



Manfred Velden

Biologism – The Consequence of an Illusion

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Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>.

ISBN 978-3-89971-748-8

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Printed in Germany.

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Contents

Preface	7
1. Explaining psychological processes via biology (biologism) – an apparently logical concept running into problems	13
1.1 Explaining psychological processes out of the function of the brain	15
1.2 Explaining mental functions via evolution theory	28
1.3 Assessing the heritability of psychological functions in order to demonstrate an evolutionary background	37
2. Biologism as part of a more comprehensive concept with problems: psychology as a natural science	47
2.1 Dealing with data, methods, terms and definitions in psychology	48
2.2 The Eysenck case	64
2.3 Psychophysics	76
2.4 Intelligence research	84
2.5 The learning of bodily functions and the so-called “bio-feedback”	91
2.6 The psychosomatics of coronary disease	97
2.7 The consequences of the obligation to posture as a natural science exemplified by research on the Type A behavior pattern .	100
3. Biologism as the consequence of the illusion of psychology to be a natural science	105
4. Biologism is not a scientific misdevelopment among others	113
4.1 Scientific Racism	113
4.2 Preventing a rational discussion about cloning and gene technology	122

4.3 Inadequate and consequential depreciation of the Humanities and the Social Sciences	127
4.4 Dehumanizing the view of man	128
5. Empirical and experimental psychology – a partial success story . . .	135
Literature	139
Index	147

Preface

Hardly a month goes by without us hearing of new scientific discoveries about the biological basis of something psychological like attitudes, behavioral tendencies, traits, capabilities etc. So we learn, for example, that memory processes have their basis in a certain region of the brain, that the inclination toward polygamy can be explained by evolution theory, that certain sequences of the DNA (which contains the genetic information) are related to homosexuality, or that a twin study has shown a high degree of heritability of intelligence, has even shown that monozygotic (identical) twins tend to use the same kind of toothpaste, even if raised independently from each other. Listening somewhat to the tenor of such studies one can hardly avoid the impression that they are part of a scientific concept, according to which anything psychological should be explained via its biological basis. Mind you: that biology not only *contributes* to explaining psychological matters, but that it is capable of explaining any psychological process exhaustively. This is exactly what is being postulated by renowned scientists, by demanding, for example, that all the humanities and social sciences be integrated into biology. So beyond psychology this would concern philosophy, linguistics, history, the political sciences, and even the sciences of art. Biology would supply the “conceptual frame”, as they call it, for all these sciences. This view is being called “biologism”.

As indicated by the “-ism”, we are dealing with a fundamental conviction, the validity of which should be contemplated philosophically rather than scientifically. Dealing somewhat closer with this view we soon find out that it is actually highly controversial. It is not generally accepted that psychological processes can be reduced to brain functions, that evolution theory is the binding theoretical instrument for explaining human behavior, that sooner or later we will know about the molecular genetic foundations of mental processes in humans, or that it makes sense to determine the heritability of quantitative psychological traits, like, for example, intelligence.

Undoubtedly, however, the pendulum, which in the history of science, has swung between explaining the human psyche via culture (cultural anthropology)

and explaining it via biology (biologism), today has swung far toward the latter view. Cautioning voices pointing to the fact that, of course, sociocultural and biological effects interact in their influence on psychological processes, yet are, as we shall see, of no help. If you start a costly scientific project it is important to know, beyond that trivial insight, in how far the route taken can in fact lead to a substantial gain of knowledge, which, above all, requires a realistic assessment of the usefulness of the means and methods applied. It is of little help if we learn that this or that factor, be it of a biological or sociocultural kind, connects to some psychological function to some, yet in no way quantifiable degree. With statements of this kind we will with certainty arrive at the absolutely correct, yet not very elucidating insight, that in the human psyche everything connects to everything.

As indicated by the title of the book I am a critic of biologism, yet not because I do not believe that there must be a biological basis for everything psychological. Quite to the contrary. I do not believe, however, that via biological means like brain research, evolution theory, molecular or quantitative genetics there will be, even in principle, an exhaustive explanation of psychological functions. I even do believe that results attained by these means have little explanatory power and are often completely useless.

The book begins with a closer inspection of some typical biologicistic projects and comes to the irritating conclusion that these are highly controversial. The conclusion is irritating not because there should not be controversy in science, but because the controversy is one among scientists, who consider themselves to be doing natural sciences, and who do not just disagree about certain methodological aspects, but who blame each other for fundamentally misunderstanding the scientific mode of procedure. They are obviously lacking a common ground for scientific exchange. There is no conciliation in sight, except for the above-mentioned trivial statement about the interaction of cultural and biological effects on human behavior.

In the controversy I am clearly on one side. Let me stress once again, however, that we are not dealing with the question whether psychological processes do or do not generally happen on the basis of a biological substratum (for all we know this is actually the case), but in how far the biological science supplies the means to bindingly explain psychological processes. There is no contradiction in these statements because even in the natural sciences different levels of complexity of a subject matter may call for different methods or procedures. Particular attention should be dedicated to this fact when dealing with the perhaps most complex matter on earth, the human mind and its biological substratum, the brain.

In this book it is proposed that the misconception of biologism is grounded in ignoring this fact, the close relation between the level of complexity of a subject-matter and the methods pertinent to dealing with it, and that there is a long

foreshadowing history leading up to it, which deals with the concept of psychology as a natural science. Psychology's claim to *be* a natural science, and not, just at times use natural scientific methods, is grounded in a tradition of thinking, the problems of which few psychologists are conscious of today and which by necessity led to calling upon the today most spectacularly successful natural science, biology, for explaining psychological processes.

In the second part of the book it will therefore be attempted to document the state of today's psychology as a natural science. The dispute about sense or nonsense of the concept of psychology as a natural science has accompanied it for long and it has largely been conducted in a conceptual form, i. e. by asking whether psychology can, in principle, be reasonably pursued as a natural science in the first place. Much more than 100 years of experimental psychology passed, and nearly 100 years after John Watson's declaration of psychology to be a natural science (largely accepted today) this book does not discuss the question "psychology – a natural science or not?" in a theoretical-inferential form, but it tries to appraise how psychology has so far performed as a natural science by considering some particularly telling examples in order to get an impression, beyond philosophical reasoning, to what degree the concept has been successful. Before doing that, however, as a kind of warning, it is shown that in dealing with data, methods, and terminology, psychology has developed peculiarities that clearly differentiate it from the classical natural sciences. In this context there will be a close scrutiny of the "Test of Significance" or "Null Hypothesis Test" as the standard form of data reduction in psychology.

If we want to get an impression of psychology's success as a natural science, to what degree it has developed a basis of facts that are generally accepted and can be integrated into a binding theoretical frame, it makes no sense to review the whole of psychology in this respect. Due to the tremendous amount of results there would be no clear picture and, in addition, this picture would soon be outdated because psychological results usually do not last all too long. I have therefore chosen to characterize psychology's functioning as a natural science by examples. In order to make sure that these examples are actually representative, I selected particularly important and broad thematic areas, in which intensive research has been conducted over long periods of time, like intelligence research or the psychosomatics of coronary disease. A closer inspection of these examples does not allow us to conclude that the allegedly natural scientific psychology may be compared to the classical natural sciences with respect to the validity and consistency of its results.

So the illusion to be capable of describing and explaining psychological phenomena with natural scientific exactness and reliability is clearly more ancient than the presently raging attempts to achieve this via biology. For quite

some time we have in fact had ample evidence from psychology which suggests that we are actually dealing with an illusion.

In the last part of the book I will try to make clear that biologism is not some scientific misdevelopment among others, but that it involves effects that are societally detrimental, even plain dangerous. An example for the latter is the advancement of new opportunities for scientifically veiled racism.

My view of psychology as a science and of the project of biologism is, how else could it be, colored by my experiences as an active participant in the scientific process.

I developed some natural scientific inclination (with respect to psychology) already during schooltime in the fifties, when I bought Hofstätter's Dictionary of Psychology, which, after I had read a lot of Freud, made clear to me that psychology is not only more than psychoanalysis but also an empirical, even experimental science. When I took up studies at university in the early sixties that inclination was particularly confirmed by Guilford who had written a book about statistics one could understand (Guilford, 1956) and whose book about psychological measurement (Guilford, 1954) conveyed the potent impression on me that psychology can in fact be a science distinguished by exact measurement. In terms of content it was Eysenck in particular who, with a large number of books, convinced me that psychology is capable of producing excellent results, predictions, and applications truly in the style of a natural science. What, as a student and young scientist, I could not anticipate was the degree of "carelessness, shabbiness and intellectual dishonesty" (Lewontin, 1975) that is connected to whole areas of psychological research, and to Eysenck in particular. I did not believe everything I read, but I thought that what I read had been written to the best of the authors' knowledge.

My natural scientific orientation soon led me to the fields within psychology which to me appeared to be particularly apt for the natural scientific manner: Perception, mainly psychophysics, and physiological psychology.

Whereas my own "positive" scientific studies were at the focus of my attention during the first years of my scientific work (e.g. Velden, 1974; Velden & Juris, 1975, or Velden, 1978) I felt increasingly driven to criticize published studies (e.g. Velden & Clark, 1979; Velden, 1980; Velden & Vossel, 1985; Velden, Barry, & Wölk, 1987; Velden, 1997, 2003), an utterly unsavory ("negative") task. It took some time before I began to grasp that this was about to become the task of my life because for each study I criticized there were several more of the kind published. What finally convinced me that there must be something wrong with this whole kind of science was the often complete offhandedness in the discourse, nightmare of every scientist.¹ It even happened that the purely mathe-

¹ When colleagues, obviously plagued by similar nightmares, took articles published in ren-

mathematical explanation of an effect, which did not leave any room for discussion, could at first not be published (Velden & Vossel, 1985). Among my (positive) studies I today deem those of relevance in particular that only indirectly deal with psychology, like those about a possible synchronizing effect of the heart on brain electrical activity (e.g. Velden & Juris, 1975), about the best way to depict the course of cardiac activity in real time (e.g. Velden and Graham, 1988), and the best form of describing the effect an innervation of the vagus nerve has on the heart (Velden, Karemaker, Wölk & Schneider, 1990).

It may not be satisfying to now again publish a negative study, i.e. one that shows what does *not* work, but it is certainly important, particularly because biologism exerts its effects in no way solely on the green grass of the academic meadow.

The discourse of this book is based, as mentioned before, on the analysis of selected examples (referring to matters of both method and content) of psychological research in the style of a natural science. As a very general conclusion is drawn from these examples, particularly important and typical ones had to be chosen and presented and analyzed in detail. The presentation and analysis may appear somewhat dry at first, but they certainly are not in the broader context. So someone not very interested in statistics, and most readers will probably be of this kind, might not really be fascinated by statistical concepts like regression and interaction. This, however, should change at the moment the presentation of these concepts leads to the demonstration of an extremely crass and weighty case of charlatanry in psychological science. A simplified, yet detailed presentation of the so-called “Null Hypothesis Test” appeared quite unavoidable to me. This procedure is nearly universally applied in psychological data reduction and decides almost exclusively about what is considered important (“significant”). The main reason for the detailed presentation is that the sense and/or nonsense of the procedure’s application is in fact contested (only few scientists are aware of this) and it is only on the basis of a clear grasp of the logic of the procedure that the reader can judge for himself.

The premise of this book that biologism is nothing but a further variant of the misconception of psychology as a natural science cannot be proven. Every colleague who deems psychology to be a natural science will instantly cite six examples that bear witness to the natural scientific character of psychology. Ultimately, my assertion represents the essence of my experience with the field of psychology from half a century –an experience nonetheless comprising all aspects of the psychological-scientific process and acquired in areas of the field

owned psychological journals, changed the authors’ names, titles and abstracts and resubmitted them to the same journals, they were to realize that only three out of twelve articles were recognized to have been published before and eight out of the rest were deemed not publishable (Harnad, 1982).

that are regarded as expressly natural scientific. To avoid misunderstandings it ought to be stressed that my critique is not directed against using natural scientific methods in psychology (the usefulness of such methods need to be evaluated according to the particular circumstances) but against psychology as a natural science.

I dare hope that the reader will not only understand the discourse but also receive the impression that it is based on the best of my knowledge.

Let me thank Petra Lehmeyer for her patience with my handwriting, Uwe Nerger for designing the figures and Gerhard Vossel for critically reviewing the manuscript.

1. Explaining psychological processes via biology (biologism) – an apparently logical concept running into problems

If we really do have a soul, where is it? It has often been suspected in places where the effects of the perhaps most prominent psychological functions, the emotions, can be observed. So metaphors have developed like the turning of the stomach, the leaping, swelling, aching or breaking of the heart, or simply the guts one can have for doing something. Yet the organ to best suit the “seat of the soul”, the brain, executes its manifold functions so imperceptibly that it doesn’t even draw attention under great strain. Metaphors that do refer to the brain only developed *after* the notion that psychological functions are performed by the brain. Strained thinking makes the head smoke (German metaphorical thinking for “to rack one’s brain”) not because it feels so hot, but because we fancy the organ of thinking as a machine that typically starts to smoke if overstressed.

In fact the brain is the best candidate for “the seat of the soul”. Put somewhat more precisely in modern science, it is said that the brain is the “biological (physical, physiological) substratum” of the psychological processes. So, to be exact, the psyche is not in the brain but the psychological processes (perceiving, learning, thinking etc.) occur in the brain or are performed by the brain. That means that without a functioning brain, the outer two millimeters of it (the gray matter) in particular, there are no psychological functions. Our knowledge about this fact is so extensive and considered so irrefutable that today the death of a human is defined as the death of his brain. If the brain is dead, there are no psychological processes anymore, i. e. what makes up the identity of a human being, sensations, thoughts, wishes and intentions – in short, the personality – ceases to exist.

Our knowledge about the brain as the substratum of psychological processes largely stems from neurology, particularly from the study of the psychological effects of brain lesions. An unambiguous relation between a specific psychological function and a specific brain area was first shown in the 19th century by the Frenchman Broca. He documented that a specific form of speech disorder (Aphasia), the inability to express language, coincided with the lesion of a specific brain area, situated on the left side with right handers. Since then many

such relations have been documented, i. e. brain areas have been found that relate to functions like perception, sensation, thinking, planning etc. There is no doubt that the occurrence of psychological functions requires an intact brain, which means that a disorder of the function of the brain will have a psychological disorder as a consequence. This is what we mean when we speak of the “biological substratum” of psychological functions.

Insofar, at least from a scientific view, the old “mind-body problem” that plagued philosophy for such a long time, is being solved. Not so much from a theological view, however. He who believes in an immortal soul, i. e. a psyche not bound to a functioning brain, must continue to consider how such a soul is to be understood and how it relates to the body. The assumption of such a “dualism” is not a scientific one, however, and need not interest us any further in the present context.

The biological, i. e. brain-physiological, foundedness of psychological functions almost inevitably implies a scientific program: explaining psychological processes via the study of the biological foundations of these processes. Brain and nervous system, like the rest of the body, having been subject to the evolutionary process (meaning that their construction is genetically coded) that study implies evolutionary and genetic studies. To establish a psychology according to this program appears to be a plausible and obvious undertaking. Yet, paradoxically, undisputed as the assumption of a biological foundation of psychological functions may be, the conclusion to primarily or exclusively study psychological processes by studying their biological basis is being vehemently disputed. With respect to this conclusion the scientific minds obviously part. Why? How can anyone fully accept the biological basis of psychological processes and at the same time deem the explanation of psychological processes via biology to go astray in the first place, particularly at a time when biology and brain research progress rapidly? How can it even be that the term “biologism” in fact connects the above scientific program with ideological obstinacy, and that the dispute about this program is being fought with sustained bitterness? Yet the participants in the dispute consider themselves to be natural scientists, i. e. people, who you think will calmly come to generally acceptable conclusions by using empirical evidence, logic and rational inference. All these inconsistencies indicate that we are dealing with discrepancies on a fundamental level, fundamental to a degree that the participants are not conscious of the actual cause of their discrepant interpretation of the empirical evidence. In any case, we may at this point have a foreboding that we are dealing with a kind of science, which is just conditionally based on natural scientific principles and where empirical evidence cannot be interpreted unambiguously. As a consequence there is room left for interpretations that are unconsciously affected by ideological positions. And besides, maybe the empirical facts brought forward have been chosen se-