



The Architects of the Evolutionary Synthesis in National Socialist Germany: Science and Politics

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Abstract. The Synthetic Theory of Evolution (Synthetic Darwinism) was forged between 1925 and 1950. Several historians of science have pointed out that this synthesis was a joint venture of Soviet, German, American and British biologists: A fascinating example of scientific cooperation, considering the fact that the evolutionary synthesis emerged during the decades in which these countries were engaged in fierce political, military and ideological conflicts. The ideological background of its Anglo-American representatives has been analyzed in the literature. We have examined the scientific work and ideological commitments of the German Darwinians during the Third Reich. We based our analysis on four criteria: 1) General attitude towards the Third Reich. 2) Membership in the NSDAP and other national socialist organizations. Endorsement and disapproval of the state ideology in 3) scientific and 4) other publications. We will mainly discuss the various authors that have contributed to *Die Evolution der Organismen* (1943), a collection that represented the evolutionary synthesis in Germany. Most of the authors promoted eugenic ideas, but not all of them adopted the racist interpretation of the Third Reich. Another finding is that there existed no direct connection between party membership and promotion of the state ideology.

Key words: Bernhard Rensch, Erwin Baur, eugenics, evolutionary synthesis, national and international science, N.V. Timoféeff-Ressovsky, science and ideology, Synthetic Darwinism, Third Reich, Walter Zimmermann

The evolutionary synthesis of the 1930s and 1940s was one of the most successful scientific theories of the twentieth century. With its acceptance

many of the controversies that had shaped the discussions about evolution since Darwin's *Origin of Species* came to an end. This unification of evolutionary biology was achieved on a Darwinian basis. Together with selection, which was regarded as the only causal factor leading to adaptation, further evolutionary factors were integrated. Mutation and recombination were identified as the sources of genetic variability. The important effects of population size were stressed, in particular for small populations, where chance effects limit the power of selection. In addition geographic isolation was seen as an important prerequisite for the slitting of a species into two separate species. This synthetic theory of evolution or Synthetic Darwinism has dominated evolutionary biology since the early 1950s.

Various circumstances were favorable for this successful unification of evolutionary biology. On the one hand the empirical, theoretical and heuristic qualities of the theory convinced many biologists (Mayr and Provine 1980). On the other hand historians of biology have emphasized external reasons for the renaissance of Darwinism, e.g., the ability of its leading representatives to present their science in accord with popular political notions of the time. Betty Smocovitis and Michael Ruse have demonstrated that the representatives of the evolutionary synthesis convinced the Western public in the 1950s that their theory offered a "sense of progress, a liberal ideology, and an optimistic and coherent worldview" (Smocovitis 1992: 40; Ruse 1996; see also Hodge 1992; Harwood 1994; Junker 1996; Ruse 1996; Smocovitis 1996). This judgment – and most of the recent work on the history of Synthetic Darwinism in general – is based primarily on its British and American representatives, the "architects" and their major books. Theodosius Dobzhansky's *Genetics and the Origin of Species* (1937), Ernst Mayr's *Systematics and the Origin of Species* (1942), and George Gaylord Simpson's *Tempo and Mode in Evolution* (1944) form the "nucleus of the synthesis" (Eldredge 1982: XV). In addition to these central books and figures few other candidates are mentioned – usually Julian Huxley (*Evolution: The Modern Synthesis* 1942), G. Ledyard Stebbins (*Variation and Evolution in Plants* 1950) and Bernhard Rensch (*Evolution above the Species Level* 1947, 1959, 1960).

In this paper we argue that our understanding of the scientific content and ideological background of the evolutionary synthesis of the 1930s and 40s will gain from a broader international approach. If Synthetic Darwinism originated not only in the US and Britain but in Soviet Russia and Nazi Germany as well, the question of ideological affinities and metaphysical assumptions of its architects may have to be answered quite differently.

In the past several authors have pointed out that modern Synthetic Darwinism had its origin in a joint venture by scientists from various countries. For example G.G. Simpson, who seems to have been the first to treat the

evolutionary synthesis as a historical entity, described it as an international movement including biologists from six countries:

“The synthetic theory has no Darwin, being in its nature the work of many different hands. To mention any of these is to be culpable of important omissions, but if only to indicate the breadth of the synthesis it may be noted that among the many contributors have been: in England, Fisher, Haldane, Huxley, Darlington, Waddington, and Ford; in the United States, Wright, Muller, Dobzhansky, Mayr, Dice, and Stebbins; in Germany, Timoféeff-Ressovsky and Rensch; in the Soviet Union, Chetverykov and Dubinin; in France, Teissier; in Italy, Buzzati-Traverso” (Simpson 1949: 277–278).

Internationalism was also stressed in *The Evolutionary Synthesis* (1980), edited by Ernst Mayr and William B. Provine. Part two of the book, covering roughly one third of the total number of pages, is devoted to “The Synthesis in Different Countries” and covers the Soviet Union, Germany, France, England, and the United States. However, *The Evolutionary Synthesis* did not lead to a change in perception and most recent accounts still focus on the few works or architects mentioned above. This is probably a consequence of the fact that many historians were interested in the reception and expansion of the theory after 1950, when Anglo-American evolutionism became “The biggest, the best, the most mature” (Ruse 1996: 178; see also Beatty 1986; Cain 1993, 1994; Smocovitis 1992, 1996).

The situation of the origination and early years of the evolutionary synthesis before 1950 may, however, differ considerably. The decisive impact of early Soviet biology has been studied quite extensively (see Adams 1967, 1970, 1994). In contrast the German contributions are largely unknown or controversial. Mayr himself has criticized that “in the case of Germany, the presentation in Mayr and Provine (1980) is particularly deficient” (Mayr 1988: 548). The unfamiliarity with the German branch of the evolutionary synthesis in Anglo-American historiography is understandable, considering the reasons mentioned above and the problems of language and tradition. More surprising is the nearly complete neglect of this topic by German historians until very recently. This situation is probably a consequence of a presumed close connection between genetics, the theory of evolution, and national socialism, which dates back to the early 1950s. When Ernst Mayr visited Europe in May 1954 he noticed: “In Germany – now a clerical state – the anti-evol[utionary] movement is particularly strong [...]. Just like McCarthy synonymizes liberalism and communism, thus after the war evolution was synonymized with the most typological selectionism, and biology with Nazi racism” (“Travel Notes 1954”; in the possession of Ernst Mayr). History of biology and in particular the history of Darwinism have

been extremely handicapped in Germany by this widespread point of view. Historians interested in scientific ideas were repelled by the prospect of dealing with pseudo-scientific ideological concepts. Social historians on the other hand who published on German biology during the Third Reich were primarily interested in the political context, racial ideas, and eugenics. This reinforced the impression that the history of Darwinism in these years was mainly an ideological movement dominated by political interests (e.g., Weingart et al. 1992; Deichmann 1992; Junker and Hoßfeld 2000). Except for publications by Wolf-Ernst Reif (1983, 1986) only in the last few years this situation has begun to change (see Junker and Engels 1999; Brömer et al. 2000; Hoßfeld and Brömer 2001).

In the following paper we review our current knowledge of the scientific standing of the evolutionary synthesis in Germany before 1950. A more comprehensive account of our findings can be found in Reif et al. (2000) and Junker (2001a). Although we think that the scientific merits and political ideas of a scientist should be discussed separately, we will consider the latter point as well. In view of the alleged close connection between scientific Darwinism and Nazi politics, it may be helpful to give a sketch of the problems and some of our results concerning this question. We are not suggesting an argument *ad Hominem*, but want to give an impression of the situation and reactions of biologists working in Germany at that time. This aspect will help to understand the almost complete absence of modern Synthetic Darwinism in German biology after 1950.

Scientific Synthetic Darwinism in Germany

Our analysis of the evolutionary synthesis in Germany originally started with the scattered statements in the literature (see Mayr and Provine 1980; Rensch 1980; Mayr 1988: 548–550; Harwood 1993; Junker and Engels 1999). We gained further information from the references in publications by Dobzhansky, Huxley, Mayr, Simpson, and Stebbins. In addition we supplemented our analysis of theoretical affinities by searching for various levels of social interaction as documented in correspondence, archives and oral history. We use the term “German” in the sense of language and geography, not in the sense of German scientific traditions. That is, we include the work of Timoféeff-Ressovsky, who lived and published in Germany, but not that of Ernst Mayr, who was strongly influenced by his German background, but lived in the US since 1932.

We identified four authors – Erwin Baur, Nikolai Vladimirovic Timoféeff-Ressovsky, Walter Zimmermann, and Bernhard Rensch – who promoted theoretical concepts that were similar to those of the “accepted” archi-

tects (Dobzhansky, Mayr, Simpson, Huxley, Stebbins) and made substantial contributions to the theory.

Erwin Baur (1875–1933)

Erwin Baur was one of the leading representatives of the early evolutionary synthesis in general. Dobzhansky and other Anglo-American architects frequently referred to Baur's crucial experimental work on the spontaneous over-all mutation rate and the frequency of small mutations (Dobzhansky 1937: 26, 46; Mayr 1942: 67). Although the mutation rates given by Baur were later considered exaggerated, his pioneering work was widely acknowledged: "The final set of genic effects to be considered are those which alter the phenotype very slightly, the so-called "small mutations." These were first described by Baur (1924) in *Antirrhinum majus* and its relatives, where they were estimated to occur at the extraordinarily high rate of one in ten gametes" (Stebbins 1950: 91).

Baur's very popular genetics textbook *Einführung in die experimentelle Vererbungslehre* was probably one of the most influential publications that prepared the ground for Synthetic Darwinism in Germany. As early as 1919 (3rd, 4th ed.) he presented a theory of selection that was based on the latest findings of genetics and elementary ideas of population genetics. He was convinced that the quantity and diversity of mutations that occur in nature together with recombination produce a sufficient amount of genetic variability for selection (Baur 1919: 343). In a short paper on the importance of mutation for the problem of evolution, published in 1925, Baur presented his version of a genetic theory of selection ("Die Bedeutung der Mutation für das Evolutionsproblem" 1925; see also Baur 1924). He demonstrated that natural populations contain abundant genetic variability resulting from random mutations and recombination. This process, he argued, provides enough raw material for selection to be effective and differences between closely related species can be explained by the accumulation of small mutations.

In 1932 he published a documentation of his extensive genetic studies of the garden snapdragon *Antirrhinum* and his studies of natural populations of *Antirrhinum* section *Antirrhinastrum* in southwest Europe. This was one of the first field studies in population genetics that took all relevant aspects into account: genetic variation, hybridization of populations, spatial and genetic isolation, and hybrid viability. As Mayr has remarked, "Population genetics had a brilliant beginning in plant science with Baur's work on the Spanish populations of *Antirrhinum*" (Mayr and Provine 1980: 280). In his experimental and theoretical publications Baur aimed at a genetic theory of selection and through his analysis of natural populations he pioneered the "Back-to-Nature"-movement that later became an earmark of

the evolutionary synthesis. Although his early death (1933) prevented him from playing a major part in the actual formation of the theory, his work made him a central figure of the preparatory phase: "If he had lived, he would probably be recognized now as one of the fathers of the synthetic theory of evolution in plants" (Stebbins 1980: 140).

Nikolai V. Timoféeff-Ressovsky (1900–1981)

Russian born N. V. Timoféeff-Ressovsky was the other leading geneticist who worked on the genetic aspects of Synthetic Darwinism in Germany. As a pupil of Sergej S. Chetverikov he had studied genetic variability in natural populations of *Drosophila* as early as 1927 (H.A. and N.W. Timoféeff-Ressovsky 1927). This project was carried out during the early years of theoretical population genetics and earlier than most of Dobzhansky's studies of natural populations. The other architects of the evolutionary synthesis, in particular Dobzhansky, highly appreciated Timoféeff-Ressovsky's work and *Genetics and the Origin of Species* contains numerous references to his publications. Dobzhansky stressed the following results and experiments: 1) The effect of a mutation on viability depends on both the environmental conditions and the genetic structure of the organism; 2) Basic experiments to determine the relative frequency of the different types of mutations; 3) The demonstration that mutations producing small changes in the phenotype occur at a high frequency; 4) One of the first systematic studies on the occurrence of mutations in wild populations of *Drosophila melanogaster* (Dobzhansky 1937: 20, 24, 26, 41). Other American architects shared this high esteem. Mayr, for example, praised Timoféeff-Ressovsky in *Systematics and the Origin of Species* (1942) for his "excellent recent discussion [...] on genetics and the origin of species" (Mayr 1942: 64; see also Huxley 1942; Simpson 1944).

Inspired by Dobzhansky's *Genetics and the Origin of Species* Timoféeff-Ressovsky published a comprehensive review article in 1939 that included new empirical work and a theoretical model describing the interactions between the factors of evolution: "Genetik und Evolution." A slightly modified version of this paper appeared in Huxley's *New Systematics* ("Mutations and Geographical Variation" 1940). In 1943 an expanded version of the article formed the theoretical core of *Die Evolution der Organismen* (Bauer and Timoféeff-Ressovsky 1943). This book, edited by the zoologist and anthropologist Gerhard Heberer, was the most comprehensive account of the evolutionary synthesis in Germany before 1945. Like Dobzhansky Timoféeff-Ressovsky took genetics, theoretical population genetics and studies of natural populations into account. Although he did not specifically discuss the problems of macroevolution he left no doubt that the factors of microevolution are sufficient to explain evolution in its entirety. Timoféeff-Ressovsky's

publications demonstrate an important feature of the early evolutionary synthesis: its international character.

Walter Zimmermann (1892–1980)

In contrast to Baur, Timoféeff-Ressovsky and Rensch, Zimmermann's influence was nearly completely restricted to Germany. Except for Stebbins none of the American and British architects cited his work (Stebbins 1950: 477–479, 486, 494). In Germany, however, his book *Vererbung "erworbener Eigenschaften" und Auslese (Inheritance of "Acquired Characteristics" and Selection* 1938) was considered to be one of the central books of the emerging Synthetic Darwinism.

Already in his first book (*Phylogenie der Pflanzen* 1930) Zimmermann argued for gradualism and against special laws and causes of macroevolution. He emphasized that there is no empirical or theoretical necessity to accept macromutations as a mechanism for macroevolution. Small mutations and selection are sufficient to explain all evolutionary phenomena. Irreversibility in evolution, for example, is just a consequence of the improbability that a number of mutations occur exactly in the reversed way. As early as 1930 Zimmermann was convinced that there was enough data from genetics, empirical and theoretical population genetics, biogeography, morphology, paleontology and systematics to demonstrate that mutation, recombination, selection and isolation are the relevant factors of evolution. He strongly rejected Lamarckian ideas and the notion that there are fundamental differences between micro- and macroevolution. Zimmermann's 1938 book *Vererbung "erworbener Eigenschaften" und Auslese* was a greatly expanded version of his 1930 theory.

After 1945 Zimmermann's books had little influence on the German discussions of evolution. He never became a full professor and German biology was dominated by typological morphologists such as Adolf Remane and Wilhelm Troll, plant systematists with little interest in evolution such as Karl Mägdefrau, or by plant physiologists such as Erwin Bünning.

Bernhard Rensch (1900–1990)

Bernhard Rensch was the only German biologist who was acknowledged internationally as one of the architects of the evolutionary synthesis. In 1951 Dobzhansky wrote: "Rensch [...] generalized the facts of comparative morphology and comparative and experimental embryology, and integrated them with genetics" (Dobzhansky 1951: X). William Provine included Rensch's 1947 book in his list of the "Major works of the synthesis" as the only book not written in English (Provine 1980: 400) and in Futuyma's

popular textbook on evolution Rensch is remembered as the only representative of neo-Darwinism in Germany: "In Germany, the zoologist Bernhard Rensch [...] independently developed a neo-Darwinian interpretation of evolution" (Futuyma 1986: 12).

Rensch was certainly one of the most important representatives of Synthetic Darwinism in Germany. But Baur, Timoféeff-Ressovsky and Zimmermann contributed equally substantial empirical data and theoretical concepts. What are the reasons for this one-sided perception? One reason was probably that Rensch did not just publish articles but a comprehensive book, that was translated into English (Rensch 1947, 1959, 1960). More important, however, was his close personal contact to Mayr, who was informed about Rensch's scientific work and knew that he was not politically incriminated. Rensch's taxonomic work was a fundamental prerequisite for Mayr, an influence that is documented by numerous references in *Systematics and the Origin of Species* (1942). Although Rensch's work was cited by the other Anglo-American architects as well, the acquaintance with Mayr was probably the major reason why Rensch was later widely accepted as the only representative of Synthetic Darwinism in Germany and invited to contribute a chapter to *The Evolutionary Synthesis: "Historical Development of the Present Synthetic Neo-Darwinism in Germany"* (Rensch 1980).

Rensch's series of publications that directly contributed to the evolutionary synthesis starts with "Typen der Artbildung" (1939). Here he developed a highly intriguing argument: Systematics and biogeography at the lowest taxonomic levels (races and species) are a first possible test for the sufficiency of the evolutionary factors (mutation, recombination, selection, isolation and drift). In 1943 Rensch expanded his strategy to test the five factors of evolution by considering "Paleontological rules of evolution," i.e., patterns in the fossil record as they were reported by paleontologists. His main conclusion was that the patterns of macroevolution can be explained largely by selection (Rensch 1943). His 1947 book is a further expansion of this argument and devoted to a discussion of macroevolution from a selectionist perspective. To demonstrate that the same factors control micro- and macroevolution Rensch used a large number of examples of patterns of evolution derived from the fossil record and the comparative anatomy of animals. Interestingly his influence on German evolutionary biology remained comparatively small (Reif 1983).

Further contributions

In addition to these four central architects we found a number of biologists who supported the early evolutionary synthesis in publications or reviews without contributing much original work of their own in this area. These

authors came from a variety of biological disciplines: genetics (Hans Bauer, Hans Nachtsheim, Klaus Patau), zoology (Gerhard Heberer), anthropology (Otto Reche), philosophy (Hugo Dingler), and botany (Werner Zündorf). A third group was sympathetic to the new theory, but favored unconventional evolutionary factors like polyploidy or macromutations. These authors were mostly geneticists working on plants (Gertraud Haase-Bessel, Georg Melchers, Franz Schwanitz, Hans Stubbe, Fritz von Wettstein, and the zoologist William F. Reinig; for this group see Harwood 1993). Finally, we could demonstrate that some of the authors mentioned in the literature as representatives of the evolutionary synthesis in Germany have to be excluded because they strongly sympathized with Lamarckian (Wilhelm Ludwig) or orthogenetic evolutionary mechanisms (Erwin Stresemann). Particularly important for the evolutionary synthesis in Germany became a collective work: Heberer's *Evolution der Organismen* (1943). In 1959 a second expanded edition and 1967 to 1974 a third expanded edition was published. In Germany Heberer's book was widely regarded as the representative document of the emerging Synthetic Darwinism.

Political participation

Various levels of direct and indirect interaction between science and politics may explain the equation of Darwinism with racism and Nazi politics. In the following analysis we will not treat the problems of a possible broader influence of Darwinian thought, but focus on a particular subset of interactions: How did its representatives position themselves during these years, what were their political beliefs and statements? The evolutionary synthesis originated between 1925 and 1950, i.e., most of the relevant articles and books were published or written during the Nazi-period and it is to be expected that this influenced their content. After Hitler came to power in 1933 several measures of the new regime were destructive for science. To mention just a few of them: Emigration of Jewish and critical scientists, a general suspicion of "foreign" ideas, censorship of books, politically motivated Berufsverbote and the constant threat of severe personal disadvantages if the results did not accommodate the state ideology. In addition some theoretical terms from biology became part of the ideological language of the Third Reich, for example, "struggle for existence" and "race".

How did the representatives of the evolutionary synthesis react to this situation? To answer this question we analyzed their publications as well as all published and unpublished biographical material available to us. One problem of our analysis has to be mentioned. Since it was not possible to publish fundamental objections during the Third Reich, predominantly

approving and few critical remarks have survived. In addition most available remarks come from published sources or state archives. The fact that we found only few critical does not necessarily mean that they did not exist, but, for the time being, that they could not be published. Jon Harwood has pointed to this difficulty and suggested to focus on the pre-1933 period in order to assess political outlook (Harwood 1993: 260). Because of this problem, we analyzed the various quotations in the context of all known publications and comments.

To gain a broader comparative basis for our analysis we included not only the “inner circle” – Baur, Timoféeff-Ressovsky, Zimmermann, Rensch –, but all authors who published in the first edition of Heberer’s *Evolution der Organismen* (1943). Except for Baur who had died in 1933 all important architects contributed articles to this collective work. Although some of the other authors did not adopt the new genetic theory of selection, they were all sympathetic to Darwinism in a wide sense. I.e., they favored selection as the major evolutionary factor. The contributors to Heberer’s *Evolution der Organismen* were not the only Darwinians and supporters of the evolutionary synthesis in Germany, but the book was the representative document of this movement. It certainly was responsible for much of the public impression.

We structured our analysis according to four criteria: 1) Membership in the NSDAP and other national socialist-organizations. 2) General attitude towards the Third Reich. With regard to verbal and theoretical adaptation to national socialism we distinguished 3) scientific publications and 4) popular writings.

Party membership

Criterion 1), membership in national socialist-organizations, can be answered straight forward and yielded the following general results. 70% of the biologists analyzed by us were members of the NSDAP; 30% joined the SS (20% without the two Ahnenerbe-members), 25% were SA-members; 35% were organized in the NSD-Dozentenbund (organization of university teachers) and 65% in the NSLB (organization of school teachers). (The figures are based on our archival research; see Junker and Hoßfeld 2000.) Ute Deichmann has found the following numbers for biologists in general: NSDAP 57.6%, SS 5.6%, SA 22.5% (Deichmann 1992: 225–238). Particularly with regard to the number for SS-membership we find a significant difference (5.6% respectively 30%). The high figures for NSDAP- and SS-membership among the authors of the *Evolution der Organismen* is mainly a result of the fact that the anthropologists had close ties to the Third Reich. On the other hand none of the four central architects of the evolutionary synthesis was a member of the NSDAP or the SS!

Table 1. Authors in *Die Evolution der Organismen* (1943)

	Specialty	Life dates
[Erwin Baur	Botany, genetics	1875–1933]
Nikolai Vladimirovic	Zoology, genetics	1900–1981
Timoféeff-Ressovsky		
Walter Zimmermann	Botany	1892–1980
Bernhard Rensch	Zoology, ornithology	1900–1990
Hans Bauer	Genetics	1904–1988
Hugo Dingler	Philosophy	1881–1954
Victor Franz	Zoology	1883–1950
Wolf Herre	Zoology	1909–1997
Konrad Lorenz	Ethology	1903–1989
Wilhelm Ludwig	Zoology, genetics	1901–1959
Karl Mägdefrau	Botany	1907–1999
Ludwig Rüger	Geology, paleontology	1896–1955
Franz Schwanitz	Botany	1907– 1982
Johannes Weigelt	Paleontology	1890–1948
Werner Zündorf	Botany	1911–1943
Wilhelm Gieseler	Anthropology	1900–1976
Gerhard Heberer	Zoology, anthropology	1901–1973
Christian von Krogh	Anthropology	1909–1992
Otto Reche	Anthropology	1879–1966
Hans Weinert	Anthropology	1887–1967

With regard to NSDAP-membership the time of entry is important and an early commitment is an indication for a national socialist conviction. In 1930, that is before Hitler came to power Victor Franz and Christian von Krogh became members. Shortly after the surge of power, in May 1933, Johannes Weigelt, Wilhelm Gieseler and Karl Mägdefrau followed. In 1937 Werner Zündorf, Gerhard Heberer, Wolf Herre, Franz Schwanitz, Otto Reche, Wilhelm Ludwig and Hans Weinert joined the party. Immediately after the occupation of Austria Konrad Lorenz became a member of the NSDAP. The last one was the philosopher Hugo Dingler who had to wait for a decision of mercy by Hitler before he was accepted. Dingler had been a Freemason in the 1920s.

Table 2. Membership in national socialist organizations

	NSDAP	SS	SA	NSDDB	NSLB
Baur	–	–	–	–	–
Timoféeff-Ressovsky	–	–	–	–	–
Zimmermann	–	–	–	–	1934
Rensch	–	–	–	–	–
Franz	1930	–	1933–1937	1936	1930
Mägdefrau	1933	–	–	–	1933
Weigelt	1933	–	–	–	1934
Herre	1937	–	X	–	1934
Ludwig	1937	–	–	–	1934
Schwanitz	1937	–	1933	1938	–
Zündorf	1937	–	1934–1938	–	1937
Lorenz	1938	–	–	[X]	[X]
Dingler	1940	1933*	–	X	1937
Bauer	–	1933	–	–	–
Rüger	–	–	–	–	–
von Krogh	1930	1931	–	1936	–
Gieseler	1933	1937	1934	X	X
Heberer	1937	1937	1933–1935	X	X
Reche	1937	–	–	–	1934
Weinert	1937	1937*	–	–	1933

Membership in national socialist organization with years of entry. X = Membership without know date of entry. [X] assumed membership; * (on SS-Membership) = "Ahnenerbe" SS; NSDDB (Nationalsozialistischer Deutscher Dozentenbund); NSLB (Nationalsozialistischer Lehrerbund).

One interesting result of our analysis is that there is no simple correlation between party membership and theoretical adaptation. Ludwig, Herre and Mägdefrau were party members, but did not speak out in favor of the Third Reich in their publications. On the other hand Baur and Zimmermann, who did not join the NSDAP, took up tenets of the Third Reich.

General attitude towards the Third Reich

Criteria 2 to 4, general attitude and verbal or theoretical adaptation, require much more documentation as well as interpretation and are, as such, open to controversial discussions. We have published a comprehensive description

of our findings in Junker and Hoßfeld (2000). In the following section we will give a short introduction to our method, a summarized account of the political ideas of the four architects of the evolutionary synthesis in Germany and some of the general results.

The question, which ideas represent the core of the national socialist ideology, has been a contended topic for decades, but most historians have reached an agreement on certain fundamental characteristics: The *völkische* and Race-ideology (especially anti-Semitism), a militaristic and extremely nationalistic political attitude, Anti-communism, and the Führer-principle. Any of these ideological elements, however, can be found in other political contexts and is not significant as such. E.g., an anti-Communist attitude is hardly more than an indication that the author was a supporter of the national socialist world view. The same is true for eugenics and even the idea that Europeans are part of a superior race was common in the age of colonialism.

An assessment if a particular biologist complied with national socialist ideology has to identify the characteristic *combination* of the elements and the *language*. With regard to language we looked for typical national socialist vocabulary, for example a “Blut- und Boden”-rhetoric. In addition to obvious and explicit statements we took the more subtle differences and the subtext into account – the question of style and wording, syntax and punctuation marks (Klemperer 1957). A further important indication is the place of publication – for example if a paper appeared in a national socialist semi-popular journal like *Volk und Rasse* or in a strictly scientific journal like *Die Naturwissenschaften*.

Our approach was comparative: the background of the analysis was not a fictitious language free of any ideological statements, but the standards of bourgeois science of the time – the science of the Weimar Republic, the US, Britain, or France. When we say that we did not find ideological statements, we refer only to specifically national socialist ideas! I.e., we were interested in the differences in content or style between the writings of the representative of the evolutionary synthesis in Germany and those of their Western colleagues that can be traced to the political situation.

Erwin Baur

Erwin Baur died on December, 2d 1933 and could witness the fate of his biological ideas in the context of Third Reich politics only for a few months. Two statements by Baur, published after his death, demonstrate that his attitude towards national socialist racial ideas was ambivalent. In a collection with the title *What is race?* (*Was ist Rasse?* 1934) an interview with Baur was published. Here he called the interbreeding of very different human races problematic: “A great part of the offspring will be unstable, i.e., has

characteristics that do not fit together” (Baur 1934: 34). As evidence, why the crossing of human races is harmful, he refers to the hybridization of two species of *Antirrhinum*. The equation of the hybridization of species and of races reminds of Hitler’s “argument,” that a general drive towards the purity of races exists, because animals only propagate within their own species (Hitler 1925–1927: 311–312). With his statement Baur clearly supports the typical national socialist rejection of interbreeding between human races with a very dubious argument.

On the other hand Baur was not willing to change his convictions because of political motifs. In the 4th edition of the *Menschliche Erblchkeitslehre* (1936) a chapter deals with the “Conscious breeding of certain pure races” (“Bewußte Reinzucht bestimmter Rassen”; Baur 1936: 93–94). In this chapter Baur calls any attempt to achieve a pure Nordic race unprofessional. The only thing that would be achieved in this way would be a certain superficial “Nordification” (“Aufnordung”). This race, however, would not be identical with the original Nordic race. According to Baur the breeding of a pure original race does not make much sense because physical and mental traits are inherited separately, but eugenic measures are sensible and promising. He does not completely reject the national socialist ideology in his conclusion, but his annoyed language, the repeated use of the word “unprofessional” and his reference to lacking genetic knowledge, demonstrate that he was not willing to accept dubious race theories.

N.V. Timoféeff-Ressovsky

The role of Timoféeff-Ressovsky in the Third Reich has attracted significant interest. How could a Russian not only survive in Nazi Germany, but also stay at his position as director of the genetics department of the Kaiser-Wilhelm-Institute for brain research? A sympathetic account of his life – published by Diane Paul and Costas B. Krimbas – gives all the relevant information (Paul and Krimbas 1992). Since the publication of this article no basically new material has emerged. Timoféeff-Ressovsky was not a member of the NSDAP or other national socialist organizations and he refused to give up his Soviet citizenship. His direct collaboration with national socialism was, from all that is known, rather small. In 1937 he stayed in Germany although he had been ordered back to the Soviet Union and at the same time declined a position in the U.S.A. Because of the refusal to return to the Soviet Union he was convicted for treason by the Soviet administration after the war. Timoféeff-Ressovsky obviously accepted the situation in the Third Reich until the end of the 1930s. There is no reason to assume that he appreciated it.

No published statement by Timoféeff-Ressovsky is known where he adopts the racial ideas of the Third Reich. He did, however, approve eugenics.

In a short paper “Experimentelle Untersuchungen der erblichen Belastung von Populationen” (“Experimental studies on the genetic load of populations” 1935) he discussed the relevance of genetics and Synthetic Darwinism for human populations. He assumed that natural selection is lowered in humans – an important notion of classical eugenics –, which leads to an increase of “strongly pathological mutations.” This, in turn, has the consequence that human populations are infected with a high number of dominant hereditary diseases (1935: 118). He does not, however, plead for any imminent measures, but stresses the many open problems. What is asked for are further scientific studies to identify the percentage of persons with hereditary diseases and the geographic distribution of heterozygous carriers. These investigations will improve “racial hygienic control” and help to answer the various difficult problems of a classification of genetic diseases. Timoféeff-Ressovsky was also one of the first biologists (together with Hermann J. Muller) who warned that mutations were not only harmful for the individual organism, but also added to the genetic load of a population. Schrödinger has later emphasized this point in *What is Life?* with direct reference to Timoféeff-Ressovsky’s work (Schrödinger 1944: 44–45).

In conclusion, Timoféeff-Ressovsky’s publications are all written in a scientific style. This is also the case with regard to his position on eugenics. His writings reflect the content and style of international genetics and there are no indications that he adopted national socialist racial or other ideological ideas. Timoféeff-Ressovsky’s central article on the genetic theory of evolution (“Genetik und Evolution” 1939), for example, was published in Huxley’s *New Systematics* (1940) without substantial changes. To our knowledge no contemporary author has claimed that this article directly or indirectly contains national socialist ideas.

Walter Zimmermann

As far as we know from published and archival sources Zimmermann was not a supporter of national socialism. He never joined the NSDAP or the SS. Politically he was a right-wing conservative. In some of his publications, however, he made statements about eugenics and races in humans that reflect ideas typical for the Third Reich. He claimed, for example, that because in the past natural selection was the major force that led to a genetic improvement of humankind this mechanism should be applied in the future as well. To guarantee progress in human evolution a “high reproduction rate” with following “hard competitive struggle” are necessary (Zimmermann 1938: 238). He called for measures of negative eugenics to prevent “hereditary inferior persons from reproduction” (1938: 299), and, in this connection, argued strongly against racial interbreeding. He was convinced

that the “hybrids of very different races” play a disastrous (biological) role and approved the Nuremberg laws (1935). With these laws marriage and sexual intercourse between Jewish and other Germans became illegal. To strengthen this idea Zimmermann referred to his studies on *Pulsatilla*. In these studies he had found that the crossing of distant geographic races causes biological problems, because “unnatural genetic combinations” increase the frequency of (mostly harmful) mutations (Zimmermann 1935: 274).

In addition Zimmermann gave his anti-Lamarckian argument an explicitly political note by pointing to the alleged connection between Lamarckism, communism and Jewish interests. In his opinion it is not by chance that the Jewish biologist Paul Kammerer had claimed in 1925 that racial minorities will lose their specific characteristics because they live in the same environment as their host nation (Zimmermann 1938: 6). Although Zimmermann never joined the party his statements were clearly meant to support the racial politics of the Third Reich by giving them a scientific justification. The connection of reasonable measures (protection against mutations from toxic substances) with the glorification of the biological struggle for existence and his attempt to give a scientific justification for national socialist racial laws could certainly discredit Synthetic Darwinism after 1945.

Bernhard Rensch

It is significant that even an author like Bernhard Rensch who was critical of the Third Reich tried to adapt to the new Zeitgeist in the years after 1933. He did this rather reservedly, but unmistakably. It must be emphasized that Rensch’s articles are all written in a sober and scientific style and there is – with two exceptions – no theoretical acceptance of the race ideology of the Third Reich. This is true for the discussion of interbreeding of human races as well. Rensch even writes that the progeny of race interbreeding shows special vitality. At the end of an article published in 1935, however, he is anxious to explain how his results can be accommodated to the national socialist race ideology: “The emphasis on the connection between environment and races is definitely in harmony with the current efforts towards an objective evaluation of races, which does not consider hybridization a suitable precondition for successful selection” (Rensch 1935: 333).

In an article published in 1934 Rensch goes one step further. After emphasizing that the psychological characteristics of humans are changed by the environment, he continues: “The much harder struggle for existence in the colder countries led to severe natural selection, which is missing in the milder regions. This might be one of the causes for the superiority of Nordic peoples in a wider sense” (Rensch 1934: 704). He concludes: “Man will never be completely independent of the environment [*Lebensraum*].

The close connection between blood and soil [*Blut und Boden*], which is so common nowadays, will be of great importance for the future of man” (Rensch 1934: 704). Both terms “*Lebensraum*” and “*Blut und Boden*” were highly valued phrases in the national socialist world view.

To understand these two (singular) statements of Rensch it is necessary to look at his personal situation at the time. Until 1935 he was convinced that Lamarckism was a valid mechanism and an indispensable alternative to pure selectionism. He defended this position in several papers and a public exhibition at the Natural History Museum in Berlin. Together with his critical position towards the regime this exhibition led to public attacks in the press and the removal from his position as a curator at the museum. With the help of Erwin Stresemann and other colleagues the imminent dismissal could be postponed. But from now on Rensch was under close scrutiny, had to attend political courses and the threat of dismissal was always present. In this situation he shortly (1934–1935) argued that Lamarckism is not opposed to national socialism. From later years, when he had abandoned Lamarckism (1936) and accepted Synthetic Darwinism (1938) no more political statements are known. This situation of course poses the question, if Rensch’s abandonment of Lamarckism – described by himself as a purely scientific question (Rensch 1983) – was also reinforced by political pressure. This, however, could not be confirmed (but not completely excluded either; see Junker 2001b).

Discussion

How can we assess the relationship between the evolutionary synthesis and national socialist ideology on the basis of our comparative biographical study? To a large extent the answer to this question and an evaluation of the political role of the Darwinians in Germany depend on the assessment of the historical role of eugenics. Other key issues were the Darwinian struggle for existence, Lamarckism and race theories.

Eugenics and racial ideas

It is well known that the link between eugenics and racism – especially in its anti-Semitic version – by national socialism is historically contingent. Important representatives of eugenics before 1933 and outside Germany did not promote racist and anti-Semitic ideas. This was also the case for some of the eugenicists who published during the Third Reich (see Weiss 1987; Adams 1990; Junker and Paul 1999; Paul and Falk 1999). If eugenics during the Third Reich is equated with racial politics and any comment in favor of

Table 3. Evolutionary synthesis and the Third Reich

	general attitude	NS-Ideology in		Race care	Eugenics
		Evolution d. Organismen	Other publ.		
Baur	+/-	[+/-]	+/-	+/-	++
Timoféeff- Ressovsky	-	0	0	0	++
Zimmermann	+/-	0	+	+	++
Rensch	-	0	?	?	[+]
Bauer	?	0	0	0	0
Dingler	++	0	+	0	0
Franz	++	0	+	++	0
Herre	?	0	0	0	0
Lorenz	++	+	++	+	+
Ludwig	-	0	0	0	+
Mägdefrau	+	0	0	0	0
Rüger	-	0	0	0	0
Schwanitz	++	0	++	++	+
Weigelt	++	0	0	0	0
Zündorf	++	+	+	0	0
Gieseler	++	0	+	+/-	0
Heberer	++	+	+	+	0
von Krogh	++	+	++	++	0
Reche	++	+	++	++	++
Weinert	++	+	++	++	++

0 = no statement; ? = evidence ambiguous; + = in favor of; ++ = strongly in favor of; +/- = ambiguous attitude; - = critical attitude; [] = pre-1933 or post-1945 evidence.

eugenics in the years 1933 to 1945 is seen as an endorsement of Nazi-politics, most of the evolutionists must be called national socialists. We think that this is a misleading simplification. After all Chorea huntington and Nordic racial features are different things, and an interest in the origin and prevention of severe genetic diseases does not necessarily imply the conviction of a supremacy of the Nordic race. For example, we found evidence in the work of Ludwig and Timoféeff-Ressovsky that they endorsed eugenics after 1933 because of medical reasons and without any racist components. Similar to the situation in the German medical community they “defended racial hygiene as

a natural consequence of the triumph of Mendelian genetics over doctrines conceived to be exaggerating the power of the social or physical environment to shape the human species” (Proctor 1988: 35).

All important architects of the evolutionary synthesis have a more or less positive attitude towards eugenics. This is true for Dobzhansky, Simpson, Huxley, Stebbins and Mayr as well as for the evolutionists in Germany (see Muller et al. 1939; Simpson 1949: 330; Paul 1994; Mayr 1997: 246). Despite controversies over the exact procedures they were convinced that the eugenic aim, the improvement of the gene pool, is not only ethically legitimate, but indispensable. It should be noted that the differences between medical eugenics and national socialist racial politics were emphasized by politicians of the Third Reich as well. The “Reichsgesundheitsführer” Leonardo Conti (1900–1945) wrote in 1934:

“Eugenics literally means hereditary health care [*Erbgesundheitspflege*]. This term was regularly emphasized in earlier years to exclude the term ‘race’ from the discussions on hereditary health care. Eugenics, which does not go beyond the struggle against severe organic and mental diseases, is not made for the specific people [*Volkstum*] and its needs. [...] Hereditary health care must not be reduced to this checking of severe pathological hereditary inferiority, but it must try to become a practical race care [*Rassenpflege*]. Part of these measures is the prevention of race mixture with strongly different blood [*wesensfremdem Blute*]” (Conti 1934: 45).

National socialist race care was based on the idea that human races have a different value and that their interbreeding is harmful. In addition there was a strong emphasis on supposedly hereditary psychological differences between races. This is one of the reasons why anthropology was much closer connected to national socialist racial theories than the theory of evolution or genetics (see Hoßfeld et al., in prep.). Eugenics on the other hand was based on a medical paradigm. It primarily dealt with classical diseases and with severe physical or mental disabilities. These fundamental differences in theoretical outlook, language, and practical politics should not be ignored. This is particularly important, because medical eugenics and racial politics were frequently mixed in national socialist propaganda publications – primarily to give the impression that the scientific background of eugenics (that is genetics) can be extended to racial ideas as well. Eugenics in the understanding of the Third Reich, that is combined with racist conceptions, was supported by Lorenz, Schwanitz, Reche, Weinert, Zimmermann – and with reservations by Baur. In favor of eugenics on a purely medical basis were Ludwig, Timoféeff-Ressovsky and Rensch.

Lamarckism

In the section on Rensch and Zimmermann we have pointed out the importance of political influence in the discussions on Lamarckism. A similar situation shaped some of the debates on creationism. In this context some of the representatives of Synthetic Darwinism appealed to the political regime to promote their scientific ideas (Schwanitz 1938; Zimmermann 1938: 235–237; Lorenz 1940). By doing this they treated Third Reich politicians as arbiters in a scientific controversy. It is interesting to see that these interventions were not very successful, but the attempt to accuse the scientific opponent of political deviation resulted in a stalemate. The national socialist botanist Ernst Bergdolt, for example, accused Darwinism of liberal and Jewish influences (Bergdolt 1937–1938: 109).

Heberer's Die Evolution der Organismen

Heberer's *Evolution der Organismen* was the most representative work of Synthetic Darwinism in Germany. It is remarkable that the book is – with few exceptions – without any reference to national socialist ideas. The major exceptions are Heberer's preface, but not his article on macroevolution, and the contributions by the anthropologists Reche and Weinert. This is true even for the contributions of authors who published in favor of national socialism in other places. One important reason was the scientific character of the book. This explanation is not sufficient, since, for example Zimmermann's book of 1938, which has a comparable scientific claim, contains rather extensive political parts.

We assume that Heberer as editor and the publisher (Gustav Fischer) have demanded ideological neutrality. Generally the *Evolution der Organismen* has an international approach. The bibliography in the contribution of Hans Bauer and Timoféeff-Ressovsky, for example, contains more Russian than German entries! The book was published in 1943 when the war with the Soviet Union was in its decisive phase (from the entries in Heberer's Diary we know that the articles were written in the years 1940 and 1941). A second reason for the scientific character of the *Evolution der Organismen* may be that with the preparation and beginning of the war the ideology of science became less important compared to efficiency. This seems to have happened in physics and a comparable development in biology cannot not be excluded (see Beyerchen 1977: 176–188; Renneberg and Walker 1994). Finally even the authors who tried to adapt to the Third Reich may have felt a rest of obligation towards their science and its values.

The book, however, had negative side effects, which, in the long run, may have done more harm than good. First, in order to give a comprehensive

picture Heberer incorporated articles by authors who were only vaguely Darwinian and had hardly any understanding of the new genetic theory of selection. Secondly, Heberer who was a member of the SS himself, invited only anthropologists who were close to the party and kept this arrangement in the post-war editions! This situation may explain why after 1945 “evolution was synonymized with the most typological selectionism, and biology with Nazi racism” as Mayr had observed (on the anthropological section of the *Evolution der Organismen* see Hößfeld et al. in prep.).

Conclusion

One result of our analysis is that the widespread impression of a special relationship between scientific Darwinism and national socialist ideology is not warranted by the historical facts. No doubt, the main architects – Baur, Timoféeff-Ressovsky, Zimmermann, Rensch – as well as the other contributors to Heberer’s *Evolution der Organismen* embraced various strategies of inner and outer adaptation. Adaptation was strongest with anthropologists and weakest with geneticists and evolutionists. Critical voices are comparatively subdued. As a consequence of the fact that criticism was suppressed during the Third Reich by constant and massive threats some of the biologists tried to survive as scientists and adapt only insofar as it seemed absolutely necessary. About half of the authors did more than this and actively served the Hitler regime by publishing approving “scientific” arguments.

At the same time, however, only marginal and superficial adaptation to the national socialist ideology can be found in the publications of the German architects. The evolutionary synthesis as it was laid out in Heberer’s *Evolution der Organismen* and other scientific publications of the time, was largely free of ideological distortions and comparable to American and British publications. Baur, Timoféeff-Ressovsky, Zimmermann, and Rensch were obviously much more influenced by the earlier traditions of the German empire, Weimar, the Soviet Union, and – particularly – by the standards of the international scientific community. There was, for example, no special emphasis on selection or the struggle for existence. The opposite is true: evolutionary mechanisms like isolation, migration, drift, polyploidy and macromutations were well received. To give one more piece of evidence: Neither Timoféeff-Ressovsky’s 1939 paper on genetics and evolution nor Rensch’s 1947 book (based largely on a 1943 paper) needed “political” revisions, when they were translated in 1940 and 1959.

The alleged special relationship between Synthetic Darwinism and national socialism, which was pronounced after 1945 by Anti-Darwinians, did much damage to the further development of the theory of evolution in

Germany. Besides the fact, that the truth of a theory does not depend on the political convictions of its advocates, it is usually overlooked that anti-Darwinians were eager to present themselves as the true representatives of the national socialist race ideology as well. There was a comparatively strong Lamarckian group (Hans Böker, Jürgen Wilhelm Harms, Ludwig Plate) as well as an anti-evolutionary movement during the Third Reich that also had political support.

How progressionist were the architects of the evolutionary synthesis in the Third Reich? Progressionism could be easily accommodated to national socialism by changing the reference point from humanity as a whole to a specific race. It is interesting that progressionism seems less conspicuous in Germany than in America. Only Rensch devoted considerable efforts to proof the existence of evolutionary progress, Timoféeff-Ressovsky more or less ignored the topic and Zimmermann criticized it as a purely metaphysical concept. How liberal were the German architects? It is, of course, difficult to estimate their political opinion during the Third Reich, but the attitude before 1933 and after 1945 gives some clues. About Timoféeff-Ressovsky's political affiliations little is known, Baur and Zimmermann were conservatives. This leaves one liberal architect: Rensch. If these characterizations are correct the picture of links between a progressionist, liberal ideology and the evolutionary synthesis are much more contingent than has previously been assumed.

With regard to the scientific aspects our analysis reinforces the notion that the evolutionary synthesis was an international movement, with representative not only in the US, Britain and Russia, but in Germany as well. The origination of the evolutionary synthesis was certainly not an Anglo-American event and not comparable to the reception and expansion of the theory after 1950. In general, our understanding of the evolutionary synthesis will gain from a comparative approach, based on results from a variety of national and political backgrounds. The interaction between the evolutionists working in different countries – as documented by numerous references, social ties, and theoretical coherence – was so intensive that any division into national branches is highly artificial. Dobzhansky was as much a representative of Russian as one of American evolutionism, for Mayr German traditions were as important as the American situation, and Timoféeff-Ressovsky was strongly influenced by his Russian education, but spent the relevant years of his scientific life in Germany. Baur, Timoféeff-Ressovsky, Rensch and Zimmermann lived in Germany, they published mostly in German, but they did not produce a German version of the theory of evolution.

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