Diesel, Father and Son: Social Philosophies of Technology

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In a recent essay on "Historians and Modern Technology," the German scholar Reinhard Rürup has indicated that in early 20th-century Germany the studies of both the history of technology and the philosophy of technology developed in a highly ambivalent atmosphere. On the one hand, enthusiasts voiced their belief in continuing technological invention and progress; yet, on the other hand, critics indicated their concern over the increasingly negative impact of technology on society, an attitude which often led to cultural pessimism.[1] Such ambivalence may be rooted in trends prevalent in 19th- and early 20th-century German intellectual history. It may mirror the relationship that individuals and social classes perceived between themselves and modern technology. Or it may have originated in the personal life histories of the individuals involved. An excellent case study involving all of these factors is provided by the lives of Rudolf Diesel (1858–1913), inventor of the diesel engine, and his son, Eugen Diesel (1889–1970), who wrote voluminously on the relationship of technology and culture from the 1920s to the 1960s. The story of Rudolf and Eugen Diesel deals with more than the account of an invention and the diverse origins of a philosophy of technology. It also illustrates the inventor's feeling of responsibility for the social impact of his invention and the influence of a famous father on his son.

Born in Paris of German parents, Rudolf Diesel grew up in an

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[1]Reinhard Rürup, "Historians and Modern Technology," *Technology and Culture* 15 (April 1974): 174.

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atmosphere of small means and some privation, but from early life he was driven by the desire to be both successful and wealthy. He studied first at an industrial school in Augsburg and then at the Technische Hochschule in Munich, where he passed his exams with record marks. Working as an engineer in the refrigeration business, first in France and then in Germany, he conceived the idea of replacing the steam engine with a more efficient heat engine.[2]

Such an idea was not new in Diesel's time. Hundreds of inventors were seeking more economical and efficient alternatives to the steam engine. In the 1860s and 1870s the German inventor Nicolaus Otto had developed the internal-combustion engine. But although many of the ideas that made up the background of the diesel engine were already in existence before 1890, Diesel claimed his approach to the problem was novel: he conceived of an engine in which combustion would take place isothermally, or at a common temperature. Such an engine would be extremely efficient. It would come close to realizing the ideal heat engine, developed in theory by the Frenchman Sadi Carnot in his Carnot cycle.[3]

Diesel knew that he would need considerable financial help in realizing his ideas. In 1892 he took out a patent for his engine, and in 1893 he published a theoretical justification called *Theory and Construction of a Rational Heat Engine* [Theorie und Konstruktion eines rationellen Wärmemotors]. The book combined detailed drawings and mathematics with speculations on the engine's social benefits. For instance, Diesel thought his small, efficient engine would help industry decentralize and restore the small craftsman to the position he had lost because of the steam engine.[4] The book was sent to leading European authorities on thermodynamics such as Lord Kelvin, who for the most part endorsed Diesel's ideas. It was basically these endorsements plus Diesel's eloquence that convinced the Krupp works in Essen and Heinrich Buz's Augsburg Engine Works to back the project. In an exhausting series of experiments between 1893 and 1897, Diesel and his helpers were able to develop the first working diesel engine in Buz's Augsburg factory. There were, however,

[2]The best full-length work on Rudolf Diesel is still his son's, Eugen Diesel's, biography, *Diesel: Der Mensch, das Werk, das Schicksal* (Hamburg, 1937). The English biography by W. Robert Nitske and Charles Morrow Wilson, *Rudolf Diesel: Pioneer of the Age of Power* (Norman, Okla., 1965), is in many instances either a paraphrase of Eugen Diesel's biography or untrustworthy.

[3]This discussion of the nature and development of the diesel engine relies heavily on two articles by Lynwood Bryant: "Rudolf Diesel and His Rational Engine," *Scientific American* (August 1969), pp. 108–17; and "The Development of the Diesel Engine," *Technology and Culture* 17 (July 1976): 432–46.

[4]Bryant, "Diesel and His Rational Engine," pp. 115–16.

numerous changes in the original plan, and in the end it proved impossible to produce an engine exactly on the model of the Carnot cycle.

In 1897, Diesel with the advice of his backers not only announced the success of his engine but also proclaimed it fully developed and ready to be marketed.[5] He spent the next several years selling the patent rights to his engine. Quite successful at first, he was on paper a millionaire, but by 1899–1900 his luck changed. Exhausted by his inventive and marketing efforts, as well as a number of legal battles over the validity of his patents, Diesel suffered a nervous breakdown. Concerned that he could not carry on his work or that he might perhaps even die, Diesel turned over control of the rights to further development and licensing of his engine to a newly created firm, the General Society for Diesel Engines (Allgemeine Gesellschaft für Dieselmotoren). Thus, Diesel gave up direct control of his invention. He was reimbursed by payments in both money and stocks in the new enterprise. Unfortunately, the stocks returned little in the way of dividends.

The too-hasty attempt to market the diesel engine had resulted in numerous mechanical problems and failures. Machines were returned, licenses dropped, and a company that had been set up to develop the part of the German market not controlled by Krupp and Buz went bankrupt. Added to these failures were Diesel's unwise investments in real estate and Rumanian oil ventures in which he lost heavily. Diesel also spent a small fortune on a new house in Munich, which further set back his financial situation. Although Diesel recovered from his illness and was able to keep up appearances, the period after 1900 saw his position continue to deteriorate.[6]

Remembered primarily for the diesel engine, Rudolf Diesel was also greatly concerned with the social consequences of his invention. Indeed, as we have seen, his publication of 1893 had stressed the benefits of a new heat engine for small craftsmen. Around the beginning of the 20th century, Diesel spent a good deal of time reading and collecting notes for a small book which was published in 1903 under the title *Solidarity: The Rational Economic Salvation of Mankind* [Solidarismus: Natürliche wirtschaftliche Erlösung des Menschen]. Rudolf's son, Eugen, points to an interesting similarity between his father's work on the diesel engine and on social problems: it was necessary to preface both with a theoretical justification. To Rudolf

[5]Bryant, "Development of the Diesel Engine," p. 441.
[6]Diesel, *Diesel,* pp. 314–16, 322–24, 334–38, 350–53.

Diesel's way of thinking, if a system were rationally constructed, its very rationality would ensure its success.[7]

It is not surprising that Rudolf Diesel took such a view, for he was well immersed in the rational, progressive atmosphere current among the late 19th-century bourgeoisie. During his school years, Diesel gradually rejected religious beliefs and substituted for them a belief in science, technology, and progress. The cathedrals of the new belief were the museums of science and technology, typified by the Deutsches Museum in Munich founded in 1903 by Oskar von Miller, Diesel's school friend and lifelong supporter.[8] According to Eugen Diesel, his father left behind notes for a proposed book on the religion of reason in which all phenomena were traced back to scientific laws. *Solidarity* was written in the firm conviction that the engineer, applying reason, could solve the pressing social problems of the time.[9]

Diesel was clearly aware of the growing social problems of the end of the 19th century, conditioned by the rise of the working class and its hostility to capitalism and the middle-class ethic. This was the period when socialist parties at least outwardly committed to Marxism were making headway, especially in Germany and France. Diesel was not, however, attracted to the Marxist idea of class struggle. Rather, he wished, by ameliorating the lot of the workers, to overcome what he saw as the growing cleavage between the middle and the lower classes.

Perhaps Diesel's own humble origins account in part for his concern with the fate of the working class. His ideas, however, are also part of the larger intellectual currents of his time. For instance, in the early 19th century, the utopian socialist Saint-Simon had laid great stress on the creation of an organic, integrated society which would overcome the split between the propertied and propertyless. This harmonious society would come about through a transfer of power to scientists and industrialists. To some extent, Saint-Simon was the father of the technocratic ideas of the 20th century.[10] How familiar Diesel was with such thinkers as Saint-Simon is unknown, although one can find him justifying his concern with economics in *Solidarity* with the argument that the economic realm is more important than either the political or the cultural.[11] Eugen Diesel certainly saw a

[7]Ibid., pp. 366–67; and Eugen Diesel, *Jahrhundertwende, gesehen im Schicksal meines Vaters* (Stuttgart, 1949), pp. 61–62.

[8]Diesel, *Jahrhundertwende,* pp. 50–55.

[9]Ibid., pp. 208–11; and Diesel, *Diesel,* pp. 384–86.

[10]Frank E. Manuel, *The Prophets of Paris* (New York, 1962), pp. 115–34.

[11]Handwritten note in the Rudolf Diesel *Nachlass,* MAN Werkarchiv, Augsburg, Germany (hereafter cited as RDN).

similarity between his father's views and those of Saint-Simon and suspected some influence.[12]

The impact of French thinkers on Diesel is not surprising if one considers that he was born, lived his childhood, and worked for a time in France, was fluent in French and familiar with French literature. Indeed, it appears that Diesel was influenced by a trend of thought quite popular in France around the turn of the century, known as *solidarité*. Developed primarily by the philosopher Alfred Fouillé, the sociologist Émile Durkheim, and the politician Leon Bourgeois, solidarity was virtually the official philosophy of the French Radical (i.e., liberal bourgeois) party from 1900 to 1914. It was touted by the press, schools, and a number of conferences and influenced both economic theory and social legislation.[13] The most popular exponent of solidarity was Leon Bourgeois, whose book *Solidarité* first appeared in 1897 and went through a number of editions in the first decade of the 20th century. Diesel was familiar with this book and took notes on it.[14]

Essentially, solidarity, as proposed by Bourgeois and others, proclaimed that society exhibited an organic solidarity, based on the division of labor. Such solidarity was the basis of organized community life. Bourgeois claimed that solidarity was more than a religious or ethical sentiment; it was a scientific fact, proved by those who have studied human society. Solidarists maintained that society could malfunction if private property became too concentrated. It was the government's duty to intervene and set the balance right again. Bourgeois saw solidarity as the perfect compromise between liberalism and socialism. It justified state intervention, but it also proclaimed class solidarity, rejected the ideas of class struggle and revolution, and in the end left the bases of capitalist society untouched.[15]

It is against this background that Diesel set about writing his own book, *Solidarity*. The work outlines an economic order based on cooperation—a system which places the common welfare above that of the individual. Backed with statistics on the population and wealth of Germany and her various social classes, Diesel maintained that if all workers contributed a fixed weekly sum to a "people's bank" *(Volkskasse)* they would in short order amass enough money to finance worker-controlled and run businesses and farms. These enterprises would produce for people's needs, mutually complement one

[12]Diesel to his mother, June 2, 1926, Eugen Diesel *Nachlass,* Freiburg, Germany (hereafter cited as EDN).

[13]J. A. Scott, *Republican Ideas and the Liberal Tradition in France, 1870–1914* (New York, 1951), pp. 124–25, 158–59.

[14]Diesel's notes on *Solidarité* are contained in the RDN.

[15]Scott, pp. 171–79.

another, and offer products at cheap prices, while at the same time offering an expansive program of free health care, education, and recreation. Diesel thought that in such worker-run enterprises technology would be used to free men from labor rather than to enslave them, as he felt was so often the case under capitalism.[16]

Diesel expected that such cooperative enterprises would arise spontaneously, without compulsion, once the workers realized it was in their interest to unite. As he said elsewhere, "Mankind is not bad . . . only badly governed."[17] While the state should not prescribe solidarity, it would be in the state's interest to further solidarity once it had started. Diesel thought, as did the French solidarists, that there was nothing artificial in solidarity, indeed, it was based on natural laws and relationships existent in society. One of a solidaristic society's greatest assets would be the eradication of class warfare.[18]

The second part of *Solidarity* goes into great detail spelling out the relationships that would exist in a solidaristic society and the terms of the contracts binding people within such a cooperative enterprise. Diesel even provides a sample identification card to be carried by the workers. While Diesel was completely serious about his project, occasionally his suggestions became ludicrous. For instance, he proposed that worker-controlled enterprises be called "beehives" and the workers themselves be called "bees."

Diesel's expectations were high. In fact, he once went so far as to evaluate his life's work in the following words: "That I have invented the diesel engine is well and good, but my chief accomplishment is to have solved the social problem."[19] Can one perhaps detect in such a statement the tendency of engineers to take an oversimplified, even naive approach to the solution of social problems?

If Diesel expected that his solution to social problems would be immediately recognized and endorsed, he was destined to be disappointed. In fact, few copies of his book were sold. Typical reviews called it a "solitary dream," "without scientific merit," and a "real pain to read."[20] Nonetheless, for some time after 1903 Diesel continued to try to propagate his ideas, although he was still primarily concerned with the fate of his engine. Lists were made of possible adherents.

[16]Rudolf Diesel, *Solidarismus: Natürliche wirtschaftliche Erlösung des Menschen* (Munich and Berlin, 1903), pp. 1–2, 5–7, 16–17, 28–30, 68–70.

[17]Handwritten notes, RDN.

[18]Diesel, *Solidarismus,* pp. 61–62.

[19]Diesel, *Diesel,* pp. 373–74.

[20]Reviews by Karl Figdor in *Monatsblätter des wissenschaftlichen Klub in Wien* (December 30, 1904), p. 19; and Arthur Mülberger in *Schweiz. Konsum-Verein* (February 20, 1904), p. 1, both contained in the RDN.

Conversations were held with such men as the chemist and reformer Wilhelm Ostwald and the economist Lujo Brentano. Brentano felt that the socialists might be won over to the cause of solidarity. Letters were exchanged with such notables as the anarchist Peter Kropotkin who, in his book *Mutual Aid* (1902), saw the dominant trend of modern history in the movement toward decentralized, cooperative societies. Kropotkin, however, thought Diesel's ideas would really require too much state compulsion for their realization. Diesel thought of appealing to such politicians as Joseph Chamberlain, Alexandre Millerand, and Theodore Roosevelt.[21]

For Diesel, nothing came of these attempts. During his last years, he was plagued with ill health, and his persisting financial problems left him at the edge of bankruptcy. He refused to consult financial experts who might have saved him from his foolhardy speculations. Nor did he approach friends who might have lent him money. There is even evidence that Diesel, undoubtedly because of his depressed personal state, was becoming skeptical of the benefits of technology. As he said to his son Eugen shortly before his own death: "It is beautiful [for an engineer] to shape and design the same way that an artist shapes and designs. But whether the whole process makes any sense, whether men have become happier—that I can no longer decide."[22] At the end of September 1913, Diesel left for a trip to England to attend the ground-breaking ceremony of the British Diesel Company's new plant at Ipswich and to address the Royal Automobile Club of London. During the night of September 29–30, 1913, he disappeared from the ship on which he was crossing the English Channel, presumably a suicide.

It had been Rudolf Diesel's hope that one of his two sons would carry on his work. The older son, Rudolf, Jr., however, showed little interest in his father's work, and in fact became somewhat of a recluse. The second son, Eugen, who was born May 3, 1889, in Paris, appeared at first more inclined to follow in his father's footsteps. Indeed, up to 1908, when Eugen Diesel finished his *Abitur,* it was taken for granted that he would become an engineer. There were, however, other influences at work. The family had lived in or near Schwabing—the artistic quarter of Munich—since 1895, and in 1901 moved into a fashionable and expensive house on the Maria Theresiastrasse. For a number of years the family lived the life of the wealthy upper middle class, and despite his declining fortunes Diesel

[21] Unfortunately, all that remains of these letters and conversations are a few notes by Diesel, contained in the RDN. On Kropotkin see his *Mutual Aid: A Factor of Evolution,* ed. with an introduction by Paul Avrich (New York, 1972), pp. 4–10.

[22] Diesel, *Diesel,* p. 448.

provided governesses and music lessons for the children, entertained cultural and political notables, and regularly attended the opera and other cultural events.[23]

From the middle 1880s to 1914 Munich was the intellectual antithesis to Wilhelmian Berlin. Artists and writers from all over Germany settled here, especially in the Schwabing district, and affiliated with journals such as the *Jugend* or the satirical *Simplizissimus*. Protected by the tolerant and traditionally anti-Prussian Wittelsbach monarchy, they launched attacks on the academic art styles and dominant economic and political trends of the Second Reich.[24] Such artistic groups as the *Jugendstil* often attacked capitalism and modern technical and industrial society. Munich at this time was variously inhabited by artists such as Vassily Kandinsky, writers such as Thomas Mann, and the politicians of the future, Lenin and Hitler. Eugen Diesel himself states that he was heavily influenced by the cultural life of *fin de siècle* Munich, which awakened his aesthetic interests. Further, on several trips and within family social gatherings he met numerous personalities who made him aware of the worldwide social impact of technology. On several occasions, father and son discussed "the impact of technology on the fate of humanity," as well as Rudolf's idea of solidarity. By his own admission these discussions had a lasting impact on Eugen Diesel.[25]

In 1908–9 Eugen worked as an unpaid engineering assistant in a Swiss factory. He was not at all pleased with his first introduction to the world of industry and was also disturbed by the same condition his father had seen—the antagonism of the workers toward the middle class. In 1909 he wrote his father a letter in which he indicated that he might not follow the engineering profession. From 1909 to 1912 a struggle ensued between father and son over Eugen's future. Part of the problem lay in Eugen's feeling that he could not hope to match the accomplishments of his father.[26] Rudolf felt that Eugen was simply afraid of taking his exams at the Munich Technische Hochschule, where he was studying. In one letter to his wife, Rudolf complains that Eugen had spent more time working on a drama than on preparing for his exams.[27] By 1912, however, the struggle was over. Shortly

[23]Ibid., pp. 274–75, 395, 444. Unfortunately, Eugen Diesel is so general in his description of his family's and his own social contacts in Munich that it becomes impossible to establish exact relationships.

[24]Gerdi Huber, *Das klassische Schwabing: München als Zentrum der intellektuellen Zeit- und Gesellschaftskritik an der Wende des 19. zum 20. Jahrhunderts* (Munich, 1973).

[25]Eugen Diesel mentions the impact of these early Munich days in his "Notizen für einen Aufsatz über Eugen Diesel," unpublished manuscript, EDN, pp. 1–2.

[26]Eugen Diesel to Rudolf Diesel, June 4, 1909, EDN.

[27]Rudolf Diesel to Martha Diesel, July 13, 1911, EDN.

before Rudolf Diesel's trip to America in March of that year, his son informed him of his plans to change his studies from engineering to geology and geography.

In September 1913 Rudolf Diesel's last work appeared, *The Origin of the Diesel Engine* [Die Entstehung des Dieselmotors]. The copy that he gave his son bore the following inscription: "This book contains merely the technical aspects of my life's work, the skeleton. Perhaps you will be able to add flesh to this skeleton, through the addition of those human elements which you more than anyone else have lived through and understand."[28] It was Eugen Diesel's opinion that his father had reconciled himself to his son's decision and was now hoping that Eugen would carry on the side of his work which dealt with the social question.[29]

Only three weeks later Rudolf Diesel died. His death was followed by the collapse of the family finances. Moreover, less than a year later World War I began. With the outbreak of the war, Eugen Diesel was for a time in the reserves. He then obtained a position in the passport office of the German embassy in Sweden and remained there for the duration of the war. After the war, he returned to Sweden and was part owner of a German import firm from 1920 to 1923. From February to September 1924 Diesel lived in New York City and was a salesman for a German scale company, but competition from an American firm caused him to give up his business and return to Germany. Here he married, settled in Potsdam, and from 1925 on devoted himself completely to a literary career.[30]

Diesel's letters to his mother from World War I through 1929 provide some revealing insights into his mental processes at that time and especially into his feelings toward his father. On the one hand, Eugen attacked what he saw as the engineering mentality which thinks it has the answer to everything and which is more interested in cold facts than cultural matters. "It's a shame when any significant human being becomes an engineer. It's a shame that Papa became an engineer."[31]

More interesting than his attack on the engineering profession, however, was his growing desire to come to grips with Rudolf Diesel's life. During the war he urged his mother, Martha Diesel, to write a biography of her husband. By 1920, he suggested that he himself had

[28]Diesel, *Diesel,* p. 5.

[29]Ibid., pp. 5–6 and from conversations with Eugen Diesel's son, Rainer Diesel.

[30]Information on this period of Eugen Diesel's life was gathered from an examination of his letters to his mother and from conversations with Rainer Diesel. See also, the obituary by Georg Bergler in *Jahrbuch der Absatz- und Verbrauchsforschung* 16 (1970): 353–57.

[31]Eugen Diesel to Martha Diesel, March 22, 1924, EDN.

become more interested in his father's life story, which he thought might go deeper than the tragedy of one man. It might, he said, reflect the fate of an entire generation. In 1922, he wrote that he was becoming involved with an analysis of contemporary technical and economic conditions. "Fundamentally, I am continuing Papa's work. He was concerned his entire life about technology and the economic situation but he was not intellectually and philosophically enough schooled to give expression to this concern. That I am now doing."[32]

By 1927 it was clear that Eugene Diesel was collecting material for a biography of his father and was comparing the progress of his own life to that of his father's. In 1928 he exclaimed how much he would have to suffer going back through his father's life, and how, interestingly enough, he was at that time dreaming constantly of his father. By 1929 he reported that critics of his first published book, a critique of contemporary culture, were proclaiming that the spirit of the father lived once again in the son. "Everything considered," Eugen said, "the Diesel flag is flying once again."[33] What we see here is not only a growing desire to understand his father's significance but also a gradual identification, in which Eugen Diesel assumed his father's role as social critic.

The result of Eugen Diesel's concern with his father's work was some ten years of labor and the creation of a classic biography, *Rudolf Diesel* (*Diesel: Der Mensch, das Werk, das Schicksal,* 1937). *Diesel* was Eugen Diesel's most successful work: by 1948 it had gone through eight editions and over 130,000 copies. In 1948 and again in 1953, new editions were published. Eugen Diesel continued to return to the subject of his father in numerous short essays, in lectures, and in work on the film *Diesel,* which was produced during World War II. In 1949 he published *The Turn of the Century Seen in the Fate of My Father* [Jahrhundertwende, gesehen im Schicksal meines Vaters], which dealt in detail with his father's relationship to European civilization at the turn of the century as well as the relationship between father and son.

Diesel's interpretation of his father was very much influenced by the events through which he himself lived. Indeed, he portrayed Rudolf Diesel's life as symbolic of the fate of the middle class in the 20th century and went so far as to suggest that his father would have been an interesting representative of his age, even if he had not invented the diesel engine.[34] In Eugen Diesel's view, the middle class, which was grounded in Enlightenment reasoning and whose rise to

[32]Ibid., December 20, 1922.
[33]Ibid., January 4, 1929.
[34]Diesel, *Jahrhundertwende,* p. 121.

power had been heralded by the French Revolution, was by the 19th century caught up in the dogmas of science, technology, materialism, and progress. By the opening of the 20th century, however, the middle class's rule was being challenged by the working class, and its dogmas were increasingly under attack by currents of irrationalism. It would become increasingly apparent during the course of the 20th century, said Diesel, that reason and technological organization alone could not solve all man's problems. Eugen Diesel saw the turn of the century as the high point of bourgeois materialism and also as the beginning of the middle class's decline. He interpreted his father as symbolic both of the bourgeois belief in rationality, technology, and progress, and the eventual collapse of that belief.[35]

Rudolf Diesel's influence remained with his son until the end. One of Eugen Diesel's last unpublished manuscripts from the late 1960s is entitled "What Does the Future Hold? A Conversation with My Father" ["Was soll werden? Gespräch mit meinem Vater"]. The manuscript begins: "When I lie awake at night, the form of my father appears in great liveliness in my mind. Then I see his world, hear again what he said to me, see how he visualized his world and his time, and how he viewed the future. One night he stood so clearly before me that I began to speak with him. Since then I have continued the conversation. This is a rather original way of giving an account of the unheard of things that have happened in the world since the death of my father."[36] Not only a convenient literary device, it is also a revealing indication of the impact of father on son.

Eugen Diesel's writing career began in earnest in 1925, although he had already published a play in 1922. His first book, *Passage through Confusion: The Experience of Our Time* [Der Weg durch das Wirrsal: Das Erlebnis unserer Zeit] (1926), contained the main arguments on the subjects of modern society and technology that reappeared in later works. By 1932 the work had appeared in a fourth, pocketbook edition. From this initial success, Diesel's writing career proceeded apace. He would eventually author fifteen books, over 100 articles, and some sixty lectures and radio talks. In the 1930s he served as coeditor and frequent contributor to the *Deutsche Rundschau.*

Diesel's work on technology brought him into contact with a number of scientific and technological organizations. He became a lifelong member of the board of the Deutsches Museum, as well as secretary of its advisory committee for several years after World War II. Indeed, at one time in 1932 Diesel felt he might be called upon to

[35] Ibid., pp. 106–9; 203–8.

[36] Eugen Diesel, "Was soll werden? Gespräch mit meinem Vater," unpublished manuscript, EDN, p. 1.

head the Deutsches Museum after the retirement of Oskar von Miller.[37] From 1939 on Diesel had connections with the MAN factory in Augsburg, birthplace of the original diesel engine. Diesel also had connections with such groups as the Verein Deutscher Ingenieure (Society of German Engineers), which he advised on various matters, and from his own testimony had connections with a variety of German industrialists, although the extent of these connections is difficult to determine today. In 1959 Diesel received the Great Service Cross of the Federal Republic of Germany's Service Order.

In the late 1920s and early 1930s, Diesel wrote numerous political essays. Although often vague, they could probably best be described as conservative and *völkisch,* attacking the political party system, calling for a new unified German spirit and a third way between capitalism and communism.[38] Diesel, however, at no time expressed Nazi sympathies. He attacked extreme right-wing chauvinism, and during the 1930s he remained aloof from the Nazi party. His writings made little mention of the Nazis, and by the end of the 1930s he was actively associated with men such as Karl Goerdler, former mayor of Leipzig and one of the leaders of the German resistance.[39] It was perhaps only his decision in the summer of 1939 to move from Potsdam to the small Bavarian town of Brannenburg am Inn and his lessening contacts with the resistance groups which saved his life.

After World War II, Eugen Diesel's life as a writer continued, but there was less demand for his works. In what was probably an unwise decision, he turned down the offer of a teaching post at the Technische Hochschule in Karlsruhe in order to devote full time to writing. It was only a financial honorarium willed by the industrialist Robert Bosch (1861–1942) that kept Diesel financially solvent.[40] Diesel made several trips abroad, for example, to Japan and to the United States in 1954, where he lectured on his father and on the history of the diesel engine. In the middle 1950s, however, his health began to fail. His last book, *Mankind before the Abyss* [Menschheit im Katarakt] (1963), found few readers. Diesel worked on several manuscripts during the middle and late 1960s, but these contribute few new insights into his thought and remain unpublished. He died September 22, 1970.

In order to understand Eugen Diesel's philosophy of technology,

[37]Eugen Diesel to Martha Diesel, February 10, 1932, EDN.

[38]An essay typical of this period is "Aus nationalem Gesamtgeist: Weder rechts noch links," *Volk und Reich* (October 1932), pp. 669–76.

[39]I hope to make Eugen Diesel's relationship to the German resistance the subject of a separate article.

[40]According to Rainer Diesel.

one must appreciate both the historical context in which he was writing and also his intellectual milieu—the progressive ideas of the Enlightenment, which were an inheritance from his father, and elements of German romantic philosophy, which were regaining prominence at the turn of the century.[41]

Although modern machine technology was having an increasing effect on Germany throughout the 19th century, it was not until the late 19th and early 20th centuries that technology was considered as an independent cultural force, with profound and possibly disturbing consequences. Before this time, writers had been concerned with individual aspects of technology and had tended to view technology as a subsidiary part of some higher system, such as Marx's attempt to incorporate technology into economics. By the late 19th century, the first attempts were being made to write independent philosophies of technology.[42]

These early studies did not, however, always consider technology in a favorable light. The extremely rapid industrialization of Germany after 1870, along with equally rapid social changes such as urbanization, proved a profound shock to many thinkers. The destruction of old ways and rapid modernization caused a number of thinkers to turn against all political and economic forms of modernity and develop ideas of pessimism, cultural decline, and a retreat to some golden age of social harmony that had supposedly existed before industrialization.[43] That such ideas were not limited to a few disaffected intellectuals is seen in the wide popularity of such writings as Julius Langbehn's *Rembrandt as Educator* [Rembrandt als Erzieher] (1890) and the racist, proto-Nazi Houston Stewart Chamberlain's *Foundations of the Nineteenth Century* [Grundlagen des Neunzehnten Jahrhunderts] (1899).[44] Much of the attraction of such works lay in their basically antiscientific, irrational attitudes.

In Germany, those who viewed modern science and technology with suspicion could draw reinforcement from the intellectual tradition of German romanticism. Romantic writers had looked with disfavor on "civilization," of which politics and technology were a part, and contrasted it with high "culture," made up of art, religion, and

[41] Diesel, "Notizen für einen Aufsatz," p. 3.

[42] Friedrich Dessauer, *Streit um die Technik* (Frankfurt, 1956), pp. 19–21.

[43] A work that relates rapid modernization to ideas of cultural pessimism in Germany in Georg Steinhausen's *Deutsche Geistes-und Kulturgeschichte von 1870 bis zur Gegenwart* (Halle, 1931).

[44] Although English by birth, Chamberlain lived almost his entire life on the continent, wrote his major works in German, and ended his days in Bayreuth, married to the youngest daughter of the composer Richard Wagner.

philosophy. The salvation of man would come from a cultivation of culture, not civilization. The romantic viewed rationality and modern science as external, mechanical, and lifeless, and sought a deeper, intuitive knowledge which alone could lead to ultimate reality. Such ideas became embedded in the German intellectual tradition and were used again at the end of the 19th century by those who attacked science and technology. Indeed, it may well be that much of the currently fashionable antitechnological writing is rooted in turn-of-the-century romanticism. However that may be, Diesel was clearly influenced by such trends. For instance, the opening pages of his first book, *Passage through Confusion,* espouse the culture-civilization dualism and are clearly influenced by Chamberlain's *Foundations of the Nineteenth Century.*[45]

Added to this romantic reaction to modernity was the shock of World War I when technology seemed to produce mass destruction, causing many intellectuals to question the notion that technology automatically led to progress. Antitechnological attitudes became the vogue among numerous novelists and playwrights. For example, the Czech writer Karel Čapek in his play *R.U.R.* (1920) made the point that if man continued to develop his technology without corresponding political and moral growth technology would destroy man. Fritz Lang's movie *Metropolis* expressed similar antitechnological ideas. In 1930 Oswald Spengler's *Der Mensch und die Technik* pictured technology as a weapon used by man, the beast of prey, in his rebellion against nature. This book did much to spread distorted views of technology.[46] Although Eugen Diesel did not subscribe to Spengler's views, he began his writing career at a time when such antitechnological ideas had captured the attention of many observers.[47]

Diesel's basic theme, which he reiterated from the 1920s to the 1960s, was that modern technology has thrown the world into a profound upheaval. We are, he said, living in the midst of a transition to a new world order in which few of our old institutions or thought processes will have any validity. As important as technological innovations are the new social forms which these innovations produce. Diesel saw technology creating greater and greater mechanization

[45]See Eugen Diesel, *Der Weg durch das Wirrsal* (Stuttgart and Berlin, 1926), p. 20. Diesel also flirted with Chamberlain's idea of the modern age being exclusively a product of the Teutonic race, although he refused to adopt Chamberlain's anti-Semitism (see ibid., pp. 267–70). Interestingly enough, references to Chamberlain were dropped from later (1932) editions.

[46]See Dessauer, pp. 35, 41–42.

[47]Diesel published a critical review of Spengler's book entitled "Spenglers Irrweg," in the *Deutsche Rundschau* (April 1932).

and organization in human life with the result that mankind's social groupings were tending to take form on an ever-larger scale.[48] Already in the 1920s Diesel predicted the ultimate end of this process would be world unity. In a purely technical sense, he said, such unity could be brought about only by scientists and engineers.[49]

Here Diesel was clearly influenced by technocratic ideas. He was undoubtedly also reflecting those youthful conversations on technology with his father, as well as the rational, progressive currents of the later 19th century that so molded his father's thought. Some philosophers in the 19th century such as Saint-Simon and Comte had sketched plans for world unity, and before 1914 H. G. Wells was writing that science and technology had completely outmoded the old European order. Before 1914 internationalist ideas and organizations proliferated greatly, to a degree based on the perception of the global spread of technology. But if, as the historian W. Warren Wagar says, prophets of global unity were uncommon before the mid-1930s,[50] then Diesel is a rare voice of unity in a divided world.

Throughout the late 1920s and early 1930s, however, Diesel's idea of world unity struggled with his German nationalist ideas. In his *The Fate of Nations* [Vom Verhängnis der Völker], published in 1934, he advocated a vague conception of European unity but insisted that it was compatible with the idea of strong nation-states. In this work, he reversed his earlier statements and rejected the idea of world unity.[51] It may well be that Diesel's nationalism was conditioned by the political and economic crisis through which Germany was passing, and that his utterances of 1934 were meant to offend the Nazis as little as possible and ensure the publication of his book. It is remarkable enough that Diesel could write of European unity in the face of Nazi hypernationalism. In any event, after World War II, Diesel picked up the threads of his arguments of the 1920s and once again advocated world unity.[52]

Although Diesel preached the idea of global unity, he also consistently emphasized the dangers of the technological age. Evolution from primitive times to the present indicates that man is increasingly losing his connections with the natural environment and surrounding himself with an artificial, technologically produced environment. But,

[48]Eugen Diesel, *Das Schicksal der Menschheit im Zeitalter der Technik* (Berlin, 1948), pp. 7–14.

[49]Diesel, *Weg durch das Wirrsal,* pp. 255–57.

[50]W. Warren Wagar, *The City of Man: Prophecies of World Civilization in Twentieth Century Thought* (Baltimore, 1967), pp. 50, 53–61.

[51]Diesel, *Vom Verhängnis der Völker* (Stuttgart and Berlin, 1934), pp. 258–69.

[52]Diesel, *Schicksal der Menschleit,* p. 11.

as Diesel says, in good romantic fashion, this modern, mechanized environment is destroying the living, natural man. Technology by itself cannot construct a new world. Although technology has revolutionized the world, the moral essence of man remains the same. What is truly worthy in moral values, says Diesel, has already been articulated. Hence, he saw man's problem as reconciling the old values with the new world created by technology. This reconciliation can, however, only be achieved when men recognize the limits of technology and when technology takes its place alongside religion and philosophy as one element in building a new world.[53]

After World War II, Diesel continued to propagate his ideas on technology. In 1952 he was one of the participants in a conference on "Man and Technology" held in Darmstadt. The problem of the demonic aspects of technology was much discussed at this conference, and when Diesel's turn to speak came, he emphatically rejected such a notion.[54]

Nonetheless, in his last book as well as his unpublished manuscripts, Diesel reviewed the world situation and found much cause for alarm in the arms race and conflicting ideologies. Echoing his father's call for solidarity, Diesel claimed that if man could learn to unite and place himself under a new religious impulse, then perhaps disaster could be avoided and the best in man would come to the fore.[55] Unfortunately, from his first book to his last manuscript Diesel consistently refused to draw a clear outline of what the future order might be like. For example, at the close of his first book, *Passage through Confusion,* Diesel says: "The old world is going under, the form of the new world is not yet visible."[56] In his last work, *Mankind before the Abyss,* he says: "In the good as in the bad, in the promising as well as the terrible, we feel the new approaching, but as yet we have no conception of it."[57] What emerges from Diesel's thought is a sense of urgency about our need to unify and cooperate. Indeed, by his last manuscripts Diesel can be found reciting a fairly standard list of the evils that beset the world, but he sheds little concrete light on the solutions to these problems.

There are some interesting comparisons between Eugen Diesel's

[53]Diesel, "Notizen für einen Aufsatz," pp. 2–3; and *Menschheit im Katarakt* (Griesbach im Rottal, Brannenburg am Inn, 1963), pp. 348–55.

[54]Hans Schwippert, ed., *Mensch und Technik: Darmstädter Gespräch* (Darmstadt, 1952), p. 88. Diesel apparently did not take any significant part in the four Verein Deutscher Ingenieure–sponsored conferences on technology held between 1950 and 1955.

[55]Diesel, "Was soll werden? Heraufkunft der Selbstbesinnung," unpublished manuscript, EDN, pp. 199–202.

[56]Diesel, *Weg durch das Wirrsal,* p. 276.

[57]Diesel, *Menschheit im Katarakt,* p. 355.

thought and the ideas of Manfred Schroeter (1881–1973), who was professor at the Munich Technische Hochschule from 1930–37 and from 1946–57, and whose most important work is the *Philosophy of Technology* [Philosophie der Technik] (1934). Like Eugen Diesel, Manfred Schroeter was also the son of a famous engineer, Moritz Schroeter (1851–1925), who taught at the Munich Technische Hochschule and who was one of the original supporters of the diesel engine. In 1947, Eugen Diesel addressed one of Manfred Schroeter's colloquia and pointed out that in both cases the sons of famous engineers could no longer believe in the same kind of philosophy of materialism and progress in which their fathers had believed. Both sons had a philosophical impulse, and both were led to investigate the impact of technology on the world, especially in view of the wars and economic crises of the 20th century.[58]

Both Eugen Diesel and Manfred Schroeter were heavily influenced by 19th-century romantic thought. Schroeter was more the academic philosopher and was influenced by Schelling's idealism and by his contemporaries Wilhelm Dilthey and Oswald Spengler, both of whom he personally knew. Schroeter was perhaps more interested in a precise definition of technology, but both men stressed the human activity of manipulating and altering the natural world, according to preconceived goals.[59] Both men stressed the tremendous importance that technology has assumed since the beginnings of the machine age, and both emphasized the dangers of the modern technological age. Schroeter like Diesel attacked the sterile rationality of modern science and the distortion of modern technology through capitalism and communism. Both men wished to see technology once again take its place as part of a higher, cultural system.[60]

During the 1930s both men occasionally were given to nationalistic pronouncements. Schroeter indicated at one point that National Socialism might be that third force beyond capitalism and communism that would reintegrate technology into the community.[61] As with Diesel, it is difficult to tell to what extent such pronouncements

[58]Eugen Diesel, "Vortrag in Colloquium von Professor Schroeter am 24. Juli 1947," EDN. Unfortunately, the Schroeter *Nachlass* is not yet open for general inspection, so that a similar study of the relationship of Moritz and Manfred Schroeter could not be undertaken. Frau Martha List of the Kepler Kommission, Research Institute Deutsches Museum, was able to examine the Schroeter *Nachlass* and reported to me that there appeared to be no important material on Manfred Schroeter's relationship with his father or on Schroeter's philosophy of technology.

[59]Manfred Schroeter, "Technik—Mensch—Natur," *Suddeutsche Monatshefte* 33 (July 1936): 585. This article summarizes a number of the arguments of Schroeter's *Philosophie der Technik* in somewhat simpler form.

[60]Ibid., pp. 586, 589.

[61]Ibid., pp. 587–88.

reflected real conviction or were merely efforts to placate the Nazis. Schroeter himself lost his teaching position because his wife was Jewish. He narrowly escaped further persecution.[62] After the war both men stressed the rise of global society and the necessity of world cooperation to solve technological problems.

In summary, one may say that Rudolf Diesel was driven by a desire not only to invent a new heat engine, but also to solve the social problems of his time. He was clearly representative of the enlightened middle class of the end of the 19th century, and he was a proponent of reason and technology as well as the solidaristic ideas of his time. He was optimistic that scientists and engineers could solve the world's problems. His pessimistic statement on technology at the end of his life may, as his son suggests, be seen as symbolic of the decline of the middle class and its beliefs. More concretely, however, it can be understood in the light of his own personal tragedy and what must have been deep depression shortly before his suicide.

His son, Eugen Diesel, shows a multiple heritage. Clearly, the influence of his father was overwhelming throughout his life. He felt responsible for carrying on his father's work in the area of the wider implications of technology. Yet, his ideas seem to reflect his divided attitude toward his father. On the one hand, he championed a modern view of technologically based globality; on the other hand, his criticisms of technology reflected the romanticism of the turn of the century, which he had imbibed during his youth and schooling in Munich and which eventually led him to reject an engineering career. Finally, the times through which Diesel lived influenced his thought. Born and raised in imperial Germany, he witnessed the loss of the family fortune and the catastrophic history of Germany after 1914. These events affected him profoundly. Thus, he combined personal, intellectual, and social currents in his own philosophy of technology.

Rudolf and Eugen Diesel's ideas reflect the times in which they originated, and there is much in these ideas that is outmoded today. The problem of technology's impact on man is, however, still very much alive today, and arguments about technology as a force for good or evil still abound. It is all the more urgent to understand the relationship of technology to society, and to this end the modern discipline of the history of technology has grown up, combining such studies as engineering, economics, and social history. If we have progressed beyond the analysis of Rudolf and Eugen Diesel, their goal is still valid: a peaceful world, in which technology aids in the development of a higher human culture.

[62]From a conversation with Professor Friedrich Klemm of the Research Institute, Deutsches Museum.