insects.

Symphony No. 8 in G, Le Soir: 8/1, Allegro molto, seems to describe the busy day activity as it comes to rest in the evening. 8/2, Andante, and 8/3, Menuetto e Trio, may describe beautiful natural scenes in the evening light. 8/4, La Tempesta Presto, describes a thunderstorm.

Landscape and nature

Symphony 'B' in B flat, c. 1760: This is beautiful, impersonal, non-devotional, descriptive music. It might describe a landscape, in 'B'/1, Allegro molto, with bird life. In 'B'/2, Menuetto e Trio: Allegretto, we hear the calls of cattle and birds. 'B'/3, Andante, brings us into the quiet woods, among the majestic trees. In 'B'/4, Finale - Presto, we follow a stream as it winds through the landscape, with ripples and waterfalls.

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Symphony No. 14 in A, c. 1762: This sounds like a description of a landscape. 14/1, *Allegro molto*, describes the landscape in its wide grandeur. In 14/2, *Andante*, we are in a beautiful spot in the shade. 14/3, *Menuetto - Allegretto*, presents the life of cattle (horns) and in the Trio a bird (oboe). 14/4, *Finale - Allegro*, describes the bird life, high in the air.

Symphony No. 40 in F, 1763, is a pastoral. 40/1, *Allegro*, describes the growth of plants and trees. 40/2, *Andante*, *più tosto Allegretto*, is the rippling of a brook. In 40/3, *Menuet e Trio*, we meet cattle and birds. 40/4, *Finale - Fuga*, describes the crawling life of animals.

Symphony No. 38 in C, *Echo*, c. 1767, takes us into the high mountains. In 38/1, *Allegro di molto*, the first theme describes the high peaks, the second theme the deep canyons, and the third the effort of climbing. 38/2, *Andante*, is a quiet scene at a ravine, with echoes. In 38/3, *Menuet - Allegro*, we meet the shepherd blowing his pipe. 38/4, *Finale - Allegro di molto*, is the high alp, again with the shepherd. (This interpretation does not contradict Robbins Landon's suggestion that the Symphony was written to display a new oboe player. It is entirely plausible that Haydn decided to write an alp Symphony in order to celebrate the musician).

Symphony No. 57 in D, 1774, is about rain. Both 57/1, *Adagio - Allegro di molto*, 57/2, *Adagio*, and 57/3, *Menuet e Trio, Moderato*, start with the sound of drops falling and develop from there into descriptions of various forms of rain. 57/4, *Prestissimo*, is a chilling picture of a fierce rainstorm.

Types and fates of men

Symphony No. 22 in E flat, 1764, 'Der Philosoph': 22/1, *Adagio*, has the philosopher, horns, in dialogue with his disciple, *cors anglais*. The philosopher expresses himself in a dry, didactic style, a triad up and down as shown above in a music example. A similar style prevails in the three remaining movements of the Symphony, 22/2, *Presto*, 22/3, *Menuetto e Trio*, and 22/4, *Finale Presto*.

Symphony No. 23 in G, 1764: This Symphony is peculiar. Movement 23/4, *Finale Presto assai*, is such that Robbins Landon wants to say nothing about it; he passes it by in complete silence. But if we listen to Symphony 23 as a whole we may discover the sense of it. 23/4 is merely the fourth stage of a development which is already indicated in the three previous movements. Symphony 23 describes the decay of a mind, madness. 23/1, *Allegro*, starts out with rich sound and fine themes. But soon a flaw in the flow of the theme sets in, a jerk, first four times in bars 10 to 13, and then nine times, in bars 25 to 33. For a while this seems to have no influence on the flow of the music. But in the middle of the movement, in bars 73-75, the jerk is heard again, like a knock on the door, three times. In 23/2, *Andante*, the interruption to the flow of the music comes as a recurrent commentary to the theme, as short scale runs in the deep instruments. 23/3, both in the *Menuet* and the *Trio*, shows the mind reduced to mere mechanical repetition of the theme as a canon. The theme of the *Menuet* is a caricature of a dance. 23/4, *Finale - Presto assai*, shows the ultimate decay, merely short wild gestures interspersed with long series of senseless repetitions of the same figure. The end is emptiness. Conclusion: Symphony No. 23 describes Madness.

Symphony No. 28 in A, 1765: How does the suggestion that Symphony No. 28/2, Adagio, quoted in music above, represents God speaking to an unrepentant sinner relate to the remaining three movements of Symphony 28? As noted by Robbins Landon, the opening of 28/1, Allegro di molto, sounds like music in six-eighth time. Not until bar 6 does it become clear that it is music in three fourth time. This is an expression in music of dishonesty. 28/3, Menuetto, starts with a shrill cry in the violins, which is a caricature of a minuet. Quite the same holds for the music of the Trio, even though it is soft, *pianissimo*. 28/4, Presto assai, is light, elegant music, but is not original with the Symphony. Thus Symphony No. 28 as a whole is a portrait of The Unrepentant Sinner.

Symphony No. 34 in d minor, c. 1765, describes The Four Temperaments, as discussed above.

Symphony No. 35 in B flat, 1767, describes the Loner In the Crowd. In 35/1, Allegro di molto, the loner is presented by the quiet theme in bars 1-2 and again in bars 3-4, *piano*. We hear the crowd in bars 4-6, not as a theme but merely as *tutti* chords over the tone B flat in the horns. Then again the theme of the loner in bars 7-8, *piano*. The crowd comes in again in bars 9 to 16, which is a kind of cadenza for the full orchestra, *unisoni*, leading again to B flat in the horns in bar 16. In bars 17 to 24 the loner is with the crowd, first *forte*, then *piano*. And so the rest of 35/1 continues to present the theme of the loner against the *tutti unisoni* of the crowd. 35/2, Andante, describes the monotonous sadness of the loner, by a quiet theme that keeps being played in the same way. In 35/3, Menuet, Un Poco Allegretto, we hear the crowd in bars 1-7 in lively music, *forte*, and the loner in bars 7-10, subdued, *piano*. 35/3, Trio, presents the loner alone, by quietly spinning triplets in the violins. 35/4, Finale Presto, consists of alternations between presentations of the crowd by *forte* music without thematic distinction and the loner by *piano* passages with several distinct themes.

Symphony No. 59 in A, c. 1767, 'Feuer': Through Struggle to Fulfilment. 59/1, Presto, from the beginning shows the struggle, a series of active attempts that all fade out. 59/2, Andante o più tosto allegretto*, with long melodic phrases in reverend tones of voice, shows the dream of the fulfilment. The fanfare fingerprint at the climax shows that the fulfilment is with God. 59/3, Menuet, displays active attempts, the Trio the feeling of frustration in the struggle. 59/4, Allegro assai, is the triumphant fulfilment.

Symphony No. 58 in F, c. 1769, is a portrait of the Contradictor, the person who always has to contradict the current issue. In 58/1, Allegro, the opening gentle, soft music soon gives way to passages in which the same theme is presented loudly, with excited accompaniment. 58/2, Andante, has the beautiful music supported by alternately quiet held chords and restless triplets. In 58/3, Menuet all zoppa e trio - u poco allegretto, the theme of the Menuet is syncopated in a manner which contradicts the Menuet rhythm. The Trio has no rhythm at all, only warm harmony. 58/4, Finale Presto, is a sequence of passages which contradict each other by their sudden changes of harmony and orchestral sound.

Symphony No. 43 in E flat, 'Merkur', c. 1770, is a portrait of unstable resignation after a life of suffering. 43/1, Allegro, is a sequence of statements of unsettled, unanswered questions, each leading to a passionate, outburst of pain. 43/2, Adagio, is reminiscence of long years of suffering. 43/3, Menuetto e Trio, shows the surface of resignation, hiding the pain. 43/4, Finale Allegro, once more brings out the unsettled questions. The end is a pained protest.

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Symphony No. 51 in B flat, c. 1770: The idea of this Symphony is stated in the first 12 bars of 51/1, *Vivace*. Here the full orchestra, *forte*, opens with an energetic statement that comes to a full close after four bars. Immediately following the strings, *piano*, make a soft statement that comes to a full close after eight bars. The whole Symphony is made out, pedantically, in four and eight bar periods. 51/1 is a sequence of such periods, each period being made from one particular musical theme or figure. 51/2, *Adagio*, is constructed similarly. It starts with a solo in the high horn of 8 bars. Then comes a solo in the deep horn of 4 bars and then a solo in the oboe of 4 bars. 51/3, *Menuetto*, has two trios. The *Menuetto* and *Trio 1* each have two periods of 8 bars. *Trio 2* has one period of eight and one period of sixteen bars. 51/4, *Finale - Allegro*, is a rondo. Both the theme and each of the interludes have two periods of eight bars. Symphony No. 51 may be titled *The Pedant*.

Symphony No. 65 in A, c. 1772: The motto of this Symphony is *Scatterbrain*. Throughout the music is made from short sections of different character that just follow upon one another without having any mutual relation. 65/1, *Vivace e con spirito*, starts with a section A consisting of just three chords, *forte*. Section B is 8 bars of soft music, *legato*. Then comes A again, in double speed. Then comes section C, 7 bars of broken chords, *staccato*, in the bass. Section D follows: 4 bars of softness in the violins. Section E has 4 bars of duet between the oboes and the violins, *forte*. Section F has 4 bars of imitations between the first and second violins. Section G has 5 bars of large skips up and down in the violins. Section H has 8 bars of soft, gliding phrases, first in the violins, then also with the oboes. Finally, to round off the first part of the movement, come 7 bars of final flourish. The second part of the movement starts in the first 7 bars with two new sections. The rest of the movement continues as a sequence of sections, using music taken from the sections in the first part, taken in the order B, G, H, A, H, A, C, D, E, F, G, H. 65/2, *Andante*, is again put together of sections of music of different character but no mutual relation. The sections making up the music mostly have 2 or 4 bars, changing in a random manner between *piano* and *forte*. 65/3, *Menuetto e Trio*, is scatterbrained rhythmically. The *Menuetto* starts off in the first 4 bars to present a theme with clear accents on the first of the three beats of the bars. But in the following bars the music unobtrusively slides into having accent, not on every third, but every fourth beat. The *Trio* starts having a three beat rhythm. But after three bars it just slides into a two beat rhythm. 65/4, *Presto*, starts with section A of 3 bars, a soft phrase for horns and violins. It is immediately repeated. Section B has 2 bars for the full orchestra, starting *forte*, changing to *piano*. This is repeated and followed again by A and then a variation of B. Section C is four bars of long chords in the oboes and strings. Section D has four bars of lively string music. And so the movement continues as a mosaic of short disconnected sections.

Symphony No. 64 in A, c. 1774, is titled 'Tempora mutantur'. As pointed out by Jonathan Foster in *Haydn Jahrbuch IX* the title is the beginning of an epigram by John Owen (c. 1565-1622):

Tempora mutantur, nos et mutamur in illis; Quomodo? fit semper tempore peior homo.

Translation by Thomas Harvey from 1677:

*The Times are Chang'd, and in them Chang'd are we:
How? Man, as Times grow worse, grows worse, we see.*

Throughout Symphony No. 64 the subject is change. 64/1, Allegro con spirito, describes relentless change. Over the first 48 bars the lively, robust themes of the first three bars undergo a continuous series of astounding changes, until from bar 49 they emerge quite differently as a striking, nervous, chromatic theme. 64/2, Largo, is a sublimely eloquent expression of what seems to be: every moment of life is a step towards death. This expression is achieved by frequent pauses in slow flow of the music. In 64/3, Menuet - Allegretto, the theme has a nucleus of one bar which then comes in ever changed forms. The Trio similarly is made from a nucleus of two bars. 64/4, Finale Presto, is a rondo with a splendid theme of 12 bars. This theme comes back in unchanged form 5 times. Jonathan Foster shows that the epigram by John Owen can be fitted to this theme. It seems that Haydn's idea is that everything changes, except the text of the epigram. The meaning of Symphony No. 64: The inexorability of change.

Symphony No. 56 in C, 1774, is about Dream and Reality. In 56/1, Allegro di molto, reality in the form of passages of noisy, energetic music alternates with dream in the form of soft music, rich in melody and harmony. 56/2, Adagio, is a dream fantasy, as imaginative and beautiful as anything Haydn ever wrote. 56/3, Menuet, like 56/1 is an alternation of noisy energy and gentle softness. The Trio is a soft, dreamy solo for the oboe. In 56/4, Finale - Prestissimo, the same triplet figures appear alternately in loud and soft passages. Noisy reality wins at the end.

Symphony No. 68 in B flat, c. 1774, is a portrait of the Elegant Man. In 68/1, Vivace, we see him, in striped suit, vest, cane, and spats, all neatness. 68/2, Menuetto, presents the smoothness, and the Trio the neatness, of the Elegant Man. In 68/3, Adagio cantabile, he tells about his life in elegance. It has not excluded sentimental attachments and pain, but only elegantly restrained. 68/4, Finale Presto, shows how the different aspects of life may all be handled neatly and smoothly.

Symphony No. 66 in B flat, c. 1775, is a beautiful expression of Thoughtful Self-Confidence. This found in each of the four movements. 66/1, Allegro con brio, starts with a long development in three parts, in which confidence develops from a quiet beginning into a glorious assertion in bars 31 to 38. But then, all of a sudden, thoughtful reflection sets in, leading to a hesitant pause in bars 42-43. Further quiet thoughtfulness follows in bars 44-50, *dolce e piano*, before the confident assertion is resumed from bar 51. In the second part of the movement the thoughtfulness is expressed at still greater length in bars 84-102. 66/2, Adagio, starts from quiet confidence, which grows into a climax in bar 21. But then thoughtfulness sets in. This leads to quiet contemplation in bars 25-38. The second part of the movement has an expanded version of the same development. 66/3, Menuetto, presents in bars 1-4 a confident theme, *forte*, which is immediately answered by the same theme, *piano*, in bars 5-8. The second part again starts confidently, *forte*, in bars 9-18. But then reflection sets in, in bars 18-22, with thoughtful hesitation in bars 22-27 before the resumption of the confident theme from bar 27. 66/3, Trio, is quiet, thoughtful reflection, *pianissimo*, throughout. In 66/4, Finale - Scherzando e presto, the reflective mood is presented in the quiet opening theme, having two five-bar periods, and again in hesitations in bars 98 and 102.

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Symphony No. 67 in F, c. 1775, is about Activity and Contemplation. 67/1, Presto, opens with 24 bars of incessantly developing activity in the violins, *pianissimo*. It continues with 30 bars of stamping activity, *fortissimo*. Then comes contemplation, in the form of three quiet questions and answers. The second part of the movement begins with quiet contemplation, which after 20 bars leads to two questions and answers. The movement continues with alternations of active and contemplative music. 67/2, Adagio, is mostly quiet contemplation. In long stretches this rises gradually into firm resolve. However, at the very end we are back in the quiet mood. 67/3, Menuetto e Trio, has the activity in the Menuetto and contemplation in the eerie Trio, played by two solo violins. 67/4, Finale, has the activity in the opening and final Allegro-di-molto sections. Contemplation is presented in the middle Adagio-e-cantabile section, which starts very quietly as chamber music for two violins and a cello and only gradually expands in the sound of the full orchestra.

Symphony No. 61 in D, 1776. This work seems to describe Ripe Maturity. 61/1, Vivace, describes the person's development from birth into ripe maturity, from bustling childishness into a rich tapestry in which activity alternates with the gentleness and tenderness of maturity. 61/2, Adagio, describes the contemplative side of maturity, in beautiful, nostalgic music. 61/3, Menuet - Allegretto, describes the character of maturity, mostly bold and firm, but also with gentleness. The Trio is all gentleness. 61/4, Prestissimo, presents the lively alertness of maturity.

Symphony No. 70 in D, c. 1777, describes Self-Confidence. In 70/1, Vivace con brio, the self-confidence is assertive, aggressive. 70/2, Specie d'un Canone in Contrapunto doppio, walks along steadily, sure on its feet. 70/3, Menuet - Allegretto, the self-confidence comes in repeated insistence. 70/4, Finale - Allegro con brio, is made out of a single assertive phrase of four repeated notes which is stated in numerous ways and comes as one of the themes in a fugue.

Symphony No. 71 in B flat, c. 1777, is about Pensiveness. This is made clear in the introductory Adagio of 71/1. This has three times a short firm phrase which is immediately confirmed by a soft, pensive one. 71/1, Allegro con brio, opens in bars 8-13 with a soft, gentle theme, which is immediately, in bars 13-28, followed by five comments of various characters. Bars 29-31 introduce a new theme, *forte*. This is repeated in bars 32-34. The third repetition of the theme from bar 35 is immediately followed, in bars 38-44, by three comments on its last phrase, leading through a long sequence of further quiet comments to a thoughtful rest on bar 58. The thoughtful comments develop into a quiet passage in bars 59 to 75. The movement continues all through with phrases that are immediately commented on. 71/2, Adagio, is a set of variations on a theme in which each phrase is confirmed in a pensive comment. In 71/3, Menuetto, the opening firm theme is immediately answered, in bars 5-6, by a soft, pensive comment. In the second part of the Menuetto the pensive comment expands into 13 bars. 71/3, Trio, is pensive throughout. In the second part the result of the pensiveness is confirmed in a three times repeated firm affirmation. 71/4, Finale - Vivace, opens softly with a smoothly flowing theme of four bars entirely made up of phrases that immediately confirm each other. This theme as a whole is then

again confirmed by being repeated, *forte*. And so the music continues all through the movement with phrases, some short, some long, that are immediately commented on in a pensive manner.

Symphony No. 62 in D, c. 1777, is about Daydreaming. Throughout the music comes in sections in each of which an idea is taken through a certain sequence of modifications, as in idle daydreaming. In 62/1, Allegro, a first idea is presented in bars 1-5 and then repeated in bars 6-10. Bars 11-14 present a new idea of four quavers, played eight times. From bar 15 an idea of three crotchets is played six times. This develops in bars 21-23 into a one-bar figure, which is played 5 times from bar 24. In bars 29-35 several similar ideas are played upon. A new idea of two bars comes in at bar 36 and is developed until bar 50. From bar 51 an idea of seven bars is presented twice in succession. In the beginning of the second part of the movement, in bars 69-100, an idea of four bars is presented successively in seven different tonalities. 62/2, Allegretto, in bars 1-27 is a fantasia over two motives, one of three quavers, the other of two dotted crotchets. In bars 28-34 an idea of two bars is played four times. In the second part of the movement these same ideas are played upon, with imaginative embellishments. 62/3, Menuet - Allegretto, presents a splendid, firm theme. In the second part the theme is prolonged with playful extensions. In 62/3, Trio, the theme opens with a striking, syncopated figure in the bassoon. The second part has further comments on this figure. 62/4, Finale - Allegro, opens with a firm theme of 3 bars played twice. Much of the movement plays on this theme, or the first two bars of it. Bars 21-28 introduces a similar theme of two bars, played three times. Bar 54 introduces a very different figure of three snaps, which is played through to the end of the first part of the movement.

Symphony No. 78 in c minor, c. 1781, is an expression of Unrequited Love. It is described in the section on the Polzelli Symphonies.

Symphony No. 80 in d minor, c. 1781, is about Toil. 80/1, Allegro spiritoso, opens with heavy music, slowly rising in the bass, like the dragging of a load upwards along an irregular slope. This continues for 56 bars, with only brief pauses for catching breath. Only then there is a brief relaxation, a gentle waltz playing for 8 bars. The second part begins with the relaxed waltz, only hesitantly returning to the heavy toil. 80/2, Adagio, describes the exhausting effort of concentration. All along the music comes in short phrases of concentration interspersed with moments of collection of forces. 80/3, Minuetto (Moderato), walks along with heavy steps. In the Trio a monotonous oboe describes the blazing sun on the brow of the tired walker. 80/4, Finale - Presto, is dominated by the monotonous syncopated rhythm, which is like the effort of pulling a rope.

Symphony No. 81 in G, c. 1783, describes Creativity. 81/1, Vivace, starts from gliding phrases that soon develop into other, more firm melodic phrases, like the first ideas of a new creation, coming to a tentative close in bar 12. From bar 13 this opening is confirmed by being repeated, this time leading from bar 23 into a long active section in which a series of new ideas are tried out, one after the other. From bar 51 these ideas combine into a fine, spirited theme. The second part of the movement presents ever further creative variations of this music. 81/2, Andante, is a theme with four variations. The theme itself and each of its variations is formed from ever new creative ideas.

Appendix 4: The Meaning of Joseph Haydn's Early Symphonies

81/3, Menuetto Allegretto, demonstrates creativity in a nutshell. It starts from just one tone which is repeated. After two bars the interval of a second is created and repeated four times, followed by a phrase of three tones, developed into three different forms. This immediately leads to the creation of a closing of the opening 8-bar phrase. This is then answered by a balancing phrase of four bars. The second part of the Menuetto continues to present ever new creative phrases. 81/3, Trio, develops a theme in the fagotto which continues to present new melodic phrases. 81/4, Finale, Allegro ma non troppo, similarly as 81/1 starts from a twice repeated embryonic phrase of four bars, which then leads to a long section of active development of new phrases.

Polzelli Symphonies

The Symphonies No.s 74, 77, 78, and 79, have characters suggesting that they all reflect Haydn's relation to Luigia Polzelli. Luigia Polzelli, born in Naples in 1750, was a singer who together with her husband, the violinist Antonio Polzelli, was engaged to the troupe at Eszterháza in March 1779. Luigia Polzelli became Haydn's mistress and her second child, Alois Anton Nikolaus, born in 1783, was regarded in the family as being Haydn's son. The Polzellis remained in the princely service until the troupe was disbanded in 1790. Thereafter they went to Vienna, where Antonio soon died. Luigia then went to Italy where she sang at the theatres in Piacenza and Cremona. The first child of the Polzellis, Pietro, born in Italy in 1777, became a favourite of Haydn's. In 1792 he came to live with Haydn in Vienna, where he was a violinist in Schikaneder's Theater auf der Wieden, until he died in 1796.

First hand documentation of Haydn's relation with Luigia Polzelli is retained in several letters he wrote to her. In a letter from London, 4th August 1791, Haydn writes to Vienna (original in *Italian*, in the personally intimate *Tu*-form, translation as in Robbins Landon, vol. 3 p. 95): 'Dear Polzelli! ... As far as your husband is concerned, I tell you that Providence has done well to liberate you from this heavy yoke, and for him too, it is better to be in another world than to remain useless in this one. The poor man has suffered enough. Dear Polzelli, perhaps, perhaps the time will come, which we both so often dreamt of, when four eyes shall be closed. Two are closed, but the other two - enough of this, it shall be as God wills. ...'

In a letter from London, 14th January 1792, Haydn writes to Piacenza (reproduced in facsimile in Robbins Landon, vol. 3, *pl.* 27, *Italian*, *Tu*-form, translation as on p. 122): 'My dearest Polzelli! This very moment I received your letter, and hasten to answer it. I am relieved that you are in good health, and that you have found a position in a little theatre ... I wish you every possible success, in particular a good rôle and a good teacher, who takes the same pains with you as did your Haydn. You write that you would like to send your dear Pietro to me; do so, for I shall embrace him with all my heart; he is always welcome, and I shall treat him as if he were my own son. I shall take him with me to Vienna. ... I am quite well, but am almost always in an 'English humour', that is, depressed, and perhaps I shall never again regain the good humour that I used to have when I was with you. Oh! my dear Polzelli: you are always in my heart, and I shall never, never forget you. I shall do my very best to see you, if not this year, then certainly the next, along with your son. I hope that you won't forget me, and that

you will write to me if you get married again, for I would like to know the name of him who is fortunate enough to have you. ...’.

In a letter from London, 13th June 1792, Haydn writes to Bologna (*Italian, Tu*-form, translation as in Robbins Landon, vol. 3 p. 175): ‘My dear Polzelli - I received your letter with the false news about my wife ... I shall write you soon, to tell you when your Pietro should leave ... My dear Polzelli, I hope to see you next year ... and I hope, as God is my witness, always to be the same to you as I have been. I love you and will always be your faithful Giuseppe Haydn.’

In a letter from Vienna of 22nd October 1792, Pietro Polzelli and Haydn write to Bologna (*Italian, Pietro* in ‘*Lei*’ form, Haydn in ‘*Tu*’, translation as in Robbins Landon, vol. 3 p. 199): ‘Dearest Mother! ... il Sigre Maes. Haydn has found a place for me in his own house, so as to have more time to be able to teach me everything ... Your most obedient son, Pietro Polcelli [*spelled thus*]’. [Haydn’s postscript:] Dear Polzelli, Your son has been very well received by my wife ...’

There is no evidence that Haydn ever met Luigia Polzelli in the later years. In his Last Will of 1809 Haydn bequeathed Luigia Polzelli an annuity for life.

Symphony No. 74 in E flat, c. 1780, may be titled: Happily in Love. The music is happy throughout, alternating between joyful spirits and moments of tenderness. In many places the happiness is expressed in a strong phrase that immediately is followed by a gentle confirmation. 74/1, *Vivace assai*, opens with three rising chords, *forte*, and continues in bars 3-7 with a twice repeated phrase, *piano*, as a tender confirmation of the happy opening. From bar 8 this opening comes again, but with the tender phrase supplemented with a spirited figure. The high spirits take over completely in bars 21-33, to be followed, in bars 34-44 with an extended form of the tender phrase. 74/2, *Adagio cantabile+*, is a tender serenade. It has Haydn’s syncopation fingerprint in bars 76 and 88. In 74/3, *Menuetto*, the happy feelings express themselves in the snaps, and in 74/3, *Trio*, in the gay solo for the fagotto. 74/4, *Finale - Allegro assai*, the happiness is expressed in the themes that continue to spin out in gentle, joyful phrases. It seems plausible that this Symphony describes Haydn’s feelings at meeting Luigia Polzelli.

Symphony No. 77 in B flat, c. 1781, has a light, feminine character, and it lies close at hand to hear it as Haydn’s portrait of his mistress, the singer Luigia Polzelli, forming a pair with Haydn’s self-portrait, No. 74. Throughout the music has the character of the music that Haydn is known to have written especially to be sung by Polzelli, e.g. the part of Lisetta in the opera *La Vera Constanza*, of which Robbins Landon says: ‘She had a kind of soubrette voice, and Haydn wrote very characteristic music for her—light, ironic, charming.’ (Robbins Landon, Vol. 2, p. 649). 77/1, *Vivace*, opens with a lively, gentle theme that continues to develop into 40 bars. The second theme, from bar 41, is again light, with a gently ironic twist. In the second part of the movement both themes are richly unfolded. 77/2, *Andante sostenuto*, consists entirely of a long, warm, songlike theme, which continues to develop with ever new delightful turns and twists. 77/3, *Menuetto*, opens with a gentle theme in the violins accompanied by regular staccato ticks in the winds. In the second part the ticks of the accompaniment come irregularly, as an ironic comment. The *Trio* is all charming gentleness. 77/4, *Finale - Allegro spiritoso*, is dominated by the opening long, gently active theme, which in the course of the movement is given a number of spirited and ironic developments.

Appendix 4: The Meaning of Joseph Haydn's Early Symphonies

Symphony No. 78 in c minor, c. 1781, is an expression of Unrequited Love. Plausibly it is a portrait of Antonio Polzelli, the husband of Luigia Polzelli, Haydn's mistress, who is portrayed in Symphony No. 77. Throughout the music of No. 78 has the contrast of passionate appeal and frustration over the failing response. 78/1, Vivace, opens with a three-bar, passionately appealing, unison gesture, *forte*, which is immediately answered by five bars of noncommittal gentleness, *piano*. This is immediately followed, in bars 9-47, by a passionate extension of the opening gesture. The response to this, in bars 48-54, again is entirely noncommittal, *pianissimo*. This leads, in bars 55-75, to a lengthy expression of despair, concluding the first part of the movement. The second part, bars 76-192, is dominated by further extensions of the passionate and despairing music, relieved only by a short return in bars 163-170 to the noncommittal response. 78/2, Adagio, opens in bars 1-13 with a series of sighs answered by light, noncommittal responses. Bars 14 and 16 sound like a prisoner desperately shaking the iron bars of his cage. The responses in bars 15 and 17-20 again are noncommittal, *piano*. The whole movement has expansions of that same music. 78/3, Menuetto - Allegretto, in bars 1-20 has one passionate appeal after the other, on and on, at first *forte*, then in bars 8-12 *piano*, and then again *forte*. The response in bars 21-24 consists merely of four totally noncommittal chords. The music then returns to further appeals. 78/3, Trio, has further appeals, less passionate, more argumentative. Of response there is none. 78/4, Finale - Presto, expresses a valiant effort to live with the unhappy situation. It opens with a short active phrase, *piano*, which is immediately confirmed in a similar phrase, *forte*, as if saying: Pull yourself together. In an interlude in major in bars 40-64 there is an attempt to look at the situation more lightly. However, this is followed from bar 64 with a repetition of the grim opening. From bar 96 the opening phrase is three times stated quietly as an appeal, and three times answered by silence. This releases in bars 108-147 a long cry of despair. In bars 208-220 the appeal is made more insistently, in new ways, and again answered by silences. The symphony ends in bars 221-241 with a final cry of despair. Haydn has signed it 'Fine'. There is no 'laude deo' signature.

Symphony No. 79 in F, c. 1783, is light, charming, and innocent, throughout, and it lies close at hand to hear it as a tribute to young children from a loving father, in other words, as Haydn's portrait of Luigia Polzelli's two sons, born 1777 and 1783. This character of the music has been noted by Robbins Landon, who says that 'The purity and beauty of the slow movement have a certain innocence ...'. 79/1, Allegro con spirito, immediately sets the tone of the whole movement as a picture of a young child by the opening gentle and lively theme, given to violins and fagotto. In bars 50-51 it has Haydn's syncopation fingerprint, indicating his fatherly involvement. 79/2, Adagio cantabile, in bars 1-60 is entirely peaceful innocence, as a sleeping child. From bar 60 the tempo indication changes to un poco allegro, and the music sounds like a child's lively tottering around. 79/3, Menuetto - Allegretto, is made from short phrases, *forte*, that are immediately followed by shorter responses, *piano*, which sounds like an adult's loving talk with a child. 79/3, Trio, is just a charming, innocent tune. 79/4, Finale - Vivace, is lively and charming music, as a picture of a child playing around on a fresh, sunny morning in spring.

Church Symphonies

The Symphonies No.s 16, 26, 30, 31, 44, 47, 48, 49, 52, and 75, have characters suggesting that they were written for use in the church service. That this may be so has been demonstrated for No. 26, Lamentatione, and No. 30, Alleluja, by Robbins Landon, who has found the source of the actual church music used by Haydn. The tone of voice throughout these Symphonies is one of reverent devotion. Further characteristics of the other Symphonies suggesting their use in church are as follows:

Symphony No. 16 in B flat, c. 1760: 16/1, Allegro, has a hymn-like theme, played with counter parts, similarly as 30/1. In 16/2, Andante, the tone of voice is respectfully reverent throughout. 16/3, Finale Presto, is an energetic assertion of the fanfare fingerprint.

Symphony No. 31 in D, 1765, 'Hornsignal', is a praise to God, *laudedeo*. This is clear from the very first moment of 31/1, Allegro, when the horns intone the fanfare fingerprint. Throughout the Symphony the tone of voice is one of reverent devotion. This holds in particular about the whole of 31/2, Adagio, and of the theme of the variations in 31/4, Finale Moderato molto. In the solo variations there is no trace of personal display. Rising scales in the flute in 31/1 undoubtedly signify the Holy Ghost. The Symphony ends as it began, with the fanfare fingerprint.

Symphonies No.s 44 'Trauer', 47, 48 'Maria Theresia', 49 'La Passione', and 52, all have passionate and tragic characters suggesting that taken together in some order they represent the events of the Holy Week, in other words that they together form an Easter Passion.

Symphony No. 44 in e minor, c. 1768, 'Trauer': The tone of voice in this Symphony is one of reverence. 44/1, Allegro con brio, sounds like a meditation on some part of the liturgy, which might be a word given in the opening.

Symphony No. 48 in C, c. 1768: 48/1, Allegro, has the fanfare fingerprint in bars 5 and 6, after the introductory flourish. Perhaps this opening describes the Resurrection.

Symphony No. 47 G, 1772: The tone of voice throughout this Symphony is one of reverence. 47/1, Allegro, sounds like a meditation on some part of the liturgy, which might be a word given in the opening horn theme. 47/2, Un poco adagio, cantabile, is similar to 16/2, variations on a solemn theme.

Symphony No. 75 in D, c. 1777: Throughout this Symphony a reverent tension is maintained by alternations of soft and loud music. 75/1 opens with an intensely serious Grave, in which long held *fortissimo* chords are answered by eloquent phrases, *piano*. 75/1, Presto*, develops from a short intense opening, *piano*, into a long, passionate passage, *forte*. At the final climax of the second part of the movement the fanfare fingerprint is stated in the trumpets. 75/2, Poco Adagio or Andante con variazioni*, is a set of variations on a serious hymn-like theme having strong contrasts of dynamics. Variation 2 has the fanfare fingerprint in *forte* passages alternating with lighter passages, *piano*. In 75/3, Menuetto - Allegretto, the serious character of the theme is brought out by the heavy accents on the first beat of each bar. The second part starts with a soft phrase which is immediately followed by a similar phrase, *forte*. In 75/3, Trio, the theme is made from an upbeat, a snap, *forte*, and two crotchets, *piano*. 75/4, Finale -Vivace, starts out with a long, tense, subdued theme in two parts. This then gives way to a long passionate passage, *forte*.

Chronological survey

The results of the exploration are given in the following survey, which lists the Symphonies in the chronological order established by Robbins Landon. Where no autograph year is given no dated autograph has been preserved. The ordering in many of its details is merely conjectural. In particular the position of Symphony No. 9, which might seem to contradict the interpretation of this work as part of the Salve Regina cycle, is uncertain. It would not contradict the evidence of the manuscripts if this Symphony were interchanged with either 'B', No. 16, or No. 17.

Symphony No.	Autograph year	Title	Fingerprints: * Fanfare, + Syncopation Meaning found in the exploration
1			*+ Salve Regina 1
37			*+ Salve Regina 2
18			*+ Salve Regina 4
19			*+ Salve Regina 3
2			*+ Salve Regina 6
'B'			Landscape
16			* Church Symphony
17			+ Self-portrait: Modest Gratitude
15			*+ Self-portrait: The Lover
4			*+ Self-portrait: Thankfulness
10			The Four Seasons: Autumn
32			* Salve Regina 7
5			Portrait: Count Morzin and Countess
11			*+ Self-portrait: Joy in God
33			The Four Seasons: Winter
27			+ Self-portrait: The Friend
'A'			The Four Seasons: Spring
3			Portrait: Powerful Intellect
20			The Four Seasons: Summer
6		Le Matin	
7	1761	Le Midi	+
8		Le Soir	
9			*+ Salve Regina 5
25			+ Portrait of Father
14			Landscape with Cattle
36			* Portrait of Prince Esterházy
12	1763		+ Self-portrait: The Confessor
13	1763		+ Portrait: Haydn With His Musicians
40	1763		Landscape: Pastoral
72			Portrait of the Orchestra
21	1764		+ Self-portrait: The Composer
22	1764	Philosoph	Portrait: Philosopher and Disciple
23	1764		Madness
24	1764		Portrait: Grandiose Lady

30	1765	Alleluja	*	Church Symphony
29	1765		+	Self-portrait: The Man of the People
31	1765	Hornsignal	*	Church Symphony: Laude Deo
28	1765			The Unrepentant Sinner
34				The Four Temperaments
39				Portrait: Artist
35	1767			The Loner in the Crowd
59		Feuer	*	Through Struggle to Fulfilment
38				Landscape: Alps
49	1768	La Passione		Church Symphony
58				The Contradictor
26		Lamentatione		Church Symphony
41				Portrait: Archangel Raphael
48		Maria Theresa	*	Church Symphony
44		Trauer		Church Symphony
52				Church Symphony
43		Merkur		Resignation
42	1771		+	Self-portrait: The Dreamer
51				The Pedant
45	1772	Abschied		
46	1772			Portrait: Warm-hearted, Imaginative
47	1772			Church Symphony
65				Scatterbrain
50	1773			Portrait: The Empress
64		Tempora mutantur		The Inexorability of Change
54	1774		*+	Self-portrait: Thanks to God for Recovery
55	1774	Schulmeister		Portrait: The Schoolmaster in Love
56	1774			Dream and Reality
57	1774			Rain
60		Il Distratto		
68				The Elegant Man
66				Thoughtful Self-Confidence
69		Laudon		Portrait of Field-Marshal Laudon
67				Activity and Contemplation
61	1776			Ripe Maturity
53		L'impériale		
63		La Roxelane		
70				Self-Confidence
75			*	Church Symphony
71				Pensiveness
62				Daydreaming
74			+	Self-portrait: Happily in Love
73		La Chasse		
76			+	Self-portrait: The Composer at Work
77				Portrait of Luigia Polzelli
78				Unrequited Love (Antonio Polzelli)
79			+	Portrait of Luigia Polzelli's sons
80				Toil
81				Creativity
82			*	Church Symphony

The plausibility of the interpretations

As reported above, the interpretations of the individual Symphonies suggested have been found mainly through attentive listening to the music. The present section will present some additional considerations that have influenced the exploration and that support the plausibility of the interpretations found.

As one circumstance it should be noted that the designation *sinfonia* was used quite commonly by Haydn and his contemporaries to denote an instrumental piece of music having an extramusical meaning. Such pieces denoted *sinfonia* were commonly inserted in operas and oratorios and were used to express some of the mood of the human situation described in the work. A well known example is the *Pastoral Symphony* in Handel's *Messiah*.

Similarly the instrumental overtures of operas were often denoted *sinfonia*. For example, Haydn's overture to his opera *L'isola disabitata* was first published in 1783 under the title *Sei Sinfonie a grand Orchestra*. This overture is in four sections: Largo - Vivace assai - Allegretto - Vivace. It clearly describes the development of the mood of the characters of the opera, from pained depression to jubilant relief.

Again what Haydn called a *sinfonia*, when played during his visit in London was announced as an *Overture*.

In this context it may also be mentioned that the similarity of Haydn's symphonies with preludes to dramas has been noted by Robbins Landon, who suggests that Symphonies No.s 9 and 25 may have been such overtures (a suggestion which is not supported by the present investigation, however).

It may further be noted that the use of instrumental compositions to describe extramusical themes was a lively tradition in Haydn's environment. As just one illustration may be mentioned that Haydn's immediate predecessor as *Kapellmeister* at Eisenstadt, Gregorius Josephus Werner, in 1748 published a *Neuer und sehr curios musicalischer Instrumental-Calender*, which was a set of 12 suites of instrumental pieces, one suite of four or five pieces for each month. Each of these many pieces has a title indicating an extramusical theme of the music, e.g. Hope for a Happy New Year, The Wedding of Father Brown, Lent, Springtime, Changeable April Weather, The Gardener, The Nightingale, An Earthquake, The Loafer, A Thunder-shower, The Cooper, The Hunt, and Sleep or a Nocturne.

The plausibility of the kinds of meanings found here rests, most of all, on the way a large number of specific details of the works, many of them highly idiosyncratic, have been given explanations that are coherent with each other.

For some of the groups of works the plausibility can be further argued from Haydn's position as princely music master. Haydn's position was similar to that of the painters who were employed by Prince Esterházy. Haydn started writing symphonies only after he entered the service of Count Morzin at the age of 27. In this capacity he wrote about 19 symphonies in one year. It seems fairly obvious that Haydn's production of symphonies was directly related to his employment, as was his later production of large quantities of music for the baryton, including 126 trios, which were directly commissioned by Prince Esterházy for his own use as a player of the baryton.

For a princely *Kapellmeister* what could be more plausible than that he would

write music portraying his princely patrons, in addition to portraits of other persons attached to the court, including self-portraits? Just as the painter of the court would do the same thing in painting. As shown by reproductions in (Robbins Landon, 1978-80) the princely painter Johann Basilius Grundmann painted a portrait of Haydn in 1762, and the princely painter Ludwig Guttenbrunn painted a self-portrait. Thus as interpreted here, Haydn's symphonies are closely analogous to the paintings of a master such as Rembrandt.

The plausibility of the interpretation of the *Salve Regina* Symphonies may be argued from the fact that, as reported by Griesinger, Symphony No. 1 was the work that impressed Prince Paul Anton Esterházy so much that he engaged Haydn to his service as *Kapellmeister*. Now, as reported in detail by Robbins Landon, the Esterházy family were staunch Catholics, particularly devoted to the Virgin Mary. Paul used to call himself 'The lowliest servant of Our Dear Lady'. Thus it seems entirely in character that he would be particularly impressed by a symphony by Haydn celebrating The Virgin Mary.

The detection of an intimately personal character of certain of the symphonies is strongly confirmed by the appearance of the personal symphonies 74, 77, and 79, at the time when Haydn formed his liaison with Luigia Polzelli.

To an argument that the meanings here found, if valid, would have been known all along it may be answered that very little of the circumstances around the original performances of Haydn's symphonies have been retained in the historical records. Practically nothing has been recorded about when and where they were performed. Even a special event, the performance of a symphony before the Empress Maria Teresa, is very incompletely recorded. Traditionally it has been thought to have been Symphony No. 48, which accordingly has been nicknamed Maria Theresia. However, Robbins Landon's researches indicate that No. 48, which was written in 1769, could not have been written expressly for the Empress's visit in 1773. He finds that the symphony played before the Empress was No. 50. This accords well with the character of the music, as a portrait of the Empress, found in the present investigation.

It may be noted that the present interpretations disagree with the idea of a crisis in Haydn's artistic development widely publicized under the heading *Sturm und Drang*. The *Sturm und Drang* idea has already been found by Robbins Landon to be historically unsound; Haydn's so-called *Sturm und Drang* symphonies were written before the literary movement of *Sturm und Drang* arose. Also there is no evidence that Haydn had any interest in or contact with contemporary literary activity. In the present interpretations the passionate character of some of the symphonies from around 1768 is explained by their belonging to a symphonic Easter cycle.

A letter from H. C. Robbins Landon

Foncoussières, F - 81800 Rabastens, 28 May 2002

Dear Mr. Naur,

It was very kind of you to send your excellent article on Haydn's early symphonies. It was high time that a competent scholar devoted his attention to this problem, and I congratulate you on your perspicacity. Too bad that the Haydn Yearbook no longer exists, it would have been the ideal place to print it. Anyway, I hope you soon find a suitable place to launch the article.

Sincerely, H. C. Robbins Landon

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