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HENRY DREYFUSS AND AMERICAN INDUSTRIAL DESIGN

by

RUSSELL A. FLINCHUM

A dissertation presented to the Graduate Faculty in Art History in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

1998

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This manuscript has been read and accepted for the Graduate Faculty in Art History in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

4/29/98
Date Marlene Park
Chair of Examining Committee

4-29-98
Date RCW Long
Executive Officer

Marlene Park

Rosemarie Haag Bletter

Rose-Carol Washton-Long

Jeffrey L. Meikle
Supervisory Committee

THE CITY UNIVERSITY OF NEW YORK

Abstract

HENRY DREYFUSS AND AMERICAN INDUSTRIAL DESIGN

by

Russell A. Flinchum

Adviser: Professor Marlene Park

Henry Dreyfuss (1904-1972) was one of the pioneers of the industrial design profession in the United States. A native of New York City, he attended public schools in Manhattan until he was offered a scholarship by the Society for Ethical Culture, allowing him to attend the Society's High School for his last two years of formal education. Afterward he worked as a student-apprentice to Norman Bel Geddes, a major figure in the establishment of industrial design in the late 1920s. After leaving Bel Geddes's office, Dreyfuss began producing stage shows and by the end of the 1920s had made the transition to the Broadway theater. In 1929, he opened an office for industrial design on West 48th Street; among his first employees was Doris Marks, his business manager who also became his wife. Dreyfuss's early designs focused on articles intended for mass production. By the second half of the 1930s, Dreyfuss could point with pride to a client list that would retain his services for decades to come: among others, Bell Telephone Laboratories, Deere & Co., Minneapolis-Honeywell Regulator Company, and the New York Central Railroad. Wartime work for the U.S.

Government and Armed Forces included the Situation Room for the Joint Chiefs of Staff and the redesign of a 105mm anti-aircraft gun. Out of this wartime environment grew his and his colleagues' interest in what would become known as human factors (ergonomics), which emphasized the interface between man and machine and the assemblage of accurate information on human dimensions. Post-war work was diverse, while restricted to an average of fifteen major clients in any given year: Dreyfuss insisted on being able to personally supervise the work undertaken by his two offices. In 1969 he turned control of the firm over to Bill Purcell, Jim Conner, Niels Diffrient, and Don Genaro. These men were the new partners in Henry Dreyfuss Associates, which began a new era in 1969 when the founder left to pursue personal interests as a corporate consultant and, with Doris Marks and other assistants, to compile his last major contribution to the profession, the Symbol Sourcebook (1972).

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One of the delights of researching the life and work of Henry Dreyfuss has been the readiness of his family, friends, and co-workers to share their recollections with me. I could not have begun to understand Henry Dreyfuss without the help of John Dreyfuss and Gail Dreyfuss Wilson, his surviving children. Rita Hart, Bill Purcell, Jim Conner, Niels Diffrient, and Don Genaro of the Henry Dreyfuss office provided insights into his character and working methods that were invaluable. Jim Ryan, Jack McGarvey, and Gordon Sylvester of Henry Dreyfuss Associates have been constantly supportive of my efforts, and my discussions with Bill Wenger and the late Alvin Tilley were essential to formulating an approach to the history of human factors in industrial design (a history that has yet to be written). John Hamilton and Juanita Alexander responded to my many requests for material. John Bruce's and the late Strother MacMinn's recollections of the office and its personnel in the period following World War II brought them to life for me; Don Holden and Jack Lowery did the same for the late 1950s and 1960s. Edward Larrabee Barnes, Mildred Constantine, Bill Hewitt, and Stanley Marcus shared personal reminiscences of their close friends Henry Dreyfuss and Doris Marks. Clifford Goldsmith, Frederick P. Rose, and many others who knew Dreyfuss professionally added a dimension to

my portrait that would otherwise be missing. Any factual errors to be found here, however, remain my own.

The archivists of former Dreyfuss clients were all generous with their time: Les Stegh at Deere & Co.; Sheldon Hochheiser, Tracy Quindlan, Judy Pollack, Ed Eckert, and Bill Heffernen at AT&T; Jacquelyn Love at the Hoover Co.; and Stacy Krammis at the Hoover Historical Society. At Polaroid, Nasrin Rohani helped me discover numerous early models of cameras with which the Dreyfuss office was involved. Mike Stapp, Nina Hammon and Ann Drake of Honeywell were all instrumental in putting the historical record in order. Jim Odom, working first for Dreyfuss and then for Honeywell, was an invaluable informant and rediscovered material that clarified my account of the "round" thermostat's development. Herbert Bissell's account of the thermostat was critical to obtaining a balanced view of Dreyfuss's involvement in the design process. H. Lansing Vail Jr., of the New York Central Historical Society made it possible to document the 20th Century Limited and other railroad work. Special thanks go to Bernard Crystal, Barbara Michaels, and Judith Rich for their help with materials from the Society for Ethical Culture/Fiedlston School Archives.

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Chapter One

Introduction

The history of industrial design in the United States has drawn increased attention over the last two decades, especially in reference to the impact of the careers of the "pioneer" generation of designers on American culture in the 1930s. To date, however, only Raymond Loewy (1893-1986) has been the subject of a major retrospective and an accompanying publication. This is somewhat ironic, in that Raymond Loewy probably had less personal involvement with the work of his firm than any of the so-called "Big Four" (the others being Henry Dreyfuss, Norman Bel Geddes, and Walter Dorwin Teague, Sr.).¹ Art history constantly returns to issues of authorship, and the group activity that is industrial design has eluded analysis through the same methods that have characterized the documentation of other "modern masters." The aim of this dissertation is to present Henry Dreyfuss (1904-1972) in both biographical and critical terms, focusing on establishing a link between Dreyfuss's personal motivations and the formal characteristics of the work of his firm. It documents developments in American industrial design during the period from the 1920s to 1972 through the experiences of one of its foremost practitioners. By looking closely at the most important

commissions undertaken by Dreyfuss and his generative process, his responsiveness to the changing nature of American society can be assessed. This dissertation concludes that Dreyfuss was a complex individual who adopted the persona of "the man in the brown suit," a seemingly omni-competent figure who educated himself regarding the wishes of the masses, in order to advance his ideals of social responsibility within the market system. By searching for continuing formal themes throughout his career and linking these with Dreyfuss's pronouncements regarding his aims and accomplishments, it is possible to critique his success in fulfilling his ideals and to establish his place in the ranks of the "formgivers" of modernism.²

An in-depth study of Henry Dreyfuss's artistic development and career has been needed for a number of reasons. Although general histories in the field, such as Jeffrey Meikle's Twentieth Century Limited: The Industrial Designer in America 1925-1939 (1979) and Arthur Pulos's American Design Ethic: A History of Industrial Design to 1940 (1983) have made important contributions to the understanding of Dreyfuss's role as an industrial designer in the United States as a whole, no monograph concerning Dreyfuss's entire life and work has been undertaken since the designer's own Designing for People (1955). Even the general histories that Meikle and Pulos provide do not examine of the body of Dreyfuss's work, and for the most

part ignore his contributions after 1939.³ Meikle's book, a reworking of his dissertation, outlines Dreyfuss's early life and identifies most of the major events in the evolution of his career to that date, especially by drawing attention to the New York Society for Ethical Culture and its influence on his character through its sponsorship of the Ethical Culture School and its High School, which Dreyfuss attended.⁴ Pulos's continuation of his history of industrial design in the United States, The American Design Adventure, 1940-1975 (1988), acknowledges the Dreyfuss organization's key role in the profession and Henry Dreyfuss's part in leading the Society of Industrial Designers and its successor organization. No attempt has been made, however, to set Dreyfuss apart from his contemporaries in terms of the visual qualities of his work, his manner of managing his firm, or the important members of his office and their contributions. No source deals comprehensively with Dreyfuss's many statements about the role of the designer and the practical aspects of creating a successful mass-produced design. Academic and popular neglect of Dreyfuss's legacy and the importance of his work stand in stark contrast to the tremendous respect that was accorded him by his fellow designers. Dreyfuss was chosen by his peers to be the first President of the Industrial Designers Society of America.⁵ During his lifetime, he was referred to both as "the dean of American industrial

design⁶," and "the gray designer."⁷ Such seemingly opposed attitudes clearly merit more detailed examination. The exhibition *Henry Dreyfuss Directing Design: The Industrial Designer and His Work, 1929-1972*, held at Cooper-Hewitt, National Design Museum, New York, from March 18 through August 24, 1997, began this re-evaluation. *Henry Dreyfuss, Industrial Designer: The Man in the Brown Suit*, published jointly by the National Design Museum and Rizzoli, accompanied the exhibition. In these complementary efforts I sought to highlight the formal aspects of Dreyfuss's best designs and to describe in detail the process of their creation in the firm he founded.

In death as in life, Henry Dreyfuss had taken a back seat to Raymond Loewy as America's most famous industrial designer, and no major exhibition had been organized on the work of Dreyfuss and his firm had been assembled since a retrospective held in Kansas City in 1971.⁸ Dreyfuss was widely admired by his contemporaries and is regarded as a major influence by a number of important industrial designers today, yet his basic messages about the profession and his role in its development have been watered down and in some cases misunderstood by some authors working from second-hand accounts. As industrial design becomes increasingly crucial in the development of a global free-market economy, it plays a key role in mediating the impact of the built domain upon the natural one. It seems

essential that designers and those people who study the history of design understand the moral imperatives that were first stated by Dreyfuss, analyze the aims of the profession as framed by one of its creators, and look for examples of how a design enterprise was successfully run in studying the career of one of the quintessential practitioners in the field.⁹

The starting point for gathering the information needed for this dissertation was the Henry Dreyfuss Collection in the Industrial Design Archives at the Cooper-Hewitt Museum Library, Smithsonian Institution, New York, New York. It contains numerous clippings, photographs, photostatic copies, and presentation books relating to specific accounts. Correspondence and written material pertaining to the development of Dreyfuss's projects was not part of Dreyfuss's gift. His selectivity in culling through the tremendous range of designs he worked on between 1923 and 1972 was high, and the collection is dominated by projects executed toward the end of his career. For example, the files and data bank assembled for the creation of his Symbol Sourcebook exist almost completely intact, while the file for a major client such as Bell Telephone Laboratories contains only a handful of photographs and press releases from the late 1960s. Perhaps Dreyfuss counted on the clients he worked with to maintain such files.¹⁰ Luckily, microfilm records kept by the office provide an almost

complete record of the office's output to 1972, and nearly four hundred reels of microfilm were donated to the Dreyfuss Collection in 1991 by Henry Dreyfuss Associates (the firm that continued his name after Dreyfuss's "retirement" in 1969).¹¹ Equally important to this history were the personal interviews conducted with Dreyfuss's contemporaries and co-workers and the evidence left behind by Dreyfuss of the creative process practiced under his direction. Throughout this dissertation I have attempted to deal with the issues raised by the role of appearance in his formulation of industrial design and the inadequacy of such terms as "functional" and "conservative" in light of the realities of how finished designs emerged from the Dreyfuss firm.¹²

The "mythology" of industrial design as it was written throughout most of the middle part of this century maintained that a single figure authored the works that emerged from the principal's design studios. This was certainly not the case, and even when individuals held remarkable sway over the production of their subordinates, recent analysis has tended to further undermine this viewpoint.¹³ Close inspection of the process of design in the Dreyfuss office has, on the other hand, pointed to the essential roles that Henry Dreyfuss played, both as the (figure)head and chief salesman of the firm and as the guiding hand in the development of what must be referred to for now as "office style." A precedent for an even-handed

view of Dreyfuss's contribution can be found in Thomas P. Hughes's evaluation of Thomas Alva Edison, who also headed a team of individuals of often divergent talents. Hughes writes:

...As entrepreneur and manager of research and development, Edison was responsible for the output of his research-and-development community. Evaluating him simply as an independent inventor is inappropriate. The question should not be did Edison invent? but rather how did he preside over inventive activity?¹⁴

How did Henry Dreyfuss preside over the activities of the office that bore his name? Largely through the control of the flow of information in and out of the office, by careful monitoring of the office's direction through the restriction of the number and scope of its accounts, and through dint of his powerful personal presence (which could make itself felt even in its absence).¹⁵ The most frequent omission in contemporary accounts of the Henry Dreyfuss method is not in the description of the generation of new designs from sketch to working prototype, but in assessing the importance of Dreyfuss's wife and partner, Doris Marks Dreyfuss.

The writing of design history suffers from the overuse of a number of ill-defined terms. "Functionalism," for example, has only recently been surveyed by scholars regarding its shifting meanings over the course of this century.¹⁶ Only recently has "streamlining" escaped being a term of opprobrium for writers of design history; its importance as a constantly-evolving aspect of Modernism has

been shown to be a truly international movement by Claude Lichtenstein and Franz Engler in their publication Streamlined: A Metaphor for Progress.¹⁷ Certainly the term as used in Donald John Bush's otherwise helpful book The Streamlined Decade has carried connotations of appeal to the lowest common denominator of popular taste.¹⁸

Characterizations of Dreyfuss's output from the 1930s as "streamlined" have done little to illuminate his approach; Dreyfuss himself, irritated at being lumped with the "stylists" of industrial products, proposed the term "cleanlining" to suggest the paring back of unnecessary decorative elements.¹⁹ Yet Dreyfuss did not eschew decoration, and even regarded what he referred to as "survival form" as a necessity in products of mass consumption. This was the use of some element from an historic design in a "new" and modern product in order to assuage the buyer's fear of "the new."²⁰

In fact, Dreyfuss's formulation of industrial design grew increasingly complex through the years, but his public pronouncements did not acknowledge this fact. The genesis of Designing for People can be traced back at least to 1946, when he first drafted a "book on industrial design;" he provided a more pictorial treatment as early as 1939, in his privately-printed A Record of Industrial Design, 1928 to 1939. As counterpoint to the flippancy of Raymond Loewy's amusing and readable autobiography Never Leave Well Enough

Alone of 1951, Designing for People is Dreyfuss's earnest accounting of his personal development and a guidebook for young readers who think they might want to enter the profession of industrial design. He emulates the seriousness of Walter Dorwin Teague's earlier Design This Day (1940) in tone while enlivening it with anecdotal material at the end of each chapter, and these conclusions tended toward the humorous in recounting his own "learning curve."

Nevertheless, Dreyfuss left out the most difficult part, which was the description of how a manager should handle the creative and often temperamental "hands" that were needed to see a design to its culmination. If any aspect of his career can be counted as a failure, it was Dreyfuss's inability to tolerate dissent from below. The "purging" of partners Robert H. Hose and Julian G. Everett in 1958 (in the partnership reshuffle of that year) and their replacement by a younger generation of designers more loyal to Dreyfuss's directives can be seen as a withdrawal from the difficulties of dealing with his own contemporaries on their own terms. Everett, trained as an architect and active in the firm from its earliest days, and Hose, with an engineering background and linked by marriage to Dreyfuss's only enduring partner, William F. H. Purcell, posed a threat to Dreyfuss's insistence on absolute control of the office's output; their presence in the New York office while Dreyfuss spent the majority of his time in the Pasadena office or visiting

clients provided an opportunity for subordinates to elude his restrictions. Nonetheless, the continuing and expanding success of the firm in the 1960s, a period of considerable turmoil for the Teague office and the collapse of the Loewy office, can be seen as a vindication for Dreyfuss's outlook. The men who would head up the firm after his retirement, with the exception of Purcell, were groomed by Dreyfuss and would continue his perfected practice for over a decade after his departure.

Dreyfuss was, however, tolerant of departures from accepted practice if the rewards were great enough; the perfect example is his acceptance through the years of the eccentricities of design engineer Alvin Tilley. Joining the firm in 1946, Tilley "was the backbone of the office" for many years, even following Dreyfuss's retirement.²¹ Tilley followed the schedule of his commuter train to and from Red Bank, New Jersey, during the entirety of his service to the firm. As Doris Marks had established working hours of 9:00 in the morning to 5:30 in the evening as a standard to which all employees would adhere, Tilley's late arrival and early departure irked her to no small degree. Yet his diligence on the job was undeniable, and when this dispute over "standard operating procedure" arose again and again over the years, it was smoothed over. Roland Stickney, a master renderer who worked for Dreyfuss from the 1930s through the 1950s, was allowed to maintain an outside account with Rolls-Royce of

America for the duration of his time with Dreyfuss; no one else was allowed this variance. These men had exceptional and irreplaceable talents, and Dreyfuss was, in the final analysis, a great respecter of talent and a manager who felt that "rules were meant to be broken" when it came to the greater success of his endeavor.

The following chapters are organized on a decade-by-decade basis from the 1920s through the 1960s, with the first providing an overview of Dreyfuss's early life and education and the last summarizing his achievements through his death in 1972.

1. Raymond Loewy, Pionier des amerikanischen Industriedesigns (Munich: Prestel-Verlag, 1990), edited by Angela Schönberger, was published in English translation as Raymond Loewy: Pioneer of American Industrial Design in 1990, in conjunction with an exhibition with the same title organized by the International Design Center, Berlin. Certainly admirable in its scope and in its range of photographic documentation, it remains nonetheless a catalogue of fragmentary essays that reach no consensus on Loewy's contribution to the aesthetics of his firm. Interviews with Loewy's former publicist, Elizabeth Reese, have convinced this author that Loewy's principal role in the firm after 1939 was as a promoter of the talents and work of others, for which he took credit, rather than as an instigator of new design concepts. This is borne out by a number of authors documenting the genesis of the "Loewy-designed" Studebaker automobiles of the 1940s and 1950s, which were in fact most influenced by Robert Bourke, Virgil Exner, and Gordon Buehrig, in order of importance (all three men were almost exclusively involved with automotive styling). See Michael Lamm and Dave Holls, A Century of Automotive Style: 100 Years of American Car Design (Stockton, CA: Lamm-Morada Publishing Co. Inc., 1996), 208-216, and Gordon Buehrig with William S. Jackson, Rolling Sculpture: A Designer and His Work (Newfoundland, New Jersey: Haessner Publishing Inc.), 115-19.

2. For Dreyfuss's own conception of modernism see Chapter 3, pages 79-80. Like the other industrial designers who came to the fore in the 1930s, he sought to distance himself from the "moderne" embodied in the works of furniture created by artists like Paul T. Frankl and Donald Deskey at the end of the 1920s. To Dreyfuss, modernism was an aspect of good mass produced designs rather than a style applied to such limited production items.

3. In fairness, one must credit Pulos with a serious attempt to extend his effort in The American Design Adventure, 1940-1975 (Cambridge: MIT Press, 1988), but his analysis focuses almost exclusively on the professional developments within the industrial design community and ignores the aesthetic component of this period to the detriment of his argument.

4. Jeffrey L. Meikle, Twentieth Century Limited: Industrial Design in the United States, 1925-1939 (Philadelphia: Temple University Press, 1979), 55-60. Some of Meikle's admirably succinct descriptions and quotations pertaining to Dreyfuss will be examined at greater length in this dissertation.

5. The I.D.S.A. fused three organizations into one in 1964. These were the American Society of Industrial Designers (founded as the Society of Industrial Designers in 1944), the Industrial Designers Institute (founded as the American Designers Institute in 1930), and the Industrial Designers Education Association (founded in 1957). This ended a long-standing rift that had opened between the industrial designers (who constituted the S.I.D.) and the "decorators" of the American Designers Institute. It should be pointed out that a number of important industrial designers initially joined the A.D.I., including Dave Chapman (1909-1978) and John Vassos (1898-1985). See Pulos, pp. 420.

6. "Dreyfuss Reveals How to Be Genius," Pasadena Star-News, 19 November 1965, 15; "News: Henry Dreyfuss," Industrial Design 15, no. 8 (October 1968), 10.

7. "...he really had this responsible feeling that if you do the right job, a good design emerges, but that design is not a jazzy design, it was never a jazzy design. And other people would call Henry a 'gray designer,' he hated that phrase, 'Oh Dreyfuss is a gray designer,' but the stuff was never flashy, and it was never exciting enough to look at, I should say rarely exciting enough, photographically, let's put it that way, to get a lot of attention in the press. Other people's stuff looked much more jazzy and photogenic...." Donald Holden, interview by author, tape recording, New York City, 20 February 1991. (Holden was in charge of public relations for Dreyfuss in the late 1950s.) "...Well by the time I got there the philosophy of avoiding

styling was quite entrenched. Actually, too much so, to the degree that Henry had gotten the reputation of being the 'gray designer.' And that was a term that went around the rounds...." Niels Diffrient, interview by author, tape recording, Ridgefield, Connecticut, 1 March 1991.

8. "Designing for People: Retrospective Exhibit of the Works of Henry Dreyfuss," Halls Exhibition Gallery, Kansas City, Missouri, 3 June through 10 July 1971. Audrey Sokoloff curated the show, which was sponsored by Hallmark Cards (founder Joyce C. Hall was a personal friend of Dreyfuss's). Photographs of the exhibition in the Dreyfuss Collection reveal that the installation was modest, however, some of its contents have not been seen since (such as Miguel de Covarrubias's caricature of Dreyfuss from the 1930s).

9. "This year [1959] industry will spend \$500 million to spruce up product looks, product sales appeal. How much of that half billion Dreyfuss himself will snag, nobody but closemouthed (about money) Henry Dreyfuss and the Treasury will know. One certainty; Dreyfuss will be the best-paid designer per working employee in the U.S. Only Loewy Associates' 145-man staff (compared with Dreyfuss' force of 30) will gross more-about \$3 million this year." "Machine Age Artist," Forbes May 1, 1951, 18-20. Also see Seymour Freedgood, "Odd Business, This Industrial Design," Fortune 59, no. 2 (February 1959), 201, for a listing of the twenty largest industrial design firms in the United States at the time of its publication.

10. The businesses that Dreyfuss dealt with during his career have, for the most part, purged their files of relevant materials or have donated them to the Dreyfuss Collection. Hoover Company, for example, discarded their corporate archives in their entirety as late as 1990. Others, such as Deere & Company, have kept excellent archives since the 1950s and 1960s, but have retained little of value to this inquiry relating to Dreyfuss from the initial phase of his career.

11. Dreyfuss had sketches, photographs, renderings, and a few written documents (such as those attached directly to the visual materials) dating from 1929 on microfilmed in 1948. It appears that the bulk of these materials were then destroyed. Work continued to be microfilmed after its completion until 1972, when the process stopped. While only poor quality reproductions can be retrieved from the microfilm, this resource is crucial to understanding the visual material that does survive, allowing us to see when a particular sketch (still in existence) was executed and its place in a project's development.

12. On the topic of functionalism as it relates to the history of modern design, George H. Marcus has done an admirable job of writing a continuous narrative in his book Functional Design: An Ongoing History (New York: Prestel, 1995). Its shortcoming, however, is its failure to address the more complex machinery of daily life in the twentieth century, focusing instead on the "museum pieces" that characterize the collections of institutions such as The Museum of Modern Art and the Philadelphia Museum of Art (where Marcus is employed).

It can be argued that Peter Behrens, in his work for the Allgemeine Elektrizitäts Gesellschaft during the first decade of the twentieth century, defined both corporate identity and the role of the industrial designer. See Stanford Anderson, "Modern Architecture and Industry: Peter Behrens, the AEG, and Industrial Design," Oppositions 21, 79-93; Tilmann Buddensieg and Henning Rogge, Industriekultur: Peter Behrens und die AEG, 1907-1914 (Berlin: Mann, 1979), translated into English as Peter Behrens and the AEG (Cambridge, Mass.: MIT Press, 1984); Hans-Joachim Kadatz, Peter Behrens: Architekt--Maler--Grafiker--und Formgestalter, 1868-1940 (Leipzig: E. A. Seeman Verlag, 1977); and Alan Windsor, Peter Behrens: Architect and Designer (New York: Whitney Library of Design, 1981). A more complex formulation is found in Frederic J. Schwartz, The Werkbund: Design Theory and Mass Culture before the First World War (New Haven: Yale University Press, 1996), where the figure of Peter Behrens is dealt with at length. Unfortunately, this work was published too late to serve as a sounding board for many of the ideas broached in this dissertation.

13. For example, few designers have held the "legitimacy" that Charles Eames did during and after his lifetime as the "author" of those designs referred to today by his name. Pat Kirkham, whose relative distance from the cult of this designer may have allowed her a clearer viewpoint, has pointed out the essential nature of Ray Kaiser Eames's contribution to the projects they undertook during the heyday of their office in Charles and Ray Eames: Designers of the Twentieth Century (Cambridge, Massachusetts: MIT Press, 1995). As important is the attention Kirkham devotes to the additions made by their employees (such as Gregory Ain and Harry Bertolia) and their "borrowings" from contemporaries like Isamu Noguchi.

14. Thomas P. Hughes, Networks of Power: Electrification in Western Society, 1880-1930 (Baltimore: The Johns Hopkins University Press, 1983), 57. Hughes's later work, American Genesis focuses on the "systems builders" of the nineteenth and twentieth centuries like Edison, Elmer Sperry, Henry Ford, and their ilk, and is not an inappropriate framework

for the consideration of what "pioneers" Walter Dorwin Teague, Sr. and Henry Dreyfuss did in their formulation of American industrial design.

15. In one of the unused "anecdotes" found in the background files for Designing for People, an anonymous member of the Dreyfuss office recounts that one young secretary/receptionist hired by the New York office left her position before even meeting Henry Dreyfuss, finding the bustle of activity in anticipation of his arrival from the West Coast "too much to bear." (Misc. files, "Designing for People," Dreyfuss Collection.)

16. See footnote 12 above. Regarding functionalism and architecture, see Stanford Anderson "The Fiction of Function," Assemblage 2 (February 1987), 18-31. Timothy Benton takes the specific case of British architectural criticism from mid-century as representative (by implication) of an international trend to use the term "functionalism" as a tool to exclude less doctrinaire approaches to Modernism from serious consideration. See Benton, "The Myth of Function," in Greenhalgh, Paul, Modernism in Design (London: Reaktion Books, 1990), 41-52.

17. Lichtenstein and Engler, Streamlined: A Metaphor for Progress (Baden, Switzerland: Lars Müller Publishers, n.d. [1993?]). This book was based on the catalogue for the exhibition "Stromlinienform" at the Museum für Gestaltung, Zurich.

18. Bush, The Streamlined Decade (New York: George Braziller, 1975).

19. "It was not surprising that when they [the early industrial designers] tried to introduce their new designs into the sacred American living room they were rebuffed at the front door. But they persisted and finally gained entrance through the back door. Their first achievements were in the kitchen, the bathroom, and the laundry, where utility transcended tradition.... Unfortunately, their inexperience led them into strange detours during those early days. As if under a spell, they accepted the half-truth of streamlining. Hearses and fountain pens and pencil sharpeners were stupidly modeled after the teardrop, which was held up as an ideal form...made even more ridiculous when high-speed photography revealed that the teardrop form was an optical illusion, that falling drops of water assume all kinds of impractical, air-resisting shapes as they tumble through space. The specter still haunts industrial design, for some manufacturers still find that 'streamlining' sells products, despite twenty years of scoffing by engineers and aesthetes. But out of the era of

so-called streamlining, the designer learned a great deal about clean, graceful, unencumbered design. He learned to junk useless protuberances and ugly corners that not only spoiled good honest lines but interfered with efficient operation. Stand a 1929 toaster with its knobs and knuckle-skinning corners and impossible-to-clean slits and over-all ugliness next to today's model, and the difference is apparent. The designer was in the right stable but on the wrong horse. Call it cleanlining instead of streamlining, and you have an ideal that the designer today still tries to achieve." Dreyfuss, Designing for People (New York: Simon & Schuster, 1955), 76-77.

20. "It would be foolhardy for the designer to delve too deeply into the mysteries of the psychic; yet we have learned one important lesson from this science. Most of us have a nostalgia for things in our past. Our senses quickly recognize and evoke interest and often pleasure when a long forgotten detail is brought back to us...Perhaps it is a security that we derive from surrounding ourselves with things temporarily forgotten, and we revel in them when they are again presented to us...By incorporating a familiar pattern in an otherwise wholly new and radical form, we can make the unusual acceptable and in a way educate a vast segment of society who would otherwise spurn it. Here the designer has a delicate duty to perform and this reasoning must not be misconstrued as merely reproducing an old form in a new material. Or even more deplorable, disguising a modern product with the dress of another era...Designing for today and tomorrow the contemporary designer expresses first the utility of the object on which he is working, second the era in which we live, and last, when the design permits, lurking in the background, some form to be remembered from the past that will unconsciously make the consumer more comfortable in accepting what may be a radical new form to him. This must be accomplished without the consumer being aware of the device. Whether or not the designer has known that he employed this technique, most products that have sold in quantity have retained something that we call "survival form." A fine earthenware jug may be the inspiration for a well proportioned thermos carafe--although the public will not be aware of the source; nevertheless, the subconscious mind will receive a pleasure in its dim recollection. A modern chair made of impregnated plywood, rubber, and aluminum can retain the proportions and comfort that Mr. Chippendale dictated, and therefore be more acceptable, although the public be none the wiser for this pardonable deception...Very often a slight detail, perhaps a color or a line around an otherwise severe form, will suffice to make the new and unfamiliar completely acceptable to the consumer." Dreyfuss, from "Book on Industrial Design 1946," Designing for People Misc. file, Dreyfuss Collection,

Industrial Design Archive, Cooper-Hewitt Museum Library. The emphasis is my own. The thermos carafe Dreyfuss alludes to is the one he designed for American Thermos Company in 1936, but its historic predecessor remains unidentified.

21. James M. Conner, interview by author, December 19, 1996.

Chapter Two

Henry Dreyfuss's Formative Years

Though Henry Dreyfuss was ready and willing to discuss both professional and theoretical design issues with interviewers, he was less willing to disclose the essentials of his early life and family background. Indeed, the normally gregarious Dreyfuss was tight-lipped on the subject of his childhood and schooling. His autobiography, Designing for People, deals only with his life from the late 1920s [Figure 1]. The details of his early years must therefore be pieced together from a number of sources. This chapter will put those pieces together, chronologically, from his birth through the establishment of the industrial design firm that bore his name.

The most important source of information for Dreyfuss's life is the record he kept of his professional career, referred to in his office as the "Brown Book" but titled by Dreyfuss A Record of Personal and Business Vital Statistics. Crucial for his early years is a brief manuscript entitled "The little I know about my family background," which he wrote to his son before his death.¹ From these two sources the following information can be established.

Henry Dreyfuss's ancestry and childhood is not unlike that of many European immigrants to the United States during the decades before the turn of the century. It is a story

of hardships, tragedies, close family ties, and eventual triumphs. Moritz Dreyfuss and Sophie Oppenheimer, Dreyfuss's paternal grandparents, were married on January 26, 1873, in Mannheim, Germany. Immediately afterwards they emigrated to New York, where they had four children: Henry and Carrie, both of whom died in an epidemic, Louis (Henry Dreyfuss's father), and Josie. Moritz Dreyfuss founded a business, M. Dreyfuss & Son, at 131 West 23rd Street in New York, which supplied fine materials for theatrical costumes and scenery. Louis Dreyfuss (1878-1915) worked as a tailor and was connected to his father's store. On June 4, 1903, Louis married Elsie Gorge (1880-1937), who came to the United States with her mother Charlotte Jelenko (later Gorge). Elsie's siblings were Maurice, Malvina, Sigmund, and Hugo Gorge.

At the time of Henry's birth (March 2, 1904), Louis and Elsie Dreyfuss lived in Manhattan with Moritz and Sophie Dreyfuss at the northeast corner of 127th Street and Seventh Avenue. They moved to Bensonhurst in Brooklyn, where Henry's brother Arnold was born on February 20, 1909. Soon afterward they returned to Manhattan and again lived with Louis's parents, now at 363 West 120th Street. Henry attended Public School 157 from September of 1910 through October of 1914. It was about this time that his grandparents died and his father contracted tuberculosis. For the sake of Louis's health, the family moved to Saranac Lake, New York. Within

two months, the family moved yet again, to Morristown, New Jersey, where Mrs. Dreyfuss' s sister Malvina Gorge had rented a house. Louis Dreyfuss died the night of their arrival in Morristown.

Elsie Dreyfuss and her two young sons returned to Manhattan around January or February 1915, where they lived at Bass' s Boarding House at 147 West 118th Street. Henry attended Public School 10 from February, 1915 until June, 1918. He delivered suits for a tailor and painted signs to help support the family. In later years he said little about this stage of his life to either friends or family; it was probably a period of hardship for all three. His younger brother Arnold had contracted St. Vitus' s Dance and suffered from a number of other debilitating illnesses. Yet Dreyfuss recalled elements of his childhood with a light touch: to one interviewer he recounted an episode in which he trimmed his mother' s hat with fresh vegetables he had raided from the icebox.²

Henry Dreyfuss' s first break came during the year he spent, 1919-20, at Townsend Harris High School. An instructor whom he did not name gave him a grade of 100 percent on the art section of the state regents' examination; Dreyfuss recalled that the Board of Regents in Albany returned the paper with a grade of 98 percent and the statement that nobody could be perfect in the subject. Henry left school in disgust shortly thereafter and thought that

his formal education was over. To his surprise his instructor had contacted the New York Society for Ethical Culture and apparently told them of Henry's great promise. The Society responded with an offer of a two-year scholarship to its private school.

The Ethical Culture movement, founded in 1876 by Felix Adler, was dedicated to affect positive moral practice in society, ranging in scope from personal to international relations, without relying on belief in a deity as a means to this end.³ The school that the New York society operated tried to inculcate the values of group cooperation, individual responsibility, and progressive social values through classes devoted to discussion of ethics in contemporary society (these were in addition to instruction in more traditional academic subjects).⁴ Dreyfuss's education in the pre-vocational art program, however, is important in respect to his formal development. Contemporary with Dreyfuss's arrival were some major changes in the school's instructional focus. Students would focus on training in fine art and craft as they related to handicraft and industrial production in the contemporary environment.

Dreyfuss attended the Ethical Culture Society's Arts High School from September of 1920 until June of 1922. This seminal period for his development as a designer came just as the school inaugurated a "tracking" program for high school juniors and seniors that was termed pre-vocational.

Under this program, students could elect to join a pre-vocational department in art, teacher training, or college preparatory, or remain in the regular program. Although these programs were normally reserved for students who had been in the school's programs for the first two years, Dreyfuss was an exception in that he was admitted and enrolled only during the two final years.

The pre-vocational art program's curriculum was a wide-ranging course of study that exposed students to diverse cultures and historical periods. This highly structured course of study taught students not only the techniques an artist employed and a survey of past art, but it also covered chemistry and physics as they related to craftsmanship. Literature served as a source for artistic inspiration; history classes were oriented toward the knowledge of the great cultures of the past, with at least an hour each week spent at the Metropolitan Museum of Art inspecting and copying works of art from all periods. The program's catalogue stated boldly, "Nothing else than a new conception of culture is involved in this plan."⁵ The study of French and German was also required.

This education prepared Dreyfuss to become the model of the "cultivated man," whose interests ranged from Pre-Columbian sculpture to classical music. He made friends in numerous areas of artistic endeavor, with Theodor Giesel (Dr. Seuss) of children's literature at one end of the

spectrum and Vincent Price, the leading actor of legendary horror films, at the other. Works by Ben Shahn and Isamu Noguchi were displayed in Henry Dreyfuss's South Pasadena home. While he may have regretted his lack of a college education in later years, his intellectual pursuits never abated. Toward the end of his life he attempted to form reasoned opinions about the nature of creativity and the possibility of universal communication. Henry Dreyfuss was a generalist in the most positive sense of the term. The final years of his formal education had a strong influence on the shape of his lifelong inquisitiveness.

The curriculum at the Ethical Culture school was not restricted to the fine arts alone. Included were "metal crafts and industrial arts," and the "study of low relief, cameo, intaglio." "Modern industrial applications of above materials" were studied, as were lettering and bookbinding, "design and execution of projects in ceramics" (as well as sculptural work in clay), and elementary architecture and its "application to industrial problems of to-day: textiles, metals, crafts, etc."⁶ In line with the Ethical Culture School's mission of helping individuals reach self-actualization, the program was an ambitious compromise between training the student to be a fine artist-well-versed in a craft-and exposing him or her to enough technical knowledge to earn a living outside of the fine arts.

Personal examples were as important to Dreyfuss's

education as the program of study. At the school, Dreyfuss met two adults who would provide, respectively, moral and practical guidance. Teacher and administrator John Lovejoy Elliott [Figure 2] gave him the moral grounding to build working relationships with other people and to understand unique needs. The other, Emma Mueden, gave him the practical knowledge of how to create a stage production (and later introduced him to his future wife). The Ethical Culture school also provided a place of refuge and respite for Dreyfuss, and a nurturing environment that encouraged his development in numerous ways. Together Elliott and Miss Mueden awakened Dreyfuss's interest and set high standards that he sought to fulfill. Elliott was, at the time of his death in 1942, the senior leader of the New York Society for Ethical Culture, having succeeded founder Felix Adler. Dreyfuss credited Elliott with giving him "purpose and direction" in life.⁷ Actual interaction with Elliott, unlike Emma Mueden, is speculative. Most likely, Elliott was Dreyfuss's teacher for the ethics course that was mandatory for students. Many of Dreyfuss's notions of what constituted good design can certainly be traced to Elliott's ideas, in an Aristotelian sense, of what constitutes a life well lived. In some respects, Dreyfuss saw the role of the industrial designer as a mediator of public taste between the manufacturer and the consumer, analogous to that of the role that Elliott played as a teacher of public values and

responsibility between society and citizen.⁸ In contrast with Felix Adler's more reserved bearing, Elliott related more easily to students.

How Elliott found his calling is worth noting in light of Dreyfuss's comment that he gave him "purpose and direction," and demonstrates that one generation can act as torchbearer for the next. While a freshman at Cornell, Elliott attended a lecture by Adler that dealt with the possibility of employing oneself in the field of ethical leadership. The son of reform-minded parents, Elliott was moved to devote his life and his talents to the causes that Adler advocated. Like Adler, Elliott studied in Germany, where he earned a doctorate in philosophy at the University of Halle. He returned to the United States and became Adler's assistant and a teacher of ethics at the schools of the New York Society for Ethical Culture.

To a large extent, Dreyfuss seems to have modeled himself after Elliott, especially in his sense of self-imposed restraint. Like Elliott, he faced what many people felt was an insurmountable task—the elevation of public standards through personal action. Both tried to win others over to their point of view through example and rational persuasion.⁹

Emma Mueden [Figure 3] was the other, very different, formative influence on Dreyfuss during the last two years of his education. An English teacher and dean of girls, she was

also in charge of all school plays and pageants, which were considered an integral part of the students' education. These productions, referred to as festivals, involved most of the student body and had a didactic purpose, stressing historical figures and events. Perhaps because of his family's experience in the costume business, Dreyfuss became the student responsible for festival settings and costumes during his two years at the school.

Miss Mueden was one of the mainstays of the school and taught there from about 1903 until her retirement in 1951. She was remembered as highly imaginative and able to inspire the same trait in her students; for example, when the classes staged a production of "Joan of Arc," she purchased dishcloths, dipped them in silver paint and sewed them together to create "chain mail" for the actors' armor.¹⁰ This ingenuity with limited resources impressed Dreyfuss, and informed his development as a stage designer-in which creating the greatest degree of illusion with a minimum of expenditure often meant the difference between success and failure. Miss Mueden became Dreyfuss's lifelong friend.

The earliest known extant artworks by Dreyfuss date from this same period. The first is the cover illustration of a program for Class Day at the Ethical Culture school, which featured a performance of The Man Who Married a Dumb Wife by Anatole France (the program also served as a dance card). Dreyfuss's illustration is of a woman in late

medieval costume, accompanied by two floral sidebars alongside its single-line frame [Figure 4]. It is dated May 19, 1922 and initialed "HD" in the lower right-hand corner. The program was hand-tinted in watercolor, and bears a strong resemblance to two later costume studies (c. 1923-28) by Dreyfuss now in the Drawings and Prints Department at the National Design Museum.¹¹

The level of Dreyfuss's creative ability at the end of his formal education is evident in two other drawings now in the museum's collection.¹² One is the floor plan, dated June 13, 1922, of an "ideal house" with two wings culminating in octagonal towers. While rudimentary in execution, the plan shows some imaginative thinking on Dreyfuss's part, whereby he separated the children's and servants' quarters from the master bedroom, retaining a large, flexible space in the central living area. The second, undated drawing shows the exterior elevation of the same dwelling. One tower from this drawing appears in faint pencil outlines on the floor plan, so it was probably done at the same time. The exterior elevation is more crisply rendered than the floor plan and displays an elegant style which is missing from its companion.

The excellent education that Dreyfuss received during his last two years of high school helped set high standards for the future designer. He had learned enough about fine art, crafts, and artistic processes to be comfortable in

these realms later in life and to exercise the "inherent good taste" that he felt existed within most people.¹³ He had discovered a world of high ideals tempered by practicality in the example set by Elliott, and he had found a calling in stage design from working on pageants and festivals with Miss Mueden. Dreyfuss was well equipped to handle the challenges he would confront in the coming decade.

During the summer following his graduation Dreyfuss was the assistant leader of a group of ten women from the school who toured Europe. This was his first trip abroad. He visited sites and monuments the night before the group, "cramming" in preparation for guiding their visits. He gained enough experience and confidence to work some six years later as a guide for American Express, when he found himself "trapped" in North Africa without money.

Upon his return, a further scholarship awaited him, again made available through the munificence of the Society for Ethical Culture.¹⁴ This allowed him to study with Norman Bel Geddes [Figure 5], who was then making his mark on the theater, and teaching a course in theatrical design at his own New York studio.¹⁵ While there is a limited amount of material on the relationship between Bel Geddes as teacher and Dreyfuss as student, it is readily apparent that the younger man was infused with Bel Geddes's enthusiasm, air of progressivism in the theatrical arts, and range of ambition.

The fact that each had little to say about the other seems to have discouraged examination of this crucial relationship. Ultimately, Bel Geddes' example was probably the determining factor in Dreyfuss' decision to follow him from stage design into the field of industrial design. Dreyfuss refers in his personal records to a "Course with Norman Bel Geddes in Theatrical Design" that ran through the winter of 1922-23, and notes that he remained "to assist him in theatre work for 1½ years after" until 1924 (it seems he actually continued to take classes from Bel Geddes through the spring of 1924).¹⁶ After finishing with the academic part of the class, Dreyfuss stayed on as "one of many assistants to Norman Bel Geddes during the time the settings for 'The Miracle' were made."¹⁷ Along with other pupil apprentices, Dreyfuss helped create a scale model for a special stage designed to present Dante Alighieri's Divine Comedy (including some two hundred miniature costumed figures). The progress of the performance had been mapped out previously through sixty-four drawings, one for every other minute of the production.¹⁸ In a letter to his former teacher, Dreyfuss recalls working with the scale models during a photography session:

You wanted to thicken the atmosphere to emphasize the third dimension and toward this end had built a smoke machine. By two o'clock in the morning the smoke machine was tired. It was a machine and we were human, so you substituted two of us for it. I must have been fifteen and had never smoked in my life. You told [Mordecai] Gor[e]lick and me to sit

under the model and keep three cigarettes going all the time, puffing like mad for ten to fifteen minutes without a breather. While you yelled to Brug[u]iere, -Hold it Francis; wait for the atmosphere. More Henry, more! I thought to myself, I would only do it for him. Whenever I look through that nice book of pictures I remember that I was the smoke. [The emphasis is Dreyfuss's; he would have been eighteen on March 2, 1922.]¹⁹

Curiously, Dreyfuss is not among the students listed by Bel Geddes in his 1924 publication A Project for a Theatrical Presentation of The Divine Comedy of Dante Alighieri.

According to Dreyfuss, it was the stage designer's excessive demands that caused him to quit.²⁰ It is reasonable to suppose that he left some time between the photo session and the published results. Bel Geddes had moderately nice things to say about his former pupil; he found him "honest, straight from the shoulder, there's nothing phoney about him, he's square-just a good human being."²¹ He made no specific statements about his pupil's strengths or weaknesses as a designer.

Dreyfuss, in contrast, referred to Bel Geddes as "genius #1 in my life" in recalling his early years. When asked by a younger colleague in the industrial design field to evaluate Bel Geddes's contribution, he said, "I believe that Norman Bel Geddes is the only authentic genius this profession has ever produced."²² From Dreyfuss's perspective he was Bel Geddes's "apprentice, office boy, and then assistant, for the first three years of my professional life." Dreyfuss summarized Bel Geddes's role in creating the

profession: "To be an industrial designer is to breathe an atmosphere that Norman Bel Geddes helped to create."²³ He describes his teacher as "a master of stage lighting," a critical aspect of stage design as well as industrial design to Dreyfuss.²⁴

It is worth examining just what Dreyfuss might have learned from Bel Geddes over the course of three years. For this we have to turn to Bel Geddes's notes for his lectures on stage design. While they tend to lack specificity, these notes are worth consideration in light of Dreyfuss's later practices as a designer:

Design is mental conception of something to be expressed. It is [an] organism of correlative parts, the relation of part to part and the parts to the whole. Principle of designing building, painting, music, poems, or drama the same. Value of form lies in its ability to express significance clearly. Preliminary visualization... Reduce problem to fundamentals... Discriminate against unessentials. See problem in terms of voids and solids.²⁵

On first reading, these statements seem so broad that they could be applied to almost any artistic pursuit. They point, however, to what would become fundamental truths for the first generation of American industrial designers. In the first statement, the importance of the coordination of the parts of a designed object and their subordination to the whole would provide the rationale for Dreyfuss's "cleanlining" of machines that resulted in stunning "before

and after" images that helped sell the profession to the general public.²⁶ The notion conveyed in Bel Geddes' s second statement is that design provides an "umbrella" or a coordinating principle for the disciplines of architecture, product design, fine art, and craft. This is essential to both men' s ideas about their broad-based activities, and is tied to the issue of industrial design' s debt to stage design. Regarding form and clarity, a mainstay of the Dreyfuss firm' s design activities during its mature phase would be the rationalization of the positions of controls, their legibility, and ease of operation. The firm' s generic designs, for example, the Model 500 telephone, the Honeywell "Round" thermostat and other projects of the post-war period, stood in contrast to a tendency by lesser design teams to rely on automotive and aviation motifs to appeal to the public. In avoiding such derivativeness, Dreyfuss hoped his designs would be outmoded not by stylistic shifts in interior decoration and popular taste but by technological obsolescence. His decisions reflected an attempt to satisfy a range of demands with the technology available at the time of their creation. In their appearance, Dreyfuss stressed the significance of the object as an achievement of its time.

According to his son, Dreyfuss felt that Bel Geddes was a futurist, in the sense that his ideas were directed several years or even decades ahead.²⁷ Perhaps seeing so few

of Bel Geddes' s brilliant ideas reach fruition made Dreyfuss especially aware of the importance of staying in the realm of the achievable when working with manufacturers and other clients. Part of Dreyfuss' s contribution to the new profession was demonstrating that the industrial designer need not be an impresario like Bel Geddes in order to achieve substantial results.

Henry Dreyfuss' s first independent stage design was for a 1923 production in Detroit of a comedy by Anthony Wharton, The Heart of Cellini. Produced at the New Detroit Theatre, it rarely appears in accounts of Dreyfuss' s stage career. Lionel Atwill, an actor and director with whom Dreyfuss worked repeatedly during the next twelve years, was cast in the lead, and the play was produced by B. C. Whitney.²⁸

During the same period, Dreyfuss courted the management of the Mark Strand Theatre, which found itself caught in the transition from stage productions to motion pictures.²⁹ Dreyfuss' s work with the Mark Strand Theatre dates from the end of August, 1923.³⁰ In his record of personal statistics, Dreyfuss summarizes the experience with Plunkett: "Wrote to manager criticizing setting for feature movies, asking for interview. Finally given job at \$50 per week; thereafter for 5 years supervised all scenery, costumes, lighting, equipment, etc. As shows changed weekly, designed and produced 52 entire new shows a year--over 250 shows." These shows probably consisted of a number of short vaudeville

skits or musical numbers between films. All did not go smoothly during these first years. An early setting for a jazz band, featuring a stylish peacock in black and white, gave Plunkett pause--the bird was considered an ill omen in theatrical circles.³¹ Another interviewer had Dreyfuss as an initial success but recalls a similar story about the theater's manager and the bird:

The boy's first effort was a success; dressing the ballet in oilcloth, he caused it to impersonate a museum of porcelain statues. He made gorgeous sketches for a peacock ballet; Plunkett was astonished that so smart a boy didn't know that a peacock was the worst bad luck that can befall a theater. Dreyfuss quickly demoted the birds to turkeys.³²

Dreyfuss himself recalled an episode when enthusiasm for his own ideas had gotten the best of him:

At the Strand in New York, I worked out an atmospheric bit for an act called Gerry and Her Baby Grands, a four-piano team. Instead of having the four instruments placed all over the stage, I dreamed up the idea of a huge simulated piano encompassing the width of all four keyboards. It was finished just in time for the opening performance, at which point I discovered it was too big to move through the stage entrance.³³

Unfortunately, no photographs of stage designs for the Strand can be attributed to Dreyfuss with certainty. He enjoyed a good relationship with Joseph Plunkett, whom he used as a reference in his application for membership in the United Scenic Artists' Association. The discipline required to produce some 250 shows over the course of five years must have tempered Dreyfuss's upstart qualities (he continually

referred to himself as "brash" in recalling his twenties).³⁴

In 1925 Dreyfuss was working on the stage settings for Deep in the Woods at the Auditorium Theatre in Baltimore.³⁵ Lionel Atwill both directed and played the male lead. The following year, Dreyfuss leapt to Broadway with the sets for Beau Gallant, which debuted at the Ritz Theatre on April 5, again with Atwill as the principal actor. Dreyfuss then endured an eighteen-month hiatus between Broadway shows. During that time, in addition to the weekly revues for the Strand Theatre, he worked on "traveling vaudeville units" for the Keith-Albee theater consortium and designed costumes for The Merry Wives of Windsor. The costume studies for this production are in the Drawings and Prints Department at the National Design Museum [Figure 6]. Dated 1927, they are executed in watercolor and show a firmness of outline, saturation of color, and freeness of movement in the figures depicted. They are among the best work from Dreyfuss's own hand.

Within four years of starting his professional career, Dreyfuss's fees for his services increased markedly. John Zanft of the Fox Theatre Circuit offered him the position of art director and raised his weekly salary to \$250 at the end of 1927.³⁶ In the letter, Zanft stated that "any time you are assigned to perform services in any theatre out of New York City, this corporation will pay your railroad fares and allow you \$7.50 per day to cover every other form of

expense"; trips to Philadelphia were commonplace.

In spite of the considerable leap in pay from his salary at the Strand Theatre, Dreyfuss was apparently not content with this position; he worked for the Fox Theatre Circuit for less than three months in 1928. Louis Brecker, a friend and the owner of the Roseland Ballrooms in Manhattan and Brooklyn, recalled this period in a letter he wrote years later to Dreyfuss's secretary Rita Hart:

I recall he worked for Fox...and had charge of the stage sets in Philadelphia but he could not stand his bosses--so one day he told them off and quit the job. He then went to Europe not knowing what he was going to do but went just to forget everything.³⁷

Dreyfuss's short period of employment with the Fox organization is confirmed by a letter written in Tunis on March 17, 1928:

I have enjoyed my vacation immensely so far and believe the rest has done me a great deal of good. What I am going to do upon my return, I don't know as yet-I've had several offers of positions but haven't definitely decided.³⁸

Dreyfuss recounted this same period in his life to an interviewer:

He went to Paris. Then to North Africa. When his savings petered out, he took a job as guide for American Express. Having accumulated enough money to go home, he returned by way of Paris, where he found a huge stack of accumulated mail. Before he could get it read, a Paris representative of R. H. Macy called to ask, with some annoyance, "Don't you ever read letters?"³⁹

These anecdotes reveal a versatile young man who was not

afraid to "wing it" over unfamiliar territory. Dreyfuss does not reveal what was going through his mind during this period. Had he really gone abroad after precipitously quitting a good-paying job "just to forget everything" as Brecker wrote, or was he mulling over "several offers of positions" (and who might these have been from)? Any comment here is speculation, but perhaps Dreyfuss was trying to figure it all out; perhaps this is the juncture at which he decided to pursue industrial design. In Dreyfuss's autobiography, in his personal accounts, and in the records of others, the next step in his life is the same: he is tracked down by the management of Macy's upon returning to Paris, and throws over his "vacation plans" to return to New York. He had been promised a chance to evaluate their merchandise for redesign. One author characterized the episode as follows:

Oswald Knauth, an executive of Macy's...told him to wander around the 100-odd departments and redesign anything he didn't like...on being asked to inspect and criticize, he [Dreyfuss] was shocked by everything he saw. He examined hundreds of objects from pocket knives to electric stoves and disliked every one...Although he was flat broke, Dreyfuss turned down the department-store job. He had promised himself that he would be his own boss...He felt also that the big idea had one important defect: it overlooked the fact that a manufacturer could seldom change the design of a product without scrapping valuable machinery and retooling his plant at great expense. It was useless, according to Dreyfuss, for a retailer to bombard manufacturers with random suggestions.⁴⁰

This illuminating story readily separates Dreyfuss from the

other early industrial designers. Not only on this occasion, but on many others, Dreyfuss refused to accept the conditions imposed by a client. He refused to compromise at the start of a project when he did not feel the parameters set provided for a true rethinking of a product's design beginning with the manufacturing process itself. Unless he could consult directly with the people who would be responsible for making, as well as marketing, a product, his design innovations might be compromised or even made impossible by the conditions prevailing at the place of manufacture. In discussing the theoretical component of Dreyfuss's approach to design, it becomes clear that a round-table approach, involving all parties concerned, became one of his most important contributions to an industrial designer's job.

Dreyfuss's friend Louis Brecker may have given him the best advice he had received about his career up to this point:

While on the way back [from Europe] he received an offer from Macy's to design their modern silverware, etc. as a permanent job. I urged him not to take it but to go out for himself. I even sent him around to some of my friends to get him started-and you know what has happened since.⁴¹

Unfortunately, the names of Brecker's referrals remain unidentified. Dreyfuss's transition from stage designer to industrial designer was neither quick nor easy. In fact, his career as an industrial designer and as a stage designer

overlapped by six years, although one would never receive this impression from his autobiography. Up to 1930, he had executed stage designs for only a handful of major shows that made it to opening night. During this same period he received modest assignments in redesigning products. Ironically, he had been referring to himself as an industrial designer for two years when he experienced his greatest successes as a stage designer.

In 1930 Dreyfuss's career began a remarkable advance on both the industrial and stage design fronts. His output as a stage designer was prodigious: sets for nine separate shows were completed in 1930 and four more were added in 1931. Bill Purcell, Dreyfuss's right-hand man in the South Pasadena, California, office during its existence, recalled reading that Dreyfuss had five shows running on Broadway at one time in 1930.⁴² When his designs are mentioned in reviews, the attitude of the critics was generally favorable and showed an appreciation of his technical skills. A high point was reached in The Last Mile, by John Wexley, a production of 1930 that starred Spencer Tracy. Dreyfuss's design of a line of death-row jail cells was admired for "a cell-block that clangs when the steel doors are thrown open," and his approach to stage design was considered very practical and well-researched by the standards of the day [Figure 7].⁴³ In search of a "morbidly accurate" setting, Dreyfuss went so far as to contact twenty-five prison

wardens in order to discover if there was any "standard type" of death-row architecture. (In the process, he discovered that there was no typical death row and that there was no capital punishment in Kansas, the location in which the fictional account was initially set.)"⁴⁴

Dreyfuss' s sets often garnered more acclaim than the plays. Of Sweet Stranger, a play from 1930, a critic stated that "what keeps it from being entirely just another of those Broadway things are Henry Dreyfuss' s Tiffany backgrounds."⁴⁵ Among Dreyfuss' s most often cited and visually interesting efforts were the sets for The Cat and the Fiddle by Jerome Kern, where "Brussels is quite satisfactory for artistic romance and it gives Henry Dreyfuss an opportunity to sketch sidewalk cafés and somberly colored quays and lavish apartments and two traditional scenes on a theatre stage [Figure 8]."⁴⁶ Photographs of the sets now in the Dreyfuss Collection demonstrate that he was capable of illusionistic turns in the design of a scrim curtain as well as expressionist effects in his townscape for the same production.⁴⁷

Dreyfuss' s last design for the stage, the settings for Humphrey Cobb' s Paths of Glory, provoked one critic to write, "meeting the scenic requirements of Paths of Glory called for ingenuity, inspiration and a superior sense of the practical." For this production Dreyfuss designed the settings "in thirteen scenes, which moved on three rolling

platforms from scene to scene without delay." Scenes changed "rapidly from place to place in the war zone, and we are shown realistic reproductions of company headquarters, a café behind the lines, front-line dugouts, observation posts, and finally a deserted château, where the court-martial scene takes place."⁴⁸ Other critics admired Dreyfuss's use of space, his angled perspective, and economy of settings. One critic viewed the settings as a series of "realistic reproductions," while another saw them as "semi-impressionistic, pitched against swathing curtains of gray."⁴⁹

On one occasion, Henry Dreyfuss acted as director as well as stage designer for a production. For Continental Varieties of 1934, a showcase for European talent, Dreyfuss redecorated the theater, wrapped the seats in white, and placed full-length caricatures of the leading theatrical critics of the day in the lounge. He whipped the performance into shape in a mere four days and eight hours. Not the least of his problems was communicating with the international cast, and he was forced to rely on pantomime to put across his points about their performances (even mimicking a number of dances to indicate to Vicente Escudero the order in which he wanted them performed). Dreyfuss managed to be a hit with both management and performers.⁵⁰

Success on Broadway brought Dreyfuss considerable public attention at the time he was making the transition to

industrial design. His reputation for pragmatic problem-solving and his longstanding relationships with theatrical clients were strong recommendations in his favor when he approached businessmen. He was a tough negotiator; involved in a number of disputes with United Scenic Artists of America, he was active in defining the role of the industrial designer versus the stage designer. A primary concern was the overlap in the fields he had been exploiting. He struggled to make it clear to the president of United Scenic Artists that in working as an interior designer for Radio-Keith-Orpheum Theaters he was not in conflict with the working rules or the constitution of the union. Dreyfuss won the argument.⁵¹

Dreyfuss had begun as a consultant for RKO in connection with a new theater the organization had built in Sioux City, Iowa. He was a keen observer of human nature, and the story about this early project became one of the favorites told in the ensuing years:

Dreyfuss, then a young theatrical scene designer, was sent to Sioux City, Iowa, by his employers, the Radio-Keith-Orpheum circuit, to find out why a brand-new, beautifully decorated movie palace in that metropolis was drawing nothing but large quantities of Iowa atmosphere. After Dreyfuss arrived, he lowered the prices, ran triple features and gave away enough dishes to equip a cafeteria-but still the majority of the populace wandered past his theater and into an unventilated flea-bag movie house down the street. Finally, Dreyfuss decided to make a scientific study of the matter.

For three days he stood outside his theater

and watched the reactions of the people walking by. Then he ordered his staff to remove the expensive, deep-pile scarlet carpet from the lobby, and replace it with a plain rubber mat. Almost miraculously, and from that time forth, the RKO theater was jammed.

Dreyfuss simply had discovered that the farmers and the townsfolk had been ashamed of messing up that gorgeous carpet with their muddy boots and galoshes.⁵²

The RKO theaters in Davenport, Iowa, and Denver, Colorado, were Dreyfuss's next major projects. He attempted no radical innovations in these two theaters but aimed for a greater sense of unity in their interiors than was evident in many of their Art Deco counterparts [Figure 9]. He dictated the following passage close to the time of the completion of the Davenport Orpheum theater:

This is the first theatre in which a designer has been called in to correlate every detail. Usually the architect does the plaster work, the carpet man the carpet, the seat man the seat covers, etcetera. On this occasion Mr. Plunkett was kind enough to call this organization in and let us do the entire job so that the result would be harmonious. In other words the carpet was designed thinking of the walls, the walls were designed thinking of the ceiling, the fixtures were designed thinking of the seat-ends, etcetera. From the base[ment] lounge to the last seat in the balcony there is one thought in design. No two schools have ever been used. Everything is in direct harmony.⁵³

The Dreyfuss theater was characterized by a tempered approach to Art Deco motifs, predominantly simple geometric and stylized floral patterns with an emphasis on visually sumptuous materials, moiré wallpapers, pierced plaster

grillwork, and leather armchairs. The men's lounge displayed silver wallcoverings manufactured by Salubra AG, wood molding and wainscoting of black ebony, flat black carpeting, and leather upholstery in brilliant vermilion [Figure 10]. Theatrical lighting effects appeared in the ladies' lounge, where vanities were lit from below (perhaps more impressive atmospherically than helpful in applying makeup). Concealed lighting illuminated false windows in the basement placed behind venetian blinds. The only "fine art" commissioned for the project was a low-relief plaster sculpture depicting a thoroughly modern scene: the shooting of a Hollywood movie. Dreyfuss even displayed a whimsical side: a children's playroom was given a circus tent theme.⁵⁴

Architecturally, innovations were tempered as well: Dreyfuss noted that "the absence of any definite proscenium arch (or really the enlargement of the proscenium arch to take in a good part of the theater), helps make this theater a bit more intimate than the average. There is no definite frame dividing the audience from the stage."⁵⁵ The overall conception was of luxury without ostentation, with facilities and furniture that were meant to make people comfortable. This conception of interior design was perhaps a source of inspiration for the interiors of both the New York Central Railroad's 20th Century Limited train and the American Export Lines's S.S. Constitution and S.S. Independence, created during the 1930s and 1950s, respectively.

Dreyfuss cited 1928 in his record of personal statistics as the year in which he opened an office "for theatrical work, and [the] start of industrial design activities." Two years passed before he achieved anything of note in the latter. When Dreyfuss contacted Emma Mueden at the Society for Ethical Culture's school, stating that he was looking for additional help with his business, she sent him Doris Marks. Dreyfuss was looking out of the window in his third-floor office at 218 West 48th Street on that day [Figure 11]. A Pierce-Arrow limousine came to a halt on the street below and the chauffeur opened the door for a young woman carrying an umbrella with a bulldog handle. After cautioning the driver not to wait in front of the building, she disappeared into its entrance. She then appeared in Dreyfuss's office for an interview, unaware that he had seen her arrival at the building. They must have made a profound impression upon one another. When Dreyfuss's secretary asked who the woman was after her departure, he replied, "That's the girl I'm going to marry." The next day Doris's father, Marcus Marks, took Dreyfuss to lunch, and when his wife inquired that evening where he had eaten earlier that day, he said, "I had lunch with the boy Doris is going to marry."⁵⁶

Doris Marks was just shy of thirty-one, being one year older than Henry Dreyfuss [Figure 12]. She had also attended the Society for Ethical Culture's school on Central Park

West in Manhattan and graduated in 1918.⁵⁷ It appears that she and her future husband were not acquainted with each other as students. Following graduation she entered Vassar and majored in psychology. During the years 1922 to 1927 she traveled extensively in Europe, especially in Italy, where she moved in fashionable circles. Gail Dreyfuss Wilson believed that her mother had been doing social work at the time she met Dreyfuss. Rita Hart, who would work closely with them in organizing the office after 1930, recalled the same.⁵⁸

As the daughter of the former borough president of Manhattan, Doris Marks had numerous contacts within the business and social circles of Manhattan. Her family was wealthy and distinguished. Marcus M. Marks (1858-1934) was noted as "a very good friend" of Andrew Carnegie.⁵⁹ As the president of the National Association of Clothiers he was able to bring harmony to the affairs of his own line of business and eventually to the woolen, trimming, cloak, and fur trades as well. He worked as a peacemaker in many industrial disputes involving taxi drivers, expressmen, textile workers, hatmakers, boilermakers, conductors, and trainmen. Leaving the daily affairs of his business in charge of his assistants in 1913, he devoted himself full time to politics and social issues. In the same year, he was elected borough president of Manhattan. In this position, during the administration of Mayor John Purroy Mitchell,

Marcus Marks established a system of open public markets, introduced welfare work among his 2,000 employees, and arranged for joint trial boards for civil service employees. From 1913 to 1917, he led the fight for Daylight Saving Time in the United States.⁶⁰

Interestingly, it was his wife's discovery of the idea of Daylight Saving Time in a German newspaper that provided the starting point for a four-year campaign for the scheme's adoption (the idea had first been promoted in Germany). Mrs. Marks was the former Esther Friedman (1867-1937). She and her husband helped found the Tuberculosis Preventorium for Children to combat what was then known as the "white plague." Active in the women's suffrage and birth control movements, she pressed for the investigation of women's working conditions in the manufacturing and hotel trades through the National Civic Federation. At one time she had been the New York chairwoman of the National Woman's party.⁶¹ The Marks family was living at 4 East 94th Street in 1912, and probably earlier; Doris Marks grew up, not only among wealth, but in an atmosphere permeated by social concerns and high standards.

In 1930, Dreyfuss moved his office to 580 Fifth Avenue. This new office, with Doris Marks as executive business head, was outside of the theater district, and signaled that Dreyfuss had decided that the time had come to push ahead with industrial design and leave theater design

(it would take another five years before this transpired). His staff consisted of Rita Hart as secretary and bookkeeper (later office manager), and Herbert S. Barnhart and Julian G. Everett as designers. Miss Marks and Miss Hart (as they were always known in the office) were referred to as partners by Henry Dreyfuss in his own records. Henry's brother, Arnold, was also working for the office at this time, but did not stay with the business long; he married and moved to La Cañada, California, where he died at age thirty (his health had been poor since childhood).

Rita Hart is the person most knowledgeable about the working relationship that existed between Dreyfuss and Doris Marks. She says that he had an excellent business sense, which was complemented by his wife's organizational skills. While he was the "creative genius" of the two, she exercised considerable influence on the flow of work in the office and its personnel selections. She sought to move Dreyfuss out of the realm of the theater and into industrial design, and discouraged him from his natural inclination to accommodate the large numbers of people interested in his services.⁶² She insisted that he charge substantial fees for his work, feeling that anything less would prove detrimental to the status of the fledgling profession.⁶³

Henry Dreyfuss and Doris Marks were married on July 26, 1930, in a civil ceremony at the Municipal Building in New York. Their honeymoon was spent on a train (where they went

is not noted). They took up residence in the Tuscany at 120 East 39th Street, where they wrote to Emma Mueden about their mutual happiness. He thanked her for being his "Guardian Angel" who "always more or less looked over me and steered me around."⁶⁴

It is clear that Doris Marks was important to the success of the firm. Analyzing her impact on the formal elements of their designs, however, remains a difficult task. Both husband and wife disavowed any contribution by her to the way things looked. In interviews with their contemporaries, the impression of her personal taste that emerged ranged from refined to very particular. One young woman in the office was delegated the task of returning items that Dreyfuss bought for his wife on trips-usually on the basis that they were extravagances. Doris Marks probably reinforced Dreyfuss's appreciation of simplicity and things European. The aesthetic of the Henry Dreyfuss firm would be influential for what it did not, in fact, include: the pandering to popular taste that characterized much of the coming "design decade's" production.

1. The facts about Dreyfuss's formative years can be verified through two specific documents. They are "A Record of Personal and Business Vital Statistics," authored by Dreyfuss, Dreyfuss Collection, Industrial Archives, Cooper-Hewitt, National Design Museum, Smithsonian Institution (hereafter referred to as Dreyfuss Collection), accession number 1972-88.178, and Dreyfuss's letter to his son, John, entitled "The little I know about my family history," dated October 4, 1972.

2. Beverly Smith, "He's into Everything," American Magazine 113 (April 1932), 43.

3. Horace J. Bridges, s.v. "Ethical Culture Movement," 1939 Britannica Book of the Year (Chicago: Encyclopedia Britannica 1939).

4. Jeffrey L. Meikle was the first scholar to point out the impact of these lessons on Dreyfuss's life, see Twentieth Century Limited: Industrial Design in the United States, 1925-1939, (Philadelphia: Temple University Press), 1979), 57.

5. Ethical Culture School; Prevocational Art Department (New York: John C. Powers Co., 1921), 11-27.

6. Ibid.

7. Dreyfuss, "The little I know about my family background." (In letter to his son, 1972).

8. Elliott had a distinguished career as both an educator and progressive social activist. He founded the Hudson Guild Neighborhood House in Manhattan's Chelsea neighborhood in 1895 with his own resources, seeking to provide children with recreational activities other than the gang warfare that was rife along the waterfront. In 1938 he founded the Central Good Neighbor Committee, which attempted to put democracy and racial tolerance on a firmer footing, and aided refugees coming to the United States. In addition, he organized the School for Printers' Apprentices, was president of the National Federation of Settlements, and in 1926, was the head of the United Neighborhood Houses of New York.

9. Information on Elliott comes from "Dr. John L. Elliott is Dead Here at 73," New York Times, April 13, 1942; "The Late John Lovejoy Elliott," New York Times, April 14, 1942 (which corrects errors made in the previous article); "Dr. John Elliott Dead; Hudson Guild Founder," New York Herald Tribune, April 13, 1942; and Nannette Rothschild, interviewed by Frieda Moss, transcript of tape recording made in 1963. All materials courtesy Ethical Culture/Fieldston School Archives, New York.

10. This anecdote and other information on Emma Mueden were related to the author in a telephone conversation with Barbara Michaels of the Ethical Culture/Fieldston School Archives in May 1991.

11. The accession numbers for these two works are 1973-15.129 and 1973-15.130.

12. The accession numbers for these two studies are 1973-15.115 and 1973-15.117.

13. "All for Joe and Josephine," Architectural Record 118 (July 1955), 48. The phrase is originally found in Designing for People, 97: "Most people have inherent good taste, but they can't be expected to use it if they can't find good things." Swiss designer Max Bill felt differently: "The persistent cultivation of this myth (of public taste) is the unhappy hunting ground of unscrupulous manufacturers and middlemen who employ all the resources of publicity to persuade the consumer (which in such cases means everybody) that the myth is reality." Form: A Balance Sheet of Mid-Twentieth Century Trends in Design (Basel, 1952), quoted in Terence Riley and Edward Eigen, "Between the Museum and the Marketplace: Selling Good Design," Studies in Modern Art 4 (1994), 170.

14. Carlton Atherton, "Henry Dreyfuss: Designer," Design 36 (January 1935), 5.

15. Bel Geddes probably taught the stage design course as a source of income and unpaid assistants. It was offered from 1921 through 1927. Norman Bel Geddes to Mrs. George F. Dalton, November 19, 1928, Design Course/SC-3/j.-4, Norman Bel Geddes Collection, Hoblitzelle Theatre Arts Library, Henry Ransom Humanities Research Center, University of Texas at Austin (hereafter referred to as Bel Geddes Collection). This and other information on Dreyfuss's studies with Bel Geddes were provided by Jeffrey L. Meikle.

16. Dreyfuss, "A Record of Personal and Business Vital Statistics." "Incidentally, I want to explain why I have been to so few meetings [of the United Scenic Artists' Association]. Last summer I signed an application to take a course each Friday night-for twenty weeks. I have been attending these lectures and they have interfered with my coming to your meetings." Dreyfuss to Carl Lessing, March 29, 1924, United Scenic Artists Local 829 Archives, New York. Lessing was president of United Scenic Artists in New York. The author's assumption that these are classes with Bel Geddes is based on the fact that Dreyfuss refers to no other such classes anywhere in his personal records or interviews.

17. Gilbert Seldes, "Profiles: Artist in a Factory," The New Yorker 7 (August 29, 1931), 22. For additional information on The Miracle, see Oliver Martin Sayler, ed., The Miracle (souvenir program) (New York: Theatre International, 1924). The full title of the latter is "F. Ray Comstock and Morris Gest present for the first time in America the stupendous, spectacular pantomime The Miracle, staged by Max Reinhardt, book by Karl Vollmoeller, score by Engelbert Humperdinck, revised and extended by Friedrich Schirmer, production designed by Norman Bel Geddes, built by P. J. Carey & Co., entire production under the supervision of Morris Gest." Bel Geddes's stage set for the Century Theatre was featured for its innovations in Albert A. Hopkins, "A Theatre Without a Stage," Scientific American 130 (April 1924), 228-29.

18. Norman Bel Geddes, A Project for a Theatrical Presentation of The Divine Comedy of Dante Alighieri (New York: Theatre Arts, 1924).

19. Bel Geddes, manuscript for autobiography, Jamaica version, chapters 48-52, Bel Geddes Collection.

20. Kimmis Hendrick, "Questions Trigger the Flash," Christian Science Monitor, May 11-13, 1968 (weekend issue), sec. 2, p. 1 (clipping in Dreyfuss Collection).

21. Bel Geddes, manuscript for autobiography, Jamaica version, chapter 76: transcript of interview with Bel Geddes by Selma Robinson of PM, January 27, 1942, Bel Geddes Collection.

22. Dreyfuss, "The little I know about my family background." Arnold Wolf, cited by Edward Zagorski, "Design Heads & Tales: An Anecdotal History of Industrial Design," Innovation (Journal of the Industrial Designers Society of America) 10 (Spring 1991), 33.

23. Dreyfuss, in "Norman Bel Geddes (1893-1958)," Industrial Design 5 (June 1958), 51.

24. "Incidentally, he [Dreyfuss] couldn't stand bad lighting, for instance. He would complain about lighting along the top of a bookshelf that had some dark spots between the lamps-that wouldn't worry me, but Henry couldn't stand it. His lighting...had to be absolutely even, and that was the stage work of the early years. He was a perfectionist at that sort of thing." William F. H. Purcell, interview with author, March 16-17, 1991. Dreyfuss also became fast friends early in his career with Edward F. Kook, later president of Century Lighting Company in New York.

25. Bel Geddes, "The Objective," lesson 2 of 20 from the elementary level stage design course, Design Course/SC-4/k.-1, Bel Geddes Collection.

26. "The form must be simple and pleasing. I have no sympathy with the thought of applying streamlined shapes to a household utility, but I do believe it can be 'cleanlined' in its design. We have a distinct problem in doing a vacuum cleaner [the Hoover 150]. The outward appearance must impress the consumer with the ease of operation and the design must silently express the many conveniences within the housing." Dreyfuss, "An Industrial Designer Thinks About His Job," in Art Directors' 18th Annual of Advertising Art (New York: Longmans Green, 1939), 170.

27. John Dreyfuss, interview with author, November 23, 1990.

28. "Plays and Photoplays: A True Picture of Benvenuto," Detroit News, October 16, 1923, The Heart of Cellini clippings file, Billy Rose Theatre Collection, Performing Arts Research Center, New York Public Library at Lincoln Center, Astor, Lenox and Tilden Foundations (hereafter referred to as Billy Rose Theatre Collection). The review notes that "'The Heart of Cellini' is Good Atmosphere, But Not Impressive Drama." A program for the performance states that "All settings and costumes in this production designed by Henry Dreyfuss and executed under his direction." The Heart of Cellini program file, Billy Rose Theatre Collection.

29. He would tell slightly different versions of the story to interviewers over the years, each emphasizing the upstart quality of his contact with Joseph Plunkett; most cite a letter written by Dreyfuss to Plunkett that verged on insulting the state of the theater's shows, and receiving a job shortly thereafter, but another version reveals that this was not the case. "At the Strand one night, impressed by the poor settings used for the weekly program, he was provoked into writing a letter to the manager commenting on the inadequate settings used by this popular theatre. The manager asked for suggestions and Mr. Dreyfuss made sketches and went to see him. After two months of sitting on the doorstep for a chance to accost the manager, he obtained an interview and got the job." Atherton, "Henry Dreyfuss: Designer," 6.

30. Dreyfuss to J. F. Plunkett, New York, August 20, 1923, Dreyfuss Collection, 1973-15.23.

31. Seldes, "Profiles: Artist in a Factory," 22.

32. Alva Johnston, "Nothing Looks Right to Dreyfuss," Saturday Evening Post (November 22, 1947), 21.

33. Dreyfuss, Designing for People (New York: Simon and Schuster, 1955), 10.

34. He also used B. C. Whitney, then at the New Amsterdam Theatre, and Norman Bel Geddes as references. He was proposed for membership by an even more distinguished list that included Lee Simonson and Robert Edmond Jones in addition to Bel Geddes. Dreyfuss was elected on January 18 and obligated on February 1, 1924 (not in 1922 as he notes in his record of personal statistics). Henry Dreyfuss file, United Scenic Artists Local 829 Archives, New York. The New York Times published an even higher number of productions and a longer term of employment of 416 settings and eight years respectively in the announcement of his wedding to Doris Marks in 1930. "Miss Doris Marks Wed to Henry Dreyfuss," *ibid.*, July 30, 1930, 15.

35. From a program for the week of November 9, 1925: "The scenery and costumes designed and constructed under the direction of Henry Dreyfus[s]." Deep in the Woods program file, Billy Rose Theatre Collection.

36. John Zanft, vice president and general manager, William Fox Circuit of Theatres, New York, to Dreyfuss, December 31, 1927, Dreyfuss Collection, 1973-15.37.

37. Louis Brecker, New York, to Rita Hart, November 12, 1952, *ibid.*, 1973-15.5

38. Dreyfuss, Tunis, to Carl Lessing, New York, March 17, 1928, Henry Dreyfuss file, United Scenic Artists Local 829 Archives, New York.

39. Hendrick, "Questions Trigger the Flash," 15. In another version of this story, Dreyfuss revealed that he had been stuck in Tunis after losing all of his money playing roulette during his first night in town. Johnston, "Nothing Looks Right to Dreyfuss," 20-21.

40. *Ibid.*

41. Brecker to Hart, Dreyfuss Collection, 1973-15-5.

42. William F. H. Purcell, interview with author, March 16-17, 1991.

43. Brooks Atkinson, "The Play: The Last Mile," New York Times, February 14, 1930, 21.

44. "Two in the Spotlight," *ibid.*, May 11, 1930, section 9, 2.
45. Atkinson, "The Play: Sweet Stranger," *ibid.*, October 22, 1930.
46. Atkinson, "The Play: Love to a Kern Score," *ibid.*, October 16, 1931, 26.
47. The cell-block scene from The Last Mile and the townscape from The Cat and the Fiddle are both illustrated in the first edition of Dreyfuss, Designing for People, on page 49.
48. "' Paths of Glory' Seen in New Haven," New York Times, September 19, 1935, 29.
49. John Anderson, "Paths of Glory," New York Evening Journal, September 27, 1935; Willella Waldorf, "War Plays Reach Local Stages as All Europe Arms," New York Post, September 20, 1935; "Impressive War Play," London Daily Telegraph, September 28, 1935; "Paths of Glory, New Haven," Variety, September 18, 1935; all references from Paths of Glory scrapbook file, Billy Rose Theatre Collection.
50. Brooks Atkinson, "The Play: Lucienne Boyer, Vicente Escudero and Others in the 'Continental Varieties,'" New York Times, October 4, 1934, 18; "Too Many Tongues for Him," New York World-Telegram, October 6, 1934, Henry Dreyfuss clippings file, Billy Rose Theatre Collection.
51. See correspondence between Dreyfuss and United Scenic Artists president W. Percival in 1931, Henry Dreyfuss file, United Scenic Artists Local 829 Archives, New York.
52. Bill Davidson, "You Buy Their Dreams," Collier's 120 (August 2, 1947), 23; Dreyfuss's less-embellished version of the story appears in Dreyfuss, Designing for People, 159.
53. Glued to the back of a photograph of the interior, this typewritten description and others are noted as "Dictated by Henry Dreyfuss 11/14/31"; Dreyfuss Collection, 1973-15.32.
54. Dreyfuss had executed a design for a backdrop with a circus theme for the first act of The Gang's All Here, a musical produced in 1931, Cooper-Hewitt, National Design Museum, Drawings and Prints Department, 1973-15.132.
55. See endnote 51. In 1983 the Davenport Orpheum was rechristened the Adler after undergoing extensive restoration and renovation. Its appearance is substantially the same as when it first opened.

56. Dreyfuss, "The little I know about my family background."

57. The Society for Ethical Culture and the schools it operated were an important vehicle for the assimilation of Jewish members and students into the mainstream of New York society. While there is no evidence that Dreyfuss or Marks were concerned with conventional religion, an important aspect of their relationship was their desire for such assimilation, characteristic of many Jewish people of their generation.

58. Gail Dreyfuss Wilson, interview with author, November 23, 1990; Rita Hart, interview with author, February 5, 1991.

59. Apparently Marks and Carnegie were golfing partners. It is a coincidence that the Doris and Henry Dreyfuss Memorial Study Center is located in the former Andrew Carnegie mansion, now the Cooper-Hewitt, National Design Museum.

60. "Marcus M. Marks Dies in Hospital," New York Times, August 27, 1934, 15. Other information comes from scrapbooks held by Doris and Henry Dreyfuss's children.

61. "Mrs. Marcus Marks, a Welfare Leader," *ibid.*, April 24, 1937, 23.

62. Rita Hart, interview with author, February 5, 1991.

63. Gail Dreyfuss Wilson, interview with author, November 23, 1990; William F. H. Purcell, interview with author, March 16-17, 1991. Some of Dreyfuss's difficulties in getting paid for his theatrical work are documented in the Henry Dreyfuss file, United Scenic Artists Local 829 Archives, New York.

64. "Miss Doris Marks Wed to Henry Dreyfuss," 15; Henry Dreyfuss and Doris Marks Dreyfuss to Emma Mueden, August 19, 1930. A photocopy of the latter was provided by Gail Dreyfuss Wilson; it was returned to the Dreyfusses by Miss Mueden on one of their subsequent wedding anniversaries.

Chapter Three

Henry Dreyfuss Becomes an Industrial Designer

In his Designing for People [Figure 13] of 1955, part autobiography, part "how-to" book, Henry Dreyfuss presents a carefully controlled account of his personal history and development as a designer. The book gives the reader a sense of his accomplishments and his temperament. His stance can be described as obliging, presuming his audience to have little knowledge of industrial design and little interest in his personal life. He tempers his sometimes dry accounts of the design process with an anecdote at the end of each chapter. Some of these provide a chuckle, and others seem a bit strained, as if such admissions as encountering problems or even mild embarrassments were not in character for him. In fact, Henry Dreyfuss was a masterful storyteller to his friends and a riveting performer in front of clients. If his book is a little dull, it is because he deliberately made it that way. He left out the personal impact the world of design had on him—a world of deadlines, budgets, critics, and managers—in which he had to depend on others to realize his ideas. There was a time, as well, when there were no others, when Dreyfuss had struck out on his own from theatrical design, renting a second-floor office at 218 West 48th Street in Manhattan, and furnishing it with a borrowed card table, two folding chairs, a telephone, and a twenty-

five-cent philodendron plant. There he confronted a reality that had no doubt struck his elders Norman Bel Geddes and Walter Dorwin Teague only a year or two earlier: billing yourself as an industrial designer was not enough to make the world beat a path to your door. Jobs would have to be solicited. This chapter is an examination of how Dreyfuss made his start in industrial design, and the seminal events that propelled him from the status of novice to major practitioner in the new field within a decade.

While there is no written documentation giving us the reason for Dreyfuss's career change (the transition from stage design to industrial design lasted from 1928 to 1935), the example of his mentor Bel Geddes must have been foremost in his mind. Likewise, Walter Dorwin Teague's public declaration that he was abandoning graphic design for industrial design in the summer of 1926 probably added to Dreyfuss's perception that the best minds were leaving these fields for more fertile territory. Dreyfuss appeared to have landed a "plum" job working as art director for the William Fox Circuit of Theatres in December 1927, but as Louis Brecker, impresario of Manhattan's Roseland Ballroom and one of Dreyfuss's earliest employers, recounted, "he worked for Fox Pictures Corporation and had charge of the stage sets in Philadelphia, but he could not stand his bosses-so one day he told them off and quit the job. He then went to Europe not knowing what he was going to do but went just to forget

everything."¹

In the spring of 1928, Dreyfuss had written from Tunis to Carl Lessing, president of United Scenic Artists in New York, on March 17, stating, "What I am going to do upon my return I don't know as yet-I've had several offers of positions but haven't definitely decided."² At least one job offer did await him upon his return, and that was as general supervisor of merchandise design to R. H. Macy & Company. The job would give him veto power over merchandise he felt was not in keeping with the image the department store wished to cultivate. He rejected the offer from Macy's because he found that he was merely to provide suggestions to manufacturers rather than having a say about new designs. Later Dreyfuss would routinely decline work when he could not have ultimate control of the design process. Just two years later, working as a consultant to Bell Telephone Laboratories on their installations of equipment in New York, he rejected their offer of \$1,000 to create an "appearance model" of a new telephone with a unified handset for a similar reason: if he could not consult with Bell's engineers on the project, he had no interest in it. In the long run, this demand proved effective: Dreyfuss received credit as the designer of Bell Telephone's 1937 Model 302 telephone. The conditions he set-working on a level of equality with the manufacturer and his employees and collaborating on designs rather than serving as an aesthetic

consultant-turned out to be among the most important in his early career.

Dreyfuss' s commitment of service to society, however, had to be balanced against the reality that he was a young man of no means, other than those provided by his wits. Throughout his life, he was realistic about the system within which he operated, and it dictated in large degree his formulation of design:

It is pointless to produce a product so expensive that no one can afford it, or so underpriced as not to permit a reasonable profit to the manufacturer. Good design need not increase cost.³

The parameters he set later in his career were repeated so often they became a sort of mantra: safety and convenience of use, ease of maintenance, cost, appeal, and appearance. For Dreyfuss, these five points constituted a road map, not a blueprint, for successful design. It was their prioritization that made his designs exceptional. His five points are all centered on human, not abstract values.

By 1929 Dreyfuss was hard at work redesigning pianos, glass containers, and household hardware, such as hinges, keys, and escutcheons.⁴ In 1930 Doris Marks began to negotiate fees for his work that reflected the level of his talent.

While Dreyfuss was not a skilled draftsman in the sense of being able to execute finished engineering drawings for his industrial designs, he had an extensive art background. His exceptional ability to produce work on schedule came

from his years of work at the Mark Strand Theatre (he was very proud of having produced an average of a show a week for this vaudeville/movie house for five years). He had developed a technique of working in watercolors that was successful, for example, in rendering costume designs, and he now applied it to the more painstaking work required for illustrating products. While few such design drawings remain, these early works must have had a significant personal importance to him, for they survived to become part of his gift to the Cooper-Hewitt Museum in 1972, the year of his death. The drawings run the gamut from mildly abstract representations of fruit for the Swift Company to the geometric patterns he created for the Hickok Belt Company. Most interesting of these works is a series of label designs he created for the Charles Higgins Company of Brooklyn, well-known at this time as a manufacturer of inks and other artists' supplies. Dreyfuss was called upon to redesign the appearance of the can that contained Higgins Vegetable Glue, a product similar to rubber cement, through what may have been an interesting episode.

A possibly apocryphal story related in a 1934 issue of Forbes magazine states that one of Dreyfuss's employees wrote to the Charles Higgins Company of Brooklyn complaining about the poor design of the glue's square container after she cut her hand on the rim.⁵ (The product was typically scooped directly from the can and spread with the fingers in

doing paste-up work.) Supposedly, the firm responded to Dreyfuss that he was welcome to do better. In spite of a number of restrictions imposed by Higgins, Dreyfuss jumped at the opportunity. Higgins dictated that the new design could cost no more to produce than the present one. Furthermore, the name of the product, its mottoes "Strength" and "Sure to Catch," and its lion insignia constituted a trademark that would have to be retained. Also, the design had to maintain the glue's identity as a Higgins product, and any innovations introduced needed to be applicable to the rest of the company's line of products.

Dreyfuss began by changing the square container to a round can, allowing for easy removal of the glue. He turned to historical precedents, specifically heraldic designs, and modernized the emblem of the lion to provide a more striking graphic treatment. In addition, he separated the light-colored upper portion of the can from the darker bottom with a wavy silver line, providing a graphic motif that could be applied to other products. By utilizing the existing silver (actually tin) coating of the container as a design element, he added a third tonality to the palette of light green and opaque white [Figure 14].

The segue from packaging design to product design was not a clear-cut transition for Dreyfuss. An electric toaster, designed for the Birtman Company in 1932, was another early challenge [Figure 15]. Sales appeal was again

an important aspect of the total design. Dreyfuss's proposal provided a package that acted as a pedestal for display of the toaster in a department store setting and as a handsome presentation box if it were to be given as a gift. The curvilinear form of the box was in fact far more streamlined than Dreyfuss's design for the toaster itself, which retained many of the angular forms associated with Art Deco. The project provides insight into a transitional stage in Dreyfuss's work: integrally cast on the bottom of the toaster's Bakelite base is the notation "style-designed by Henry Dreyfuss." This seems to be the only time this phrase was used, but it accurately describes his role. Dreyfuss's major idea was that the bread should be visible as it toasted. Seeing the toast brown in the Birtman Visible Toaster was not so important, but it helped to persuade customers to move away from the open type of toaster. (Later toaster-ovens with their large glass panels recognized that there are limitations to the degree that automatic control satisfied users.) The range of toaster design schemes in Dreyfuss's proposals to the Birtman Company is very broad, even including a model that can only be described as Cinderella's carriage because of its pumpkin-like form. Here also was an early instance of Dreyfuss's preference to work with a clay model of the product, to resolve the proportions of the design.

Another early, and somewhat unexpected, success was

the reshaping of an entire line of inexpensive kitchen tools for the Washburn Company of Worcester, Massachusetts, not just in form but also through the use of color. John S. Tomajan, the organization's president, remembered that an air of humility distinguished Dreyfuss from his peers in early 1934. Tomajan had already visited a number of designers he had read about in a Fortune magazine article that same year. He noted, "the general impression I had of the profession at that time was that there was an air of cocksureness on the part of designers."⁶ Dreyfuss was different from, and also the youngest of, the designers mentioned in the article. He promised Tomajan only consistency, saying, "Mr. Tomajan, I do not claim to be infallible. You have a widespread responsibility. You have to be concerned with sales, manufacturing, engineering, financing, and, incidentally, design. I spend all of my time on design. Therefore the chances are that my batting average will be higher than yours, simply because I work at it more constantly. That is all I have to sell to you-my batting average."⁷

Tomajan stated that this approach was so sensible that the company decided to cast its lot with Henry Dreyfuss, and added, "all through the experience of the next three years we found that he had the faculty of making complicated things seem simple. And, incidentally, that simplicity seems to be the basic characteristic of the work he produces."⁸

Simplicity, yes, but not mere functionalism. Dreyfuss participated in the reductive tendencies that were part of the aesthetic of the late 1920s and early 1930s, but this was not the stripped formalism of the Bauhaus of the mid-twenties. In fact, in his work for the Washburn Company, Dreyfuss seemed eager to harness the possibilities of combining such pure forms as the spheres that formed the terminus of many of the kitchen tools with "streamform" elements that made up the handles and bowls. Rather than approaching the assignment as a challenge to find perfect forms for universal tools, he expanded the line of tools, creating double-lipped ladles, spatula-like whisks, and meat forks with mechanisms for dispensing cut slices along with the more mundane slotted spoons and potato mashers [Figures 16 and 17]. This wide range of tools was unified through the use of bright colors. Red, green, and yellow brought the kitchen utensils up to date even if the kitchens they entered were not. Dreyfuss continued to propose new designs for the series well into 1936. Among the range of tools, the item most typical of his design was an ice pick with a handle flattened on one side to keep it from rolling off counters. In addition, he placed a metal insert in the handle that allowed it to be used like a hammer to crush ice.

Perhaps the most representative example of Dreyfuss's evolving approach to product design is found in his work for

the Minneapolis-Honeywell Regulator Company (later simply Honeywell). Beginning with the opening of his office, Dreyfuss pursued this account with vigor, proffering speculative designs for thermostats that ran the gamut from an ultra-contemporary, "cubistic" version with faceted planes to an ultra-traditional model in the form of a nineteenth-century banjo clock complete with the company's name and the date of the design in roman lettering and numerals [Figure 18]. While there is no indication that the management of the company took any of these unsolicited suggestions seriously as candidates for manufacture, Dreyfuss continued his advances to the company. A change took place in 1934 when H. W. Sweatt succeeded Mark Honeywell as the firm's president. It appears that Sweatt (whose father W. R. Sweatt had been president prior to Mark Honeywell) was much taken with Dreyfuss's approach. Dreyfuss's display of the existing product line, for a showroom at the recently opened Rockefeller Center, led to the revamping of the existing thermostat's appearance and soon after to the design of a completely new product, the Chronotherm.⁹ With a digital, that is, numeric, time display and a subtly curved housing that was reminiscent of a clock designed by Kem Weber for the Lawson Company of Los Angeles, the contours of the thermostat displayed the complex streamlining that characterized works of the mid-1930s [Figure 19]. The outline of this design became the formal

basis for Dreyfuss's second reworking of the company's logotype, a synthesis of the curvilinear and angular framing the Honeywell H. Displayed in the center of the Round (T-86) thermostat design when it made its debut in 1953, the H logo was a reminder to the consumer that the company's equipment extended beyond this simple control [Figure 20]. More important, perhaps, it also served as a distinct reminder to the manufacturer of the extent of Dreyfuss's influence over the visual character of their production. Dreyfuss also assembled a handbook for Honeywell employees and marketers that told them the correct manner in which to use the new logotype, implicitly recognizing that a good design can be undermined by inconsistent use. As the 1930s progressed, and Dreyfuss focused on product design for mass production, he was also casting about for chances to design on a larger scale. The end of the decade would find him on the cutting edge of interior design for air and rail transportation. The firm's projects grew ever larger and more ambitious. Dreyfuss crafted an interior for William K. Vanderbilt's private Sikorsky S-43 amphibian plane, which first appeared in 1936. His scheme complemented the modern conveniences on board (including shower and kitchen) and included photomurals of clouds that wrapped around the passenger compartment, creating a feeling of lightness in what might have been a claustrophobic space. Two years before, he had shaped a "flying boardroom" for the Cities Service Petroleum

Company's DC-2 executive plane, which emphasized flexibility-the interior contained fold-down tables for meetings and individual swivel seats that converted into beds. Referring to the galley of the Douglas-built plane, Architectural Forum stated, "reduction of space in this direction can go no further." The article also postulated that the planning of the corporate plane's layout might prove inspirational to architects looking for ways to make domestic spaces do double duty.¹⁰ Soon afterwards, Cities Service (later CITGO) asked Dreyfuss to consult on the outfitting of a gymnasium facility at their 70 Pine Street skyscraper in Manhattan. By the 1950s he was planning not only their facilities-mostly service stations, including a visitors' center for highway travelers-but also taking responsibility for their product packaging and signage.

Dreyfuss credited Fred Williamson, New York Central Railroad president during the first half of the 1930s, as the man who gave the go-ahead for the development of the nation's first streamlined train to be designed as a totality. Previously, locomotives had been streamlined-most notably Carl Kantola's landmark sheathing of the New York Central's Commodore Vanderbilt around 1932 [Figure 21]. Innovative new trains like Union Pacific's M10,000 (the "City of Salina") and Burlington Northern's Burlington Zephyr were treated as totalities on their exteriors at least (though their consist, or make-up of cars, was quite

abbreviated in terms of what the public expected from a full-service train). Dreyfuss's work on the Mercury, which traveled the Cleveland to Chicago route, was seminal. He was solely responsible for coordinating the appearance both inside and out on a major line that provided all the amenities offered by rail travel, the only mode of land travel at this time that could be referred to as luxurious.

The New York Central Railroad was feeling the pinch of a contracting economy as well as competition from automobiles and airplanes. Dreyfuss recounted that the project was almost scrapped because the cost of a completely new train was prohibitive. He had given up, it seems, when he took a trip to the country (probably to his house in Kent Cliffs, New York, purchased in 1935) in order to relieve some of the stress resulting from a failed enterprise. Leaving Manhattan, he saw a train yard full of unused commuter cars owned by the New York Central, and, suddenly inspired, he immediately returned to the city. By using the existing stock as the starting point for a redesigned train, he got the railroad's accountants to agree that this new strategy could cut costs by 75 percent, and the plans for the Mercury were revived. The debut of this ensemble of modern design in 1936 was widely heralded as a breakthrough in rail travel. By lowering window sills in the observation car, Dreyfuss gave passengers a panoramic view. (Turning passenger seats around to face the landscape rather than one

another was, no doubt, as important an innovation.) The Mercury seemed to onlookers to be a single tube of flying gray metal, an illusion aided by a color scheme that unified the appearance of all of the cars and redesigned vestibules that finessed the junctions between them [Figure 22]. It was a success with business travelers and the public alike, and put Dreyfuss and his associate Julian G. Everett in position for what was so far the firm's greatest single success, the all-new, "all-room" (that is, no coach class) 20th Century Limited.

The 20th Century Limited had been in existence long before Dreyfuss began his relationship with New York Central. It had been the flagship train of the railroad since its inception. The train's appeal was not only its facilities but the unrivaled service it provided to passengers in an age when it was the conveyance of choice for the well-to-do making the trip between New York and Chicago. From the iconic cowl of the engine to the wrappers on the sugar cubes in the dining car, the Dreyfuss version of the 20th Century Limited [Figure 23] was rivaled only by its exact contemporary, the Broadway Limited, styled by Raymond Loewy and architect Paul Philippe Cret.¹¹ The two trains made their debuts on the same day in 1938. Like the Mercury, the new 20th Century Limited exposed the running gear of its motor power while exhibiting near seamless form in the thirteen trailing cars, where sheathing of vestibules

and the pinstriping of the cars carried the theme of continuity even further than the Mercury did. Dreyfuss had specified that lights be installed above the drive wheels so that mechanics could work with ease at nighttime. In fact, these lights were left on all night, adding to the public's sense of awe at the train in motion. The steam evacuating from its huge cylinders also added to the train's atmospheric quality.

While contemporary photographers and artists such as Charles Sheeler were enamored of the train's external forms, a real revolution in transportation design had been wrought in the interiors as well. The dining car was the masterpiece of the train. It contained two small spaces at either end that could be screened off from the main body by glass partitions, creating more intimate dining rooms. These spaces could also be used as waiting areas for travelers coming to dine. The need for waiting, however, was partially obviated by the inter-train telephone system that allowed passengers to call ahead for reservations. The train's logotype-the "chimney," as it was referred to by New York Central enthusiasts-appeared on plates, menus, wine lists, and paper ephemera. Travelers would first have seen the graphic logo on the red carpet that greeted them at Grand Central Terminal in New York or LaSalle Street Station in Chicago, and well-wishers would have glimpsed it on the observation car's tailboard as the train departed.

This simple treatment of horizontal bars is an important survivor of Dreyfuss's initial conception of the 20th Century Limited, in which the exterior and interior of the train were to be even more closely related. Photographs of the clay model first shown to New York Central's executives [Figures 24 and 25] demonstrate that Dreyfuss intended this "graphic" treatment to begin at the top of the locomotive's "cowcatcher" and extend over the boiler and run the length of the top of the locomotive. This sheathing provided what might be appreciated as a more gradual evolution in form from the Mercury's "inverted bathtub." There is no existing documentation on what criticisms engendered the creation of the "classic" form of the 20th Century Limited's locomotive as finally produced [Figure 26], but this episode does discredit many writers' notion that Dreyfuss's "classicism" of pure forms had resulted in the perfect solution on the first try.

The interiors of the cars were a model of restraint and serenity. Skillful lighting, provided by newly designed fixtures manufactured by the Luminator Company of Chicago, provided a warm blend of general lighting with tightly focused incandescent spotlights. Some of these fixtures contained a second tiny red bulb that allowed them to be switched from white to red in the dining car after the dinner service was cleared. Dreyfuss imagined the Café Century, as it was dubbed, as a rolling nightclub, with

chinaware in rust reds to complement the color scheme and long-range radio reception and phonograph records to provide music. Sound emanated from speakers concealed behind photomurals depicting the New York and Chicago skylines. In other cars contrasting color was used to provide narrow widths with a feeling of greater space, which was emphasized by trough lighting running the length of the cars. Divans and tables broke up what had once been rows of seats [Figure 27]. Dreyfuss eliminated the mirrors that typically hung on bulkheads in the cars and replaced them with framed reproductions of great paintings drawn from the collection of the Metropolitan Museum of Art, an approach so successful with the public that it became a standard feature on many New York Central trains. In the observation car, instrument displays of the train's current speed and the miles elapsed on the trip added a theatrical touch that involved people in the drama of the train trip.

Just as Dreyfuss had wanted the 20th Century Limited to evoke a comfortable vision of modernity in the mind of the public, he wished to create an imagery of streamlined efficiency in his work for Western Union. He took a single element, the standard message form that was used at the telegraph office, and made it the central motif of the signage and interior of the model office he proposed. Black-and-white photographs can hardly do justice to the impression that the vivid yellow of the forms, echoed in the

yellow stripes in the linoleum flooring, created when complemented by the blue of the walls and floor. (Dreyfuss felt these yellow dashes evoked the Morse code used by telegraph operators.) On the exterior, the impact was more immediate and dramatic. A contemporary account stated that the massive telegraph form, which read "Western Union Everywhere," seemed to hover over the entrance, an effect aided by back- and diagonally-lit etched glass, framed by thin strips of aluminum.¹² Inside [Figure 28], the emphasis was on speed and convenience-message forms were stacked in etched glass containers that also separated the circular desk into four units, defining the user's space. The mixture of direct and indirect lighting put illumination where it was needed most-at the service counter and the customer's fingertips. Even a cursory glance around the office directed the customer's attention to the clock marking "official time." The brushed aluminum hands of the clock echoed a decorative band of messengers running around the central "column" (which also cast light against the ceiling). The yellow Catalin plastic numbers and dashes of the clock marking the hours and minutes completed a scheme that distinguished the public areas (blue) from that of the office workers (yellow).

By the second half of the decade, a persuasive formal language had been developed by Dreyfuss and his associates Herbert S. Barnhart (perhaps the first designer he hired),

Julian G. Everett, and a master renderer named Roland Stickney. The stylistic approach of the Dreyfuss firm was applied to any number of disparate commissions worked on by these men. Moving away from the streamlined teardrop forms that dominated industrial design in the early 1930s, Dreyfuss' s new approach emphasized an abstract play between vertical and horizontal forms that resulted in a convincing imagery of power. This can be seen in a brief survey of the firm' s important designs from 1937 to 1940: the Hoover model 305 vacuum cleaner [Figure 29], the John Deere Model B tractor [Figure 50], the cowl of the Hudson J-3a locomotive that pulled the 20th Century Limited, and the lesser known but coeval truck cab for the Federal Motor Truck Company. In all four designs a dominant vertical is balanced by flanking horizontal forms. This aesthetic reached its ultimate statement in the design for the 20th Century' s locomotive, which recalls a rooster' s cockcomb or the crest of a classical warrior' s helmet [Figure 23]. This masculine symbol is juxtaposed with the smooth half-sphere of the engine' s boiler. In actuality, the boiler stood well behind the locomotive' s headlight and the sphere is, in fact, hollow. As was pointed out by automotive designer Strother MacMinn, a Dreyfuss employee in the years immediately following World War II, all four designs are linked by another factor: they all move. Whether slowly (the tractors) or even back and forth (the vacuum cleaner), they

take their cues from the world of automotive styling, where the illusion of "movement while standing still" has long been a desirable goal. (An automobile that is perfectly balanced visually may be admirable, but may lack emotional appeal, which is what sells cars, and probably vacuum cleaners.) Perhaps this is why Dreyfuss abandoned the strategy of stressing movement when it was suggested by his designers for the revamping of Royal's typewriter. In relation to early studies, the final design has its share of rounded forms, especially at the corners, giving a subtle message about the quality of its manufacture, but as a stationary object it was designed to sit very solidly and rather squarely on its table or desktop.

Indeed, an obscure but pointed critique of the streamlined designs of Dreyfuss's rival Raymond Loewy is found in the marginalia of Designing for People, where Dreyfuss drew a cartoon of the famous teardrop pencil sharpener (a prototype, in fact, that never reached production) with an overemphasis given to the two screws that mount it firmly to its support.¹³ He might just as well have criticized Walter Dorwin Teague's "Bluebird" (also known as the "Nocturne") radio receiver designed for the Sparton Corporation in 1934--as powerful an example of "façadism" as one is to find during this period in United States industrial design.¹⁴ (The components of the Bluebird are fitted into a small sheet-metal box that bears no

relation to the circular blue-glass mirror in front of it.) All of these examples, including the locomotive of the 20th Century Limited by Dreyfuss, are characteristic of the "classical" phase of the design decade of the 1930s and the reliance on the visual vocabulary of what has been termed the Machine Age. Yet these are consumer items, and, were we to look at other categories, for example, at machine tools, we would find that there is a confluence of approach on the part of industrial designers: concern for legibility and placement of controls, horizontal and massive forms giving reassurances of stability and safety, and unification of awkward and dirt-catching forms of subcomponents. In addition, there is something else that they contributed that engineers had not concerned themselves with--an appreciation that the proper mental state of a machine's operator is as much an aspect of functionalism as is the layout and structure of the mechanism itself.

With the coalescence of the industrial design profession and its working processes in the late 1930s, Dreyfuss was turning his attention from the consideration of specific products to their context: the packaging of the product and its replacement parts or accessories, the look of the organization that sold it, and soon, the packaging of services that were less tangible than washing machines and alarm clocks. In 1936 he noted:

A second important change in industrial design is the way in which it is branching out into new

fields—from the merchandising of clocks, washing machines, stoves, furniture and glass, etc., design is beginning to play a part in the merchandising of such things as railroad tickets, telegrams, gasoline, and business, institutional prestige...Designers are busy using color, form and materials, concretely to help sell such intangibles...the designer must be able to understand merchandising and know how to extract the vital principles involved in the problems. These ideas must be dramatized through visual design so that they are intelligible to the average person.¹⁵

The successful industrial designer was thus involved in abstracting the most important elements found in a product (often its newness) and dramatizing them—an operation analogous to a stage designer's attempts to represent a mood through a setting. At the same time, the product-by-product approach that initially put Dreyfuss in the public eye progressed into a consideration of systems, such as telegraphy and transportation. We have seen this abstraction in the linoleum pattern at Western Union that denoted the Morse code and made it visible, and in the Hudson J-3a locomotive's forms that came to stand for power, speed, and stability. In a 1934 article targeted at managers of bus transportation services, Dreyfuss wrote that their struggle was one between "modernism and archaism":

That it could be made far more interesting to travel by bus rather than by train or private car, that it could be a travel service [emphasis the author's] and not merely a means of getting from one place to another, is entirely within the realm of possibility and is certainly desirable. Bus travel needs sales appeal and the bus company which operates a service that invites and attracts, that makes the public want to travel in its buses as the most desirable way of going

places and doing things, will lead the field.¹⁶

Dreyfuss placed his message in a positive context, revealing how the success of design in other realms of transportation boded well for bus services. The specifics he suggests in the remainder of the article relate not so much to such things as color and fabrics to enhance the image of the vehicle or its operator, but to the creation of sales appeal on the part of bus companies. He is no longer addressing a product per se but the packaging of a service. His recommendations to railway operators were similar:

In designing a train we not only design the train outside and in, but also every detail and accessory including the porters' uniforms, matches, magazine covers, china, silver, etc. We feel that if we are designing a product, any detail related to that product in the way of cartons, display, lettering, etc., is part of the job.¹⁷

Dreyfuss does not make a distinction between the service of transporting people and the marketing of a product. His desire is for the transition to seem a smooth and effortless one, as if the shift from designing an alarm clock to organizing the appearance of an entire rail line was simply an increase in scale. Speaking of design as some amorphous abstraction, he saw it as living protoplasm, engulfing and absorbing independent entities and growing stronger by doing so: "Being of proven value, design is growing, broadening, permeating other fields in which it has not before been tried...it is now tackling more extensive and more complicated problems."¹⁸ It would be more accurate to say

that the Dreyfuss firm was "growing, broadening, [and] permeating other fields." His urge to connect design with the Zeitgeist obscures the fact that the progress he celebrates came from the discrete actions of individual men and women. In this passage he does, however, touch upon design's evolutionary qualities: a concern with the modernization of products and with a widening of design's domain. Marketing or creating appeal was key to furthering both tendencies.

Thus, the new profession asserted itself in an area that had once been the jurisdiction of architects and interior designers. A review of Dreyfuss's architectural and interior designs indicates that, partly as a result of his work designing for the stage, he sought to emphasize the integrated setting rather than rely solely on visual effects. His later interiors were designed to augment and accommodate the drama of human events that transpired within his spaces and were not designed simply according to visual aesthetics.

The 1930s saw the establishment of Henry Dreyfuss's basic tenets of design: utility without sparseness, attention to detail within a comprehensive and cohesive program of appearance, and an emphasis on human use that would grow even stronger. These priorities would continue to guide the work of Dreyfuss's firm in the following decades, but certain crucial modifications would determine the

character of his mature work following the turbulent period of World War II. Dreyfuss soon restricted his activities to an average of fifteen major clients at any time, all employing him on a retainer basis and ceding responsibility for most aspects of their public appearance to his control. Such a stable and profitable system of operations allowed him the freedom to experiment, which simply was not feasible when working on a purely case by case basis. This system was linked to the development that most distinguished him in the following years from his contemporaries in the field: that is, a dedicated pursuit of a rational system of anthropometrics that could complement and guide his focus on consumer comfort, safety, and convenience. The coming decade would find Dreyfuss and his associates facing a series of challenges that would take this line of inquiry from the status of luxury to that of necessity. In responding to these challenges, they changed the nature of the practice of industrial design in the United States.

1. Louis Brecker to Rita Hart, November 12, 1953, Designing for People anecdote file, Dreyfuss Collection, 1973.5.5.

2. Dreyfuss, Tunis, to Carl Lessing, New York, March 17, 1928, Henry Dreyfuss file, United Scenic Artists Local 829 Archives, New York.

3. William F. H. Purcell, "Designing for Heavy Duty: A Study of Functional Design Application to the Hyster Company," Automotive Industries (June 15, 1962) (unpaginated offprint in promotional mailings files, Dreyfuss Collection). While Dreyfuss's partner Purcell is the author of this article on their redesign of Hyster's forklift truck, the observation

is Dreyfuss's and is expressed, less succinctly, in his writings from the 1930s.

4. These were for the Stanley Works and P. & F. Corbin Co. In addition, temporary exhibition designs for the Delman Shoe Company, Dennison Manufacturing, and Macy's were helping to pay the rent.

5. "New Product Designs Start Stampede," Forbes 33 (February 1, 1934), 15.

6. John S. Tomajan to Rita Hart, November 9, 1953, Designing for People anecdote file, Dreyfuss Collection, 1973.15.5.

7. Ibid.

8. Ibid.

9. Some confusion is caused by the company's re-use of historic names through the years, but there is no mistaking the earlier Chronotherm, with its vertical thermometer and round clock face, for Dreyfuss's sleek and unified box of 1938.

10. "Planning for Intensive Use of Space," Architectural Forum 64 (April 1936), 238-39.

11. Illustrated in Schönberger, Raymond Loewy..., 78 and 79.

12. The summary in one article noted: "The effect is dramatic, and the design is also thoroughly sound from a practical point of view... Henry Dreyfuss has made this telegraph office stand out from its neighbours, and competitors, as expressing a service which is endeavouring to-day to establish itself as something more than an occasional necessity." "Workshops for Minds: A Telegraph Office Designed to Attract Business," Industrial Arts [England] (Summer 1936), 104-105. See also "Office for Western Union Telegraph Co.," Architectural Forum 66 (February 1937), 119-21.

13. Dreyfuss, Designing for People (New York: Simon and Schuster, 1955), 77.

14. Illustrated in Richard Guy Wilson, Dianne H. Pilgrim, and Dickran Tashjian, The Machine Age in America 1918-1941 (New York: The Brooklyn Museum in association with Harry N. Abrams, 1986), 26. Loewy's pencil sharpener appears on the previous page.

15. Dreyfuss, "What Is Happening in Design," Electrical Manufacturing 17 (February 1936), 20-21.

16. Dreyfuss, "Modernism or Archaism in Transportation," Bus Transportation (July 1934), 241.

17. Dreyfuss, "Industrial Designing is a Profession," Electrical Manufacturing 18 (October 1937), 50.

18. Dreyfuss, "Modernism or Archaism in Transportation," 239.

Chapter Four

The Decisive Decade

The 1940s opened with a challenge for American industrial designers. They had finished celebrating their success in shaping the future at the New York World's Fair to find that exhibition design was not the growth industry they had expected. The large number of designers gathered under the roofs of Teague, Bel Geddes, and Loewy were unnecessary to the now-leisurely pace of redesigning products. Were the stars of the fair victims of their own success? Hardly. The lingering doldrums of the Great Depression, consumer anxiety over the war in Europe, and a lingering inferiority complex about European sophistication impeded the realization of the "World of Tomorrow" in the United States.

Henry Dreyfuss recalled that on the day Franklin Delano Roosevelt opened the New York World's Fair in 1939, the industrial designers had followed the comfort station attendants in the parade of contributors to the fair.¹ It was easy for Dreyfuss to make this comment some fifteen years later, when he was clearly at the top of his profession. But joking aside, the fair had not been without its difficulties for him. Dreyfuss's exhibition for AT&T had gone well enough, with demonstrations of the Voder (an early electronic synthesizer capable of imitating the human voice)

and free long-distance phone calls for those people not averse to being monitored by their fellow fair-goers. But the World of Tomorrow had gone less well [Figure 30]. Attempts to end the six-minute multimedia event in the center of the Perisphere in "a blaze of Polaroid light" as he had originally proposed proved unworkable. Julian G. Everett, his associate and architect on the project, mentioned to another colleague in later years his own animosity toward Grover Whalen, president of the fair, who continually cut the budget for this exhibit.² In a handwritten note, composed at midnight on May 7, 1939, and mailed to S. F. Voorhees, president of the board of design, Dreyfuss noted that the night he had visited the exhibit in person his meticulously organized presentation was a cacophony of lighting, projection, music, and narration all out of synchronization.³

The end of the "Design Decade," as the 1930s were labeled by Architectural Forum in October 1940, did not find Dreyfuss decisively the leader of the "Big Four" (or Five, if one adds Harold Van Doren, in the Midwest, to the list of Bel Geddes, Teague, and Loewy). Dreyfuss benefited tremendously from a number of enduring accounts that expanded his purview during this period: Hoover, Deere & Co., and Bell Telephone Laboratories, among them. He was beginning to define an approach that was friendly to big business but still allowed him to criticize the status quo,

that was protective of the consumer without being patronizing, and that was devoted to an aesthetic of simplicity without the perceived harshness of European formalism of the 1920s.⁴ Graphics, corporate identity, and packaging-what may have been separate pursuits during the 1930s-became the province of a unified design sensibility that stressed evolution over revolution, cleaning over streamlining, and "survival form" over strict functionalism.⁵

This period in American design history is not well documented, but one case is instructive in understanding the difficult situation the industrial designers encountered in the 1940s. Walter Dorwin Teague, Sr., a member of the board of design for the New York World's Fair since its inception in 1936, had contributed an astonishing nine corporate exhibits to the fair. Yet the drop-off in commissions once the fair opened had Teague searching for new possibilities to keep his staff busy. He began undertaking trips to Washington in search of assignments connected with military work and was successful in obtaining military contracts.⁶ Dreyfuss, his competitor, was on a more secure footing during this period. His work for Bell Telephone Laboratories and other major clients increased dramatically as it became clear that the United States's involvement in the war in Europe was certain.

It is difficult to assess Dreyfuss's accomplishments in

the first half of the 1940s. He was among the most important industrial designers involved in the war effort. As his office manager Rita Hart recalled, the entire office was reviewed, and, with one exception, granted "Q" clearance, the highest security rating accorded civilians.⁷ Because much of the firm's involvement with the war effort involved matters of national security, and were confidential at the time, their accomplishments during this era have been overlooked.

One interesting, apparently unpublicized, project that Dreyfuss undertook in 1943 was for Henry Luce, editor in chief of all Time Inc. publications. Dreyfuss prepared a lengthy, seventeen-page letter giving Luce his critique of Time magazine.⁸ In this document he showed tremendous concern that the magazine articulate the political and social differences between the United States and Germany. Dreyfuss was not merely noting these contrasts; he was also telling Luce how to make them sharper and more striking visually for the reader (one suggestion was to illustrate President Roosevelt against a background of Allied flags and Adolf Hitler against a background of massed artillery). In the 1946 prospectus for his autobiography, realized in 1955 as Designing for People, Dreyfuss referred to the industrial designer as "the artist of democracy,"⁹ and surely his conception of this role evolved from such assignments. Dreyfuss also advised Luce to revamp the cover of Time to

make it more informative to the potential reader by associating the ever-present portrait of the man or woman of the week with symbols of his or her pursuit. It was this presentation that determined the format of both Dreyfuss's own portrait on the cover of Forbes (May 1, 1951) and Raymond Loewy's on the cover of Time (October 31, 1949).

In this aspect of his work with big business, Dreyfuss needed sensitivity to be able to mediate between self-promotion and self-effacement. While he seldom displayed anything resembling envy of Raymond Loewy's practice, he was heard to remark, "I don't want to be publicized the way Raymond Loewy is, and all that flashy stuff, but I really would like a Time cover story."¹⁰ Dreyfuss was shy regarding such fanfare. He was also mindful of the conservative attitudes held by his clients. When he did choose a higher profile, following his move to California in 1945, he hired publicist Ben Sonnenberg at the princely sum of \$25,000 per year. Both the outlay of funds and the intrusion into their private lives discomfited Dreyfuss's wife. As part of the publicity campaign, however, a well-placed article in the Saturday Evening Post quelled rumors that the office in New York was on the verge of closing.¹¹

Dreyfuss played up his involvement with important projects whenever and wherever he could. For example, a Life magazine article on the new 500-series telephone in 1949 shows him with Bell Telephone Laboratories President William

Martin.¹² A likeness of the designer also appeared in a two-page advertisement for Honeywell heralding the universal adaptability of the round thermostat in 1953. Dreyfuss obviously enjoyed the respect of his clients--witness his involvement with Washburn Tools throughout the 1930s, the resumption of his work with Crane Company in the 1940s following the Neuvoque line of bath fixtures in 1936, his enduring relationship with Deere & Co. on long-term projects, including the development of a high-visibility compact tractor. Also his regular updates of the Westclox (by this date General Time) lines of clocks and watches, the new vacuum cleaners he designed for the Hoover Company, and his revised layout of McCall's magazine were all part of work quietly pursued during this period. Not all business relationships, however, were successful. For the National Biscuit Company (Nabisco), he proposed new graphic designs for packaging and patterns for their crackers and cookies, but the account went to Loewy. Product, transportation, and environmental or interior design remained the strongest areas of his output during the 1940s.

Dreyfuss's practical knowledge on how to best display and present information began with such designs as the Socony-Vacuum display at Rockefeller Center in 1934 and 1935 and AT&T's New York World's Fair displays of 1939-40. His ability in this area probably gained him the design project for the Situation Room for the Joint Chiefs of Staff in 1942

[Figure 31]. The Situation Room, officially Strategy Rooms A and B, built under tight security, was a commission ideally suited to Dreyfuss's abilities. General William "Wild Bill" Donovan of the Office of Strategic Services, the predecessor of the Central Intelligence Agency, was responsible for Dreyfuss receiving the job. While the information conveyed from this office may have been more important than that of a corporate client, clarity of presentation had always been a paramount concern for Dreyfuss.

Given only six weeks to assemble the conference rooms, he had the interiors built in sections at a set design studio in New York. The sections were then reassembled "like a jigsaw puzzle" in Washington:

...[the assembly] constituted the relatively simple part of the problem, however. The real jigsaw puzzle lay in planning, procurement and installation of security devices, soundproofing, air conditioning, a telephone system, several means of still and motion-picture projection, and a complicated lighting system.¹³

Solutions to spatial challenges were found that were nothing short of ingenious:

The setup was resolved into two large rooms identical in size and parallel in the long dimension, and a small workshop for the preparation of material and storage of maps. Also adjacent was a "file" of sliding four-by-eight-foot screens arranged so that they could be pulled out on tracks. One screen could be used, or a series of screens buckled together, with transparent overlays showing essential data pinned to them.

A world map, accurate and up to date, was painted on a curved, metal-clad surface, twenty-five feet

long and twelve feet high, on a wall of one of the main rooms.... A projector was also trained on the map so that slides, when inserted, graphically depicted action anywhere in the world or indicated weather conditions or other desired information. The other room was for projection of 16-mm. motion pictures, still pictures, and drawings.

Emphasis was placed on making the necessary machinery (movie and slide projectors, variable lighting, etc.) as unobtrusive as possible. In a moment of inspiration, Dreyfuss sought out an overhead projector similar to those used in bowling alleys for the display of participants' scores. Curved contours allowed for the mounting of large-scale maps without interruption.

By downplaying hierarchies in the placement of seating, Dreyfuss helped assuage sometimes difficult issues of rank and service in a setting where such matters were best put aside. To create the Situation Room, Dreyfuss drew upon his knowledge both as a theatrical designer and as an industrial designer, with over ten years experience in each field. We begin to understand the significance of his special approach, when he states that "the genius and experience of Hollywood and Rochester [i.e. Eastman Kodak] were called in to help devise the best visual presentation."

Dreyfuss' s entree into the upper echelons of government probably came through Wallace K. Harrison, whom he would have met in the 1930s, during the building of Rockefeller Center, for which Harrison was one of the leading architects.¹⁴ Harrison' s connection with Nelson Rockefeller

also later led to Dreyfuss's receiving the contract for outfitting the conference room at the U.S. Office of the Coordinator of Inter-American Affairs in Washington. Harrison held several posts in this agency established by Rockefeller in 1941.¹⁵ It was in their designs for the Socony-Vacuum Touring Service Bureau in Rockefeller Center that the Dreyfuss firm experimented with curved and contoured walls, as well as the kind of gadgetry that became essential in the Situation Room. Publicity photographs taken when the touring service opened show Nelson Rockefeller happily engaged in operating the displays Dreyfuss and his associate Julian G. Everett had designed.¹⁶ Historian Jeffrey L. Meikle has associated the curvilinear forms of the touring bureau's interior with the smooth flow of products within a consumer culture, a "streamlining" to ease sales resistance.¹⁷

While the codification and application of the Dreyfuss firm's work in anthropometrics and human factors is the province of the 1950s, important antecedents for their development are apparent in the firm's wartime experience and its immediate aftermath. Historians of design have often emphasized the European contribution to ergonomics, as it has been dubbed, or human factors, short for "human factors in engineering psychology," as it has been referred to in the United States. Certain rules of thumb for the design and use of seating and tools existed in Europe during the 1930s,

but nothing as extensive or detailed as Dreyfuss's seminal Measure of Man of 1959 was available to civilians prior to its publication.

Undeniably, the interest in human factors in the operation of machinery resulted from military experiences during the last years of World War II. The origins of these concerns are largely based on the work of psychologists like Paul M. Fitts, who, because of their experience as pilots, worked out problems in cockpit design during the war, especially regarding the interaction between fighter pilots and their equipment. The high speed of such aircraft had led to increasing numbers of "human errors," many of which proved to be the result of asking for too many responses from the pilot in too little time. Certainly the most crucial realization was that such situations had to be conceived of in terms of a man/machine system, in which a human subject receives information via displays and takes action through controls in an environment of continual feedback.¹⁸ Probably the greatest and least heralded advance Dreyfuss made during this period was his recognition that use, most notably of "fitting the machine to the man rather than the man to the machine," was beginning to play a larger role in his working method.¹⁹ The seminal developments pioneered in wartime work concerned the rapid setup and use of carriages for 105- and 155-millimeter guns for the War Ordnance Department [Figure 32] and habitability studies of

crew interiors for the United States Navy in the postwar years. The accounts of the research of the "classical period" of human factors development (the so-called "knobs and dials era" that followed on the heels of the war) and the presence of such publications in design engineer Alvin Tilley's files in the Dreyfuss office point to the firm's importance in this area. It was Tilley, hired by Dreyfuss in 1946, who drew the now-famous charts of Joe and Josephine, Dreyfuss's typical Americans. Tilley was responsible for most of the interpretation of the hodgepodge of information Dreyfuss's researchers presented to him. For example, information on human measurements came not only from military sources but from the fashion industry in Manhattan.

Work accelerated at the Dreyfuss office when the United States officially entered the war. This was partly due to their involvement with Bell Telephone Laboratories, which had many military contracts. Early work on the physical aspects of radar and sonar systems had the firm consulting on airborne and shipboard equipment. During the last two years of the war, considerations about the way people interact with new technologies was no longer a matter of a system versus its operators. A "man/machine system" with input for a human operator through displays and his or her taking action through controls had become a reality. For example, in designing a radar display featuring a cathode-ray tube, it was not enough to make a durable machine that

reported information accurately. Locating controls according to their importance, rather than the convenience of the manufacturing process, was more than desirable. Operator vigilance was paramount; for example, simply making a picture tube's display brighter would not solve the problem of eye fatigue. The shape of things began to matter as much as the actions they performed. For example, investigations at the Wright-Patterson airbase in Dayton, Ohio, had determined that there were eleven shapes that could be distinguished by touch alone when mounted at the top of control levers. This meant that operators no longer had to take their eyes off the displays or views outside their windshields in order to operate controls safely.²⁰

In addition, there was substantial involvement on the part of the Dreyfuss firm in projects intended for postwar production. The most famous of these were undertaken for Consolidated Vultee Aircraft Company. The company was formed in 1943 when Consolidated Aircraft and Vultee Aircraft merged; later it became Convair, and still later part of General Dynamics. William A. Blees, considered something of a maverick in the world of aircraft manufacturing, had risen quickly in automotive sales to become a vice president in charge of the Buick, Oldsmobile, and Pontiac sales divisions at General Motors in the 1930s. By the early 1940s Blees was a vice president and West Coast manager for Young & Rubicam, the advertising agency that handled the Consolidated Vultee

account. Irving Babcock, chairman of the board of the new company and a former GM man himself, hired Blees away from GM to head military, commercial, and personal sales. Blees discarded the attractive but high-priced models the company's Stinson division was planning to market following the war in favor of updating the Stinson Voyager and a similar model with a larger space for baggage marketed as the Flying Station Wagon. Both planes would have interior furnishings, color schemes, and soundproofing worked out by Dreyfuss. Blees's formula would make Consolidated Vultee one of the few personal aircraft manufacturers to realize a profit in the postwar era.²¹

Dreyfuss had already been involved in building interior mockups for Consolidated Vultee's transport planes (Models 37 [Figure 33] and 39) and with the massive XC-99, the largest transport designed in the pre-jet engine era to be built (with the exception, of course, of Howard Hughes's "Spruce Goose"). The most exciting aspect of Dreyfuss's work for Blees, however, came in two non-military projects, a manufactured house and a flying car.²²

Young architect Edward Larrabee Barnes joined Dreyfuss in California to collaborate on a project for a prefabricated house.²³ Although Dreyfuss was active in California in 1943 and 1944, he did not move his family there until 1945. Barnes and his wife, the former Mary Elizabeth Coss, whom he had married in 1944, lived for a

time in an apartment over the garage of Dreyfuss's first California home. Dreyfuss brought to the collaboration a fascination with assembly-line processes from his design work for mass production in the 1930s. Barnes contributed an innovative scheme to break up the repetition that often results from building large numbers of houses at one time. He varied the contours of the layout by using an L-shaped patio wall. This allowed the houses to be staggered in relation to one another and thereby avoid the monotony associated with developments like Long Island's Levittown.²⁴ Dreyfuss, working with engineers, came up with a plan for building much of the plumbing, ductwork, and electrical wiring into prefabricated wall sections, which would then be erected on site. This proposal took full advantage of assembly-line production and reduced the on-site building of the components. The plan also called for a wall section that combined a honeycomb-like paper insulation that was glued to metal panels to provide rigidity with lightness and take advantage of wartime breakthroughs in materials technology. Dreyfuss worked with Barnes's wife Mary on color schemes for the interior of the model house.

The project was originally intended to provide employment through the government's Guaranteed Market Program for the large numbers of workers formerly involved in the production of military aircraft. Like many of the prefabricated housing schemes developed during this period,

it did not have a major impact on the postwar housing market. Still, the project's viability concerning consumer acceptance was worked out in greater detail than many schemes, as were its technical aspects. A finished example was displayed to the press in a Consolidated Vultee factory in 1947. In spite of favorable press in such periodicals as Arts & Architecture, Consolidated Vultee sold the project to a corporation formed to market the design, Southern California Homes, Inc. It appears that plans went no further than production engineering. Neither of the two prototypes seems to have survived.²⁵

For comparison, one might examine Donald Deskey's designs for Borg-Warner Industries, which sought to address the problems of cost-efficiency and rapid construction through the creation of a mechanical core, encompassing plumbing, heating, and electrical supply in a single unit.²⁶ The differences in Deskey's and Dreyfuss's approach to building systems is that Dreyfuss sought to apply mass-production technology to the walls while Deskey focused on addressing the increasing energy demands and machinery of the modern home (dishwashers, electric water heaters, central heating, etc.). Neither project was as adventurous as R. Buckminster Fuller in his postwar Dymaxion House, which was revolutionary in the system of construction and the mechanical core, which also served as its main support. Both Dreyfuss's and Deskey's conceptions were vulnerable to

the political goals of unionized labor which saw in such plans the usurping of their domains. The plumbers, electricians, and carpenters whose work would be less necessary to the completion of such houses clearly saw the implications of this type of thinking. This situation is particularly ironic as the Consolidated Vultee house originated from the desire to provide employment opportunities. In any event, political considerations at least partially account for the lack of commercial success in these postwar mass-produced housing schemes. Barnes felt that the withdrawal of government support was also to blame for the commercial failure of the Consolidated Vultee project.

Another project for Consolidated Vultee garnered far more public attention. This was the Convair Car, more popularly known as the flying car, a project directed by Theodore P. Hall, chief design engineer for Consolidated Vultee. Hall deserves credit for the idea of the functioning design. The predecessors of the flying car are too numerous to mention, but a working version of the idea was rare. From the limited accounts available, it seems that Hall had developed his concept independently, built a successful prototype, the Model 116, and then sold it to Consolidated Vultee. Ideally, the flying car would provide its users with greater mobility and independence. The Convair Car, unique among such competitors as Robert Fulton's Airphibian,

provided separate power plants and fuselages for the airplane unit and its road-going counterpart. It did not have to expend the energy necessary to haul its flight unit from location to location, and had the additional appeal of making it feasible for owners of the vehicles to rent flight units, reducing their initial investment. Salesmen, for example, might own the ground vehicle, rent the flight unit at a local airport, fly several hundred miles to another airport, then use the vehicle alone to make their business calls.²⁷

Henry Dreyfuss and his team joined the project after Consolidated Vultee decided to produce a more robust four-seater version, the Model 118, in 1944 [Figures 34 and 35]. A remarkable team was assembled for this effort [Figure 36]. Joining Dreyfuss immediately after the war was a talented designer named Strother MacMinn, a native of Pasadena. As a young man, MacMinn had worked for the Walter M. Murphy Company, a carrozeria that built the bodies that covered the chassis of such luxury cars as the Peerless and the Cadillac. MacMinn, a self-described car nut, had worked briefly during the late 1930s in Detroit under Harley Earl at General Motors in the Art and Colour Section (later the Styling Section). He brought to the Dreyfuss office firsthand knowledge of automotive aesthetics as well as the working process perfected at GM. He later passed these skills on to some of the most distinguished figures in

postwar automotive design as an instructor at the Art Center College of Design in Pasadena. MacMinn worked with an excellent draftsman and model specialist named Charles Gerry, whom he said "could draw a perfectly straight line with a 9H chisel-point pencil." Together they coped with Consolidated Vultee's demand that the vehicle be changed from a two-passenger, Volkswagen-like aerodynamic unit to a four-passenger sedan. Working in clay from quarter-scale up to a full-sized version of the car, they prepared the necessary engineering drawings to realize the vehicle in fiberglass, making it extremely light and capable of reaching an astonishing ninety miles per hour, powered by a 26 1/2-horsepower Crosley engine. In short, the resulting automobile was far ahead of its time in terms of its aerodynamic envelope and efficiency. Coupled with a flight unit that boasted a 190-horsepower Lycoming aircraft engine, the flying car, Model 118, was an engineering success.²⁸

Alas, this remarkable achievement fell victim to a new management and bad press. When Floyd Odlum purchased Consolidated Vultee after the war, he began weeding out unprofitable ventures. Odlum's policies led to a sense of urgency regarding the Model 118's development. During flight trials in 1947, an unfortunate set of circumstances led to an accident that sealed the fate of the project. A team working with the Convair Car had spent many hours testing the flight unit. Satisfied with their progress at the end of

the day, they left the combined unit at the airstrip with its electrical systems disconnected. The next morning, when the flying car became airborne, the pilot was unaware that electricity had not been flowing to the fuel gauge, and thus he had no indication that he was dangerously low on fuel. He soon realized, however, the precariousness of the situation and managed to crash-land the aircraft in the desert. The pilot and his passenger survived, thanks, in part, to the vehicle's aerodynamic, flat bottom, but this prototype was a total loss. Reports of the accident in the press made no mention of the Model 118's air- or even crash-worthiness. Coupled with a limited market for such an innovative system of transportation and the high cost of production, the flying car suffered a quiet death.²⁹ Hall continued to work with the concept, buying the two remaining vehicles back from Consolidated Vultee. He went on to produce a road vehicle, the Airway. An all-aluminum compact two-seater car, it was powered by a 10-horsepower engine and utilized a single-speed transmission with an emergency low gear.³⁰ This car was clearly an outgrowth of his Convair Car experience, but it was out of step with the developing trends in postwar automotive design, which favored powerful engines, options like power steering and power brakes, and styling that was more derivative of the look of aviation than of aerodynamic efficiency.³¹ Photographs of the Convair Car in flight have captured the imagination of many young design enthusiasts.

Its carryover of the wartime can-do attitude into the postwar period is indicative of the aspirations, achievements, and failures in the world of design in the 1940s.³²

Simultaneously, in New York, a somewhat less romantic but more far-reaching design project was taking shape. Dreyfuss's relationship with Bell Telephone Laboratories (BTL) had begun long before most accounts, including his own, indicate. As early as 1930, on a consulting basis, Dreyfuss had begun submitting written reports on the installation of Bell equipment in a variety of settings to its management. American Telephone & Telegraph (AT&T) was responsible for renting telephone units and providing service to consumers. Its subsidiary, Western Electric, manufactured the units designed by BTL. For the most part, Dreyfuss's recommendations from the early 1930s were of an aesthetic nature, stressing the need for unifying equipment designs and creating a cohesive appearance that would reflect the research of the company's engineers. BTL, the research and development arm of AT&T, was taking consumer reactions to its designs very seriously.

Many writers have since discussed the competition that BTL underwrote in the early 1930s when they approached a range of designers to make suggestions regarding a successor to the 202 series telephone produced in 1927 [Figure 37]. Research by Sally Clarke has revealed that the mechanical

failings of the combined handset of the "French Phone" (as the 202 was popularly known) lay behind the urgency associated with creating its successor.³³ Dreyfuss refused to participate in the creation of a new model telephone when he was not allowed to consult directly with BTL's engineers. Later, when proposals by other designers proved unworkable or unpopular with BTL's engineers, he received the commission for the Model 300, properly the 302, which went into production in 1937. Dreyfuss's formal debt to Jean Heiberg's 1930 telephone design for L.M. Ericsson of Stockholm is readily apparent in the 302's rectangular base and inward-curving upper body. Indeed, the fact that the 302 as it first appeared was available only with a die-cast metal base while the Heiberg design was produced in Bakelite plastic from its inception is a gauge of the relative conservatism of the engineers at Western Electric and Bell Labs.³⁴ Nonetheless, the 302 was a marked improvement over its predecessor in both form and function [Figure 38].

Dreyfuss received the go-ahead for the development of a new telephone design from BTL in 1946. According to Bill Purcell, Dreyfuss's partner from that year forward, Robert H. Hose (who was Purcell's brother-in-law) was hired by Dreyfuss after a meeting in which Hose presented alternative conceptions of the new desk set model, referred to as the 500 [Figure 40]; Hose went on to head up the Dreyfuss effort and the new design was put into production in 1949.³⁵ When

the 500 first appeared, consumers had their choice of black, as Henry Ford might have put it, for like Ford's Model T, the speed of the production lines limited any possibilities of a choice.³⁶ The designers knew that colored plastics would eventually be used but were unable to get the uniform color range and durability they wanted from the materials available in 1949. There are sketches and even a photograph of a two-color model that preserved the black dial and handset with a colored shell; these date from the period between the 500's debut and the introduction of color. When colored phones became available, all elements were color coordinated, save for the finger wheel and plungers which disconnected the set; these were clear plastic. Color even came to the cords, which were now coiled instead of straight.³⁷ The 500 type, as it first appeared, had a black body and a black dial, with the numbers and letters on the outside of the dial rather than under the holes in the finger wheel, as was the case with its predecessor. This allowed the user to read numbers and letters while a finger was still in the hole. The metal finger wheel was painted black.

At first, inexplicably, the dialing speed of customers using the new telephone in simulations was less than that of the previous 302 model. This led to considerable consternation on the part of BTL's engineers. John Karlin, the first human engineering psychologist in this country to

be employed in private industry, became involved in the project at this juncture.³⁸ Joining BTL in 1945, Karlin had extensive experience with telecommunications equipment from working under S. Smith Stevens, one of the founders of the field, at Harvard University. Their experiments on the intelligibility of spoken messages under a variety of conditions had far-reaching implications, and, as with improvements in aircraft cockpits, had been spurred by the war effort.³⁹ One of his earliest tasks was to evaluate the new desk set telephone design in terms of consumer use and acceptance. Since people rented telephones as part of AT&T's service and did not own them, it seems quite progressive in retrospect of AT&T to have taken consumer preferences as seriously as they did. Karlin soon realized why users were having difficulty in matching their previous efficiency in dialing with the new design. Moving the numbers and letters of the dial to the periphery improved their legibility, but people had difficulty telling when the finger wheel had stopped moving because it was black against a black background. He suggested placing white dots beneath the holes in the finger wheel, and subsequently the addition was made. Dreyfuss later claimed that Karlin had found that adding the "aiming dots" decreased dialing time by seven-tenths of a second.⁴⁰

The "combined set," as the 500 series was called, was composed of the sculptural shell covering the components of

the apparatus, a neoprene-coated fabric cord, and what has come to be referred to as the Type G handset [Figure 39]. The previous handset had been triangular in cross-section along its handle, with the narrow section at the top, which meant that it couldn't be held against the user's shoulder to free both hands (the user's mouth also ended up too close or too far away from the transmitter for speech to be intelligible). The new handset's section was referred to by the design team as "the lumpy rectangle" because of its mongrel (i.e. non-geometric) form.⁴¹ When Dreyfuss first encountered the new handset in a conference with Purcell, he stated that it gave him "griptomphobia," and slammed it down on its base, cracking the base model. Purcell assured him that this was exactly what they were looking for, a design that would provide a firm, flat surface for just such abuse. The telephone company's biggest concern was for what it termed ROH, "receiver off hook" situations. Breaking the connection completely and reliably was a major consideration.⁴² Work on the Type G handset was completed in the summer of 1947, well before the base. A design patent was assigned on November 2, 1948. The same handset is still used in most public telephones in the United States today, partly because of its resistance to vandalism. The handset's thick section, a result of the manufacturing technology of the time, makes it extremely resistant to abuse.

The designers' intention regarding the sculptural shell

of the Model 500's base was concisely summarized by Alvin Tilley in 1953:

Data for the handset preceded the combined set to such an extent that they were almost designed separately, with only a germ idea in the minds of some for the forms tying together. The first form conceived by HD for the new combined set underwent many alterations but it was basically the same from start to finish. It was called the "shoeform" by the staff. All external surfaces were convex with optical cambers to reduce its apparent size. The predecessor was basically an upper section of four concave walls superimposed over a rectangular base. Hence the original conception was the logical outcome of three of our axioms: 1) simplify form, 2) if it is circular make it square, and if it is square make it round, and 3) a design that is neither concave nor convex and without sex is the darndest thing!⁴³

Thus the formal inspiration for the 500 was in part due to its predecessor, the 302; the square base with its classical molding in the 1937 version became a rounded, slightly "bulged" form in the 1949 model, and the "fat triangle" of the Type F handset became the "lumpy rectangle" of the Type G [Figure 40]. This summary makes the process sound extremely easy. In fact modelmaker John Amore was producing so many subtly different versions of the "shoeform" that a new process had to be used to create large numbers of identical plaster models that were then customized to hundredths of an inch [Figure 41]. As the summary below notes, the language used to note these changes could be pretty dry:

Note model #140 to include built-up front corners add to this model a skirt and 1/4 inch high feet like model #98, otherwise the same as #103. Combined set C-42-185, 5 1/4" wide, with optical

corrections and 7 degree rear. Combined set B-42-192-1, 5 3/8" wide, 26 degree dial angle, concave number ring.⁴⁴

The 500 series was tremendously successful in providing a starting point for bringing new services and convenience to users. Multi-line sets, wall telephones [Figure 42], automatic card-dialing sets [Figure 43] and mobile phones were all spun off from its basic makeup of components and forms. Even the Princess, the first telephone marketed by AT&T on the basis of style, had its origins in the 500's development (its internal components were almost identical with the 500 except that it had no internal ringer). Its formal development began with the desire to align handset and base in the same plane. Intended as a bedside telephone, the Princess was the first AT&T product to be targeted at a specific market-teenage girls. This stylistic sensation was soon being used in situations that the designers had not anticipated, such as offices. In fact, its base was so light that it sometimes moved under the force of dialing the phone, and many a Princess was pulled off of a tabletop when its cord reached the limits of its stretch. The design solution in this case was to add a concealed metal weight in the base.⁴⁵

The number of 500 series telephones produced is astounding: from an initial shipment of 86,000 units in 1950 the figure mushroomed to 7,184,000 in 1965, for the desk unit alone. These units were clearly among the most numerous

objects of a technological nature ever shaped by one person's aesthetic. In total, between 1950 and 1982, 93,412,000 units of the 500 desk set were produced, and the total number of permutations including wall sets, key (TouchTone) sets, and general purpose sets including the desk model comes to a stunning 161,679,000.⁴⁶ During a collaboration that lasted almost three decades, Henry Dreyfuss never lost sight of his role as a surrogate for the eventual user of the telephones and systems he helped to design. His role was to anticipate consumer concerns about how these modern necessities would fit into their existing environments, whether they would demand more of the user's attention than previous models, and how they made people feel about a vast communications empire that they usually related to only through these design objects. His "five points": safety and utility, maintenance, cost, quality, and appearance served as a guideline for his designs but were not a road map. The interpretation and prioritization of these points have made his designs endure. Sometimes overlooked because they now seem old-fashioned, these telephones are entirely representative of their respective eras, and of the best that these decades had to offer. Their quiet message of quality was a reflection of the man who helped to shape them.

1. Dreyfuss, Designing for People, 200.
2. Julian G. Everett to Raymond Spilman in a taped interview of 1978, conveyed to the author in a telephone interview with Spilman, March 27, 1992. More than likely it was Everett who drew upon sources as diverse as Ebenezer Howard and Le Corbusier in creating a city of tomorrow with a central hub ("Centerton") and smaller outlying communities linked by transportation networks.
3. In his letter, Dreyfuss urged Voorhees to see that someone would be hired to keep the equipment in order. "Theme Center--Democracity" folder, file box #45, section C.10, New York World's Fair 1939-40 Archives, Manuscripts Division, New York Public Library.
4. Following his European trip of 1927-1928 which ultimately led him to Tunis, Dreyfuss's next direct exposure to European modernism came in 1931, when he went to Leipzig to visit the industrial fair and to meet with Max Reinhardt. Dreyfuss, "Brown Book," 2.
5. On the legitimacy of streamlining in design and Dreyfuss's neologism "cleanlining," see Dreyfuss, Designing for People, 77. About "survival form" he wrote: "Designing for today and tomorrow the contemporary designer must express first the utility of the object on which he is working, second the era in which we live, and last, when the design permits, lurking in the background, some form to be remembered from the past that will unconsciously make the consumer more comfortable in accepting what may be a radical new form to him." Dreyfuss, "Book on Industrial Design 1946," Designing for People misc. files, Dreyfuss Collection.
6. Dorwin Teague, interview with author, January 21, 1993.
7. Rita Hart, interview with author, April 22, 1996.
8. Dreyfuss had previously done the same for Life magazine in 1938. Client response files, Time/Life folder, Dreyfuss Collection.
9. Dreyfuss, "Book on Industrial Design 1946," Designing for People misc. files, Dreyfuss Collection.
10. Donald Holden, interview with author, February 20, 1991.
11. Alva Johnston, "Nothing Looks Right to Dreyfuss," Saturday Evening Post 220 (November 22, 1947), 20-21, 132-39.

12. Life 27 (December 12, 1949), 67.

13. Passages quoted on the Situation Room come from Dreyfuss, Designing for People, 162-64.

14. Wallace Kirkman Harrison (1895-1981) was a member of the team properly referred to as the Associated Architects: Reinhard & Hofmeister; Corbett, Harrison & MacMurray; Raymond Hood, Godley & Fouilhoux. Between 1932 and 1940 this team was responsible for the first phase of building at Rockefeller Center. Raymond Hood's death in 1934 effectively elevated Harrison to the top position as the liaison with John D. Rockefeller, Jr., and Nelson Rockefeller. Harrison's marriage to the former Ellen Hunt Milton in 1926 brought him within the Rockefeller family circle.

15. Dreyfuss and his team had also collaborated with Harrison and his partner André Fouilhoux on the interior of the Perisphere at the 1939-40 New York World's Fair. Dreyfuss noted the following in his "Brown Book," his compilation of personal projects, under 1942: "Strategy Rooms for Joint Chiefs of Staff (for Gen. Wm. Donovan)." Rita Hart recalled a visit from Donovan to the Dreyfuss offices in an interview with the author on April 22, 1996.

16. Most of these displays sought to entertain the public while informing them of the superiority of Socony-Vacuum's process of production, resulting in, for example, lubricating oil with fewer impurities, which were anthropomorphized as the bad elements of society. Rockefeller is shown manipulating a marionette with a control located in front of a display cabinet at the exhibit. Socony-Vacuum, uncatalogued microfilm reel, Dreyfuss Collection. On the business begun by John D. Rockefeller, Sr., see Daniel Yergin, The Prize: The Epic Quest for Oil, Money, and Power (New York: Simon and Schuster, 1991)).

17. See Jeffrey L. Meikle, 20th Century Limited: Industrial Design in America, 1925-1939 (Philadelphia: Temple University Press, 1979). For more on the subject of streamlining and its relation to the consumer and the human body, see Ellen Lupton and J. Abbott Miller, The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination (Cambridge, Mass.: MIT/List Visual Arts Center, 1992).

18. For an introduction to the history of the development of human factors research and applications in the United States, see Paul M. Fitts, "Engineering Psychology and Equipment Design," in S. S. Stevens, Handbook of Experimental Psychology (New York: John Wiley, 1951); Fitts,

"Engineering Psychology," in Sigmund Koch, Psychology: Study of a Science (New York: McGraw-Hill, 1963); Walter F. Grether, "Engineering Psychology in the United States," American Psychologist (1968), 743-51; John A. Kraft, "A 1961 Compilation and Brief History of Human Factors Research in Business and Industry," Human Factors 3 (December 1961), 253-83; E. C. Poulton, "Engineering Psychology," Annual Review of Psychology 17 (1966), 177-200; Paul G. Ronco, "A Bibliography and Overview of Human Factors Reference Works," Human Factors 5 (December 1963), 549-68; and F. V. Taylor, "Human Engineering and Psychology," in Koch, Psychology.

19. For the earliest published statement on the Dreyfuss office's approach, see the article written by his partner Robert H. Hose, "Designing the Product to Fit...Human Dimensions," Product Engineering 26 (September 1955), 166-72.

20. See Francis Bello, "Fitting the Machine to the Man," Fortune 50 (November 1954), 137, for a picture of the shaped knobs in use.

21. "Stinson's Flying Cars," Newsweek 30 (August 4, 1947), 76.

22. It was on the flying car project that Dreyfuss began collaborating with Dr. Janet Travell, who was critical to the development of many postwar projects, making major contributions in the area of seating in transportation design. Travell, a physician who specialized in injuries of the muscular and skeletal systems, had been introduced to Dreyfuss in 1944. For the story of how Travell and Dreyfuss came to be collaborators, see her autobiography, Office Hours: Day and Night (New York: World Publishing Co., 1968), 286 and following.

23. Dreyfuss had solicited recommendations from Walter Gropius, then at Harvard, who suggested Marcel Breuer's student Barnes.

24. Edward Larrabee Barnes, telephone interview with author, February 5, 1991.

25. Henry Dreyfuss and Edward L. Barnes, "House in a Factory," Arts & Architecture 29 (September 1947), 31-35, 49-50; "A Quality House Designed for Quantity Production," House and Garden 77 (March 1940), 124-26, 181; Edward L. Barnes, "Defense Housing," Task (New York) 2, 1941.

26. Borg-Warner Industries document and photograph folders, Donald Deskey Collection, Industrial Design Archives, Cooper-Hewitt, National Design Museum; Jeffrey L. Meikle,

"Donald Deskey Associates," in David A. Hanks and Jennifer Toher, Donald Deskey: Decorative Designs and Interiors (New York: E.P. Dutton, 1987).

27. In a promotional brochure for the flying car published by Consolidated Vultee in 1947, it is referred to throughout as the ConVAIR Car. Folder 1, Consolidated Vultee, Industrial Design Clients, Dreyfuss Collection. For the Convair Car's predecessors and competitors, see James R. Chiles, "Flying Cars Were a Dream That Never Got Off the Ground," Smithsonian Magazine 19 (February 1989), 144-62.

28. Strother MacMinn, interview with author, November 24, 1990.

29. MacMinn estimated that, even in optimistic scenarios, the automobile component would cost more than the entire assembly's original estimate of \$6,000. Consider, for example, that the top-of-the-line Cadillac for 1953 cost only a few hundred dollars less than this figure.

30. David Burgess Wise, The Illustrated Encyclopedia of the World's Automobiles (Secaucus, N.J.: Chartwell Books, 1979), 70.

31. A sad note was added to the flying car's story when a second prototype of the vehicle was lost in a fire at the San Diego Air & Space Museum (now the San Diego Aerospace Museum) in 1978.

32. For contemporary reports on the Convair Car project, see "Designed for the Air-Minded Autoist," New York Times, November 17, 1947 (Dreyfuss Collection); "Long Journey Home: Convair Car Runs Out of Gas," Architectural Forum 87 (December 1947), 14-15; "New Aircraft: Close-up of Convair Car," Aviation Week, April 19, 1948, 21. For more recent overviews, see John Wegg, General Dynamics Aircraft and Their Predecessors (Annapolis: Naval Institute Press, 1990), 184, 186-87; Joe Stout, "GD Flashback: Flying Car Was Designed for Salespeople," General Dynamics World (May 1986); Ted P. Hall clippings file, San Diego Aerospace Museum Archives. The last three references were provided by Ray Wagner, archivist at the San Diego Aerospace Museum.

33. Sally Clarke, "Consumer Demand and Bell Labs' French Phone," unpublished paper, Shelby Cullom Davis Center, History Department, April 28, 1995, Princeton University, Princeton, N.J.

34. Heiberg's design is illustrated in Kathryn B. Hiesinger and George H. Marcus, Landmarks of Twentieth-Century Design: An Illustrated Handbook (New York: Abbeville Press Publishers, 1993), 121.

35. William F. H. Purcell, interview with author, March 16-17, 1991. It is unclear whether Hose was acting as a consultant or as an employee for BTL just prior to his hiring by Dreyfuss.

36. When the Model T began to be produced in staggering numbers in 1913, the only paint that would dry rapidly enough to accommodate the speed of assembly-line production was black.

37. Colored plastic bodies for the 302 had in fact been produced during the early 1940s, but were a rarity. See Kate E. Dooner, Telephones: Antique to Modern, a Collector's Guide (West Chester, Penn.: Schiffer Publishing Ltd., 1992); Ralph O. Meyer, Old-Time Telephones: Technology, Restoration, and Repair (New York: TAB Books, 1992).

38. Bruce L. Hanson, "A Brief History of Applied Behavioral Science at Bell Laboratories," The Bell System Technical Journal 62, no. 6 (July-August 1983), 1573; Karlin, interview with author, August 18, 1995.

39. One notable project that matured in the 1950s was SIBYL, which allowed researchers to test subjects' reactions to the time-lag caused by transmissions relayed by satellite, long before such satellites were operational. Its first tests were on rotary versus push-button telephones. Hanson, 1578.

40. John Karlin, interview with author, August 18, 1995.

41. This and the following quotations are taken from Alvin Tilley's interoffice memorandum summarizing the design effort, dated May 1953, and found in the Designing for People misc. files, Dreyfuss Collection.

42. Without visiting the residence or business where the phone was located, the telephone company was unable to determine in these circumstances whether equipment was out of order or if the handset was simply off the hook.

43. Tilley, interoffice memorandum, May 1953, 1. The fine arts influences on the sculptural form of the Model 500 set are more difficult to ascertain. It is significant that Tilley had been working for Peggy A. Rohde, widow of Gilbert Rohde, immediately before joining the Dreyfuss office. Tilley recounted that Mrs. Rohde would send him and other members of the office to the Museum of Modern Art on a

regular basis during working hours. In addition, Henry Dreyfuss was profoundly interested in the work of Charles and Ray Eames during this same period.

44. Ibid., 3.

45. This may have led designer George Nelson to recall incorrectly at Dreyfuss's memorial service that this had been the case with the Westclox Big Ben alarm clock; see "Henry Dreyfuss 1904-1972," Industrial Design 20 (March 1973), 42. One might recall Dreyfuss's surprise at a customer's choosing a heavier competitor over the Big Ben in Dreyfuss, Designing for People, 68.

46. Program Planning Report A-2402, 1-2, AT&T Archives, Warren, N.J.

Chapter Five

Henry Dreyfuss, Man in a Hurry

The 1950s saw Henry Dreyfuss's conception of industrial design reach millions directly through products such as the Model 500 telephone and the Honeywell Round thermostat. He found himself a leader in his profession, successful in dealing with corporate clients and in articulating the possibilities that industrial design presented to society.¹ The development of an industrial design practice in the office of Henry Dreyfuss, however, cannot be addressed through an examination of his work alone. We have seen that Dreyfuss developed artistically and arrived at a theoretical stance regarding industrial design. Now we need to consider the working methods practiced in the firm he headed.

That Dreyfuss's approach evolved can be seen through his "five points":

The approach—the intelligent approach to any industrial design project is to take the five points that are the catechism of a good industrial designer. They usually are a surprise to manufacturers. They are amazed about it because so many people feel that we are just interested in what a product looks like. That is a consideration, but it is not the first consideration. The vital factors are first, convenience of use, including utility and safety; second, ease of maintenance; third, cost of manufacture and distribution; and fourth, merchandising and competition. And last, but not least, we consider appearance [Figure 44].²

Only a few years before there had been only three points:

Convenience of use
Ease of maintenance
Ease of manufacture³

Bill Purcell noted that Dreyfuss loved the idea of being able to sketch the points out on the fingers of one hand, a quick and easy graphic.

Well, you know why he came down to five? Because he used to draw the hand to show it; each finger got a title!...To hell with it if they were six! Henry was a wonderful mixture of loyalty to reality, but when he got a human interest thing, like drawing a hand, instead of a list of things, one under the other, he would do that and cheat, make it come to that. That's the innovative mind.⁴

In his maturity, Dreyfuss was a prototypical "design manager" rather than an industrial designer in the sense in which this professional label is used today. Like his contemporaries Bel Geddes, Teague, and Loewy, Dreyfuss stood at the apex of a hierarchy where the cultivation of client relationships was of greater importance to the success of the firm than the day-to-day progress of the efforts of design teams. For this first generation of American industrial designers, selling the client was the most exciting part of the job. Niels Diffrient, who came to Dreyfuss from Eero Saarinen's office and was later a partner in Henry Dreyfuss Associates, has the perspective of a second-generation American industrial designer:

...judging from what I've seen of Loewy's work, and Bel Geddes's work, and Teague's, I think that they were used to the flourish, and it was drama, it was high drama to them, and they played it like the theater. And they wanted to be stars in their own rights. And

when the star era began to wane, I think they all generally lost an interest in it. And of course they loved the accomplishment of snaring a big client, and landing a big client was really the thing they were out to do.⁵

This aspect of the profession is of primary concern to the history of design, as these "Big Four" designers were admired by contemporaries as much for their skill in selling design services to major clients as they were for the designs their firms executed. What set Henry Dreyfuss apart from these men was the tight aesthetic control he maintained over the designs executed by his office over the course of forty years. Dreyfuss personally approved every design that left his office, a claim that has not been made for the other three designers. He balanced his excitement for the acquisition of business with a self-imposed restriction, limiting the total number of accounts to what he could oversee personally. Even then he was to feel the strain on his time as he shuttled between the California and New York offices. When in New York, he lived at the Plaza Hotel, where he redesigned the Persian Room in 1950. Besides flying coast to coast he also visited clients, logging hundreds of hours on prop-driven airplanes:

From the outset, I determined to keep our staff small and compact, so we might render a personal service to our clients. As a result, we have restricted our client list to approximately 15, sometimes less, depending on the magnitude of the jobs. If this figure seems small, it should not be interpreted to mean that we have time on our hands. On the contrary, our offices are beehives. The

explanation is that some of our clients may each produce more than 100 products a year, or request us to oversee the design of products made in as many as 20 factories or may have us designing a fleet of transport planes simultaneously.⁶

Dreyfuss liked to say that industrial design entered the domestic scene through the back door-via the kitchen and the bathroom. Dreyfuss the design manager, however, always tried to go to the boardroom first. The outfitting of a Cities Service corporate airplane interior, for example, eventually led to the Dreyfuss firm redesigning the corporation's entire image during the 1950s. Dreyfuss was persistent: in 1930 he proposed packaging designs for American Safety Razor. From 1960 through 1968, his firm was retained by the company to rework its line of products, including the design for an injector razor that won a "Design in Steel" award in 1962. Thirty years of pursuing a client had finally paid off. In the so-called golden age of industrial design, the Dreyfuss firm was the only one employed by all of its clients on a retainer basis.⁷

Maintaining aesthetic control over the firm's output was a primary challenge for Dreyfuss. His talents usually went where they were most needed: in the guidance of other designers, beginning with rough working sketches often made by Dreyfuss in close negotiation with clients. Not a draftsman in the technical sense, Dreyfuss did execute sketches, renderings, and packaging schemes during the first years of the firm's existence. He was fairly skilled in

handling watercolors, but soon left the day-to-day visual development of projects to others, especially Julian G. Everett, whose architectural training had prepared him in a variety of drawing techniques.⁸ Dreyfuss used a shorthand sketching style throughout his career to illustrate his concepts for more skilled draftsmen to work up. This style resembled his marginalia in Designing for People. Rather than cultivating draftsmanship, Dreyfuss learned to draw upside down in order to impress clients. His wife, upset by designers discarding colored pencils before they were used up, bought pencil holders for the office. When the designers showed a reluctance to adopt them, Dreyfuss began carrying the stubs in his jacket pocket and perfected a technique whereby cupping a stub in his hand and drawing in broad motions over a sketch pad, he hid the sketch until it emerged in completed form.⁹

Donald M. Genaro, who persuaded Dreyfuss to let him join the firm as its first "co-op" student and then later headed Henry Dreyfuss Associates, described Dreyfuss as an idea man, capable of immersing himself in details when necessary, and a "quick study" in a number of areas. Work that called for a lot of concentration on Dreyfuss's part could prove exasperating for his employees when there were other decisions, on other projects, to be made. While definitely not a nuts and bolts man, he could follow the details of most engineering arguments. The office staff

tried to avoid getting him bogged down in details, because he was usually the only one in the office (with the exception of Doris Marks) who knew where the organization was headed in a general sense. It was more important for him to concentrate on the overall picture because he was the only person capable of framing it.

Genaro said that Dreyfuss could visualize a total picture in a way that seemed almost mystical. In imagining an interior, the color scheme and overall layout would come to him quickly, reminding one of the skills he had used for stage design. Genaro's description of these cases suggested that Dreyfuss approached states of reverie in which he could visualize something as a totality far more rapidly than anyone else in the office. Dreyfuss, it seems, had thought the same was true of his mentor, Norman Bel Geddes, whose imagination he recalled

was prodigious. He once told me that he needed a blank wall opposite his desk. It represented the unknown, the untried, the realm he loved most to start into. It was his crystal ball. Such an imagination demanded boundless courage. He had the audacity to step through that blank wall into worlds where no one had dreamt of setting foot. And he had no fear that people would scoff, though many did.¹⁰

Dreyfuss managed the business part of the firm with the able assistance of a core team that consisted of Rita Hart in New York, Katherine (Kay) Bray in Pasadena, and, of course, Doris Marks. After interviews with contemporaries and designers who worked for Dreyfuss, it is clear that his wife

freed him from many of the concerns he might otherwise have encountered with such things as personnel, billing, and client contracts. She remained outside of the design process in the office itself, but she and Dreyfuss were a team nonetheless; Henry Dreyfuss, the firm, was their business. While difficult to document, their relationship was crucial to the functioning of the firm. Without his organizational support team, Dreyfuss could not have maintained the schedule that made him a "Man in a Hurry," as one U.S. Steel advertisement described him.¹¹

Henry Dreyfuss and Doris Marks were attentive to their privacy outside of professional matters. Yet many clients were also family friends. When their personal and professional worlds intersected, confidentiality was as important to them as it was in their own family's affairs. Dreyfuss routinely sent letters, clippings, and drawings to friends, and they are kept by many people as personal mementos.¹²

In 1950, when he was written up in the financial section of the New York Times, Dreyfuss was a dynamic forty-four years old.¹³ Teague was a very mature sixty-seven; Bel Geddes, whose star was fading, was ten years younger than Teague, as was Loewy, who would outlive them all. For another eighteen years, the Dreyfuss firm remained in the front rank. Dreyfuss ultimately exercised control, shaping the team that remained when he "retired" at the end of 1968.

They were William F. H. Purcell, his partner since 1946, Niels Diffrient, James Conner, and Donald M. Genaro, all of whom came to the firm in the mid-1950s. Their achievements as Henry Dreyfuss Associates after January 1, 1969, while considerable, cannot be fully explored in this discussion. Dreyfuss's office was always kept small, around thirty people in New York and fewer than ten in California.¹⁴

Dreyfuss, in spite of the buttoned-down image that he projected to the business community, was a creative man who sought new techniques in stimulating the design process. Early on, he had stressed the importance of bringing all division heads from a client firm together for initial sessions in a roundtable approach. An early Dreyfuss cartoon shows a two-headed industrial designer attempting to listen to all of them at once. As his firm grew in size, he used a similar tactic with his own designers and staged "think tanks." Designers and non-designers from the office, usually people not directly involved with the account, would be pressed for new approaches that those more familiar with the challenge at hand might have ignored or discounted. The "outside point of view" that he had emphasized as critical in the design process was sought in his own office.¹⁵

The visual component of these verbal sessions came with the assembly of "boards," on which were pinned the publicity photographs, brochures, and advertisements generated by the competition [Figure 45]. Designers in the office referred to

a "visual logic," in which the important areas for consideration would emerge from the welter of such material. This was different from "research" because it was not a considered, but an intuitive, approach that stressed an immediate reaction.

Well, we always put up all the competition boards. We'd get everything we could on the competition, mainly from the brochures and stuff that the company would have, and we were great believers, all of us were believers in what we called "visual logic." Visual logic was not that process by which you thumb through a report and read about things, but one in which you would take all the data and applicable information and pin it up on the wall, and visually scan it, and see what would register as important and not important. And of course we learned such things as who were the big sellers, and we studied them to see why they were better than others, and we'd read all the specifications on something like a tractor, and see what it did...You couldn't come right out and say, 'Henry, that's a crummy idea,' you know. You had to say, 'Uh-huh, uhn-uh,' so you didn't tell him it was a truly lousy idea. But at least he did foster creative sessions. Of course, those of us sitting around were just pushing with all we had to try to be the one that had the idea that was best, you know. And so it did encourage some innovative thinking. And oftentimes we would come up with some good things that way.¹⁶

Henry Dreyfuss was a man of few and carefully measured words when it came to the weightiest matters in managing his staff. His ability to shift roles and become relatively outgoing in creative sessions serves as an assessment of the range of his abilities. Unlike some of his contemporaries, Dreyfuss exercised, albeit infrequently, his right to veto design decisions by even his top-level staff. A simple

comment such as "that's not our office" from him would be understood by those versed in his style as a command to drop that specific approach or design.¹⁷ When it came to assigning projects, a simple pushing of a stack of sketches across his desk to the person he wanted working on the project was deemed sufficient evidence that the delegation of responsibility had been made. Conversely, a presentation might be rejected in just the same way, with the visual and written material headed for the floor unless the person making the presentation grabbed it.¹⁸

He could be equally efficient when it came to making his expectations understood. Jim Odom, who worked for Dreyfuss before moving on to Honeywell where he runs a department of industrial design, relates a story from when he was a junior member of the office:

Henry, for all of his success, was a fairly modest person, not given to excess in life-style or demonstration. He could quietly devastate a junior designer with an understated remark about lack of attention to a request he had made earlier-I being the devastated party in several instances. On one occasion I had not followed up on an idea he had suggested, and he asked...later at my drawing board (he never forgot that sort of thing) if I had done as he had asked. I made several excuses as to why I had not, and he just turned and walked away. After lunch that same day, he came back to my desk and tossed a copy of Message to Garcia next to me and said, "Read that!" Which as you probably know is the classic, fabled account of someone who was asked to perform a very difficult task and then proceeded to do it without asking how or why or how difficult it might be or making any excuses. I didn't let Henry's softly stated wishes go unanswered again.¹⁹

Dreyfuss educated himself regarding products and processes where his clients were involved. He learned, for example, to sew when working for Singer [Figure 46]. (As there were no other men in his sewing class, he had to use a tailor's dummy while other students paired up to make garments for one another.) An urban dweller, he learned to operate tractors when Deere & Co. became a client; later he kept one at his home in South Pasadena. He learned to type when designing for Royal and rode in tanks (stateside) during World War II-this he promptly reported to his children in a one page hand-drawn "newspaper" he called "The Rinkydink Gazette." Just as he found the time on airplanes to clip articles from magazines to pass on, with notes attached, to friends and clients, he took the time to document his work both publicly and privately. First issued in 1939 as "Ten Years of Industrial Design," a series of privately printed books of his designs was updated in 1947, 1952, and 1957.²⁰ They went to clients, libraries, and advertising agencies, among other places. For his family, Dreyfuss assembled travelogues, drawn in colored pencil, "abstracted" from hundreds of photographs taken with a miniature camera. These pictures might document elements as specific as the place settings and centerpiece at their table on the maiden voyage of the S.S. Independence, one of Dreyfuss's most impressive efforts from this era. He gives the impression of a man constantly in motion, at work even

when pursuing pleasure. Not a "workaholic," Dreyfuss rather seems to have been a man immersed in his role, almost as an actor, delighting in mastering the nuances of his performance.

As convincing as he might have been to outsiders, Dreyfuss left those closer to him with the perception that he did enjoy a certain distance from his assumed persona, who might be dubbed "the man in the brown suit."²¹

He was an imposing figure, tall, handsome and immaculately attired. On entering the boardroom, where we usually met...he had the personal presence to seemingly dominate the scene and challenge others to question his work. I'm sure he recognized this asset as a sales tool. He made the most of it. You could readily think Henry arrogant but happily, in my view, this was only his front."²²

Still Henry Dreyfuss was a man deeply enmeshed in his work and in his mission. The author of the previous description went on to write:

He was a dignified gentleman of integrity and quite willing, with those whom he respected, to make changes that did not violate his standards.

One of the most revealing and unguarded statements Dreyfuss made about his approach was recalled by his partner, Bill Purcell:

So he had, coming up that way [through the theater]...got a lot of self-confidence. In fact I wonder that he didn't get more, because later, when we traveled, we'd talk a lot, and once I asked him how he felt about going into all these firms and talking to people, selling this idea. We were just going in to someone who had kept us waiting quite a long time, and I said, "Henry, what do you

figure you're going to say first to them?
 What do you say to yourself? How do you think
 just before you go in, what kind of a plan?"
 And he said, "I just walk in saying, to
 myself, you bastards, you bastards, you
 bastards."²³

There was, in fact, an adversarial element to his approach with new clients based in the reality that many considered what he had to offer them a luxury. Thus the tight control he maintained throughout his career over initial presentations, with his insistence on presenting a single well-crafted idea, and only ceding control to his associates once the client was committed, seems perfectly understandable. As one person recalled, when you hired Henry Dreyfuss, you were not hiring an industrial designer so much as you were hiring the man and his sense of integrity; he repeatedly described his goal as designs that would reflect the integrity of their manufacturers.²⁴ As his daughter Gail put it, "I think there was such integrity, that people...knew that if it was going to be able to work, that Dad would be the one who could make it work and would give everything to it, too."²⁵ Mildred ("Connie") Constantine, an assistant curator in the Department of Architecture and Design at the Museum of Modern Art during its formative years, gave a pointed assessment of Dreyfuss's place among his competitors. After an international design conference in Tblisi in the Soviet Union, where several of the American attendees were not offered the opportunity to speak, an informal conference was arranged in a hotel room by one of

the officials:

...the man from the design conference didn't want it held any place where it could be bugged. Well, this was 1968. And we had the most fantastic conversation, give and take, each one of us was able to speak, and ask and answer questions all over the place. And it was better than that whole conference. But there it was very clear that Henry and George [Nelson] were carrying the banner, and in similar ways and in different ways. Because they were both men of integrity, and dignity.... And that moral underpinning I don't think existed in a Teague or a Deskey or a [Gilbert] Rohde or certainly not in Raymond Loewy.²⁶

Nelson, probably the most articulate writer on design working in the United States during the period from the 1930s through the 1970s, recounted at a memorial service for Doris and Henry Dreyfuss that

...we fought a good deal. I guess I fought with him. I don't think he really fought back very much. It was like a little puppy yapping at a great, well-organized, well-balanced dog. But I did disapprove of him. I disapproved of him because I envied him greatly. And I disapproved of him because he was always taking the corporate side in any argument. And I disapproved of him because he didn't do real far-out "Bauhausy-type" designs.

But Nelson found that his own "purity" regarding design changed as he became more involved in the difficulties of managing the creative aspects of a design firm, especially during the vagaries we now would label as the break-up of modernism:

...surprisingly, these many, many things that we see in our houses and our offices that Henry had something to do with have stood up very, very well. Even that almost invisible

little thermostat you see everywhere. It's quite hard after ten years to figure out what you would do that would be any better. As time went by it became clear that Henry was not kidding around. He was a bit of an actor and he came by this honestly and he was very conscious of his impact on other people and he got a lot of fun out of playing this up to the hilt until it got to be a habit. But he never really fooled around with any of these assignments and he never took them on as some of us have done as a convenient opportunity to...build a monument to ourselves. This is why a lot of the far-out stuff doesn't look quite as good these days and Henry's looked [sic] very, very solid.... I realized the absolutely extraordinary thing about this man was that he was all of one piece. And the Latin word that has to do with all of one piece I think is called "integrity."²⁷

In many ways, this tribute from Nelson is more compelling than many others because these two men, in the years following their deaths, have come to stand for the best that the two camps they represented had to offer. Nelson, who through his writing and savviness in marketing, raised furniture design in the United States to the level where it could legitimately be discussed in the same breath as fine art, represented a segment of the American intellectual community that could be classed as Europhile and architecturally centered; Dreyfuss, perpetually concerned with "what is American about American design," represented a group of commercially-oriented improvisators who felt that the torch had been passed from the old world to the new in the 1930s.²⁸ The battlegrounds ranged from the galleries of museums to the pages of local newspapers. The ironies of this opposition were revealed in strongest relief

in the "Good Design" shows organized under the auspices of the Museum of Modern Art in New York and the Merchandise Mart in Chicago, where it has been noted that at one 1951 show "a sterling-silver jug designed by Johan Rohde for the Georg Jensen Silversmithy was, at \$210, equivalent in price to the washing machine designed by Henry Dreyfuss for the Hoover Company shown that same year."²⁹ We are left to contemplate what modern design consists of, in the broadest sense. Can handcrafted designs for a wealthy audience be meaningfully compared to the machinery necessary for modern living? Can we consider twentieth-century design apart from the post-World War I notion of "design for the masses?" Such questions were not lost on Nelson, who, erudite, with an excellent education, and highly articulate, was in a very strong position (versus Henry Dreyfuss, a man with a high school certificate but a great deal of practical experience), to place his arguments before the public. His recognition of Dreyfuss's ability in operating in this realm of shifting standards must be understood as an accolade of the first order.

Nelson's mention of "that almost invisible little thermostat you see everywhere" (and the fact that it had been in production for twenty rather than ten years at the time of his speech) provides an opportunity to explore the complexities of creating a successful commercial design during the 1950s [Figure 47]. To appreciate the intricacies

of this process, we first have to recognize that the development of the Round thermostat took place over thirteen years and included a number of technical setbacks and a hiatus caused by World War II.³⁰ Its history borders on mythology, and most of the key players are no longer alive. The Honeywell thermostat is probably one of the most easily recognized and numerous mass-produced designs of this century, and yet its authorship seems disputed. Like much industrial design from this time, the story of its creation is "messy." Messy in the sense that participants did not always keep records or evidence of the contributors to team efforts. The design process is rarely linear, and many product designs resulted from the desires of marketing and sales departments. Nonetheless, it seems that Henry Dreyfuss's role was critical in the success of the Round. He enjoyed the esteem of Honeywell's management as well as its staff, and this new piece of apparatus illustrates perfectly his conception of the role of design in society.

By the late 1930s, Dreyfuss was working with the Minneapolis-Honeywell Regulator Company on the creation of both consumer items like the Chronotherm and such industrial components as housings for gas valves and linkage covers. Honeywell was involved not solely with specific devices but with systems. Industrial design had proven its worth in addressing not just sales appeal, in the phraseology of the 1930s, but improved function. Questions of the role of

appearance in design become more complicated when a mass audience and the desire to encourage mass consumption are also involved. A designer shaping a flagship locomotive does not face the same constraints as one working on a washing machine design meant to appeal to an upper and middle class clientele (as was the case in Dreyfuss's work on the Sears, Roebuck & Co. Topoperator and the higher-priced version for Associated Merchandising Corporation, both produced by the Nineteen Hundred Corporation of Binghamton, New York).³¹ For Henry Dreyfuss, generating a sense of cohesiveness through all of these categories of design, high and low, consumer and industrial, was a primary concern. If we observe the same formal elements being used over a range of categories by the same designer, it is not illogical to see these as a manifestation of his desire to create a sense of cohesiveness within a corporate appearance.³²

Dreyfuss addressed sales appeal in the case of the Chronotherm thermostat by first redesigning the MH logo, making it more linear and uniform, while retaining the "survival form" of the serif on the M, and then relating it to the linear treatment of the Chronotherm casing. In this manner he was reiterating formal themes in a way that stressed the comprehensiveness of his approach, making it "all one thing," while creating a design with immediate visual interest. In the case of industrial components, Dreyfuss strove for a visual solidity of form, such as a

look of massiveness and the elimination of visible screws, combined with attention to color, graphics, and proportion. By the 1950s, the application of these concepts on an item by item basis had reached the level of addressing the "family appearance" of Honeywell's products across all categories. In a now-lost rendering by Roland Stickney, dated May 29, 1950, a proposed round Chronotherm appears among both thermostats and industrial gauges. Dreyfuss's designers were soon generating guides to camber and radius treatments for box-type covers for industrial components, giving them the look of quality that did away with the sheet-metal aesthetic of the engineer.³³

The genesis of the Round thermostat, arguably Dreyfuss's most enduring design, probably began in discussions between himself and Harold W. Sweatt in 1940. Sweatt, as president, now headed the firm where he had begun work under his father, W. R. Sweatt, and immediately following Mark Honeywell. H. W., as he was known, had been involved in the business since he was a teenager, and was keen on bringing Honeywell's marketing approach to a more sophisticated level. Dreyfuss's alter-ego in the development of the Round was Carl Kronmiller, a design engineer who had come to Honeywell from Time-O-Stat Controls, a competitor purchased by Honeywell in 1931. According to Kronmiller's associate Carl Hoyt, another Honeywell employee, Kronmiller

...told me quite frankly that H. W. came to his area one day in 1940, sat down at his

desk, and they talked about products. Carl told H. W., "We need a radically new thermostat. Why can't we make something a lot different from our competitors' models and different from our own thermostats?"

Carl told me that as they talked, H. W. picked up a piece of paper and started drawing circles on it. Then he handed the paper to Carl and said, "Here. Go ahead and make something of it."³⁴

This detail is especially telling as it describes Dreyfuss's typical working method as well. In fact, one of his pastimes was attempting to draw perfect circles freehand. Proposals he drew for clients on cocktail napkins from the Plaza Hotel's Oak Room were numerous.³⁵ Dreyfuss also made the observation that rectangular thermostats (at this time, all thermostats were essentially rectangular or ovoid in shape) seemed to be impossible to mount on the wall without appearing crooked.³⁶ To further complicate the story of the Round, it should be noted that during Kronmiller's time as Time-O-Stat's design engineer, the company had manufactured a round thermostat of a sort prior to its absorption by Honeywell.³⁷

Initial models of the Round thermostat differed considerably from the form we know today. From the front it appeared to be a solid, rounded disc of buff-colored metal or plastic, with the dominant element being a curved thermometer with a scale beneath it keyed to its rise and fall and to a central rotating disk that allowed the temperature to be raised or lowered. The earliest extant

rendering of one of these models is dated April 1, 1942, which belies the accounts that say development ceased because of World War II. In fact, test models had been installed in Honeywell employees' homes a year prior to this date. A design patent for a "control instrument," this early version of the Round, was filed by Dreyfuss on June 19, 1942, and was granted design patent 136,850 on December 14, 1943. Carl Kronmiller filed for a patent on the mechanics of the same design on December 4, 1942, which was granted on February 12, 1946 (2,394,920). But Honeywell still did not have a functioning round thermostat it could market. However, two aspects of the final Honeywell Round first appeared in this line of development: a rendering from May 19, 1943, shows an "Acratherm w[ith] clear plastic cap[,] concentric line treatment wall plate." In the final version, the cap would be removable, allowing it to be painted to match the color of the room in which it was installed; the wall plate, considerably larger in diameter than the thermostat itself, would cover the outline of any previously installed thermostat which the Round replaced.³⁸

According to Honeywell, the program was revived in 1946. The chief problem with the existing format was the curved thermometer, which one source states had an 80 percent discard rate-only one in five functioned properly. Ultimately, it was done away with entirely, and the thermostat came to rely on a bimetallic coil thermometer

(invisible with the cover in place) for sensing variations in room temperature. Methods developed during wartime production lowered the cost of manufacturing this item considerably and increased its reliability. Kronmiller and Dreyfuss introduced the concept of the plastic "picture window" to the thermostat's design. This called for considerable hand labor in painting half of the interior of the plastic dial, adding to the cost and slowing the production rate. The program abruptly came to a halt again in 1947, with the project now \$58,000 in the red. Dated sketches by Dreyfuss and his staff, which are found in the firm's microfilm records, however, indicate that the office continued to work with permutations of this idea. It was in 1948 that Dreyfuss seems to have first proposed a "Round Chronotherm," which would take the 1946 version of the design with the clear plastic window and add an electric clock. This was an updating of an idea he had worked with since his speculative proposals to Honeywell for thermostats in 1929. He would continue promoting this concept well into the early 1950s, when the Round reached its final form.

It was early 1950 when a new marketing director at Honeywell saw considerable potential in the idea of a round thermostat. Herbert D. Bissell recalled that, despite Honeywell's domination of the market, he was stunned by how little their products differentiated themselves from those of their competitors. Further, he saw that the "plain-Jane"

rectangular boxes being manufactured at that time as a major challenge in terms of creating an advertising campaign.³⁹

Apparently searching for any way out of the situation, Bissell recalled

One day I learned there was an old clay model of [a] round design gathering dust on a shelf in the engineering department. I went to see Charles B. Sweatt, brother of Harold and Executive V.P., and explaining our marketing dilemma, asked for permission to see what we could do with the round model...The lead Heating Controls engineer was Carl Kronmiller. He welcomed my visit while claiming the round design was really his idea rather than that of Henry....⁴⁰

It seems that marketing drove the program to bring the Round to production. But serious challenges remained for engineering and production teams to solve. The increasing use of modern conveniences in the home, such as central heating, clothes dryers, and natural gas for heating and cooking, as well as aesthetic changes like uncarpeted floors, led to a proliferation of dust in typical interiors which clogged the open electrical contacts used in early test-market versions of the Round. The substitution of a miniature mercury switch within the thermostat (like the bimetallic thermometer, invisible when it was installed) solved this problem. It also allowed for the use of line voltage—the same level of electric current that ran throughout the rest of the house. This was a tremendous advantage, eliminating the need for a separate power supply and the wiring it would entail. Flaws in mercury switches

plagued production for the same reason many of the curved thermometers had failed-contamination from foreign matter.⁴¹ Again, wartime production provided an answer, in this case the creation of "clean rooms" in factories where positive air pressure from air conditioning machinery kept contaminants like dust outside of the workspace. At first Honeywell produced their own mercury switches, but in 1950 they acquired Micro Switch of Freeport, Illinois, enabling them to produce more switches, more cheaply, due to the expertise in this new division. It is fair to credit the final use of both the bimetallic coil thermometer and the mercury switch to Carl Kronmiller, who was familiar with these components through his previous work with Time-O-Stat. But again, assessing the decision-making process behind the development program is difficult.

Bissell gave a frank and appreciative evaluation of Dreyfuss' s contribution:

Henry Dreyfuss had little to do with the production and sales planning overall. But he and his people had everything to do with perfecting the design with the engineering department and recommending to me and sales that we make our product appear in color in our promotion and attempt, in effect, to give an historically uninteresting device, some sex appeal. The result...[was] the full color double spread advertising in the Saturday Evening Post and Life plus trade papers and literature.

The introduction to both manufacturer and to the trade was a smash!...it was the design [his emphasis] that did the trick...The painting idea was exciting and played, in my view, a valuable and treasured role. The fact that the color option was not often widely

followed later on was an academic issue. The opportunity it presented to present the product in color took it out of a black and white category and made it sparkle. Henry did this for us....⁴²

When it was released in what was, by Honeywell's previous standards, a major advertising campaign in 1953, \$633,500 had gone to the development program. The Round debuted as the least expensive of Honeywell's line of thermostats, costing \$12.80 plus installation. In comparison, the Chronotherm retailed at \$39.50.⁴³ Kronmiller was granted a patent (2,729,719) for the Round's mechanical aspects on January 3, 1956; Dreyfuss was granted the design patent (Des. 176,657) on January 17 of the same year. Bissell would present an award to Kronmiller as "the guy who more than anyone else did the job on the Honeywell Round."⁴⁴ It was Henry Dreyfuss, however, who appeared in the advertisements, and the number of his collaborations with Honeywell increased markedly in the following years.⁴⁵

One can definitely see Dreyfuss's mind at work in a product that expressed his design credo but never proved the hit that the Round was—that is, the "Tap-Lite," [Figure 48] which, with its clear plastic wall plate, allowed customers to align it with their wallpaper, much as the Round had removed concerns about thermostats hanging straight. In retrospect, the Tap-Lite appears to be the quintessence of the push-button era, and another design that sinks comfortably into the background, like the Round, or the Bell

Telephone 500 desk set. These were designs that did not "date." Years later, Dreyfuss would summarize the role of the industrial design profession, clearly thinking in terms of these achievements:

We say that a design expresses the excellence of its engineers and reflects the integrity of its manufacturer. That hardly suggests a seasonal change. We [industrial designers] are not in the business of style or fashion. Ours is a basic approach; our designing must be generic by nature. If the most contemporary of design can be called "classic," then call us classicists.⁶

By the end of the decade, Dreyfuss was increasingly described as the conscience of his profession. By 1958, he was openly critical of one branch of the profession: the school identified with GM's chief stylist Harley Earl, going so far as to describe "the car Detroit should be building." He proved rather biting in this instance:

Detroit's reliance on the stylist is based on the perverse notion that the way to care for a sick man is to call in a tailor. Don't fret about his organic ills, just buy him a new suit. He'll look better...for all the emphasis on styling, our cars are vulgar and monotonous. They're like the legendary brassy blonde: she's pretty dazzling for the first five minutes, but then you're embarrassed to be seen with her....⁷

Dreyfuss backed up his reproach with criticism of the Motor City's products from the human factors standpoint, citing the eventual discomfort caused by bucket seats, for instance. But his censure was less of Detroit than of the disposable values he felt were expressed in the aesthetics of planned obsolescence:

...But while one manufacturer is using "artificial obsolescence" as a convenient way of maintaining the status quo, another manufacturer is capitalizing on "genuine obsolescence." The realistic manufacturer is working toward a fundamental improvement in his product, an improvement that will give the consumer a really convincing reason for trading in the old model...In our fast-changing world, nothing seems so obsolete as the idea of "planned obsolescence." We're going to see products become functionally obsolete so fast that it will seem absurd to think up ways of making them stylistically obsolete.⁴⁸

Genuine obsolescence, for example, could be expressed in the change from the open electrical contacts of the conventional thermostat to the mercury switches used in the Round. These improvements literally outmoded their predecessors on the basis of function. An equally relevant case can be found in Henry Dreyfuss's work on farm tractors for Deere & Co.

In 1937, engineers at Deere's Waterloo Tractors Works in Iowa found that they were encountering aesthetic problems they could not solve on their own. Vice president of manufacturing Charles Stone was dubious about the involvement of "stylists" in the creation of agricultural machinery. Nonetheless he gave his blessing to the engineers seeking outside help. A young engineer named Elmer McCormick was promptly dispatched to New York, where he made quite an impression in a fur coat and straw boater and persuaded Dreyfuss to accompany him to Iowa that very night.⁴⁹

Soon Dreyfuss and his associate Herb Barnhart were busy consulting on the revision of the Model B tractor. A full-

scale wood-and-steel mockup was constructed that was split bilaterally down the center of the hood; two different appearances were created on each side. Other aspects of their suggestions were truly prescient, such as recommending that brake and clutch pedals have appropriate symbols cast in their iron forms. The suggestion was not taken at the time, but such symbols were a major innovation of Dreyfuss's work with Deere following World War II.⁵⁰ The Model B tractor of 1938 that emerged from their consultations had a visual unity [Figures 49 and 50]. They had taken the machine from the look of an assemblage of discrete parts to one that was whole, with the most dominant element being the unified radiator cover and hood on which Dreyfuss received a design patent.⁵¹ This was not a mere dressing up of components, as in the case of the slightly later tractor that placed the works under the body of what appeared to be a conventional sedan. [Dreyfuss noted that operators tended to remove the metal panels that covered engine compartments the first time they had to work under the hood and leave them essentially discarded in barns or garages.⁵²] The narrow hood and horizontal radiator louvers constituted a new look for Deere & Co.'s tractors and created a "family resemblance" between all models in the coming years. They were replaced with the complete reworking of the John Deere line that constituted the "New Generation of Power" of 1960, some twenty years later.⁵³

The new line of tractors came on the heels of a model-by-model updating of Deere's equipment, in which Dreyfuss and his team created more than a few classics. For the Model R Diesel tractor of 1949 [Figure 51], they managed to create an image suited to its tremendous power. For the previous horizontal treatment of the radiator louvers, Dreyfuss substituted a vertical radiator grille, which was perforated for ventilation and shaped in a "corrugated" pattern that increased its surface area. This idea came from Dreyfuss's observation that farmers often had to rake chaff from the radiator grilles with their gloved hands, and the design (again, the recipient of a design patent) accommodated this situation.⁵⁴

Deere & Co.'s tractors had been known for their robust character beginning with the Model D (1923), the first tractor to bear the name John Deere. Prior to 1960, all John Deere tractors were powered by two cylinders, mounted horizontally. This meant that individual engine components were relatively large, and their operators could serve as their own mechanics. "Poppin' Johnnies," as the tractors became known because of the distinctive sound of their engines' exhaust, were served well by large, durable gears, a one-piece transmission case, and pressure lubrication to the main and connecting rod bearings and piston pins.⁵⁵ Demands for additional power, however, put an end to this format. At first the need was for operating attachments and

hydraulic systems, and later for amenities such as air conditioning for enclosed cabs. To stay with the two-cylinder engine would have meant increasing the size of the pistons to a degree that they could no longer be contained within a tractor of a size that could function between rows of crops.

Rather than simply accommodating the need for a redesigned engine, Deere & Co. management, in the persons of Charles Wiman, the chairman of the company during the inception of the program in 1955, and William Hewitt, his successor, opted for a complete redesign of the line of John Deere tractors.⁵⁶ For the first time, the nomenclature for referring to the various models would be standardized by numerical designations (there would be no more Model As, Bs, Rs, etc.). This meant that graphics for the tractors could also be unified; field tests were done on the legibility of typefaces and colors at varying distances (Deere & Co.'s sales and advertising divisions had long recognized the potential public relations benefit inherent in "chance" news photographs of its equipment). Most important, perhaps, was the fact that a certain amount of redundancy and performance overlap between models could be eliminated through this complete revamping. Yet the program carried with it a large amount of risk: the buyers of agricultural equipment were known for their reluctance to embrace untried products. Since the United States companies producing tractors had, by

this time, pooled many of their patents in a cooperative arrangement, the performance of similar machinery made by different firms often proved identical. It was understood that appearance would have to be a determining factor, and that, in distinction to many industries, there would have to be a serious effort to create a reassuring continuity while introducing a radical change.

The most visible aspect of carryover from the previous equipment was the green and yellow paint scheme that had been a part of the aesthetic of John Deere tractors since the Model D. Yet even this was not ignored during the design phase: surviving sketches in the Dreyfuss Collection show the hoods of Deere & Co. tractors with stainless steel panels, a number of predominantly yellow schemes, and even some suggestions that Dreyfuss's beloved brown was considered at one point by his designers. In the end, the vibrant green punctuated by yellow detailing prevailed as it had in the past. Dreyfuss's primary concern was with the overall impression created by the tractors' hoods [Figure 52]. Early in the planning stages he made the argument that the new tractors should be able to accommodate liquid propane storage tanks within their contours, rather than being bolted on to the exterior as an apparent afterthought⁵⁷ (the bulkiness of the fuel versus kerosene or diesel caused this problem; its relative cheapness was the reason operators used it in the first place). This concern

was addressed by moving the fuel tank to the front of the tractor, which increased operator safety to some degree, but made the tanks more liable to damage. Thus, the tractors, viewed head-on, changed radically from their predecessors. Instead of the horizontal louvers of the tractors of the '30s and '40s, or the vertical, "corrugated" radiator shields of the '40s and '50s, now a solid and substantial plate of painted steel formed the "prow" (small vertical louvers were added late in the design process to increase air flow to the engine compartment for cooling). The radiator grille, so to speak, was now shifted to the sides of the tractor. Two benefits accrued following this change: the addition of the heavier-gauge steel at the front meant better support for the hood, which was to be a single, die-formed sheet of steel, and for the industrial versions of the tractors which became front-loaders, no additional protection needed to be added, substantially improving their appearance over their predecessors. Dreyfuss had insisted from the early stages of the project that the one-piece hood was feasible, citing the roofs of contemporary automobiles as proof. Its curved form was to visually compensate for the varying dimensions of wheels that might be outfitted on individual tractors. On most of the "New Generation" tractors, the one-piece hood contributed to the visual impression that the vehicle was in the process of pulling, reinforcing the notion that a new, more powerful engine was

concealed underneath. As with most of his designs, Dreyfuss demanded that visible seams, screws, or anything that distracted from an impression of massiveness be avoided—in this case that included frankly acknowledging the joins in the metal panels.

The design of the seats for the new line of tractors was an undertaking of such significance that it merits discussion. Even those unfamiliar with farm equipment instantly recognize the steel seats, pressed into a saddle-shape, that were first used in the nineteenth century and were still the norm in the 1930s. One of Dreyfuss's earliest proposals to Deere & Co. was for a seat that would have more comfortable slits rather than the "cheeseholes" that served for ventilation and the drainage of rainwater if equipment was left out in the elements. (Dreyfuss's proposal was rejected at the time because all of the Deere & Co. divisions would have had to implement its use, and due to the decentralized nature of the company, this was unlikely.) The design process at the time prior to Dreyfuss's involvement with Deere was simplicity itself: the worker with the largest posterior dimensions was chosen as the model.⁵⁶ This changed markedly with the entrance of Dr. Janet Travell, who had been studying tractor operators from films provided to her by Dreyfuss. Her contributions to earlier projects for Consolidated Vultee had made her Dreyfuss's consultant of choice on seating. She apparently

caused quite a stir when she appeared wearing green slacks and a yellow blouse for her first meeting with Deere's engineers, and probably some amusement when she took the driver's seat herself and piloted a tractor "at a snail's pace." She later wrote, "for awhile theory and practice seemed far apart," but she was gratified when the final design approached her initial conception quite closely.

I was proud of the end product of my happy collaboration with Deere and Company's research and development team and with Henry Dreyfuss and his associates. When our seat was finally unveiled on a new line of John Deere tractors at the introductory show in Dallas, Texas, on August 30, 1960, I was told that one demonstration used a lanky tall Texan and a short fat boy to emphasize the quick adjustability of the tractor seat to accommodate operators comfortably.

In that period of time, I was meeting with Presidential candidate John F. Kennedy in New York. From the start of the tractor seat project in January, 1953, I had stipulated that my name not be used in connection with any advertising, and my wishes were meticulously respected. I was a dark horse in tractor seat design.⁵⁹

The seat was the ideal complement to the visual refinements made to the tractor. By mounting the moving, three-piece seat on a metal support angled at roughly twenty-seven degrees, a wide range of body types were accommodated. The seat slid down and forward to adapt to shorter operators; when a quick-release lever was pulled, the seat rose with the operator when he stood. An ingenious mechanism "remembered" the previous setting of the seat when the operator sat down again. This was very desirable as

farmers were in the habit of standing while driving tractors for a better view of their path and to stretch tired muscles during hours spent at the wheel. The bottom of the seat was inclined slightly forward to encourage operators to brace themselves with their leg muscles while moving over rough terrain; a lumbar support cushion for the lower back was extended to provide arms. The spring-mounted upper cushion allowed the driver to lean back and relax when riding on smooth terrain. Suspended by "rubber in torsion," the seat absorbed much of the shock that had plagued farmers since the introduction of mechanized agriculture.⁶⁰

Prior to "Deere Day in Dallas," 136 [Figure 53] tractors and 324 other pieces of machinery were shipped in relative secrecy to the location near the Cotton Bowl stadium where the events would be held in the gigantic parking lot. A more intimate introduction of the tractor, however, took place at Nieman Marcus department store, where a gigantic gift box, complete with bow, appeared near the jewelry counter with a card telling customers they would soon see something that they had never seen in the store before when the box was opened. On hand that day were Bill Hewitt, Tish Hewitt (who, presented with shears on a velvet cushion, cut the bow), Stanley Marcus, the presiding marketing genius of the store, and his friend Henry Dreyfuss [Figure 54]. When the sides of the massive package were lowered, the assembled crowd beheld a brand-new John Deere

tractor, decorated with a number of diamond accessories that Marcus had attached to it at such key points as the exhaust stack. A model in pearlescent sequined coveralls stood astride the green-and-yellow machine. A few weeks later a chanteuse named Marlene Dietrich bought the coveralls.⁶¹ A distinctly American cultural milestone was reached that day. Henry Dreyfuss, clad in brown, was in his element.

1. Dreyfuss was President of the Society of Industrial Designers in 1947 and of the newly unified Industrial Designers Society of America in 1965. The latter unified the Society of Industrial Designers (renamed the American Society of Industrial Designers in 1955) with the Industrial Designers Institute (founded as the American Designers Institute in 1938) and the Industrial Designers Education Association.

2. "The Role of the Industrial Designer," Product Engineering Magazine (September 1950) (clipping in Dreyfuss Collection).

3. Gilbert Seldes, foreword to Henry Dreyfuss, A Record of Industrial Designs, 1929 through 1947 (New York: Davis, Delaney, 1947), 2.

4. William F. H. Purcell, interview with author, March 16-17, 1991.

5. Niels Diffrient, interview with author, March 1, 1991.

6. Henry Dreyfuss, "Industrial Design: Profile of an Organization," transcript of a speech delivered before General George Doriots's class in manufacturing, Harvard University Graduate School of Business Administration, Cambridge, Massachusetts, November 9, 1965, 3, Dreyfuss Collection.

7. For his time against these retainers, Dreyfuss initially charged \$75 to \$100 per hour (later, in the 1950s, \$150 per hour). Rita Hart, interview by author, April 22, 1996. These amounts, among the highest charged by anyone in the profession, were greeted with disbelief by his contemporaries. Dreyfuss also insisted on yearly contracts with clients that retained him "to make sure you still love us" (i.e. the Dreyfuss firm). This is confirmed by copies of

the contracts in the Deere & Co. Archives in East Moline, Illinois.

8. For an example of Everett's proficiency, see the article he co-authored with Robert H. Hose, "The Mechanics of Industrial Design," Product Engineering 24 (January 1, 1953), 121-28.

9. Donald M. Genaro, interview with author, October 16, 1990.

10. Dreyfuss et al., "Norman Bel Geddes (1893-1958)," Industrial Design 5 (June 1958), 51.

11. "Henry Dreyfuss: Man in a Hurry" [U.S. Steel advertisement], *ibid.*, 7 (October 1960), 19-21.

12. Unfortunately, Julian G. Everett and Robert H. Hose, Dreyfuss's partners in New York during the 1950s, left behind few written documents about their years with Dreyfuss other than published works. In 1958, the Dreyfuss office was reorganized after an extensive look into problems with the chain of command in the day-to-day management of client accounts. A partnership, which had begun in 1930 with Dreyfuss, Marks, and Hart, and by 1952 had come to include Everett, Hose, and Purcell, was dissolved; only Purcell remained as a partner. Heads of accounts were now referred to as associates. In effect, Everett and Hose had been demoted. The situation was especially difficult in light of the fact that Hose and Purcell were brothers-in-law. Everett retired within a few years, and Hose opened his own office, where he was followed by several Dreyfuss accounts, Hoover being among them. Hose was president of the Society of Industrial Designers from 1953 to 1954.

13. Robert H. Fetridge, "Along the Highways and Byways of Finance," New York Times, June 18, 1950, Financial Section.

14. According to Don Wallance, there were thirty staff members at the time of the creation of the Model 500 telephone. See Wallance, Shaping America's Products (New York: Reinhold Publishing Company, 1956), 43.

15. "Rita Hart: Occasionally you would have think tank sessions, he would call them that.

Don Genaro: Henry would oftentimes pull in people that had no experience within a given area in an effort to try to show up some fresh ideas. Industrial designers pride themselves on being able to switch gears very quickly.

RH: The outside point of view.

DG: The outside point of view, exactly. And sometimes he would bring people in who were not working on telephones or

tractors or whatever, and stir them up. And it paid off." Rita Hart and Don Genaro, interview with author, February 5, 1991.

"Dreyfuss would throw out a hundred ideas. Maybe ninety-seven of them were no good, but three of them would be the best. And Henry insisted that you couldn't get those three without the other ninety-seven." Donald Holden, interview with author, February 20, 1991.

16. Niels Diffrient, interview with author, March 1, 1991.

17. Jim Conner related the following story. He had been working with Bill Purcell (who had been heading this project for Deere & Co. as with many others) for about a week on a roll assembly, similar to a roll bar used in dune buggies and other open vehicles. Working in the South Pasadena office one Saturday, Conner was approached by Dreyfuss who asked him what he was working on. Conner showed him a series of drawings that Dreyfuss felt looked too irregular or skewed for the kind of solid image he wanted to convey. When Conner replied that he thought he should talk to Purcell about the matter, "Dreyfuss went red just like a cartoon character." It was clear that he was furious with even the suggestion that he was not exercising ultimate control in this case. No harsh words were exchanged, and Dreyfuss returned to apologize some fifteen minutes later. But Conner felt that this instance was as close as he had come to ending his career with the organization. Jim Conner, interview with author, October 16, 1990.

18. Ibid.

19. J.A. Odom, senior principal, Industrial Design Department, Residential/Business Controls, Honeywell, Golden Valley, Minnesota, letter to the author, February 27, 1996.

20. These were published as Industrial Design: A Pictorial Accounting in the years mentioned and as Industrial Design: Volume 5 at some unspecified date between 1960 and 1968.

21. Dreyfuss dressed habitually in brown from the early 1930s. Gilbert Seldes mentioned this point in a biographical sketch published in the New Yorker. This penchant partly arose from the practical concern of having his socks match when he traveled. However, the fact that Dreyfuss owned a set of evening clothes in brown leads one to believe that this eccentricity allowed him to set himself off from the blue- and gray-suited executives he constantly rubbed elbows with. Seldes, "Profiles: Artist in a Factory," The New Yorker 7 (August 29, 1931), 22-24.

22. Herbert D. Bissell, former corporate vice president of marketing, Honeywell, Minneapolis, letter to the author, August 26, 1993. Bissell was director of merchandising for Honeywell at the time under discussion.

23. Bill Purcell, interview with author, March 16-17, 1991.

24. While his concern for projecting the integrity of his clients may be seen as a public relations ploy, Dreyfuss made a number of statements that illustrate that integrity was indeed a crucial part of his conception of design. For example, "...industrial design is an expanding profession and a good design, whether in a piece of machinery or on a printed page, expresses the integrity of the product and is, perhaps intangibly, a trade-mark of quality. If a tractor appears well put together outwardly, it is logical to assume that the internal mechanism is equally sturdy. A dealer, after looking at a new tractor design, once told me, 'If it works as well as it looks, I'll buy it.'" Designing for People, 146.

"The product that results from the application of these five points [safety and convenience of use, ease of maintenance, cost, sales appeal, and appearance] should be well-designed and marketable. It should fit the consumer's anatomy and his pocket-book, advancing his taste and reflecting the integrity of the manufacturer. The industrial designer's role has been fulfilled by applying taste and logic to the product." Dreyfuss, "People Come in Assorted Sizes," Human Factors (Journal of the Human Factors Society), August, 1966, 275.

25. John Dreyfuss and Gail Dreyfuss Wilson, interview with author, November 23, 1990.

26. Mildred Constantine, interview with author, February 26, 1991.

27. Nelson, in "Henry Dreyfuss 1904-1972," Industrial Design 20 (March 1973), 42-43. For an initial assessment of Nelson's own practical and theoretical approach to design, see Stanley Abercrombie, George Nelson: The Design of Modern Design (Cambridge, Mass.: MIT Press, 1995).

28. Dreyfuss, "Does America Have a Design Heritage?" Product Engineering (May 18, 1959) (clipping in Dreyfuss Collection).

29. Terence Riley and Edward Eigen, "Between the Museum and the Marketplace: Selling Good Design," Studies in Modern Art 4 (1994), 161. Riley and Eigen make this comparison in pointing out the "elasticity" of Edgar Kaufmann, Jr.'s "definition of reasonable cost" in the choices for the Good

Design exhibitions. It is worth noting that the washing machine was initially designed for the European market for Hoover, Ltd. of Perivale, England, rather than the United States, but was later marketed internationally.

30. Honeywell Inc., the Minneapolis-Honeywell Regulator Company at this point in time, was later successful in trademarking both the word Round (trademark number 1,439,016, granted May 12, 1987) and the shape itself (Trade Mark 1622108, granted November 13, 1990). (This information courtesy Clyde Blinn and Fred Lange, retired Honeywell patent attorneys, and conveyed to the author by Herbert Bissell in a letter dated August 26, 1993.) The thermostat was properly known at the time of its introduction on October 15, 1953, as the T86 (Honeywell Circulator [house organ] 17 (October 15, 1953), 1. A "Golden Jubilee Round" with a larger central dial was introduced in 1960 to coincide with the company's seventy-fifth anniversary. Modified again in 1964 to accommodate central air conditioning--and known as the T87--this is the most commonly seen version today.

31. See design patents for "Combined Wringer and Casing for a Washing Machine" 89,879 (May 16, 1933) and "Combined Wringer and Casing for a Washing Machine" 90,616 (September 5, 1933).

32. Refer to Chapter One, note 11.

33. The "design standards," as they are labeled, are dated March 24, 1954 (project 68-2) and appear in a notebook titled "Status of Design Projects 11/1/53 - 9/1/54" found in the Client Response Files in the Dreyfuss Collection. Similarly, when the Honeywell logotype was redesigned by Dreyfuss in 1951, a fifteen-page bible of its proper usage in company designs, publications, and advertisements was also published. For the introduction of the new logo, see Honeywell Circulator for Friday, October 26, 1951, 3. The new logo echoed the shape of the 1938 Chronotherm.

34. "Thermostat Still Moves Round the World After 30 Years," Honeywell World (Centennial issue), January 7, 1985, 13.

35. Even "informal" proposals were studied well in advance, and Dreyfuss's decision regarding when to make his pitch and the tools he would utilize at that time came from his on-the-spot personal reading of the client. Don Genaro, interview with author, October 16, 1990.

36. "Architectural Products by Industrial Designers," Progressive Architecture (June 1964), 15.

37. The Time-O-Stat thermostat had a vertical thermometer attached to its face and it used a mercury switch, as well as a coiled bimetallic strip--the last two features appeared in the final version of the Round.

38. "Thermostat Still Moves Round the World after Thirty Years," 13.

39. "I came to Honeywell from a Toledo company where I directed a large advertising program involving magazines and radio and television networks. I tell you this because coming to Honeywell proved to be a major shock. The problem: I found there was nothing to promote to consumers other than the current wall thermostat. It was a plain-Jane rectangular box with no distinctiveness from the competition. It was tough, if not impossible, to merchandise." Herbert D. Bissell, letter to author, August 26, 1993. "I can only tell you what I found when I arrived and essentially [I] had nothing to promote in the box-like product on the wall of millions of American homes...." Herbert D. Bissell, Minneapolis, letter to Amy Chen, Stern School of Business, New York University, July 5, 1994.

40. Bissell, letter to author, August 26, 1993.

41. Contaminants such as dust caused the mercury to separate in the thermometers and created short-circuits in the switches.

42. Bissell to Amy Chen, July 5, 1994.

43. "Thermostat Still Moves Round the World after 30 Years," 13.

44. Honeywell Circulator [house organ], November 26, 1953, 3.

45. The advertisement appeared in the Saturday Evening Post for October 31, 1953; Life magazine for November 9, 1953, and the November issues of American Home and Better Homes and Gardens. Dreyfuss had consulted with Honeywell and its divisions on a total of twenty-nine projects between November 1, 1953, and August 1, 1954, according to the "Status of Design Projects" notebook in the Dreyfuss Collection.

46. Dreyfuss, "Adapting Products to People," Bell Telephone Magazine 46 (September/October 1967), 23, also quoted in The Wall Street Journal, January 8, 1968, "Notable and Quotable," [editorial page].

47. Dreyfuss, "The Car Detroit Should Be Building," Consumer Reports 23 (July 1958), 351-55. Dreyfuss was of course not alone in his criticism; even Raymond Loewy, as implicated in styling as any designer of his age, managed to cast brickbats at Detroit while waiting for Studebaker's last gasp in South Bend, Indiana. That last gasp turned out to be Loewy's Avanti of 1959. Earl, head of styling for General Motors since the 1930s, left GM in 1962 and established an industrial design firm under his own name.

48. Dreyfuss, speech to the Thirteenth Annual Conference, Reinforced Plastics Division, Society of the Plastics Industry, February 6, 1958, quoted in "Clips and Quotes," Industrial Design 5 (May/June 1958), 8.

49. Frank Walters, Product Engineering, John Deere Waterloo Tractor Works, to H. D. Witzel, director, Product Planning, Deere & Co., February 5, 1975, File #19014, Deere & Co. Archives. Witzel adds in a note to the executive office to which this letter was attached that "Following this visit in early 1937, the Industrial Design work was started on the Model 'B' resulting in Waterloo Work Order 6923-G of September 27, 1937..." making this the first assignment Dreyfuss undertook for Deere & Co.

50. The early design work on the Model B and Model A tractors by Dreyfuss and Barnhart is documented in File 2330, Deere & Co. Archives, East Moline, Illinois. Progress Report #2 of November 24, 1937, details the changes recommended to Deere & Co.

51. Design patent 112,365 (November 29, 1938).

52. Bill Davidson, "You Buy Their Dreams," Collier's 120 (August 2, 1947), 23.

53. For additional background on Deere & Co. tractors, see Wayne G. Broehl, Jr., John Deere's Company (New York: Doubleday & Company, 1984); Randy Leffingwell, John Deere Farm Tractors: A History of the John Deere Tractor (Osceola, Wisc.: Motorbooks International, 1993); Will McCracken, John Deere Tractors, 1918-1976 (Lincoln, Nebr.: Deere & Co., 1976); and Robert C. Williams, Fordson, Farmall, and Poppin' Johnny: A History of the Farm Tractor and Its Impact on America (Urbana and Chicago: University of Illinois Press, 1987).

54. Strother MacMinn, interview with author, November 24, 1990.

55. McCracken, John Deere Tractors, 6.

56. Wiman died soon after the inception of the program. William Alexander Hewitt had married Wiman's daughter, Patricia ("Tish") Deere Wiman in 1948, and, soon after joining Deere & Co., had risen through the ranks of the sales force, beginning in his native San Francisco with the John Deere Plow Company. His familiarity with Europe from his work there following World War II, his education at Harvard Business School and the connections resulting therefrom, and his personal interest in matters of art and design took the company to a new level of sophistication. This was most visible in its headquarters building in Moline, Illinois, begun by Eero Saarinen (his final project) and completed by his partner Kevin Roche. Dreyfuss, along with Robert McNamara, was a fundamental influence on Hewitt's choice of Saarinen as architect for the project (see Broehl, John Deere's Company, 635-38).

57. William F. H. Purcell, "Industrial Design, A Vital Ingredient: A Study of Its Application to the New John Deere Tractors," Automotive Industries, May 15, 1961, unpaginated offprint in Publicity Files, Dreyfuss Collection.

58. Hewitt recalled one old hand at Deere & Co. describing the process as follows: "I remember when we would get old Pete, who had the biggest ass, and sit him in plaster of Paris." William Hewitt, telephone interview with author, March 14, 1991.

59. Travell, Office Hours, 286 ff. Travell went on to become both Kennedy's and Lyndon Johnson's personal physician during their respective terms as president.

60. Purcell, "Industrial Design, A Vital Ingredient."

61. Bill Hewitt, telephone interview with author, October 10, 1995.

Chapter Six

The Limits of Design

We bear in mind that the object being worked on is going to be ridden in, sat upon, looked at, talked into, activated, operated or in some other way used by people.

When the point of contact between the product and the people becomes a point of friction, then the industrial designer has failed.

On the other hand, if people are made safer, more efficient, more comfortable-or just plain happier-by contact with the product, then the designer has succeeded.¹

When Henry Dreyfuss revised his credo between 1957 and the mid-1960s, he removed a key phrase from the third paragraph, where he stated that the industrial designer had succeeded if he made people more eager to purchase.² What had changed in his attitude toward design that distanced him from his earlier stance? He had told the American Association of Advertising Agencies in 1953 that

It is indisputable that a measure of the value of both our services is sales. If we designers don't come up with a product that has sales appeal, then we have failed our client.³

Twelve years later, Dreyfuss stood as spokesman for the profession, and such candor regarding consumer appeal seemed unbecoming to the president of the Industrial Designers Society of America. By gathering all of the industrial design-oriented professional organizations under one roof (the newly created IDSA), there was to be a new, unified voice for all designers. This was a very different vision

from that of the founders of the Society of Industrial Designers in 1944, where the exclusivity of the club was assured by requiring that members show evidence of having produced designs in three different areas (in other words, those who designed only automobiles or anything else within a single category of design were not eligible for membership). With his long-standing interest in educational issues relating to design, Dreyfuss seems to have been chosen for the presidency by consensus. In his statement to the new society, Dreyfuss wrote, "In any age, but particularly in the mid-20th Century, to stand still is to slip backward. And of course this is what the profession of industrial designers is dedicated to-to take what is good today and make it better for more people tomorrow, because making anything better is the only road to human happiness." The confidence reflected in this statement was part of the ethic of his generation, and of course particularly important to Dreyfuss in light of his personal background.

Ralph Caplan, an observer who knew the cast of characters well, found the ranking of importance among the first generation of industrial designers academic:

Henry Dreyfuss was sometimes called "the dean of American industrial designers." Walter Dorwin Teague, a contemporary of Dreyfuss, was also called that. I don't know why industrial design should have two deans-I don't even know why it should have one-but of the two, Dreyfuss was more deanlike: mellow, eminently successful, warm and accessible to

colleagues, although less intellectual in style than Teague. Maybe Teague was Dean of Academic Affairs and Dreyfuss was Dean of Students.⁵

The editor of Industrial Design magazine for many years, Caplan's critique indicates the shift in sensibility that came about during the late 1960s and the 1970s. His claim of not knowing why there should be a dean of design was to question the very system that Teague, Dreyfuss, and others had hoped to establish with the creation of the SID.⁶ Leadership was the critical issue to the first generation, and seniority was part of the equation. Niels Diffrient, the man Dreyfuss groomed to replace him in the role he had created for himself, reveals the ambivalence that characterized this next generation:

...by the time I got there [to the Dreyfuss office in 1955] the philosophy of avoiding styling was quite entrenched. Actually, too much so, to the degree that Henry had gotten the reputation of being the "gray designer." And that was a term that went around...a lot of people criticized our conservative approach, even within the office, myself for one. Because a lot of the stuff was too conservative, it didn't take advantage of the potential to put some life into it. I would guess that was probably at the bottom of my discontent there, that we didn't really struggle hard enough to go beyond just solving the problem, and give the thing some real life or excellence beyond the expected. The forms were never really surprising; they were always good and solid, honest, straightforward, useful, all of that. But often we didn't take the extra step, I felt. Of course some things came out remarkably well, I have to admit. But that's the reason that it lasted.⁷

Diffrient, who worked for Dreyfuss in California, was

invited to have a drink with Doris and Henry one evening after work. Not merely a social gesture, Dreyfuss was aware that Diffrient was feeling some frustration with the operating procedures long established in the office; the younger man understood that this husband and wife team were trying to figure him out.

I still remember he and Doris sitting with me, saying, "Well, just what is it you want?" I can still remember the looks on their faces. It came through to me, at that moment, that they must have been somewhat dumbfounded, as to what was troubling me. Then I realized I didn't know what I wanted.⁸

And in this Diffrient had much in common with many Americans in the 1960s, but not with Marks and Dreyfuss. Brought up within a system of beliefs that stressed duty to one's fellow man and "dedicated to the ever increasing knowledge and practice and love of the right,"⁹ it must have seemed inconceivable to them that someone of Diffrient's intelligence and ability would not likewise aspire toward a similar path. Their friend Connie Constantine understood their orientation and the bond it forged between them:

No evaluation [of Dreyfuss] would be complete without the mention of Doris Marks Dreyfuss, his wife, as many of his accomplishments belong to both of them...Mrs. Dreyfuss' contribution was her insistence upon absolute clarity of meaning with simplicity of expression.¹⁰

While Connie Constantine spoke specifically of the Dreyfusses's last great project, the Symbol Sourcebook,¹¹ her apt phrasing of Doris Marks's aesthetic permits a

glimpse into the role she played beyond the business side of the firm. The linkage between appearance and legitimacy became increasingly important to the Dreyfusses during the same period that most industrial designers catered to consumer tastes in a manner that some have characterized as craven. Henry Dreyfuss, the firm, was to be above "styling," and yet had its origins within that very approach.

In their critique of the Good Design exhibitions planned by the Museum of Modern Art under the direction of Edgar Kaufmann, Jr., Terence Riley and Edward Eigen attempt to classify the most successful entrants. While acknowledging the importance of the generation born prior to the twentieth century, they state:

...the majority of those whose talents were featured in Good Design were born in the first two decades of the twentieth century...[and] primarily completed their education and apprenticeships after the Paris Exposition Internationale des Arts Décoratifs et Industriels Modernes in 1925 and before the outbreak of World War II in 1939. They had in common the experience of spending their early careers designing for societies conditioned by the privations of economic depression and wartime.¹²

Of the designers listed by the authors, Dreyfuss is clearly the most industrially (i.e., mass production) oriented.¹³ Creating an imagery of plenty in the midst of "the privations of economic depression and wartime" was a tall order, and the intelligent mediation between luxury and utility is undoubtedly one of the strongest attributes of

Dreyfuss's body of work. The designs were restrained, but the restraints were largely his own, in a self-imposed system that sought to put useful, attractive designs before the public in a commercial environment. In addition, Dreyfuss is almost without exception presented to readers as the youngest of the first generation of industrial designers, and, under Riley and Eigen's conception, he is viewed as part of the mainstream, not as a junior member.¹⁴ Dreyfuss was suspicious of the attitudes toward industrial design found at the Museum of Modern Art. Visited by a delegation from the museum to discuss the possibility of a one-man show, he placed his office's output on display through sketches and models. One member of the group remarked,

"The numerals on this clock dial seem out of proportion." Another asked, "Why did you put that chrome on the bottom of the typewriter?" Rather than try to explain, I suggested that we forget the idea of an exhibit. It occurred to me that the only museums in which I care to show my work are places like Macy's, Marshall Field's, and the May Company, and I hope never to have a permanent exhibit in any of them.¹⁵

Dreyfuss's disdain for both grandstanding and the aesthetic niceties of the fine arts establishment masked his feelings about having to compromise his own taste at times to retain clients. A master of the soft sell, he found himself cast with increasing frequency in that role, while others took care of the messy details of design. Part of his success came from the selection of talent he had assembled

in the two previous decades: Bill Purcell, his sole partner after 1958, would, with Jim Conner, Niels Diffrient, and Don Genaro, become Henry Dreyfuss Associates in 1969. By the end of the 1950s, all four men were working with him. Purcell, Conner, and Diffrient lived in California as Dreyfuss did. As they proved their competency, the day-to-day design aspects for major clients became their provinces: Purcell worked with Deere & Co. engineers while Dreyfuss discussed color schemes with its chairman Bill Hewitt; Conner likewise consulted with Polaroid Corporation's engineers and production managers on the SX-70 camera while Dreyfuss presented leather samples for the same to Edwin Land, founder of Polaroid. Dreyfuss was being replaced as a designer by men with specific talents he lacked (in engineering or architecture) or by those educated specifically in design. One of the latter was Charles Pelly, educated at Pasadena's Art Center College of Design and the Konstfackskolan, the Swedish National College of Art, Craft and Design in Stockholm. After a brief stint with the design firm Latham Tyler Jensen, he was hired by Dreyfuss in 1962 as a "grunt," as he put it. His was "sort of a love/hate relationship" with Dreyfuss, which stemmed from his admiration for Dreyfuss's practical way of handling his clients (and trying to make profits for them) coupled with some contempt for "all that old classic stuff" and the egotism typical of the first generation industrial

designers. In what might be described as a cynical, or simply realistic, assessment of the job, Pelly says that Dreyfuss once stated "designers are here to make the rich richer."¹⁶ It is interesting to note that Pelly felt there were few "Art Center types" (i.e. from the fine arts side of the spectrum of design schools) in the California office, among the ones who stayed the longest were himself, Conner, and Diffrient; the last two were graduates of Cranbrook Academy of Art in the 1950s. Along with Pratt Institute graduate Don Genaro, this was "the next generation," and they all shared an artistic bent with Henry Dreyfuss.

Dreyfuss still took tremendous interest in certain projects. He and Diffrient began working on a major presentation to the Edison Electric Institute in the wake of the first public outcries against high-voltage electrical transmission towers (for aesthetic reasons more than health concerns at this time). As Dreyfuss was involved with the South Pasadena Beautiful and Los Angeles Beautiful organizations on his own time, his concern was two-fold: personally he sided with the "aesthetes" who wanted the power lines buried, but he was sympathetic to the utility companies who knew that the cost would be astronomical.¹⁷ It was in fact the sort of challenge for which Dreyfuss was uniquely suited: to make the necessary invisible, and when visible, attractive. He had ample experience in dealing with domestic items like telephones and thermostats, but

concealing a "power tower" in the midst of a path of clear-cut landscape was a challenge on a different scale entirely. The EEI had charged the Task Force on Environment, on which Dreyfuss sat as the principal figure regarding aesthetics, with developing "universally acceptable" designs. As one might have expected, considering Dreyfuss's orientation toward robustness and seamlessness, the forms generated tended to be sturdy and unified-looking in contrast to their spindly predecessors; they made the combination of materials (steel, wood, aluminum, fiberglass-reinforced plastic, concrete) a virtue in generating a variety of appearances [Figures 55 and 56]. Dreyfuss and Diffrient justified this by considering the task each category of tower had to perform and seeking an appropriate and "functional" appearance for it. Here again was the theoretical dilemma of modern design: where does function end if part of the function of a design is to have universal appeal? Dreyfuss and Diffrient were exploring the limits of design, effectively questioning what an object is, and how it differs from architecture. When does a product become a public work or resource? What does the public expect beyond the mere solving of problems on an engineering level? One aphorism regarding the utilitarian approach of the engineer is that "an engineer can do for one dollar what any fool can do for two." The latticed (i.e. open trusswork) steel predecessors of the Dreyfuss-designed towers functioned

perfectly well for carrying power lines and holding down costs, but something more was needed. Deciding what that "something more" should be and how it should be constituted was Henry Dreyfuss's area of expertise. He sold himself on a track record of basic designs for a consumer market and implied that this experience was applicable to the design of transmission towers. Dreyfuss was expected to know what would satisfy "the people," or at least those people who were politically active. He found himself cast in the role of a modern-day Everyman, in which his personal tastes were, in effect, to substitute for opinion polls.

It is important to note that the role of anthropometry was more complicated in the actual creation of designs by the Dreyfuss firm than some have implied.¹⁸ The charts of Joe and Josephine [Figure 57], Dreyfuss's "typical" Americans created by the firm during the 1950s, did not, in fact, create a "universal yardstick" for the generating of all designs for human use, nor did they claim to. They were guidelines for designers to use in their preliminary investigations, and consideration of the specifics of any given situation relied on the individual designer's insights into human behavior. Certain aspects of human factors were restricted to the most basic perceptions: for example, that color can be distinguished only within a segment of the total zone of vision (i.e. most people can discern shapes over a broader range than they can color). Yet the

objectivity that these charts provided in approaching new challenges was helpful, and they gave Dreyfuss a resource that was not available to the profession at large until he published The Measure of Man in 1960. The charts also provided him with an additional sales tool. Who could disagree with the layout of a new design that incorporated the needs of what appeared to be the "universal man?" In short, the new approach had the appearance of taking the "guesswork" out of the design process. The "scientific" aura of this strategy must have impressed many potential clients.

It is illuminating to note that the Dreyfuss office was aware of the nature of the compromise that was behind the human factors charts. In an interoffice memo of December 7, 1960, Jim Conner queried Alvin Tilley:

Mr. Bjornlie at Douglas Aircraft called to ask if it [The Measure of Man] was available (I told him yes!) He asked if the source or sources from which all this data was gathered had been noted.

In checking I could find no specific reference to any source. The bibliography does not say that these sources were used or to what extent, and incidentally for the male measurements only "armed forces studies" are noted. Does this mean that our 2-1/2 to 97-1/2 percentile men are all military? If so, wouldn't this automatically screen out most civilian males-and especially those not meeting military physical qualifications?

The question of source of data will probably be asked again more than once and it might be a good idea to have a well thought out answer to it when the occasion demands.¹⁹

On this copy of the memo, Doris Marks has questioned whether

listing such sources wouldn't prove entirely impractical, making us aware that she did in fact monitor more than just the business aspects of the office's work. Tilley replied to Conner two days later:

Our information is a summation of practical data for our type of use. Some material is a composite of many different sources, some information is extrapolated. If reference sources were given for each piece of data the book would become so voluminous and complex as to be impractical; also we might receive criticism for taking material out of context. (We can give a specific reference source when ever you need it.)

Your point is well taken about the 2½ and 97½ percentiles not representing the civilian male population. However we are forced to make use of available sources representing the largest number of measurements with wide distributions. We are probably safe for the 97½ figure since "military rejection for extremes of height alone accounted for only a negligible small proportion of total rejections"--quote from the Report No. 1 - BM On Men Inducted Into the Army and for Rejected Men during 1943. "Specific causes for rejection relative to height and weight were dwarfism, giantism, disfigurement, pituitary dysfunction, excessive overweight and serious organic diseases. 0.2% rejected for undersize." Size accuracy is more important for the large man, the small man can adjust to improve his position.

Some day better data will be available. Until then we must make use of the tools we now have.²⁰

Making use of the tools at one's disposal is an essential component in defining the industrial designer's job description. Rarely charged with the responsibility of inventing a new way of doing things, industrial designers

try to stay well informed regarding the progress of others and to seek ways of employing new discoveries. The achievement of the Dreyfuss firm was not, in fact, a matter of original research, although much had been discovered in consultation with Janet Travell and other experts, but rather the collation and interpretation of data from disparate sources. Tilley's orientation, from his training as a design engineer, was toward the creation of usable tools that would save time in the generation of new designs, utilizing research that had been undertaken before. He updated this information throughout his career with the office.²¹

To understand the growing complexity of the relationship between consultant industrial designers and their clients' personnel that developed in the 1960s, one can look to the Dreyfuss office's work with Polaroid Corporation in the 1960s. First it is worth examining Polaroid's orientation toward industrial design, and the history that preceded that relationship.

Edwin Land, founder and presiding genius of this exemplar of technological innovation, had a keen appreciation of the difference that industrial design could make. He had wanted to work with Dreyfuss on the development of his "instant" camera from its inception, but Dreyfuss's commitment to camera manufacturer Ansco prevented him from taking the account.²² Certainly a recognition of the

association between aesthetics and engineering was involved in the earlier redesign of Polaroid's desk lamp, which was introduced in 1938 and revised in the following year. The first version, a massive-looking structure molded in Bakelite, took its visual cues from a familiar predecessor. It showed an often-encountered tendency in this period to shelter innovation in the garb of the well-known, in this case, mounting in the body of what appeared to be a banker's desk lamp the polarizing filter that eliminated glare. When Walter Dorwin Teague was hired to redesign this product, his son Dorwin Teague brought engineering to bear in the creation of the plastic (again, Bakelite) housing that contained the bulb and anchored the Polaroid filter, creating integral vents for cooling in the plastic shell and increasing the effective working area beneath the lamp.²³ A stylish brushed-aluminum stem that tapered to a Bakelite base was added to the cowl-like shade by Frank Del Giudice. The support looked a great deal like a sculptural exclamation point, emphasizing that this was a very different kind of lamp. In many ways, it is an illustration of the shift from streamlining to "cleanlining" pioneered at the Dreyfuss office during the same period. Examples such as this and Dreyfuss's post-Model 150 vacuum cleaners for Hoover illustrate the evolution of the industrial design aesthetic in the United States, which at its best moved away from simple geometries and teardrop shapes toward more

complex, yet defensibly functionalist, forms. Teague's firm would go on to contribute to the first commercially available Land Camera (as the "instant" camera is properly designated), the Model 95, which debuted in 1948.

Dreyfuss's fascination with Polaroid's inventions was continuous in the years up to 1961, when the account was secured. Whether it was "a blaze of Polaroid light" proposed for the Theme Exhibit at the New York World's Fair or a "curtainless window," obtained by using two Polaroid filters, for Consolidated Vultee's airplanes a little less than a decade later and eventually installed in the portholes of staterooms on the S.S. Independence, Dreyfuss sought to apply Land's innovations to his own designs.²⁴

The Automatic 100 Land Camera was the first case in which a contribution from Dreyfuss to a Polaroid product had a decisive impact [Figure 58]. The break through design made its commercial debut in 1963. According to Industrial Design magazine, the new camera was less than half the weight of its predecessors, which brought it into the same range as a number of non-instant single-lens reflex cameras, then the state of the art in 35-mm photography. Perhaps more revolutionary was automatic electronic control of the shutter mechanism, which had been attempted in a previous Polaroid camera, the J33 [Figure 59] but which was considerably refined in this version. The redesign of the mechanism did away with a number of complicated mechanical

parts in favor of a greater reliance on electronics. Coupled with an easy-to-use rangefinder, this design reduced the complaints about the cameras producing over- or under-exposed and out-of-focus images.

The most significant advance, however, was in the overall operation of the camera. The Automatic 100 introduced pack film, that is, snap-in packages of either black-and-white or color film that eliminated the awkwardness associated with roll films. Roll film had limited the speed of operation and often proved messy in less-than-ideal operating situations. Now users no longer had to wait for the image to develop within the camera body, but could remove the developing photograph and immediately shoot another. Chemicals for each photograph were sealed within discrete packets on the film, eliminating or reducing leakage.²⁵ This, combined with the introduction of color film that developed in fifty seconds and a new and faster black-and-white film that developed in ten, meant that Polaroid's equipment could successfully compete with that of conventional camera manufacturers.²⁶

The Dreyfuss team was headed Jim Conner, who supervised the work (which was done in the California office) and acted as the primary contact with Polaroid's research, design, and production engineers.²⁷ Land had begun development of the Automatic 100 by placing a lens atop a film package and stating that Polaroid's next camera should be no larger than

those components, clearly an unrealizable goal but one characteristic of his driving vision of a superior, "absolute one-step photography" that would culminate in the SX-70 of 1972 [Figure 60].²⁸

The focus of the Dreyfuss contribution was to enhance the camera's ease of use, making buttons and levers more discernable for novices and deriving shapes for these controls that made them easier to operate. While the technology of the film, optics, and electronics were solely Polaroid's province, Conner and others made significant suggestions regarding the reduction of the camera's size (through the arrangement of components) and making the materials lighter and more robust. They applied the office's own system of symbols to the camera (which had begun in work for Deere & Co. and National Supply Company in the late 1950s). In developing the design of the camera, the team had analyzed the individual steps in its handling through charts of a cartoon-like user (a shorthand "Joe") to anticipate details of how a Polaroid camera, which could now be slung over the shoulder, could be used most efficiently. The technical capabilities of this camera were thus reconciled to the way people actually used it. For example, now that the developing photographs could be removed from the camera before they were "done," where were they to be stored if the user wanted to take another photograph? Could the user accomplish this with the camera slung over his or her

shoulder? Such niceties might not be anticipated by engineers oriented most strongly toward technical feasibility and cost reduction, but were essential in assuring the success of a consumer product. Here the firm's expertise, developed in work such as the NIKE missile system (where an operational misstep had far graver implications than a too-dark snapshot), found application in peacetime. The offshoot of this work has been a part of everyday experience for millions over the last twenty years. Most cameras used to make identification cards have been Polaroid products, operated by people not necessarily trained in photography who had to be guided through procedures in a straightforward, intelligible fashion. A mixture of symbols and words made this system effective. Drivers licenses, for example, have been handed to eager new operators in minutes as a matter of course rather than reaching them in the mail days or weeks later.

The Automatic 100 Land Camera defined the start of a new generation of Polaroid products aimed at a broad consumer market (products for scientific, medical, and other specialized purposes had long formed a major, but less visible, portion of the company's output). In a pattern that would be repeated, a relatively high-priced model would be introduced with a number of startlingly new features. Breakthroughs would begin to appear in more modestly priced cameras in the following years, but the lower-priced version

would rarely compete directly with the earlier model. A great deal of the Dreyfuss firm's work involved these designs, standardizing appearances while maintaining a certain "snob appeal" for the top of the line model (again, price differentials were based on functional superiority and not appearance alone). For example, changes might call for replacing leather with a plastic substitute, collapsible bellows with solid bodies, or similar cost-saving strategies. The Swinger was an exception to this general principle of operations [Figure 60]. Designed from the start to be a product that would be inexpensive enough for teenagers (and debuting in 1965 at \$19.95), the Swinger took Polaroid decisively into the world of popular photography. An improved roll film, which reduced costs, also allowed photographs to develop outside of the camera body. A fixed-focus lens coupled with a solid body and an extremely simple photometer exposure system eliminated many user options but did away with guesswork as well. When looking through the viewfinder, the user simply squeezed the stem of the shutter release and rotated it until the word yes became distinguishable. This meant that the exposure would be correct, and the shutter could be activated by pushing down on the same stem. Light, easy to use, and affordable, it was accompanied by an advertising campaign that urged consumers to "meet the Swinger." In many ways, it was a return to the basis of popular photography sketched out by George Eastman

with his Brownie of the turn of the century, with one important exception: rather than having to wait to see a snapshot, the photographer's gratification was instant. Brownie owners sent film and camera both back to Rochester for processing and reloading; those purchasing the Swinger had the chance to see immediate results.

At first glance, the Swinger seemed no different than many other cameras, except that its body was white instead of the expected black.²⁹ All of its elements, including the one-piece focusing stem/shutter release, involved the Dreyfuss design team from the start. When handling it, the user became aware of the camera's sculptural form. To accept the roll film, the camera's back was made considerably wider on the right-hand side, which also created a substantial hand grip. Weight was reduced through the use of plastics to the point that the camera could be dangled from a plastic strap (as bikini-clad Ali McGraw did in a television commercial that was part of the advertising campaign).³⁰ The white plastic body had a black "face" which was enlivened by a metallic Mylar "sandwich" that surrounded the lens.³¹ Distinct from most of the Polaroid line, it had an undeniably pop art appearance.

A large and rather simple wood-and-vinyl model of a camera is preserved today in the Polaroid Corporation Archives in Cambridge, Massachusetts. On Dreyfuss's microfilm is a sketch of a similar design, labeled

"Homebody." The Cambridge model is for a bellows-type folding camera. Its large size did not make it very portable, rather it was intended as an easy-to-operate "second" camera for portrait photography. The idea again was Land's, but it began to take shape during a meeting with Dreyfuss.³² It would be a "stay-at-home" camera that might be stored in a closet or behind the couch. What emerged was the Big Shot, a solid-body camera with an extremely long "barrel" that was an offshoot of the earlier Swinger or Model 20 Land Camera, the least-expensive Polaroid camera ever marketed. While not a great commercial success, the Big Shot was immortalized by Andy Warhol, who no doubt admired its convenience, and whose output with this camera was as prodigious as Dreyfuss's with his Minox miniature.³³

Industrial designers had long been involved in the gray areas that exist between the practices of architecture and product design. Exhibition and interior design had become important elements of Dreyfuss's practice by the mid-1930s. Whether these efforts were ephemeral (such as displays for Plymouth Motor Corporation for the National Auto Show in New York in 1933 and 1934) or durable (the model office built for Western Union in Philadelphia in 1936), they make a point about Dreyfuss's practice that is too often ignored. While most industrial design surveys identified him as a shaper of products, the creation of environments comprised a major component of Dreyfuss's work.

Dreyfuss's aesthetic was subtle. While Raymond Loewy accused him of being color blind regarding the interiors of the 20th Century Limited, Dreyfuss no doubt found Loewy and Paul Philippe Cret's interiors for the Broadway Limited garish. Dreyfuss once reminded Loewy that many passengers travel under duress.³⁴ In an interview, Strother MacMinn noted that to understand the Dreyfuss aesthetic one has to imagine the interiors of the 20th Century Limited decorated by the stylish outfits and cultivated manners of the people riding it, or dining in the Persian Room at the Plaza Hotel, or dancing aboard the S.S. Independence. As with his product design, people were the focus of Dreyfuss's concern: their comfort, their convenience, their safety, and their "inherent sense of good taste." If he sometimes fell back on the dependable (he was an avid admirer of Americana, such as folk carvings, weathervanes, and the like, and used them in otherwise modern interiors), the quality was rarely compromised. In creating a new headquarters building for Bankers Trust Company at 280 Park Avenue (between 48th and 49th Streets) in New York, Henry Dreyfuss received top billing. In a press release from his office, the building was described as "the first structure for which entire design responsibility has been given to an industrial designer-Henry Dreyfuss." Yet in what might be considered his crowning achievement in this area, compromises played a large role.

The project began with the acquisition of the site in 1958 by Rose Associates from the New York Central Railroad on a ninety-nine year lease for a fixed sum. During negotiations, Bankers Trust Company became interested in possible tenancy, with the stipulation that certain specifications to the "new" building (which in fact partially reused the framework from an older apartment building on the site) would be theirs to make. Likewise, some aspects of the design and fit-out of the building were to be their prerogative. Luckily, it was "a very happy marriage," characterized by collegial relations. According to Frederick P. Rose, president of Rose Associates, he and Herbert G. Maser, who represented Bankers Trust in the negotiations regarding the building, "wanted something better," and both wanted to employ Henry Dreyfuss on the project, primarily for his taste and his sense of practicality. Since Bankers Trust did not want responsibility for the entire space necessary to make the project financially viable, additional rentable office space was always part of the scheme. The two elements were visually separate: the Bankers Trust offices were housed in the base of the skyscraper, and the rental space placed above, distinguished by the setback in the building's exterior halfway up its height.

Rose recalled that it was "the worst possible place to have a building" in that the building stands where the

express and local train tracks merge below street level, creating an intricate web of supports to deal with.³⁵ The basic problem confronted by any architect working on a Park Avenue site has been the existence of the railroad tracks beneath the street. The tracks inhibit placement of elevators at ground level because elevators need a considerable amount of space for machinery beneath the lowest level reached by an elevator cab. Dreyfuss's solution, a rational one, was to make the public ascend steps in approaching the building, which stands on a "platform" raised three feet above the sidewalk. This solution would probably prove unacceptable today because of the issues involving accessibility. Architect Edward Larrabee Barnes was emphatic in stating that 280 Park Avenue has proved to be as good as or better than any building along this area known for its skyscrapers. Dreyfuss consulted informally with Barnes regarding the setback that the building takes as it climbs skyward. Barnes regarded this as a more important challenge than the roofline of the building itself. Dreyfuss created a large, garden-like space at this level (the greenery of the plantings is readily visible from the street level today) [Figure 62].³⁶

Not everyone was happy with the result. Julian Everett, who in a later interview claimed total credit for the building's interiors and graphics, was convinced that the proportions were seriously marred when the total height of

the building was reduced to thirty stories. Everett felt that the building may have been "Dreyfuss's status symbol" but was not proud of the result.³⁷ Yet critical commentary on the building was generally favorable. "The one strikingly human building on the Avenue," was how Industrial Design magazine described it (an exception was made for the "great dignity" of Mies van der Rohe's Seagram Building).

The architecture is not outstanding...but it is a building tailored to the bank staff and wealthy clients: not only to shelter them, but to make them comfortable, to reflect their conservative taste, their pride, solidity and hospitality. This unusually resonant expression of a client's personality is partially explained by the fact that the architecture was supervised by an industrial designer-Henry Dreyfuss-and it is the culmination of a corporate identity program.³⁸

Architectural Forum noted that few banks had "espoused the visual arts quite as enthusiastically" as Bankers Trust had in their new headquarters.³⁹ Certainly the Bankers Trust building has not aged as gracefully as the Seagram Building, a recognized work of exceptional quality and finish. Dreyfuss's interiors, however, showed a greater clarity and originality than those that replaced them in 1997.

Betraying Dreyfuss's fascination with mass production, the building was faced in precast six-by-twelve foot modules of Mo-Sai, an aggregate of high-strength concrete and translucent quartz. The recessed forms with their intrinsic texture lent the building a visual distinction, a departure from the metal-and-glass ziggurats that surrounded it. Roman

travertine was chosen to clad the exterior walls that fell inside the supporting columns and also appeared inside in the lobby. At the ground level of the building, visitors encountered two-story screens of woven bronze rods flanking the escalators that lifted them to the elevator banks on the second floor. Sculpted by artist Stephanie Scuris, the screens acted to establish a sense of scale, and also partially obscured the bank's vault and first two stories of perimeter offices [Figure 63]. Offices on the second level behind the screens were joined by an executive office area overlooking Park Avenue (a row of planters separated the staff's desks from the exterior glass). With the original "garden" of miniature pines and azaleas beneath the escalators in place, the ground level of the building revealed an appreciation of the aesthetic successes of the Seagram Building and the earlier Lever House by Skidmore, Owings and Merrill [Figure 64].

The real impact of Dreyfuss's aesthetic was to be felt on the interior rather than the exterior of the building. Here Dreyfuss sought to "customize" what might have been a somewhat chilly corporate environment with site-specific artworks. The staff lounge and dining facilities, located on the ninth floor, were enlivened by brighter colors than seen elsewhere in the building. Accents in red were found in a custom-woven carpet by textile artist Dorothy Liebes and handwoven screens by Lozano Fischer. The regular grid of the

building gave way to a soft curvilinearity in the Liebes carpet and the sofas in the lounge [Figure 65]. On the tenth floor, a stained-glass screen in blue tones by Alistair Bevington separated the customer reception and dining areas (Dreyfuss had chosen historic tavern signs to decorate the teak walls of the latter, as well as specifying the table settings, glassware, and linens).

The sixteenth-floor boardroom was decorated with a seventeenth-century Chinese Coromandel screen, and nearby the money room had a complementary eighteenth-century Japanese screen in watercolor on paper. From that level, the bank's officers and their guests ascended a central bronze staircase, where they encountered a remarkable gilded-wire wallpiece created by sculptor and designer Harry Bertolia [Figure 66].⁴⁰ A twelve-by-eighteen-foot stained-glass window was fashioned by artist Robert Sowers to separate the executive dining room from the reception area. Two interior garden spaces beneath skylights continued a theme of greenery from the beginning of the building's property line [Figure 67].

Dreyfuss took a tremendous personal interest in the project. Clifford Goldsmith, chairman of Philip Morris when he knew Dreyfuss, recalled that he visited the building one night with Dreyfuss after they had attended the theater; according to Goldsmith, Dreyfuss "knew where every light switch in the place was located."⁴¹ It is interesting to

note that when a brochure was printed describing the building's progress at the end of 1962, the cover consisted of a series of printed color "swatches"-some of which had been part of Dreyfuss's aesthetic since the 1930s. Blues and beiges that could have been found on the 20th Century Limited were still a part of his palette.

In 1967, the firm that had been known simply as Henry Dreyfuss became Henry Dreyfuss & Associates. To most observers this would have indicated only that Dreyfuss had decided finally to elevate a handful of his colleagues to a status just below his own; few would have predicted that the founder would leave the firm in less than two years. No one has intimated that a single event or concern lay behind his decision, but it was certainly one he would not have made without consulting Doris Marks.

Dreyfuss left the firm officially on January 1, 1969. He intended to pursue a new career as a corporate advisor after that date. But according to Bill Purcell, Dreyfuss may not have realized what an effective team he had built. Dreyfuss and Purcell visited major clients together, to present Dreyfuss's scheme that both he and his successor firm should continue working for them, although in different capacities. One day, at a meeting in New Jersey with Bell Telephone Laboratories, Dreyfuss encountered little enthusiasm for his plan:

We went to all the clients. AT&T, that didn't work at all. AT&T said, "No, we think Bill's

great. We don't think you ought to stay on."
They said it just like that.⁴²

Purcell made a common mistake in relating this story: Dreyfuss actually did continue to advise AT&T, but not Bell Telephone Laboratories, the client for whom the industrial design work was done. That must have been a heavy blow for a man who had begun consulting with them in 1930. (Perhaps this was softened somewhat when he became the first honorary member of the Telephone Pioneers of America in 1971).

Others did in fact find Dreyfuss irreplaceable: Deere & Co. and Hallmark continued to make considerable use of his talents. Association with the company founder Joyce Hall had begun in the late 1930s, when Dreyfuss persuaded the greeting card company to shelve plans for a World's Fair exhibit in favor of a store on New York's Fifth Avenue. While the Dreyfuss office never officially worked for Hallmark, Dreyfuss himself maintained a steady back-and-forth with Hall and his employees. According to Stanley Marcus, Hall was prone to calling Dreyfuss in the middle of the night to discuss matters. John Dreyfuss recalled his father stopping their car by the roadside one day to pick flowers, not out of a sudden whim to commune with nature, but to send them off as color samples to Hallmark.

The dominant project following Dreyfuss's "retirement," however, had nothing to do with former clients. It had everything to do with the remarkable abilities of Henry Dreyfuss and Doris Marks to gather, collate, and assemble

information into a usable form. Together they worked on the Symbol Sourcebook: An Authorative Guide to International Graphic Symbols, published in 1972. Its origins lay in the 1950s, when National Supply Company, a manufacturer of oil-drilling equipment, was searching for a solution to the very real problem of seeing their equipment safely operated in regions where English was uncommon. These "pictographs," as they were labeled by Alvin Tilley, sought to use simple two-dimensional illustrations to "jump the language barrier." There were some false starts: a tortoise was almost universally understood as "slow," but a speeding bullet was transformed into a running hare to represent "fast."

By the inception of the project, the Dreyfuss firm had been using such symbols for years in conjunction with work for Polaroid, Deere & Co., and others. (Bill Hewitt recalled that French insistence on labels in French frustrated Deere & Co.'s effort to make this a truly comprehensive effort.) In much the same way as Tilley's initial human factors "mural" (showing Joe standing, sitting, driving a vehicle, etc.) provided a "sticking place" for the addition of information on anthropometrics, these early product labels soon began to reach into more challenging areas. Henry Dreyfuss and Doris Marks, along with assistant and consultant Paul Clifton, began to sift through materials received after a mass-mailing to professional organizations and friends. The challenge was not simply to put all of this

information together but to make it graphically cohesive as well: to simply publish the existing information would only leave the job to someone else. Dreyfuss drew upon a life-long interest in typography and practical experience that reached back to his revision of McCall's magazine in the 1930s. Doris Marks marshalled her expertise in record-keeping and information retrieval. So impressive was the final product that Buckminster Fuller, writing the foreword to the volume, stated openly that he had little use for most industrial designers but that Henry Dreyfuss was an exception. Quickly leafing through the book, one page jumps out at the reader because it lacks the standardization found on all other pages, and strikes one as unmistakably Dreyfuss's inclusion: it is a page of symbols as drawn by hoboes, left in the scrawl that would characterize chalk or pencil marks.

At some point in 1972 Doris Marks was diagnosed with cancer of the liver. She evidently decided against any course of treatment that would prolong her life as recovery from the illness was out of the question. Apparently she and Dreyfuss, who at sixty-eight was still healthy and vigorous, had decided after the initial diagnosis that they would end their lives together when her pain became unbearable. On October 4, 1972, they were found in their car at their South Pasadena home, having succumbed to carbon monoxide poisoning.⁴³

Some friends were shocked by the news; others had intuited that their last visit or conversation with Dreyfuss would be, in fact, their last. Perhaps this troubling ending to a life that had seemed a definitive success story muffled the acclaim one might expect upon the passing of such a man. Nonetheless, Henry Dreyfuss was recalled in memorial services in both New York and California as a warm and often inspirational figure. The Dreyfusses's quiet generosity to many people emerged with time. For all of his public exposure, Henry Dreyfuss had managed to keep many things private.

Appearing on the opinion and editorial page of The Wall Street Journal was one of Dreyfuss's summary statements about his attitude toward the practice of industrial design:

...although industrial designers are in the business of change, we resent planned obsolescence. A change in the technology, improved efficiency, additional safety or comfort, a new utility development, an improved method of fabrication, the introduction of new material--these warrant a new physical expression. But to put a "new look" on an existing piece of merchandise--this, to us, constitutes the duping of an unsuspecting public.

We say that a design expresses the excellence of its engineers and reflects the integrity of its manufacturer. That hardly suggests a seasonal change. We are not in the profession of style or fashion. Ours is a basic approach; our designing must be generic by nature. If the most contemporary of design can be called "classic," then call us classicists."

This is not the place to discuss "the legacy of Henry Dreyfuss;" that will be for others who are more

knowledgeable about the actual practice of industrial design today to do. One aspect of what he left behind, however, seems clear--human values have a place in the shaping of our environment, right down to the tools we grip in our hands. Only when people become the focus of design can we say that we are on the way to fulfilling a promise that Henry Dreyfuss felt was worth keeping.

1. Dreyfuss, Industrial Design: Volume 5 (New York: Comet Press [privately printed], [1965]), frontispiece.

2. Dreyfuss, Industrial Design: A Pictorial Accounting, 1929-1957 (New York: Photogravure and Color Company [privately printed], 1957), frontispiece.

3. Dreyfuss, "Products Yet to Come," lecture to the Annual Meeting of the American Association of Advertising Agencies, New York, unpaginated printed transcript in Dreyfuss Archives.

4. "The New Society: Statement by Henry Dreyfuss, President, On the Formation of the Industrial Designers Society of America," IDSA Design Notes 1 (April 1965), 2.

5. Ralph Caplan, By Design: Why There Are No Locks on the Bathroom Doors in the Hotel Louis XIV and Other Object Lessons (New York, McGraw-Hill Book Company, 1984), 25-26. The phrase "dean of American designers" seems to have first been applied to Norman Bel Geddes, in an article noting that Dreyfuss was the youngest member of this new profession. Carlton Atherton, "Henry Dreyfuss: Designer," Design 36 (January 1935), 4.

6. "...the Society of Industrial Designers (SID) was established in 1944 in New York City after the courts ruled in a 1941 Unincorporated Business Tax suit versus Walter Dorwin Teague (who was supported by other prominent industrial designers) that Teague's primary activity was providing a service to the public and that, therefore, he was not liable for the tax. This has been taken since then as *prima facie* evidence that industrial designers are professionals." Arthur Pulos, American Design Ethic: A History of Industrial Design to 1940 (Cambridge, Mass.: MIT Press, 1983), 402.

7. Niels Diffrient, interview with author, March 1, 1991.

8. Ibid.

9. This inscription appears on the exterior of the building that houses the Society for Ethical Culture in New York.

10. Mildred Constantine, s.v., "Dreyfuss, Henry," in Contemporary Designers, [Ann Lee Morgan, ed.] (Detroit: Gale Research Company, 1984), 163.

11. Dreyfuss, Symbol Sourcebook: An Authorative Guide to International Graphic Symbols (New York: McGraw-Hill, 1972).

12. Terrence Riley and Edward Eigen, "Between the Museum and the Marketplace: Selling Good Design," Studies in Modern Art 4 (1994), 164.

13. Ibid. The artists and designers mentioned are Arne Jacobsen, Kaj Franck, Finn Juhl, Boris Kroll, Marianne Strengell, Freda Diamond, Eszter Haraszty, Trudi and Harold Sitterle, Russel Wright, and Eva Zeisel.

14. Russel Wright and Henry Dreyfuss shared 1904 as their birth year. Charles Eames, born in 1907, had a different sensibility than the industrial designers who founded the SID.

15. Dreyfuss, Designing for People, 209. Mildred Constantine, who worked in the Department of Architecture and Design, confirmed that the unspecified museum was in fact the Museum of Modern Art. Mildred Constantine, interview with author, February 26, 1991. It is interesting to contrast Dreyfuss's anecdote with one found in an early draft of his autobiography: "When the model of a new alarm clock we had designed was presented for final inspection, I appalled our client when I requested that a narrow chromium band be placed around the otherwise simple and functional base. They reminded me that for years I had been the exponent of no extraneous decoration. Eventually they were convinced that I was not expressing my personal taste, but my belief of what the consumer was ready to accept, and that the shiny metal I was recommending would be inoffensive and make the severity of the form acceptable because it would recall other things with which the public was familiar." Dreyfuss, "Book on Industrial Design 1946," Designing for People misc. file, Dreyfuss Collection.

16. Charles W. Pelly, interview with author, November 21, 1990. Pelly is the founder and president of Designworks/USA, a California-based design firm that maintains an office in Troy, Michigan, as well. Pelly was president of the IDSA in

1991-92.

17. One person working for the power industry stated that Henry Dreyfuss's handsome fee would still be less than properly burying a single mile of 230 kv power lines. Eugene Levy, History Department, Carnegie Mellon University, Pittsburgh, "The Aesthetics of Power: High Voltage Transmission Systems and the American Landscape," unpublished paper, March 18, 1996, 18.

18. "On the basis of exhaustive medical and human engineering studies, Mr. Dreyfuss has assembled a basic list of human requirements which provides a universal yardstick of good seating design." The phrase appears in an article detailing the creation of a new seat design for Lockheed's JetStar airplane. Norman M. Lloyd, "Comfort Criteria for Seat Design: Dreyfuss-Designed Armchair Provides Universal Yardstick for Passenger Comfort," Automotive Industries 123 (November 1, 1960), 44.

19. Jim Conner to Alvin R. Tilley, December 7, 1960, Measure of Man Correspondence File, 1973.15.9, Dreyfuss Collection.

20. Tilley to Conner, December 9, 1960, *ibid.*

21. A revised edition of The Measure of Man was issued in 1967, and, with Niels Diffrient, Tilley created the Humanscale series. The Measure of Man and Woman was nearing completion when he died in 1994.

22. Ansco was owned by film manufacturer Agfa; Dreyfuss had held the account since 1939 and designed a popular twin-lens reflex camera for Ansco in 1946. Jim Conner, telephone interview with author, August 30, 1996.

23. "The trouble with most desk lamps is that they provide a small pool of bright illumination right under the shade, which rapidly fades out into darkness as the distance from the lamp increases. The user must work in this small area if he needs illumination for his work. The ideal reflector is one which provides the most even amount of illumination all over the desk top.

"This was my goal when I designed the shade for the Polaroid lamp. I assumed that the light came from a point source at the center of the bulb at a height of about 13" and that it was equal in all directions. As in all reflectors, the angle of incidence equals the angle of reflection, so I drew a curve representing a section of the reflector which reflected each segment of light to an equal space on the surface of the desk. Of course the light source is not a point but a 2 1/2" sphere so the result is only an approximation, but even so it is vastly more even than what

you get with a conical shade. I designed the shade with two ridges which are pierced with slots for ventilation.

"Once I had the dimensions and exact contour of the shade I turned it over to Frank Del Giudice, who designed the conical support and the spherical section base for a very simple and effective ensemble." Dorwin Teague, letter to author, July 4, 1993. The two lamps are illustrated under the years 1938 and 1939 respectively in Richard Saul Wurman, Polaroid (New York: Access Press, Ltd., 1989), n.p.

24. The effect Dreyfuss sought to achieve must have been aborted late in the formulation of the Theme Exhibit, as the phrase "blaze of Polaroid light" appears in the description of its contents in Frank Monaghan, Official Souvenir Book: New York World's Fair 1939 (New York: Exposition Publications, Inc., 1939), n.p.; Helen A. Harrison points out the gap between the exhibit as imagined and as realized in "The Fair Perceived: Color and Light as Elements in Design and Planning," in Harrison, ed., Dawn of a New Day: The New York World's Fair, 1939/40 (New York: Queens Museum/New York University Press, 1980), 50; "Curtainless Window," Davenport (Iowa) Democrat, January 26, 1947 (clipping in Henry Dreyfuss file, Deere & Co. Archives, East Moline, Illinois). According to Jim Conner, it was Land who approached Dreyfuss again in 1961. Conner, interview with author, August 30, 1996.

25. Edward Carpenter, "Developing the Product 2: Polaroid Camera," Industrial Design 10 (November 1963), 67-71.

26. The Automatic 100 was the first Polaroid camera that allowed owners the option of using either film.

27. Conner's personal interest in photography also led to his work with Honeywell's Heiland division on the development of electronic flash units for conventional cameras. William F. H. Purcell, interview with author, March 16-17, 1991.

28. Carpenter, "Developing the Product," 69. An illustration of the consistency of Land's vision over the course of some twenty-five years, "SX-70" was the designation of his "dream camera" of 1943 as well as the actual product of 1972. Mark Olshaker wrote of Land, "His original instructions to his engineers [for what became the realized SX-70] consisted of a small list typed triple-space on a single sheet of paper: Compact, Integral, Single-Lens Reflex, Garbage-Free." Olshaker, The Instant Image: Edwin Land the Polaroid Experience (New York: Stein and Day, 1978), 172. Jim Conner related in an interview that the single-lens reflex idea was a late development in the program. Conner, interview with author, August 30, 1996. While there were a number of

"teething problems" with the new camera, the SX-70 was a crowning achievement that may well have been the most ambitious, successful development program in the Polaroid Corporation's history. The Dreyfuss team was involved from its beginnings.

29. Conner related that this was Land's idea from the inception of the project, and that a great deal of effort was applied to creating a truly opaque white plastic that wouldn't allow light to reach the film. Jim Conner, interview with author, August 30, 1996.

30. Wurman, "1965," Polaroid (n.p.).

31. The metallic Mylar was left off of one section of this "face;" the non-metallized plastic formed the flash lens.

32. According to Jim Conner, "Land liked Henry because Henry didn't know what you couldn't do." Figuring out how to do things was the province of Land and his scientists and Dreyfuss's engineering-oriented designers.

33. Dreyfuss took hundreds of pictures with this "spy camera," as it has been popularly dubbed. "He must have discarded 90 percent of the photographs," stated John Dreyfuss. Many were used as a basis for the "travelogues" he illustrated in colored pencil of family vacations, such as the inaugural voyage of the S.S. Independence. John Dreyfuss, interview with author, November 23, 1990.

34. For Loewy's comment, see the issue devoted to his work for the Pennsylvania Railroad of The Keystone. Anita A. Pins, "The Pennsylvania Railroad Streamlined by Raymond Loewy," The Keystone (official publication of the Pennsylvania Railroad Technical and Historical Society) 24 (Spring 1991), 30, footnote 16. Arthur Detmers Dubin, recognized expert on the train, received the following in a letter from Dreyfuss. "Colors used in transportation should give the passenger a feeling of security. While colors can be bright and cheerful, one must remember that among the passengers some would be going on a vacation, or a honeymoon, but others could be ill or en route to the funeral of a loved one. The Century had a neutral background as a basis for the colors used as accents in the decoration." Dubin to Charles Blardone, December 4, 1991. Blardone published Dubin's refutation of Loewy's accusation in the next issue of The Keystone.

35. Frederick P. Rose, interview with author, February 10, 1993.

36. Edward Larrabee Barnes, telephone interview with author, February 5, 1991.

37. Julian G. Everett, interview with Raymond Spilman, 1978; information via a telephone interview between Spilman and the author, March 27, 1992. Everett retired from the Dreyfuss office shortly thereafter.

38. Maude Dorr, "Banker's Trust, Park Avenue: A Designer's Experiment in Architecture," Industrial Design 10 (March 1963), 52.

39. "A New Art of Banking," Architectural Forum 118 (April 1963), 106.

40. Dreyfuss must have become aware of Bertolia's talents by the time they both worked on the Manufacturers Hanover Bank at 43rd Street and Fifth Avenue in the early 1950s. Architect Gordon Bunshaft headed the project for Skidmore, Owings and Merrill, and Dreyfuss's associate Julian Everett contributed a remarkable round vault door for Mosler Safe that was visible through glass at the street level. Bertolia created a wire sculpture that hung above the escalator that took the public to the banking floor on the second level (this resembled the piece created for the Bankers Trust building). Equally important was Bertolia's seventy-foot long bronze-and-steel screen that separated public from private banking areas on the second floor; this may well have been an inspiration for the functional considerations behind Dreyfuss and Scuris's screen at Bankers Trust.

41. "He was a conceited guy--he'd let you know that he thought he was very good," stated Goldsmith, who added that Dreyfuss was the only person he knew from business that he would go to the theater with or even have lunch with. "He never wanted to be huge, and want to do no more work than he could do well." Clifford Goldsmith, interview with author, January 14, 1991.

42. William F. H. Purcell, interview with author, March 16-17, 1991.

43. With typical thoroughness, Dreyfuss had left a note for their housekeeper to call their doctor, and another note for the doctor asking him to summon an ambulance.

44. "Notable and Quotable," The Wall Street Journal, January 8, 1968. The full text of Dreyfuss's statement appeared in the Bell Telephone Magazine, September-October 1967, 18-24.



Fig. 1



Fig. 2



Fig. 3

THE CLASS OF JUNE

Nineteen Hundred and Twenty Two

Edmond Barry	Evelyn Kronman
Frederick Bernheim	Olga Maisel
John Corbino	Bryna Mason
Henry Dreyfuss	Mary Mason
Adele Epstein	Aimee Mayer
Frank Gianninoto	Robert Pilpel
Louis Harap	Louis Pincus
Eldridge Hedges	Alice Sachs
Helen Hesslein	Florence Schoenthal
Viola Hoffman	Max Seid
Edith Jacobson	Ruth Weinberg
Marie Weisel	

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Fig. 4



Fig. 5

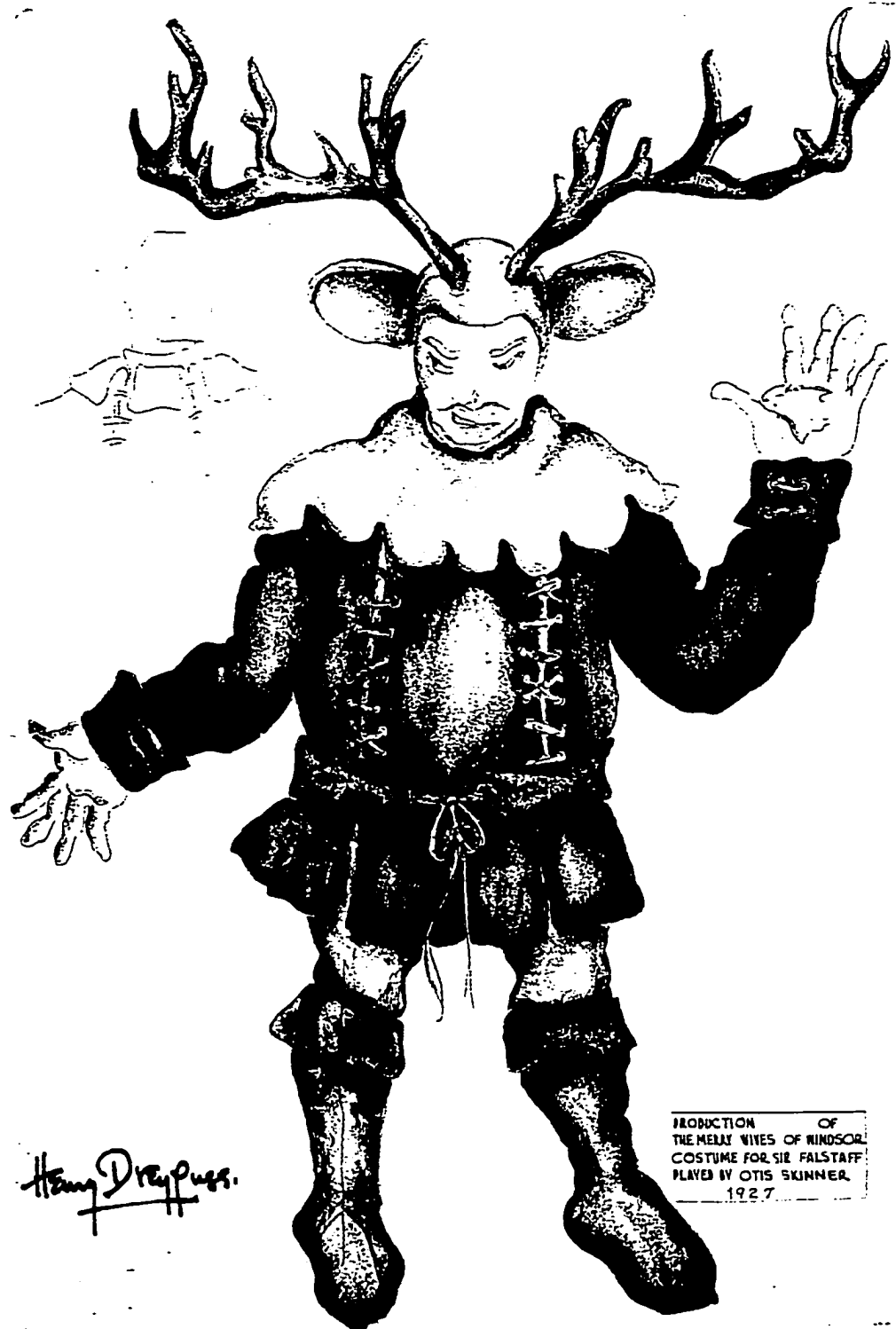


Fig. 6

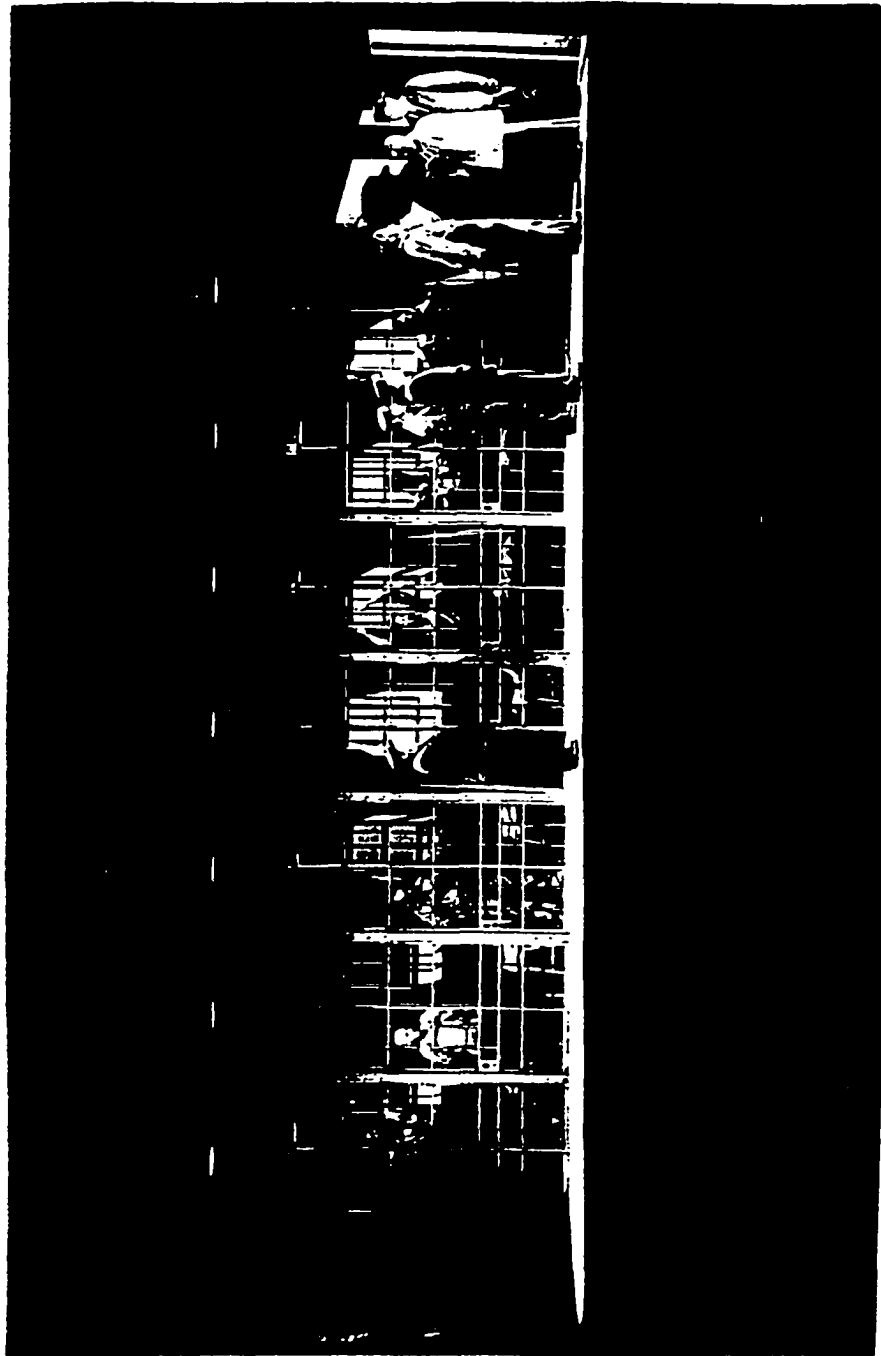


Fig. 7



Fig. 8

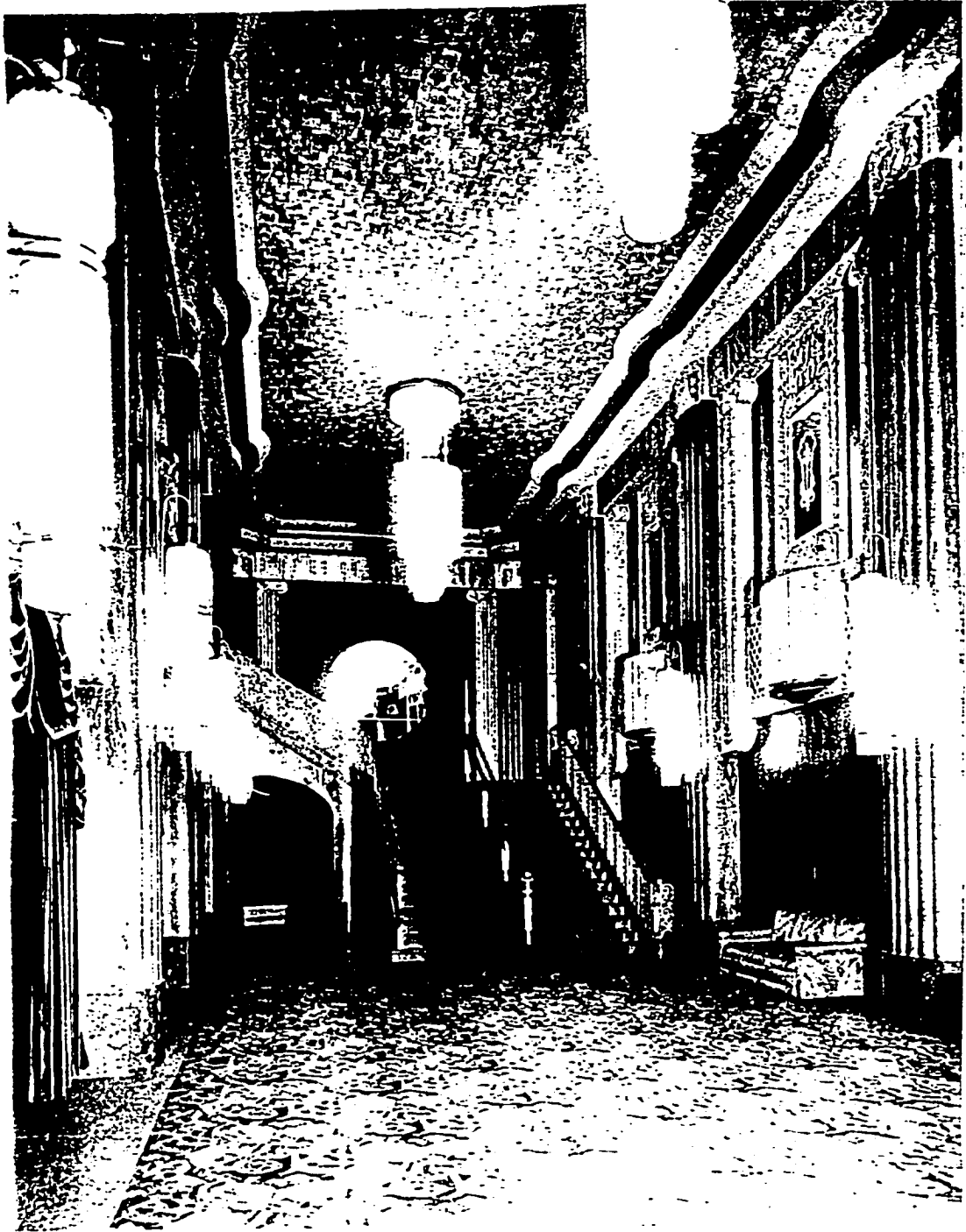


Fig. 9



Fig. 10

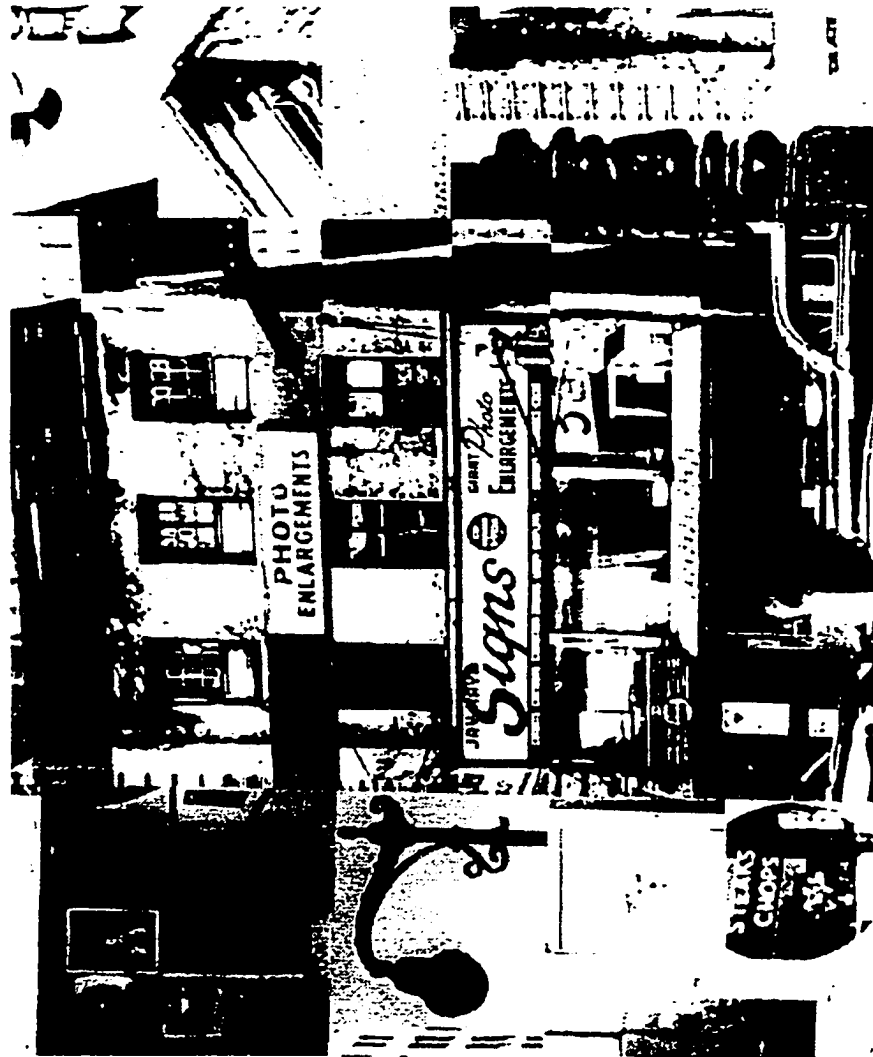


Fig. 11



Fig. 12

We bear in mind that the object being worked on is going to be ridden in, sat upon, looked at, talked into, activated, operated, or in some other way used by people individually or en masse.

When the point of contact between the product and the people becomes a point of friction, then the industrial designer has failed.

On the other hand, if people are made safer, more comfortable, more eager to purchase, more efficient—or just plain happier—by contact with the product, then the designer has succeeded.

H.D.

Designing for People

HENRY DREYFUSS

Fig. 13

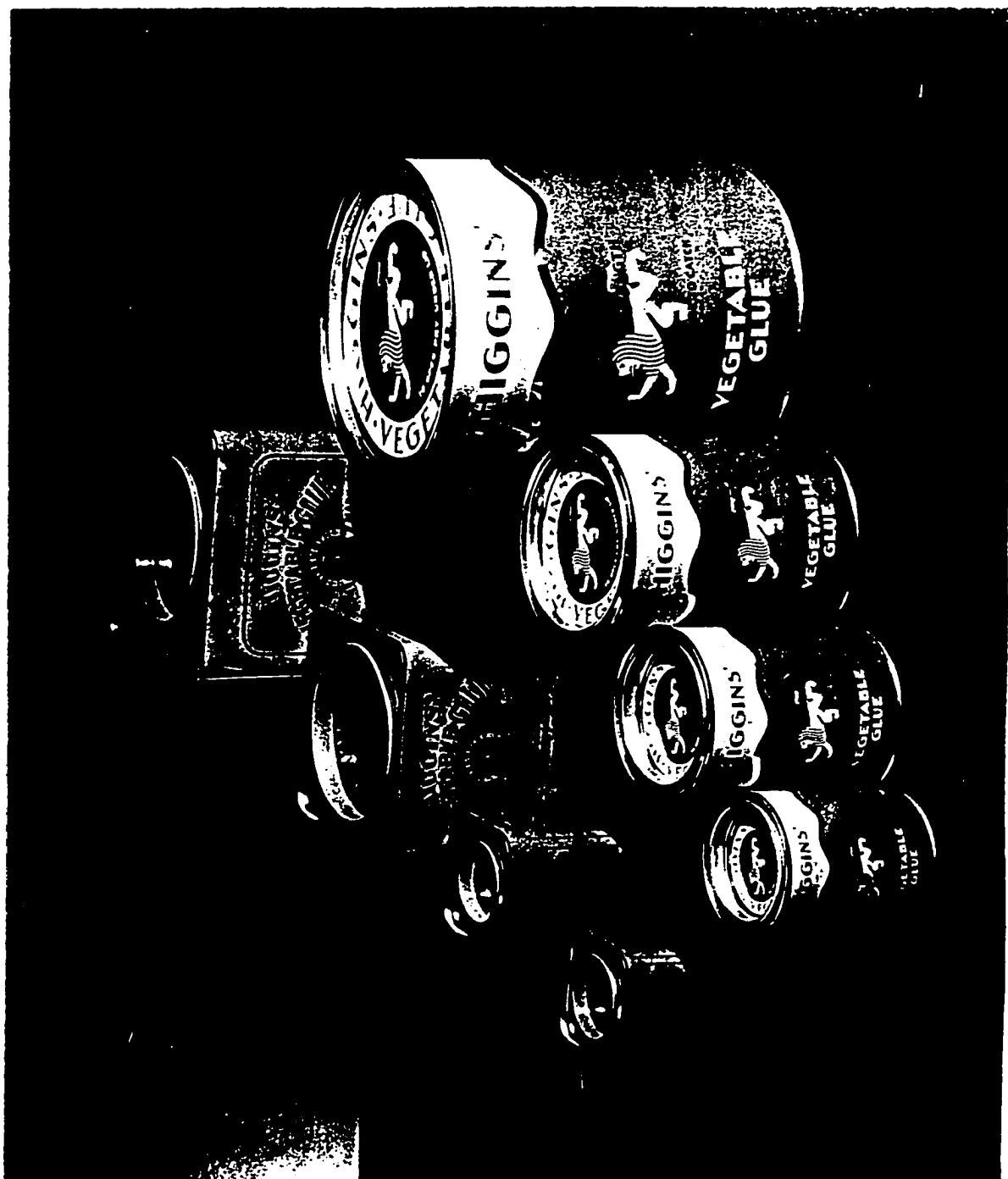


Fig. 14

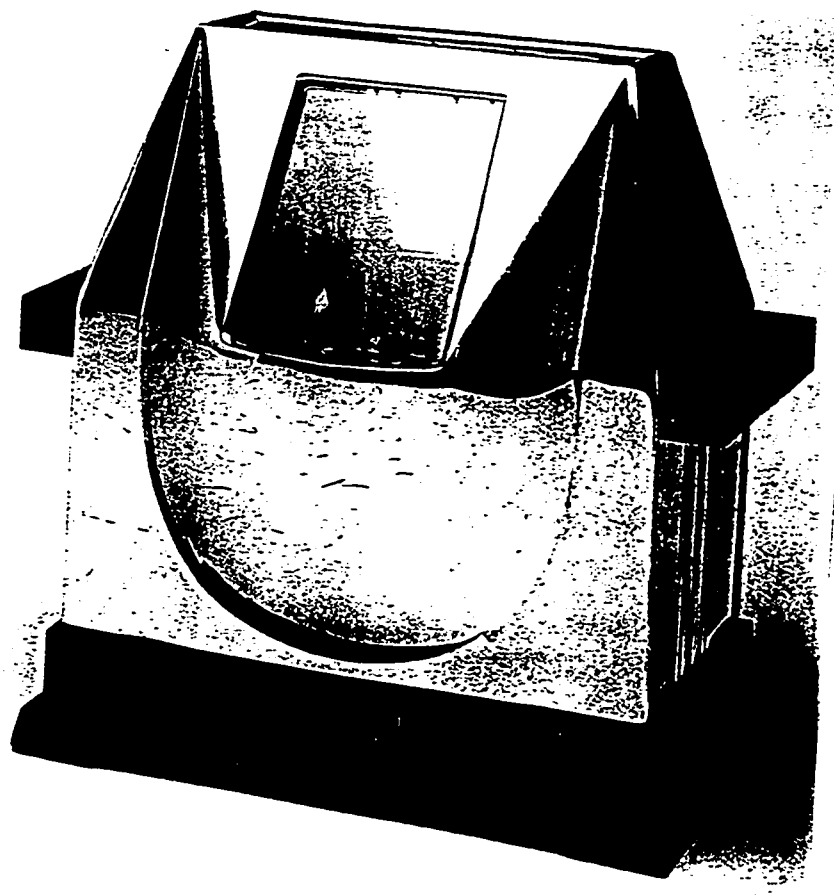


Fig. 15

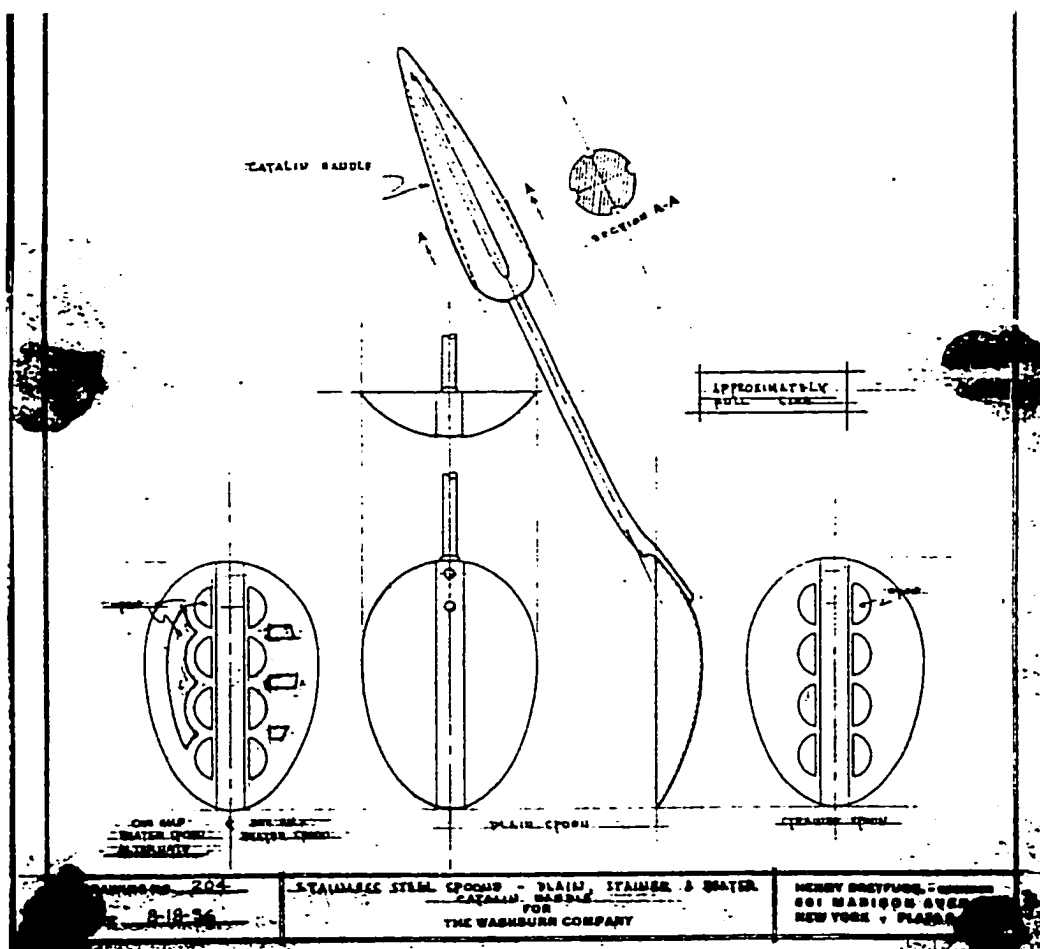


Fig. 16

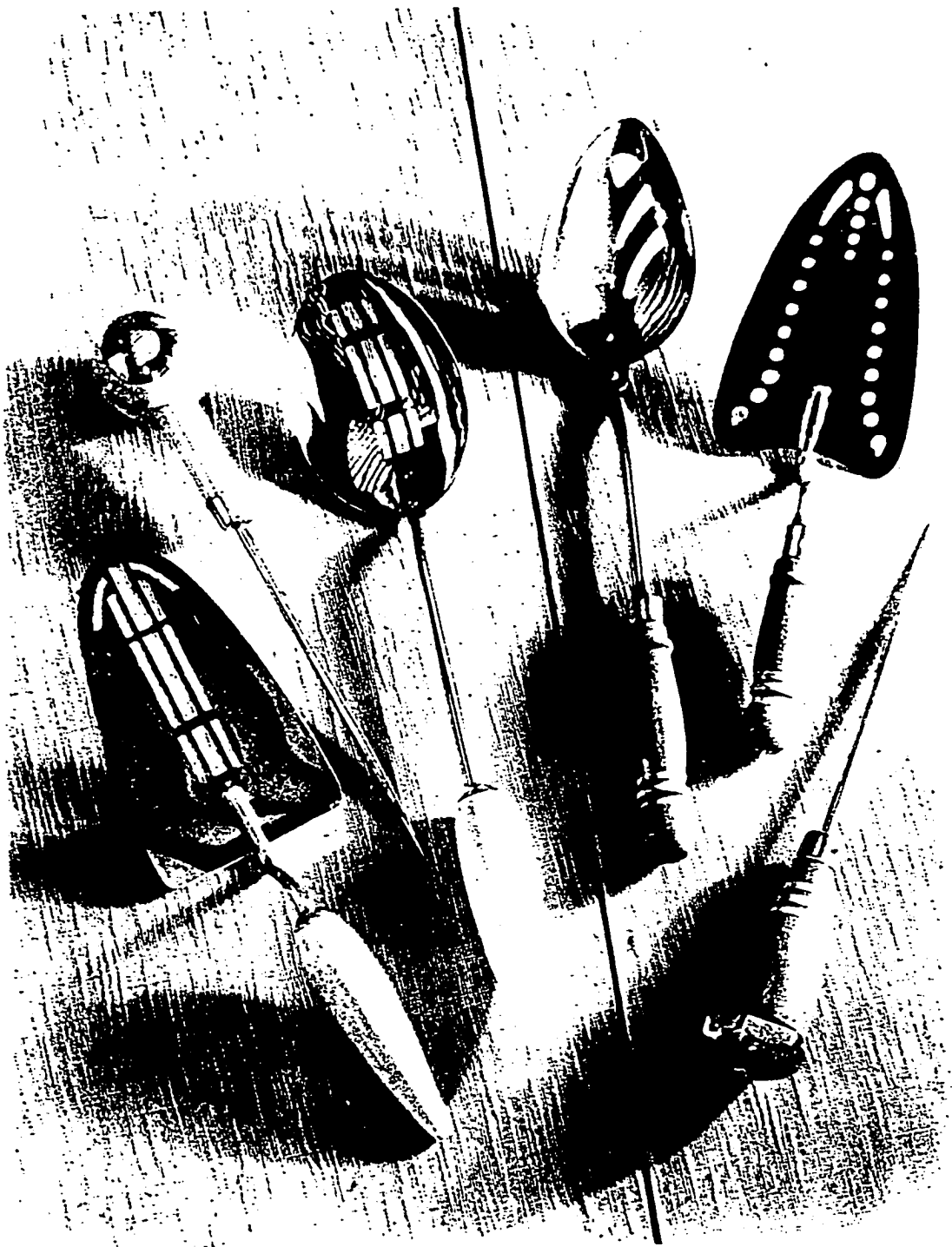


Fig. 17

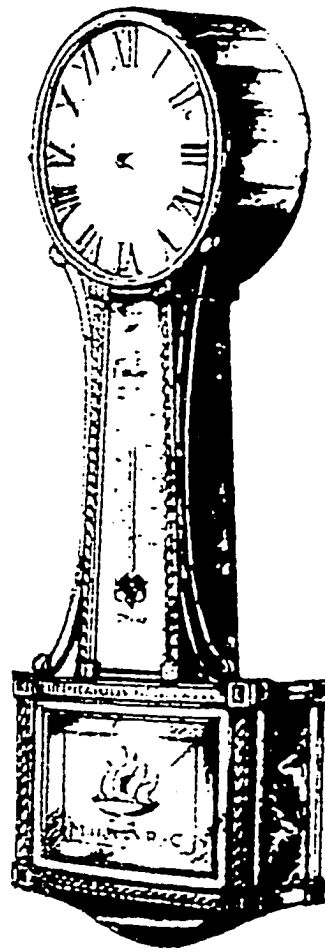


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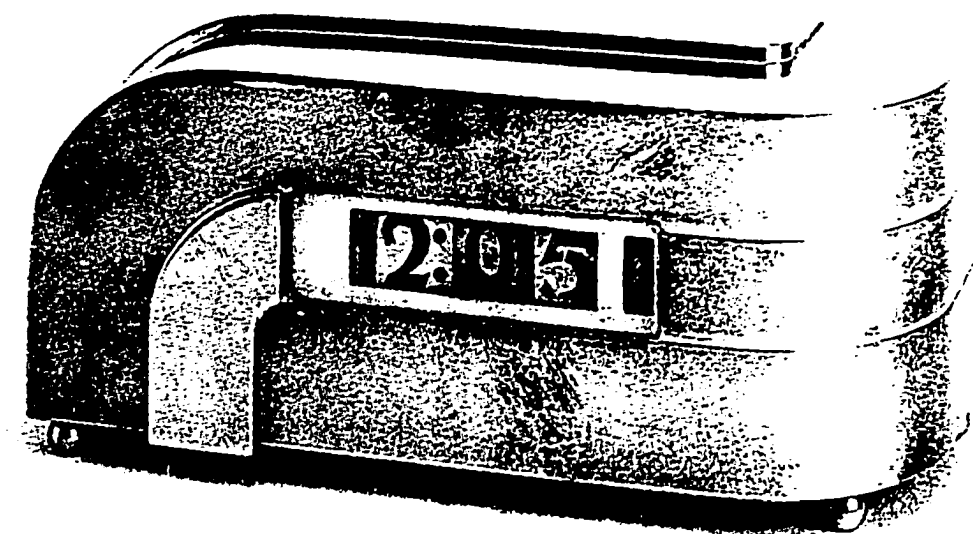


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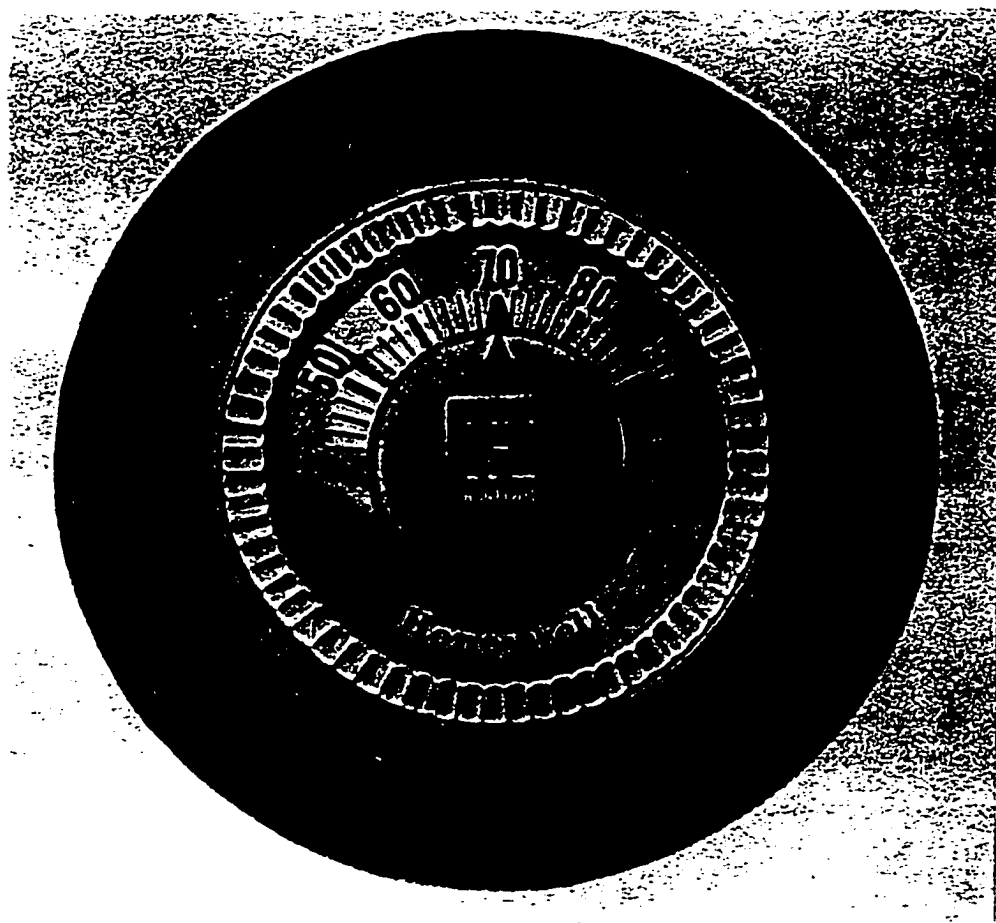


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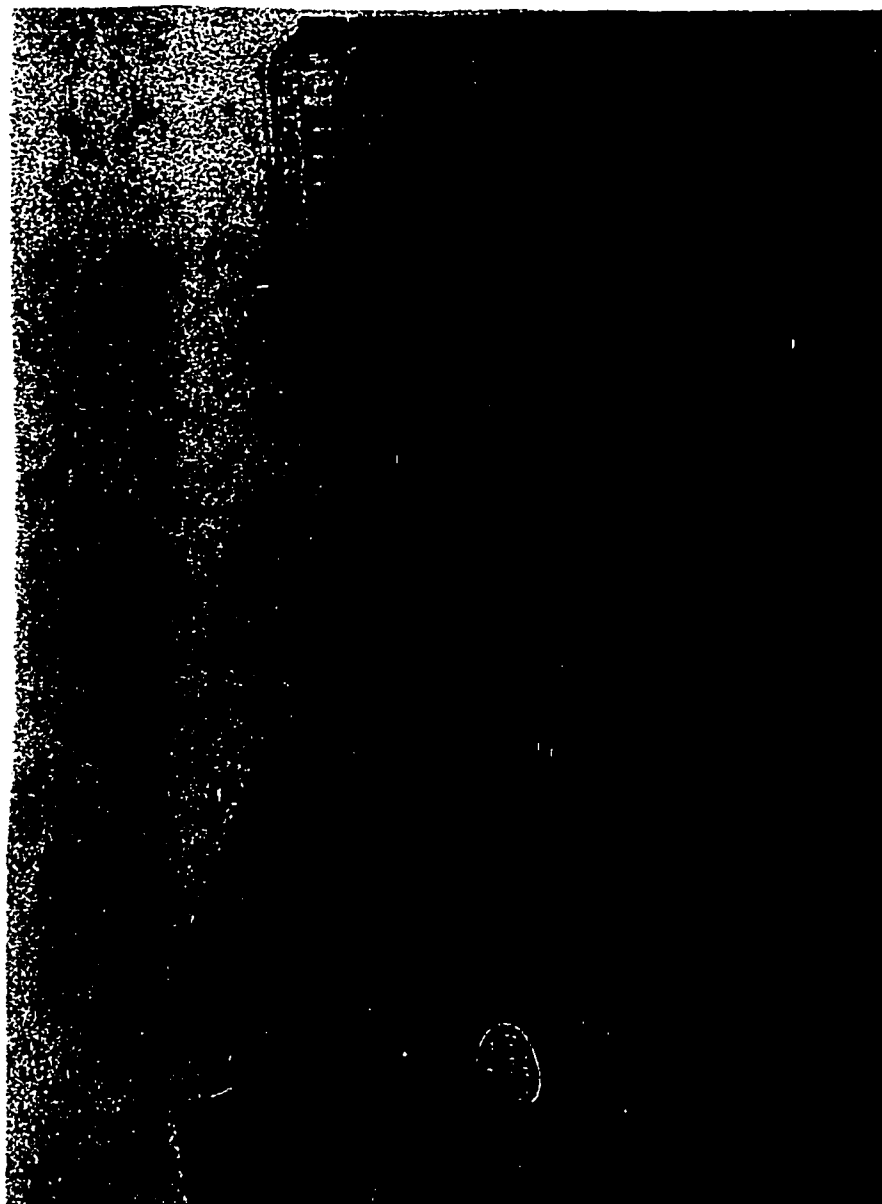


Fig. 21



Fig. 22

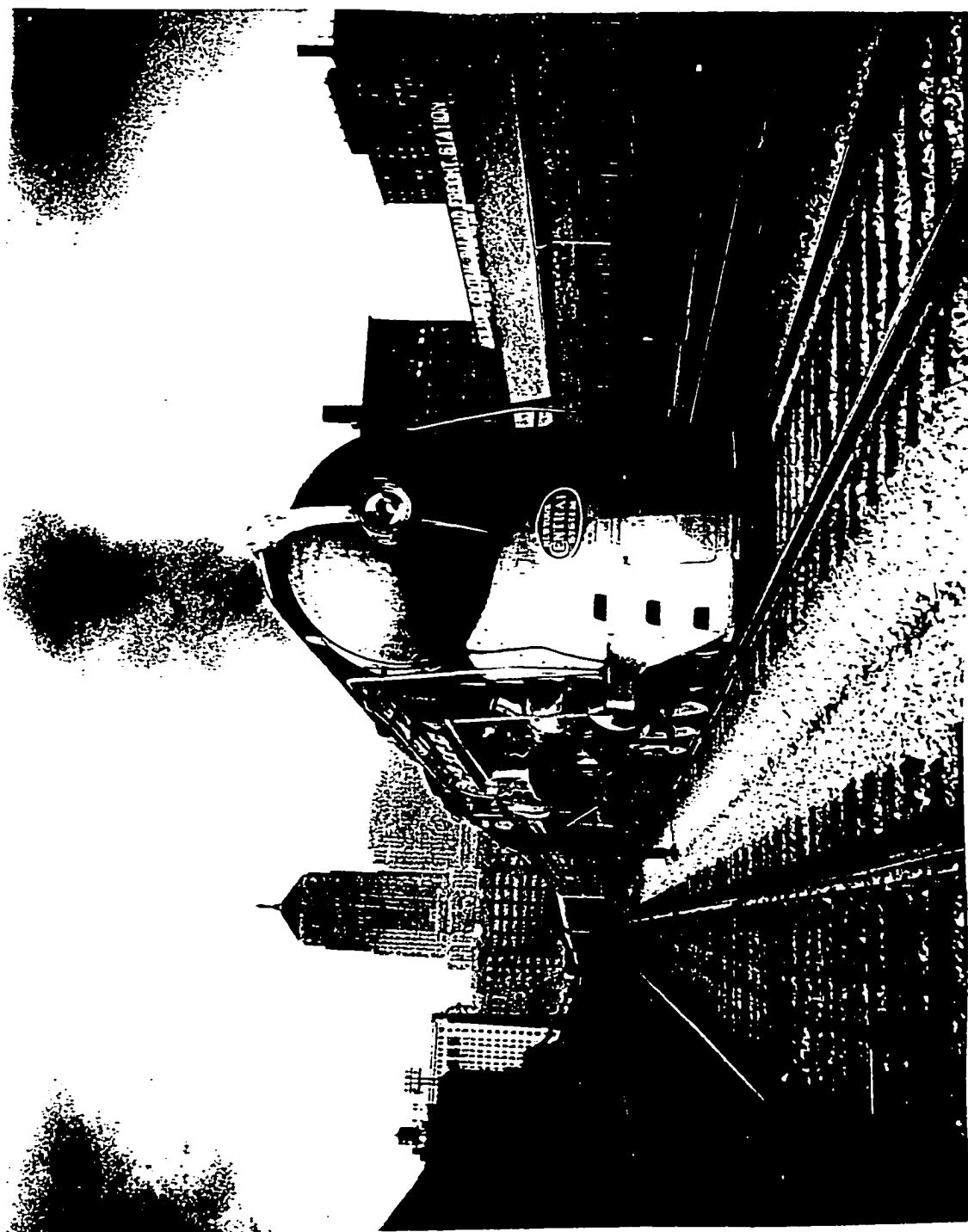


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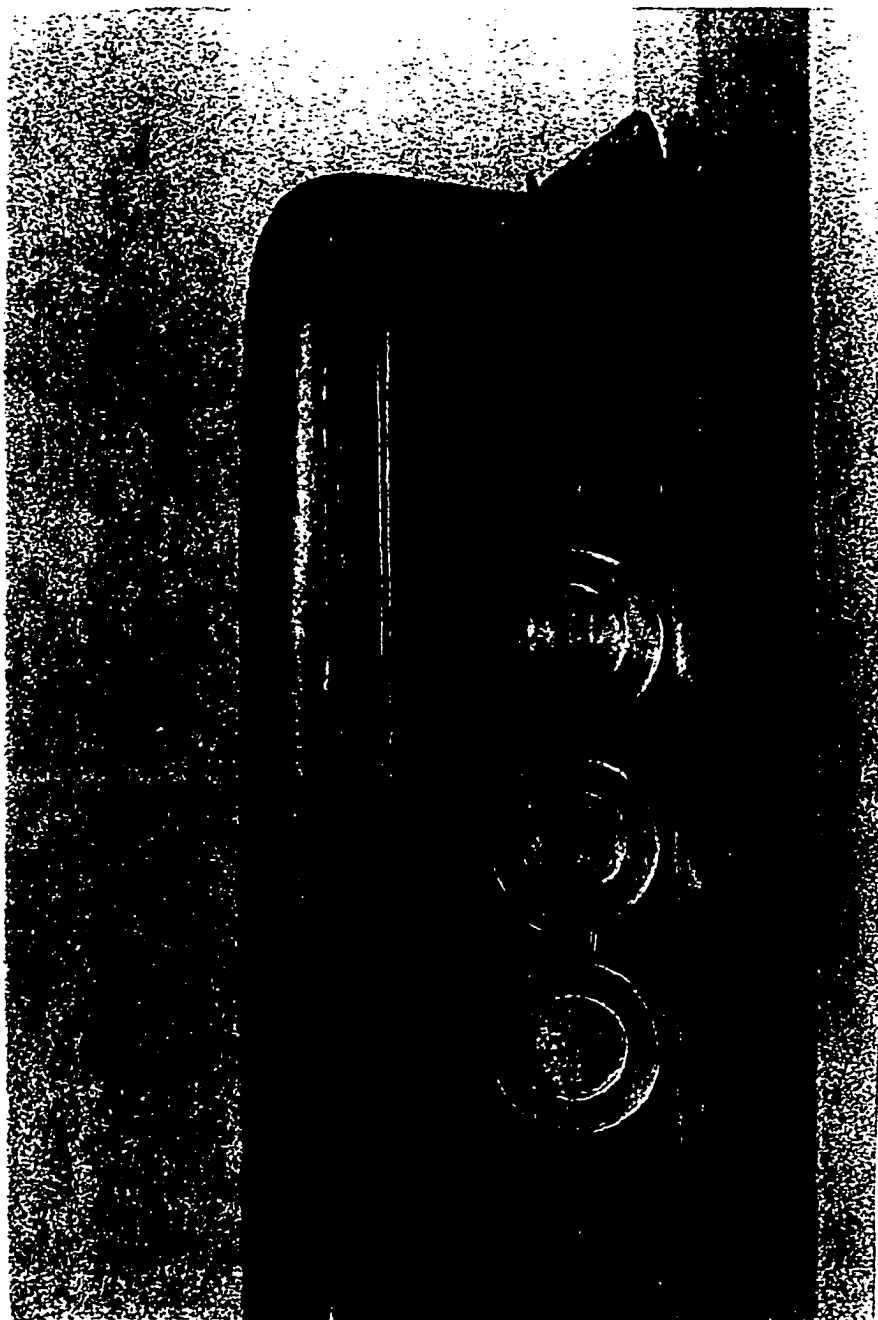


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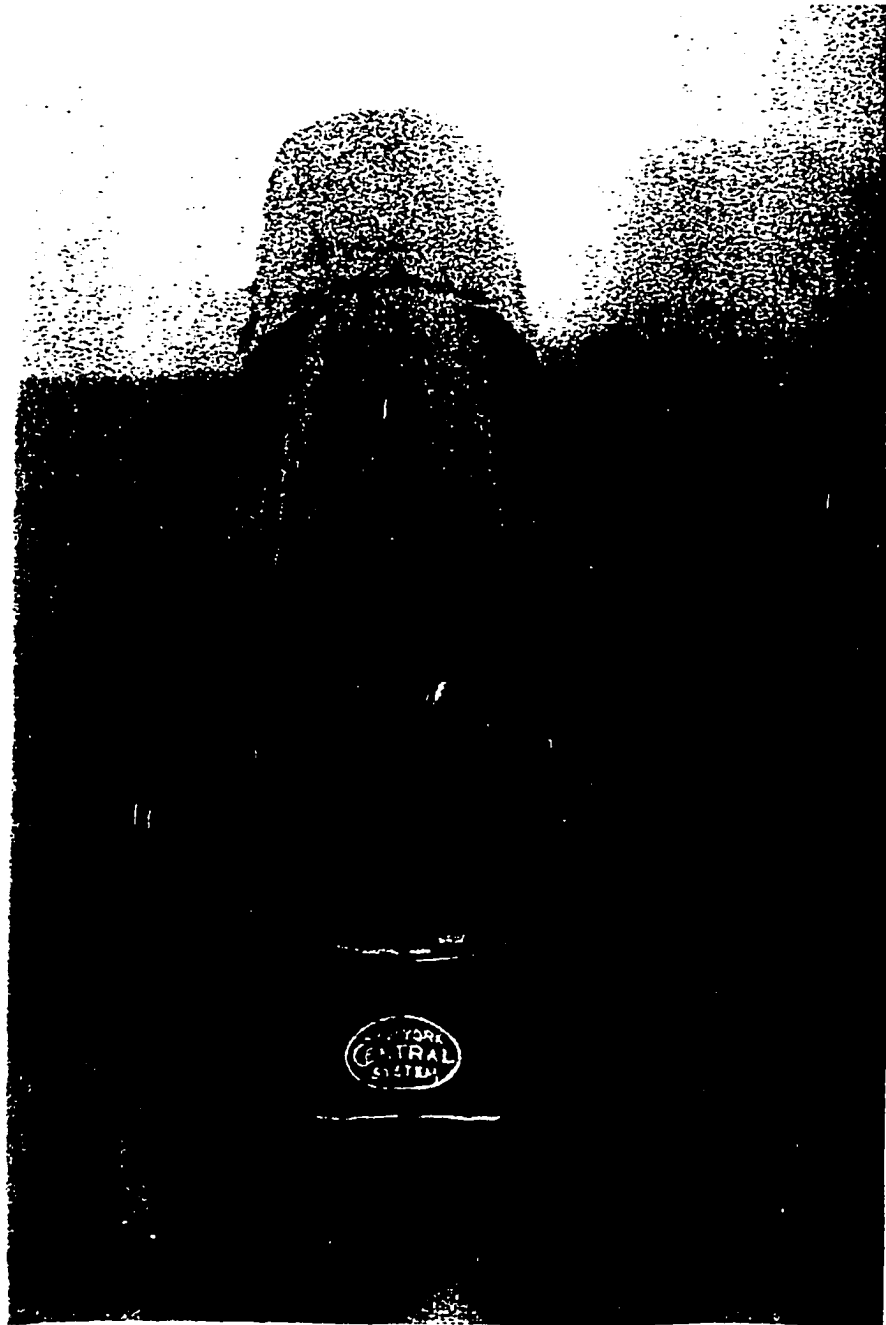


Fig. 25



Fig. 26



Fig. 27

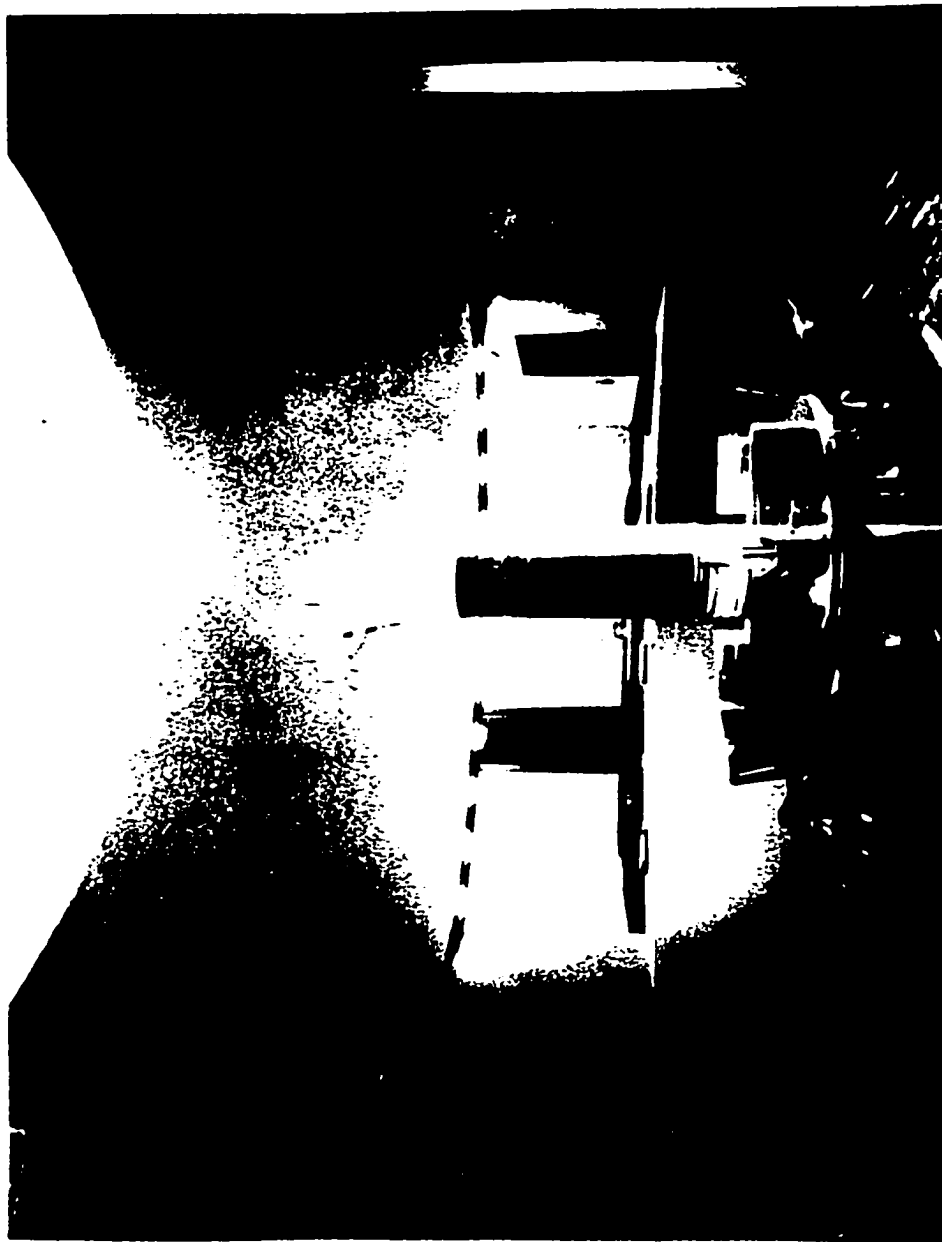


Fig. 28

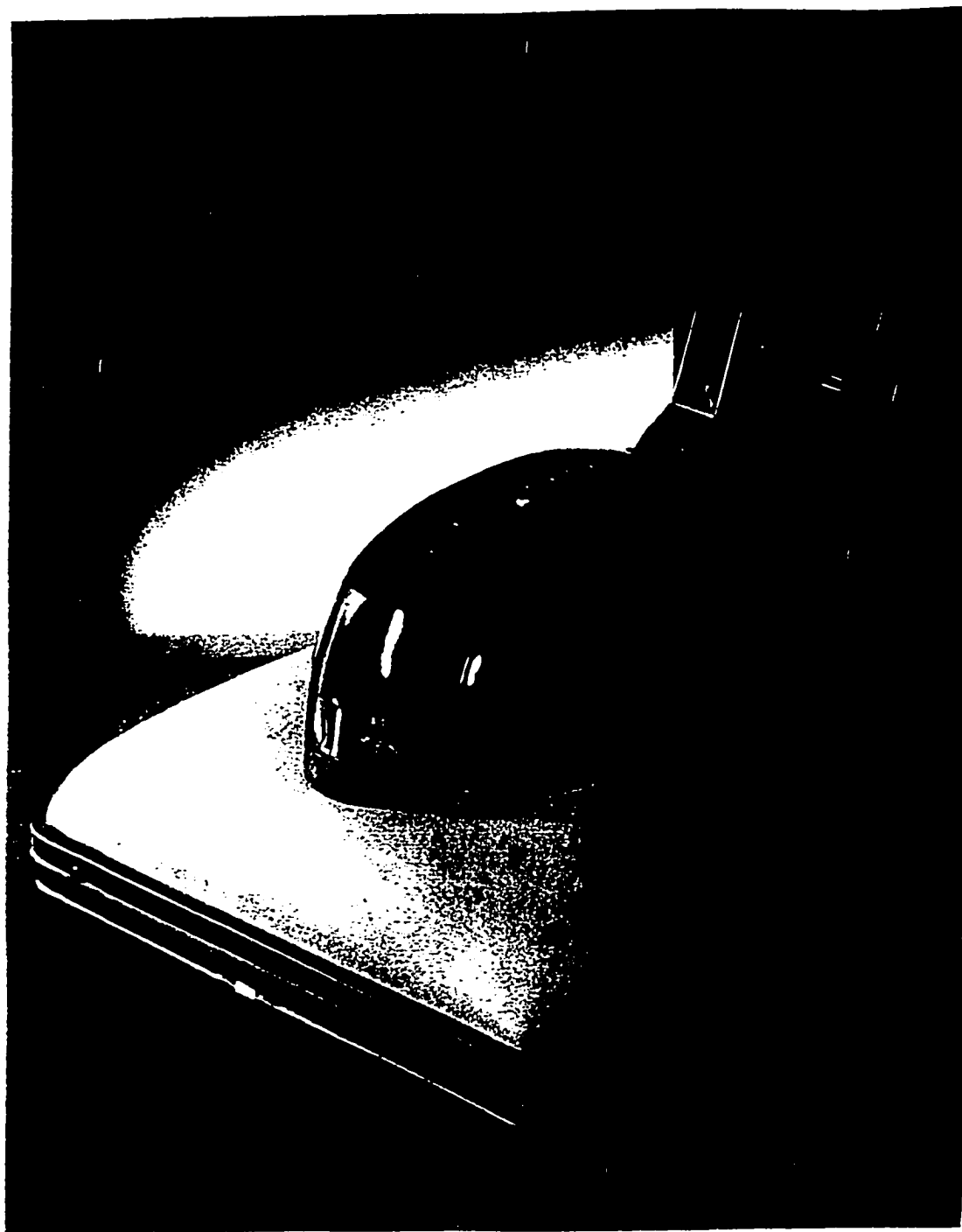


Fig. 29

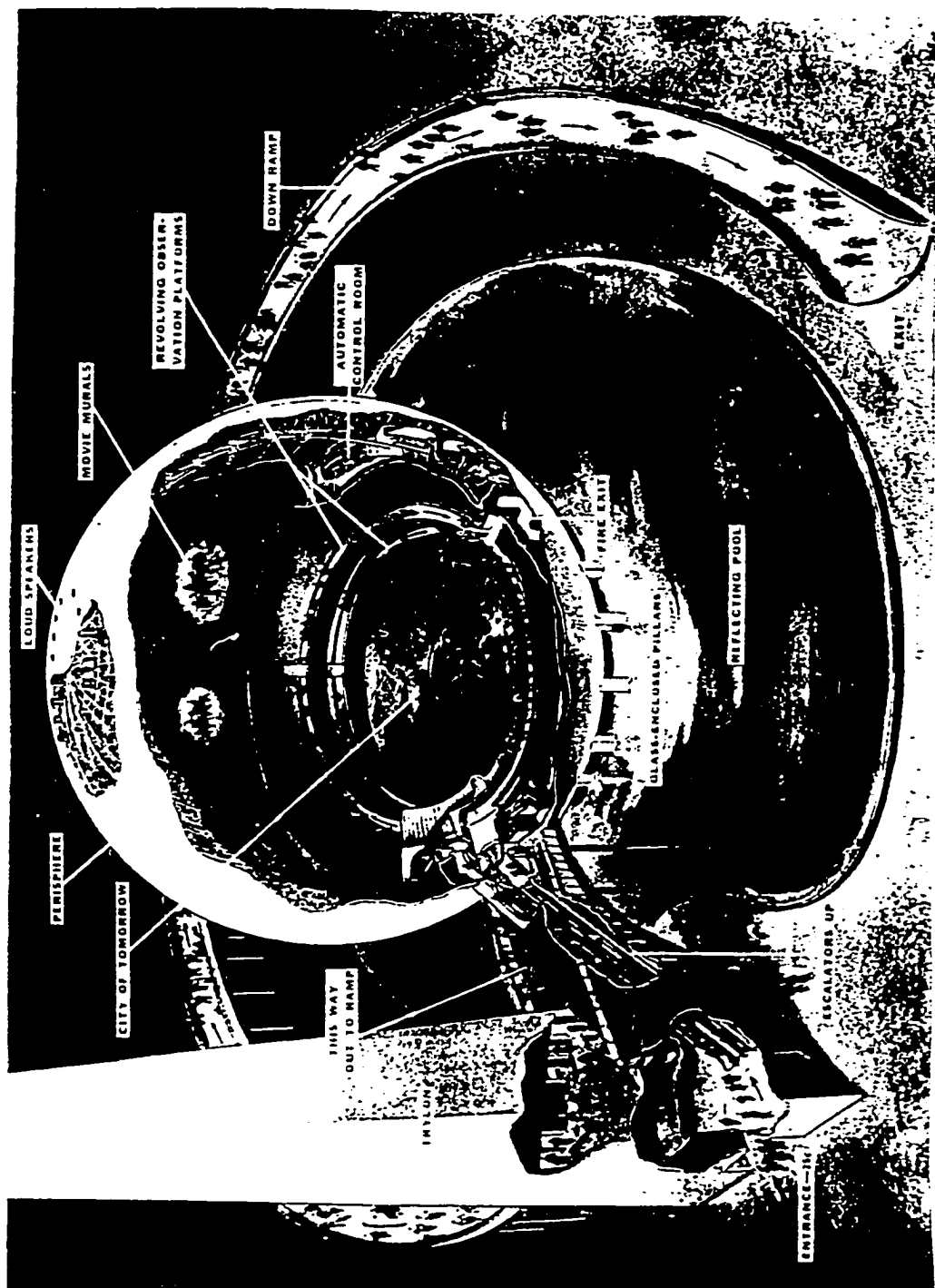


Fig. 30

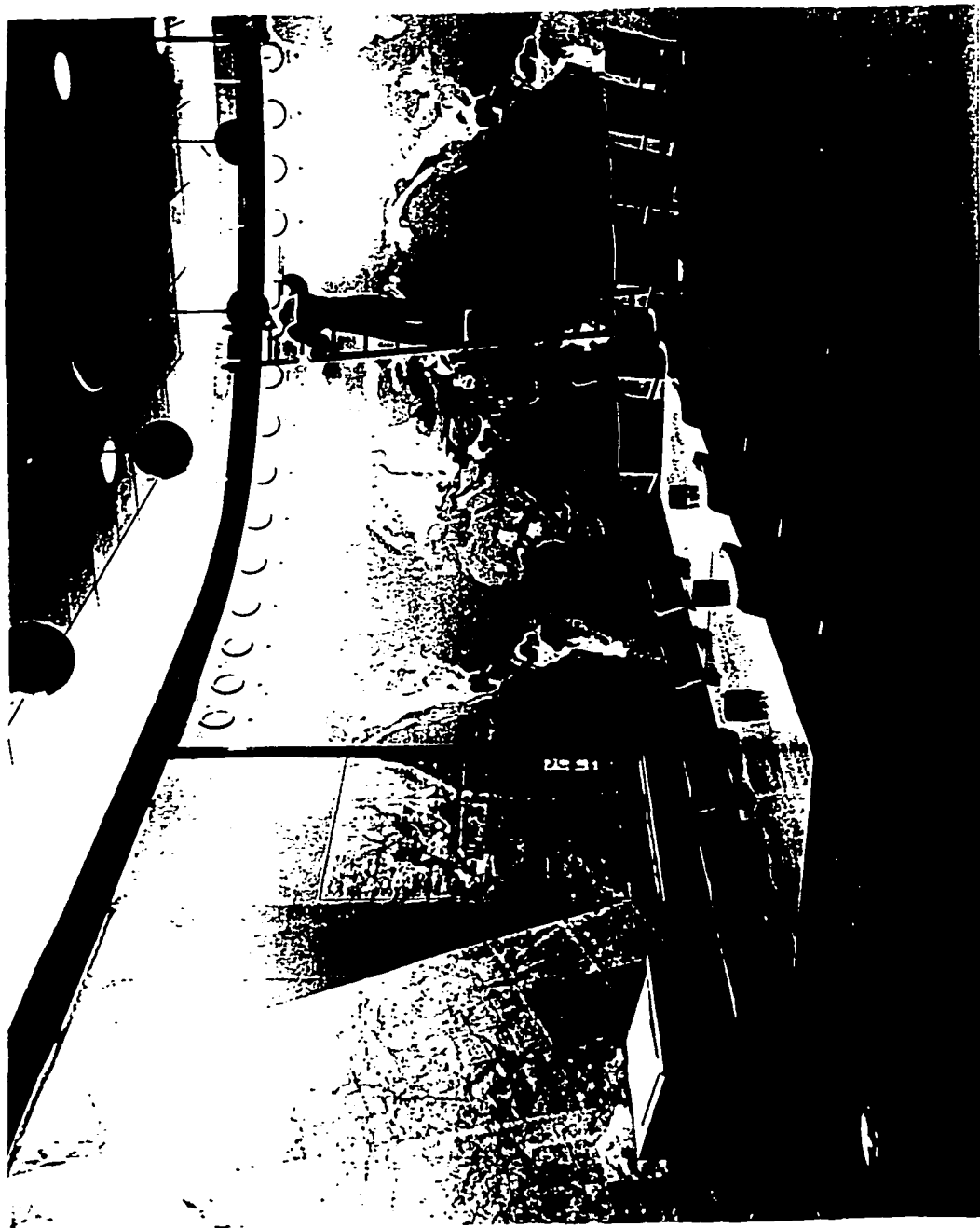


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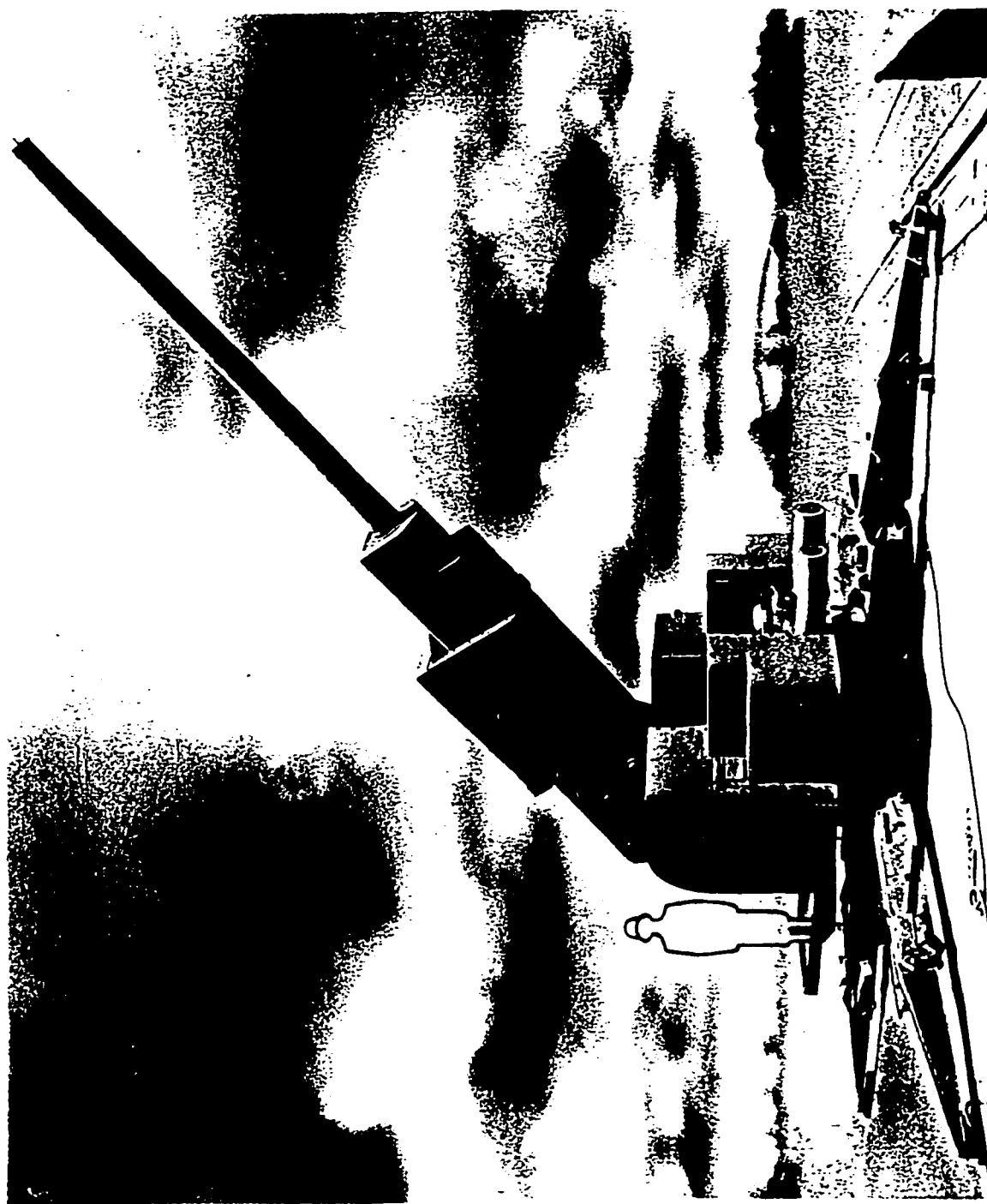


Fig. 32



Fig. 33

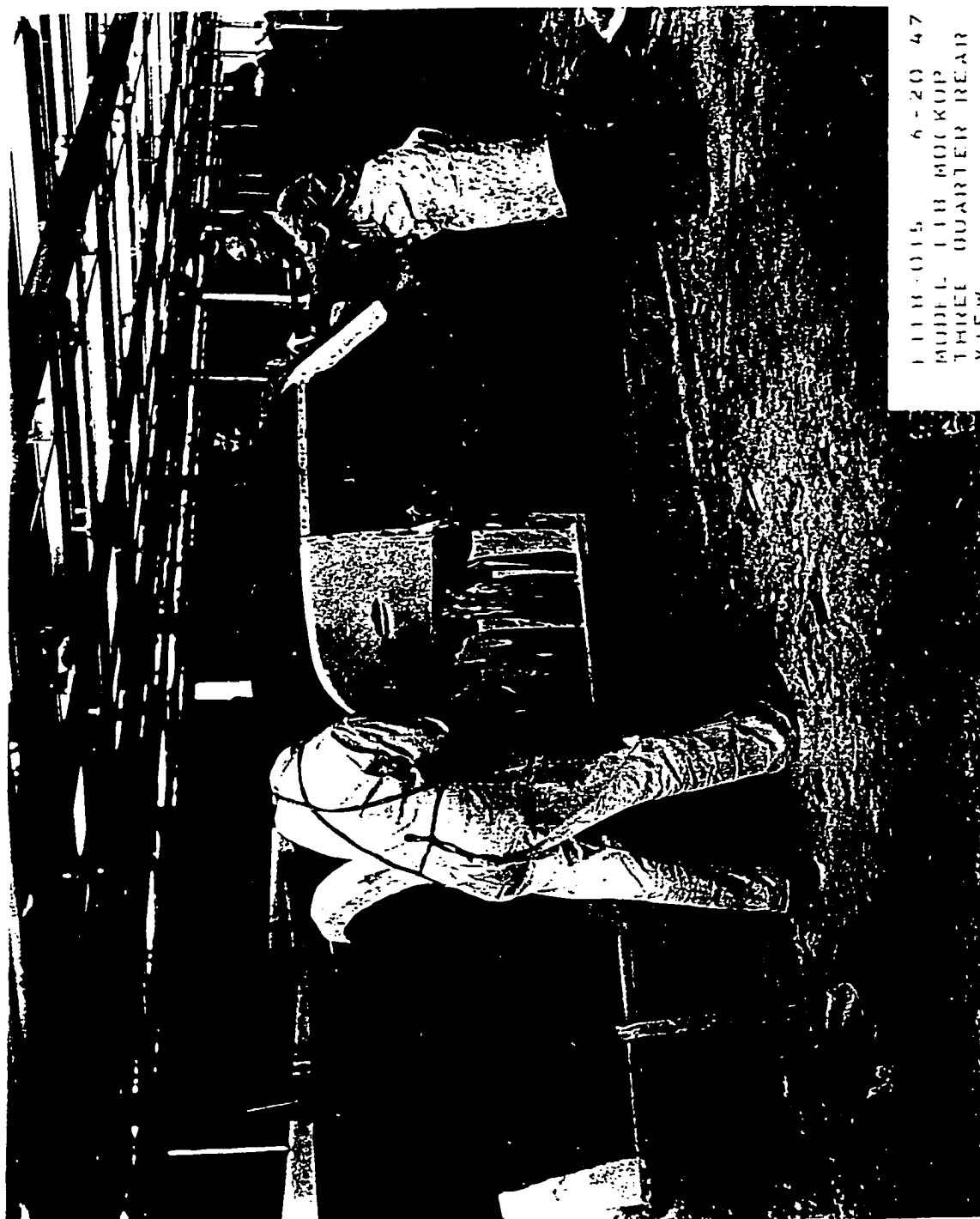
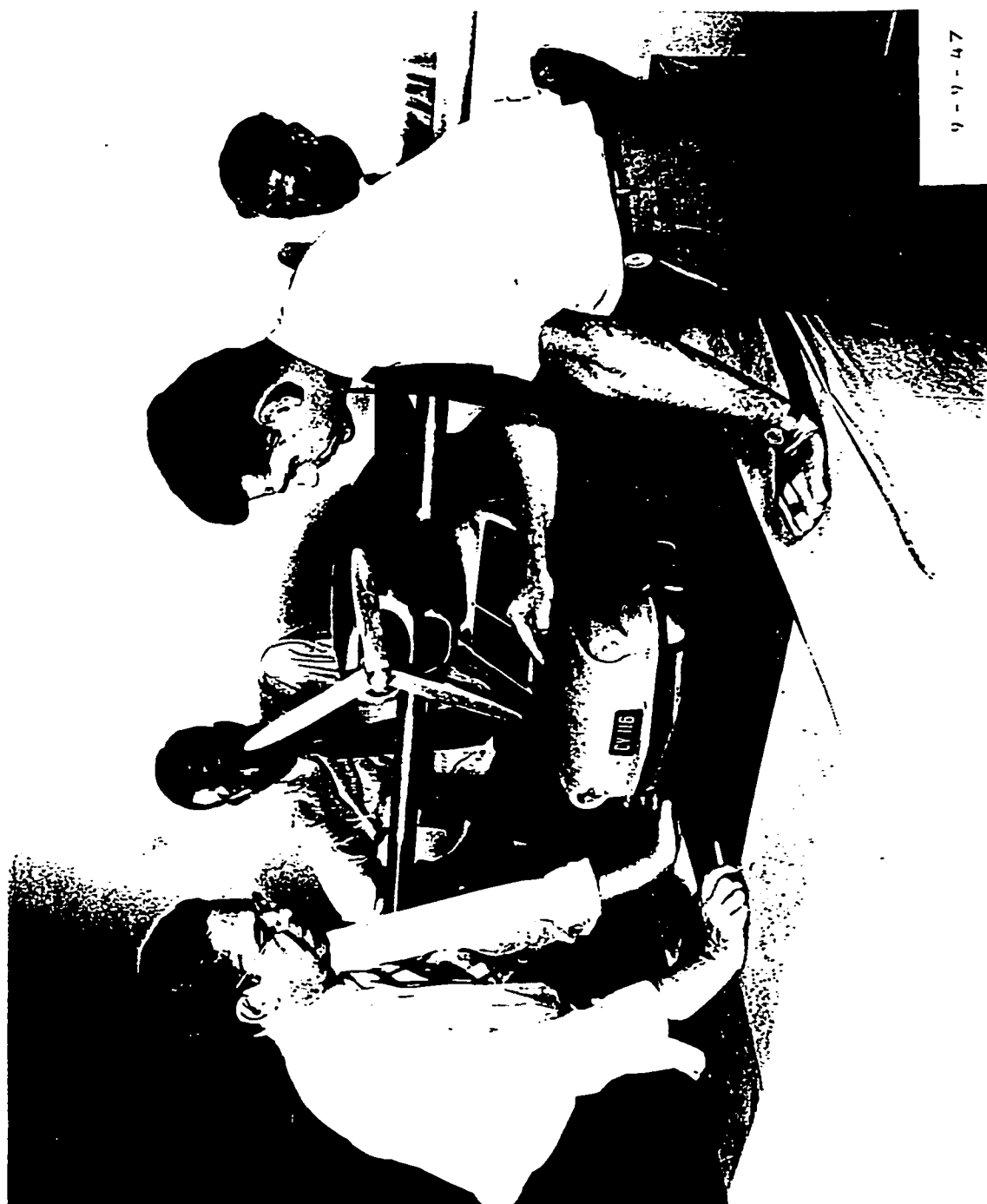


Fig. 34



Fig. 35



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Fig. 36

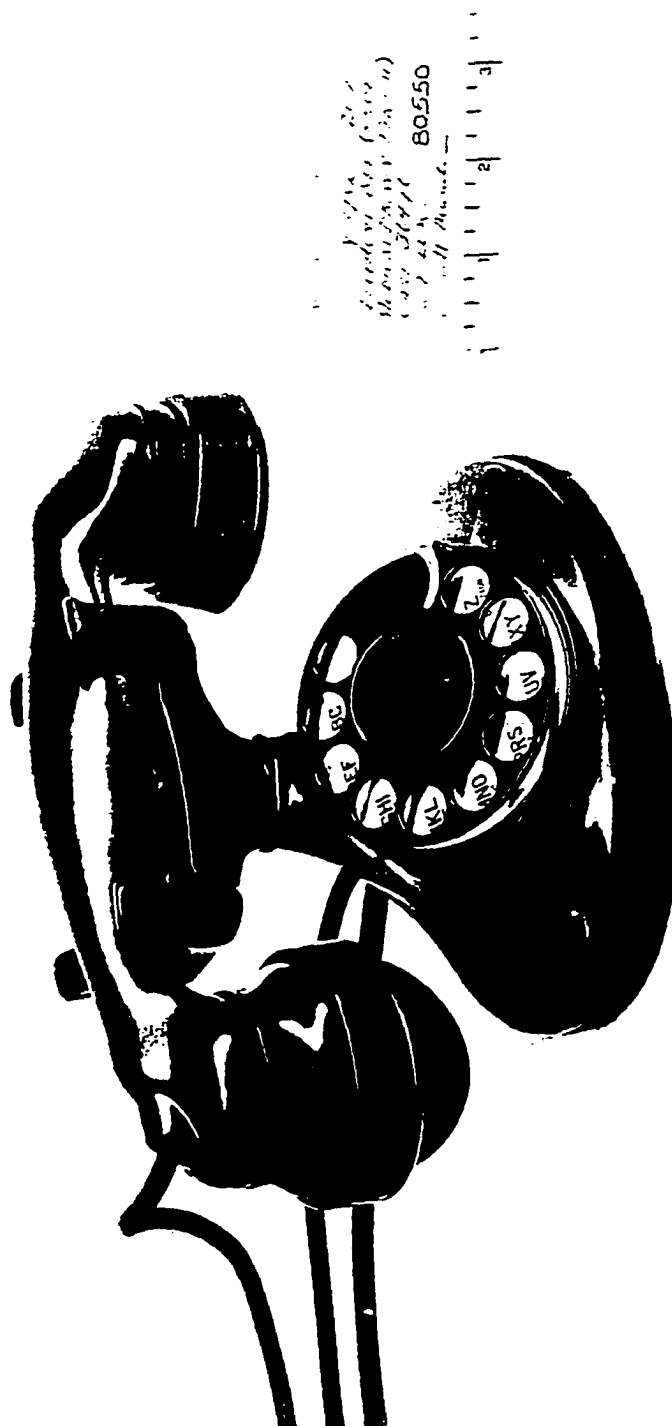


Fig. 37



Fig. 38



Fig. 39



Fig. 40

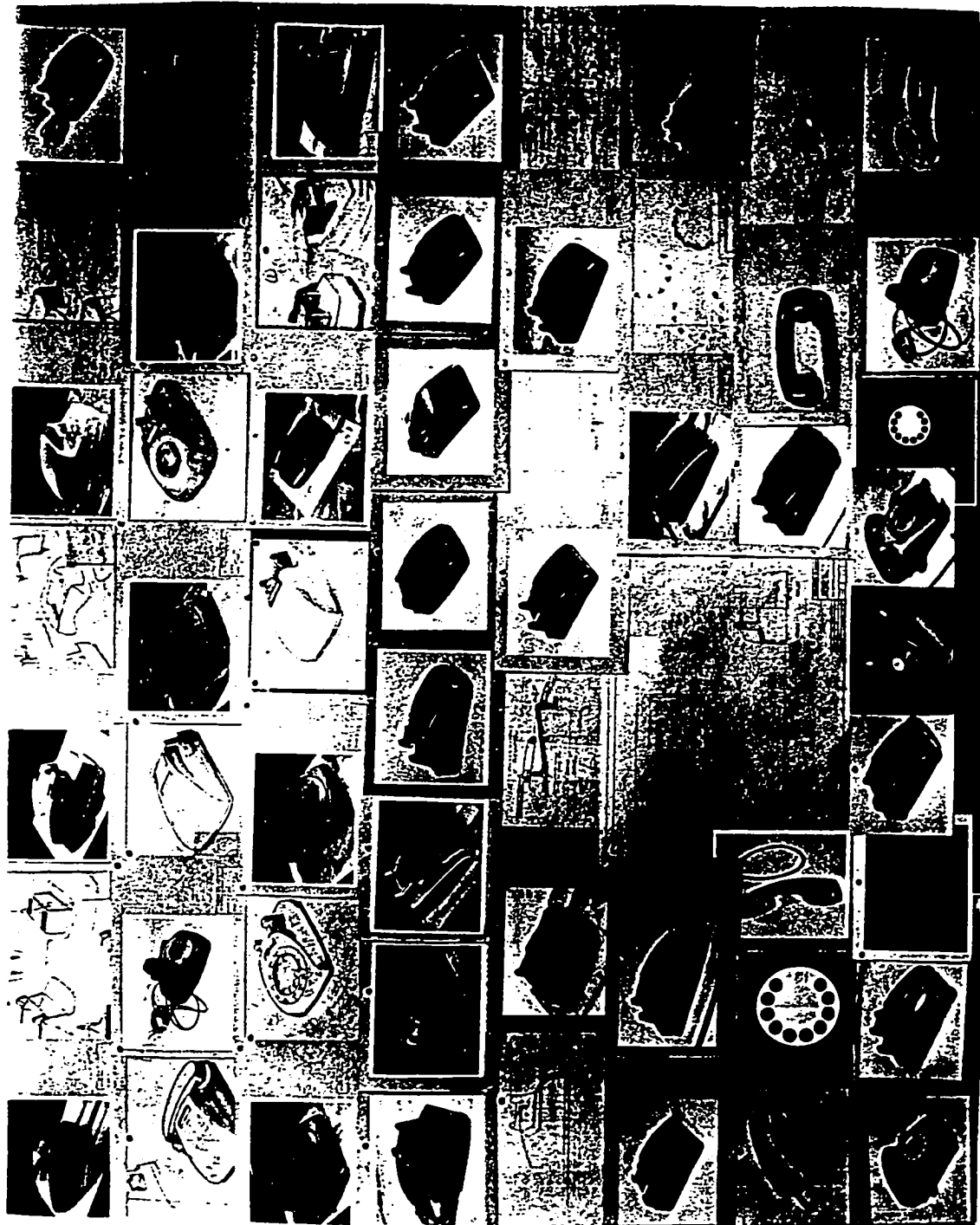


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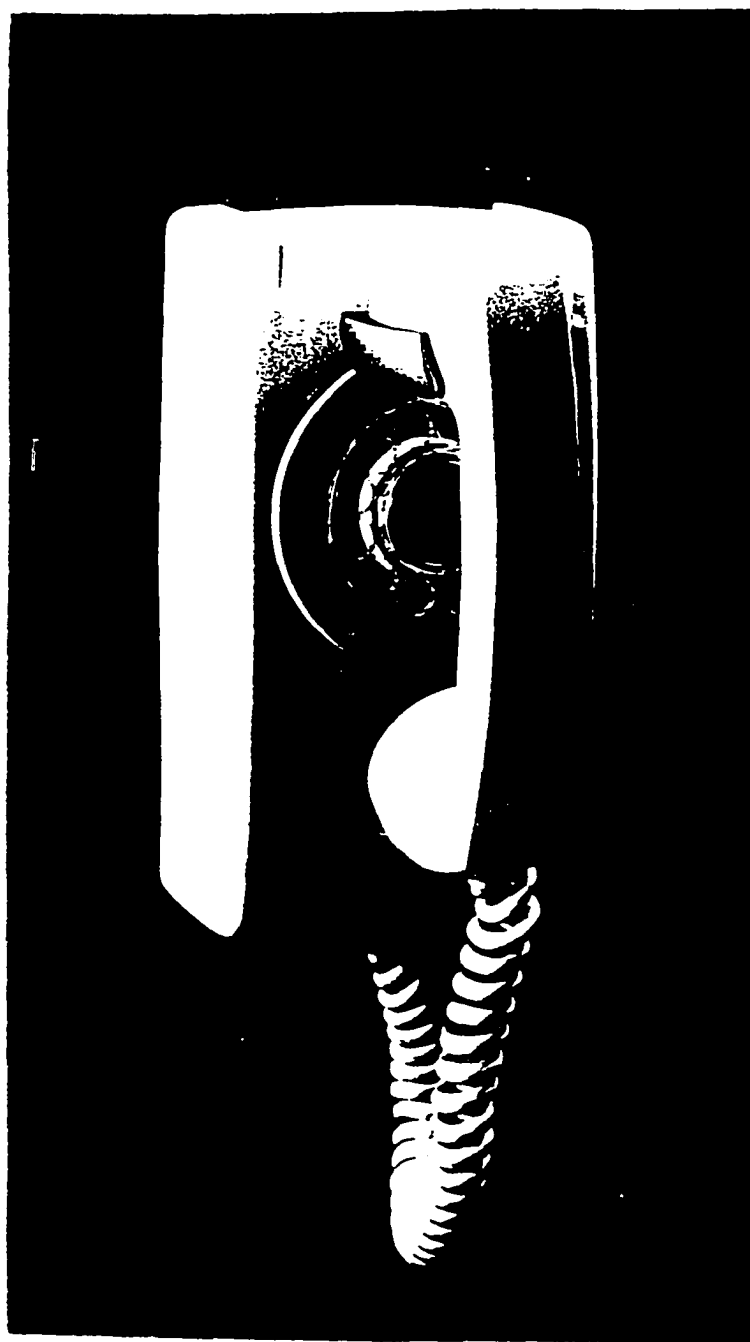


Fig. 42



Fig. 43

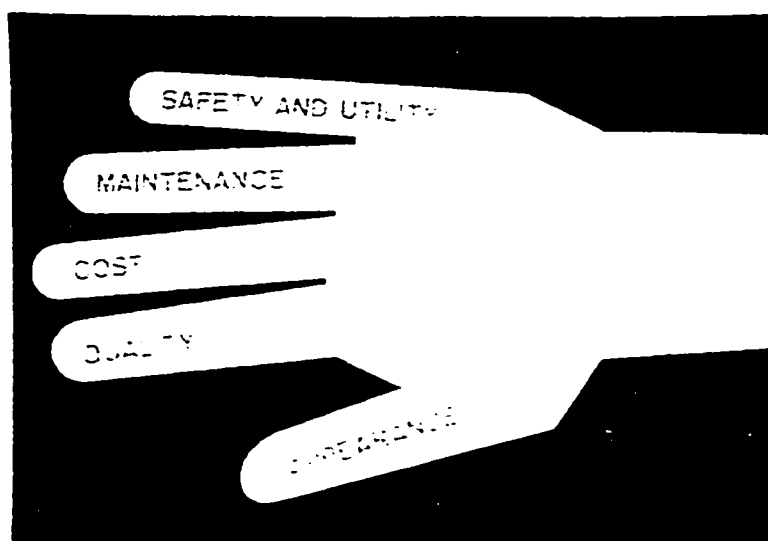


Fig. 44



Fig. 45



Fig. 46



Fig. 47

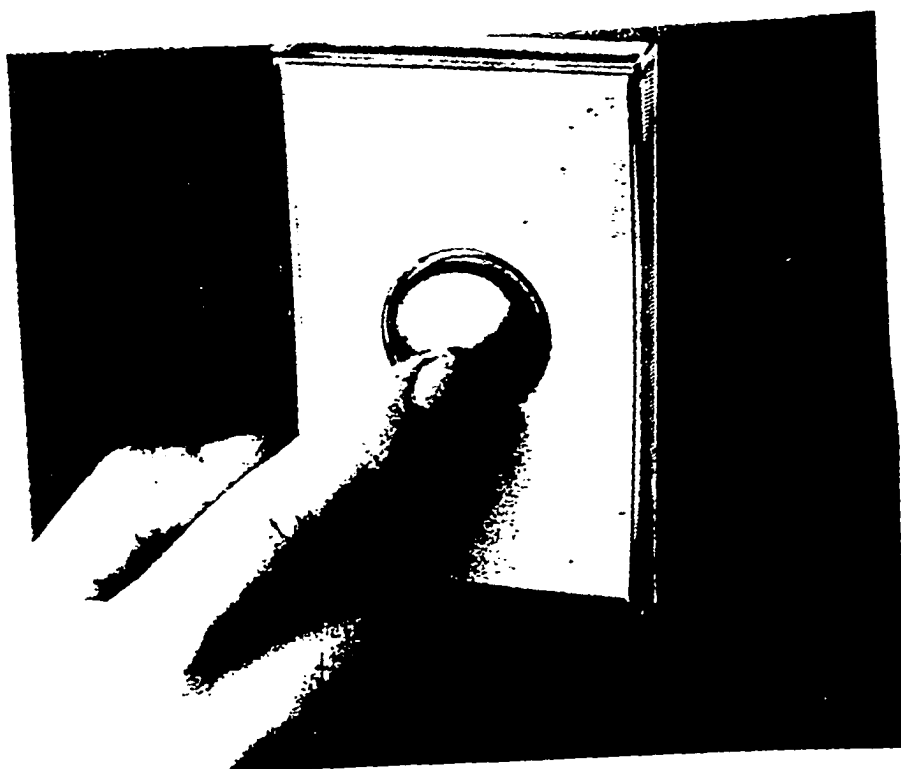


Fig. 48

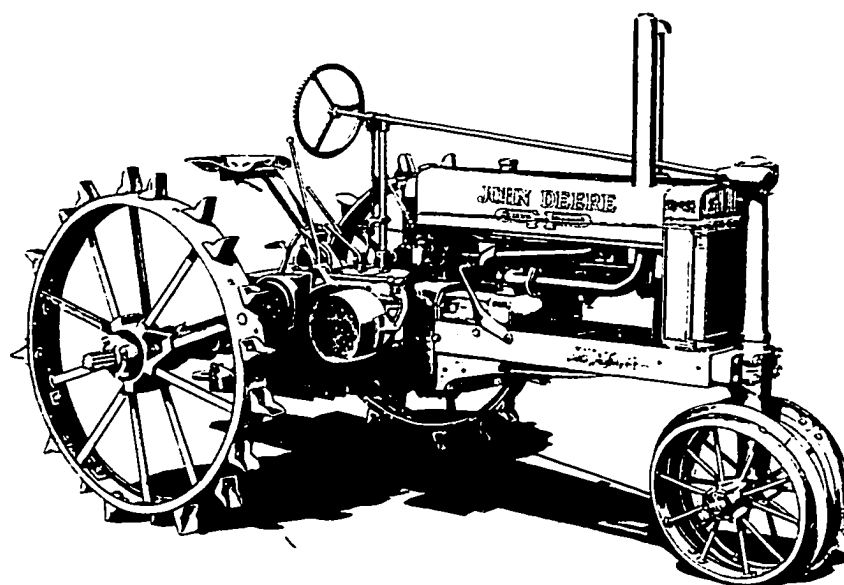


Fig. 49

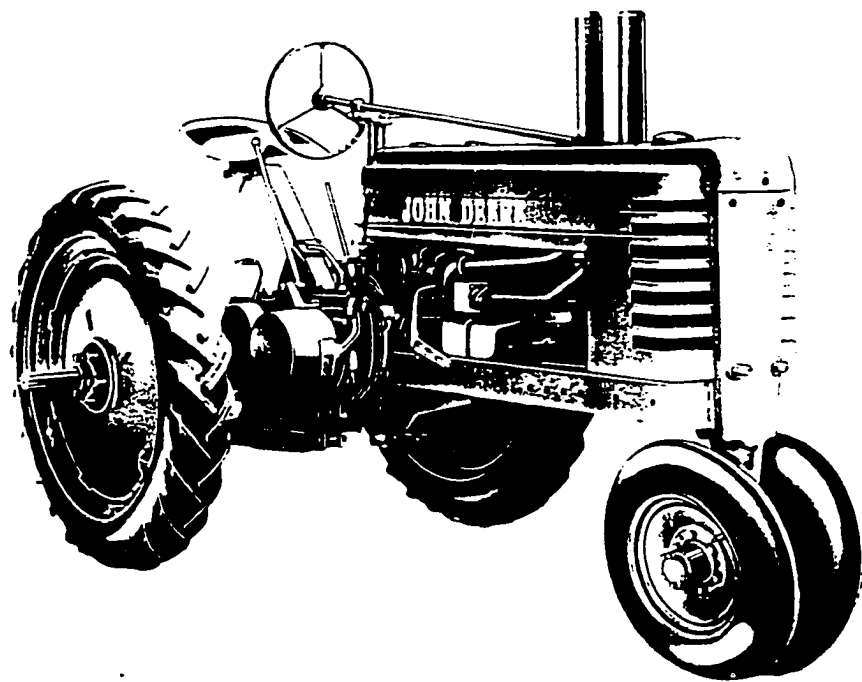


Fig. 50



Fig. 51

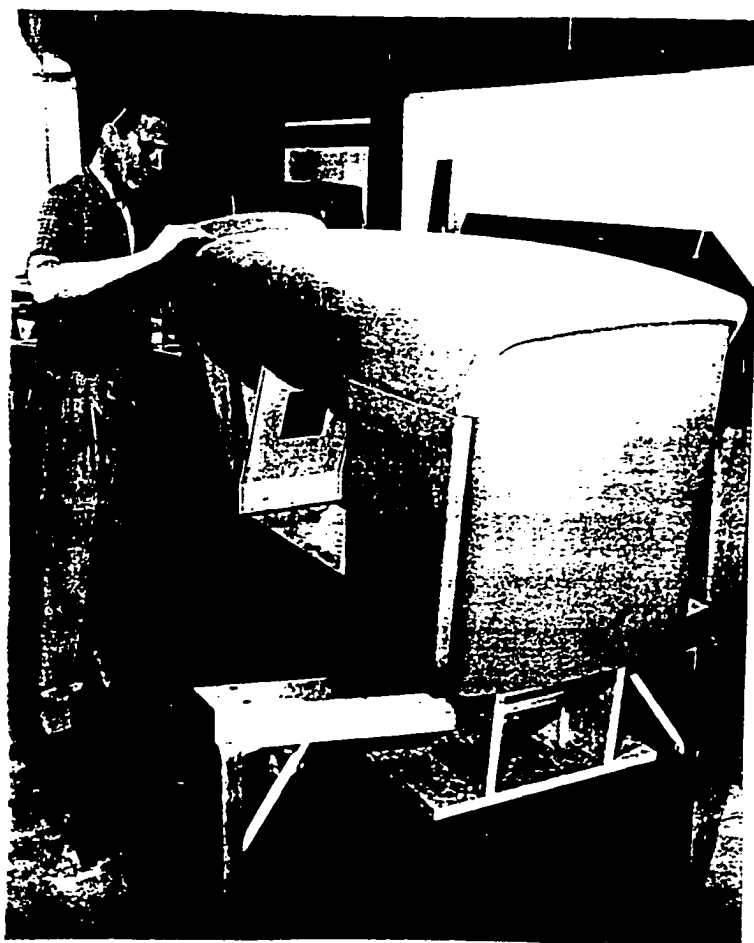


Fig. 52

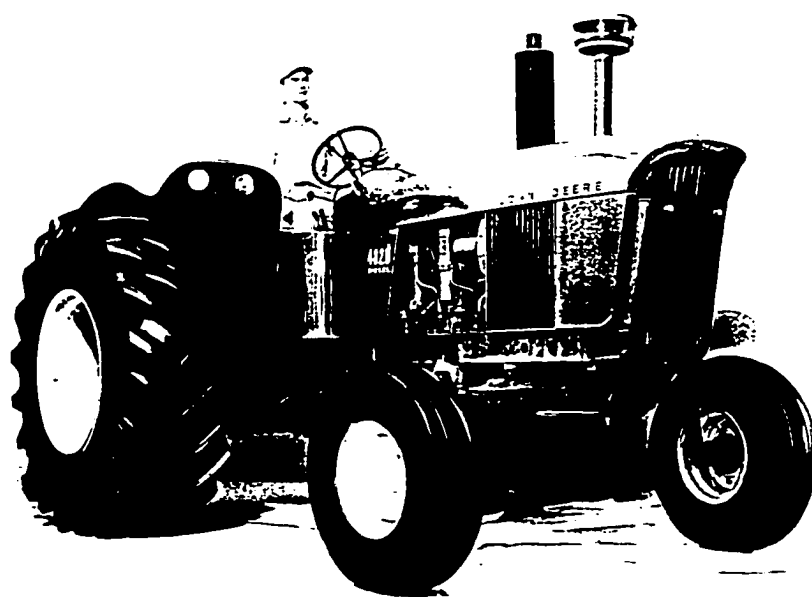


Fig. 53

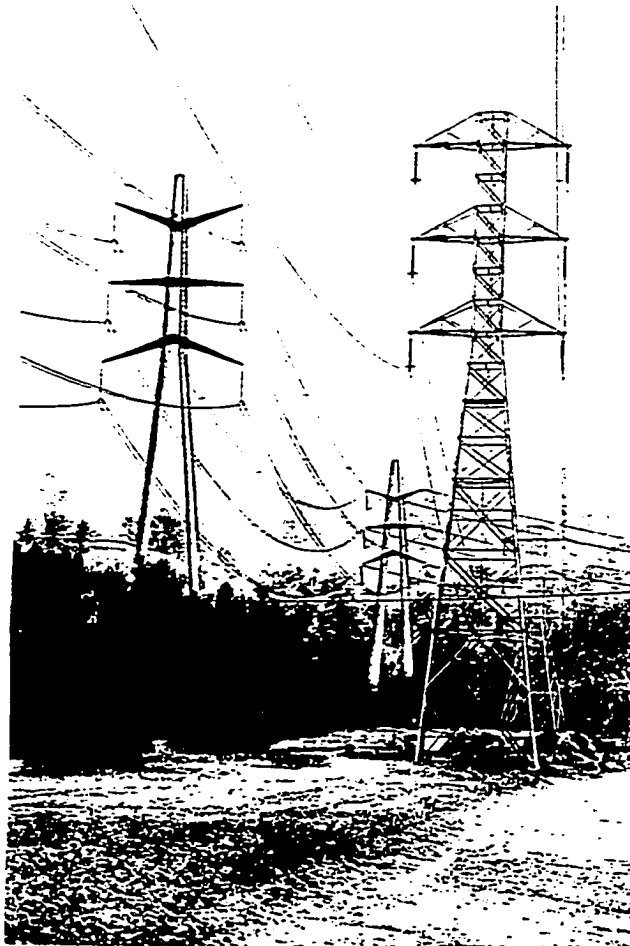


Fig. 55

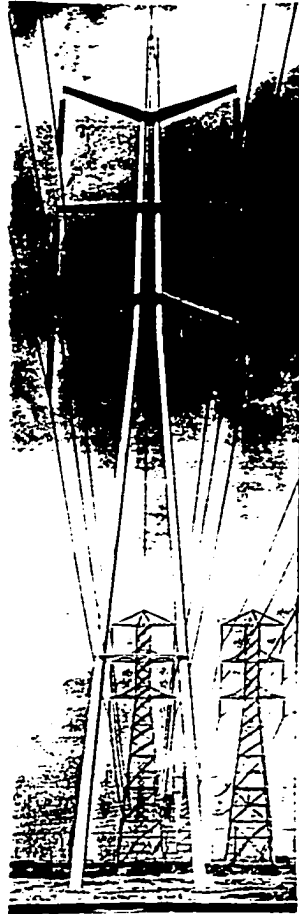


Fig. 56

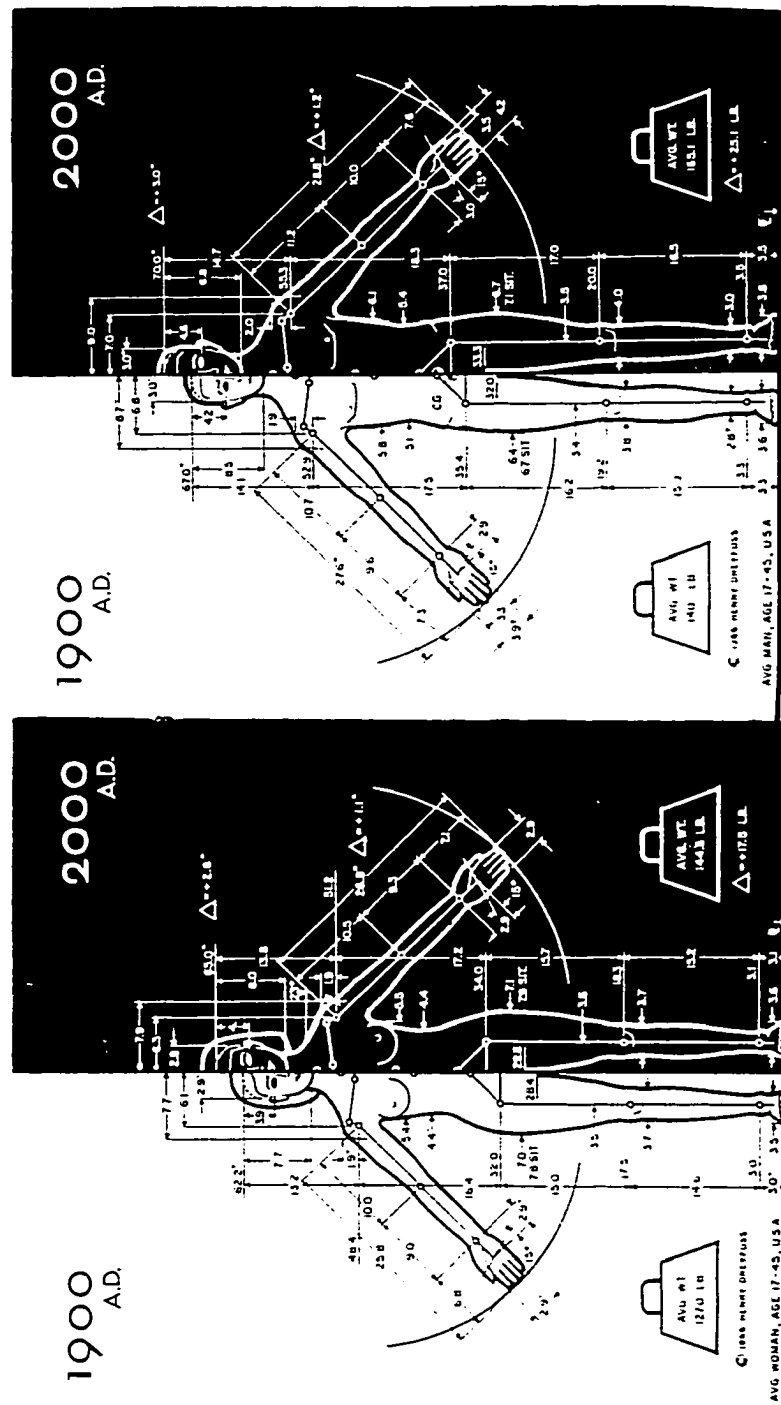


Fig. 57



Fig. 58

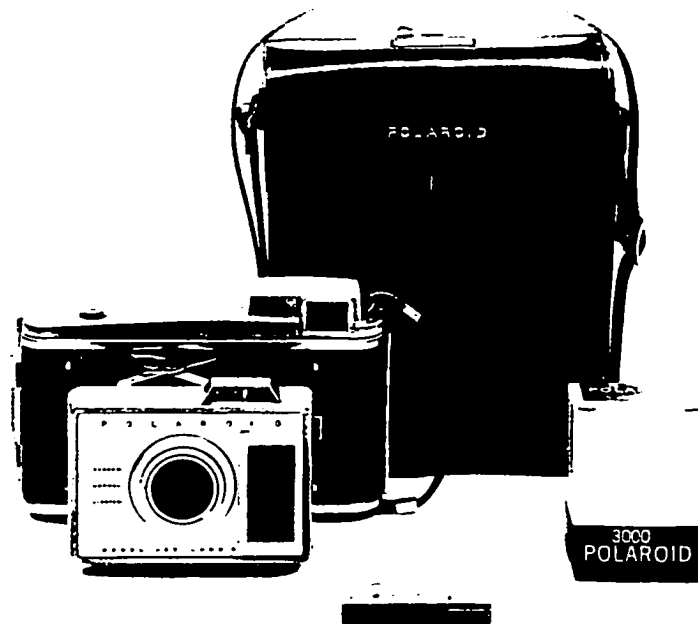


Fig. 59

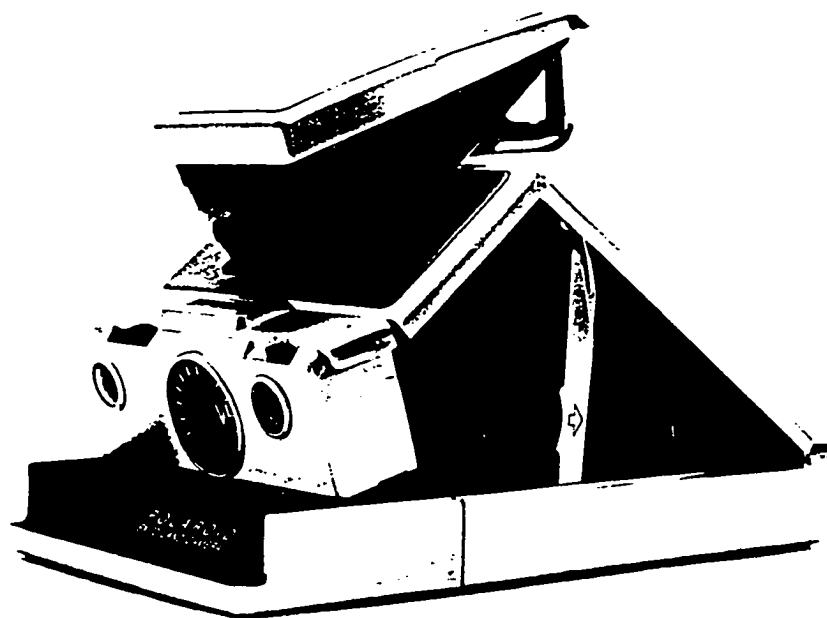


Fig. 60



Fig. 61



Fig. 62

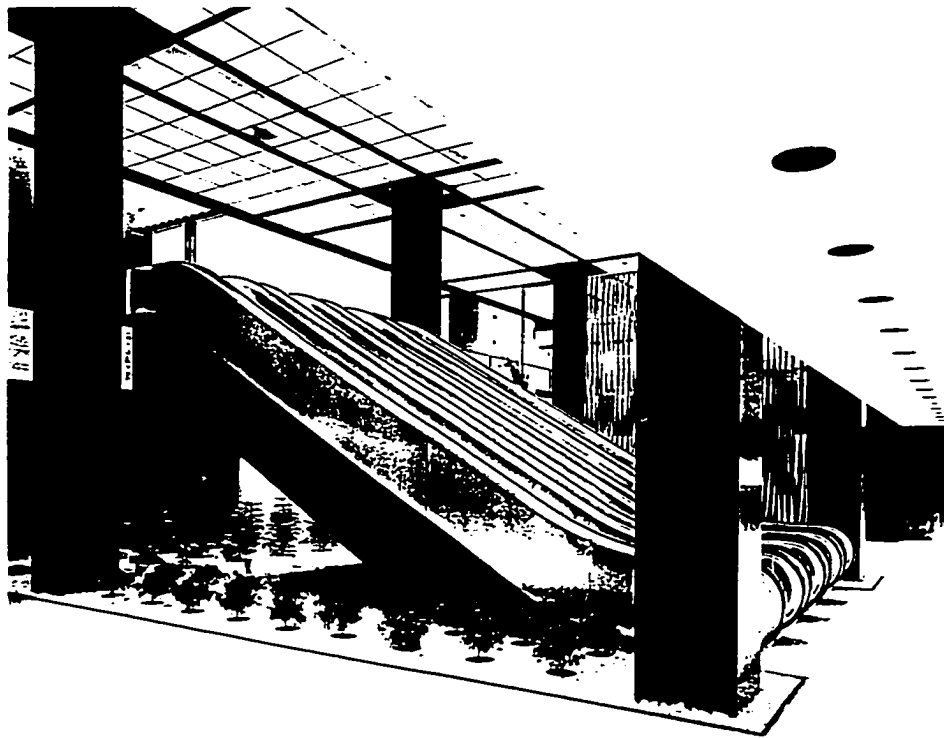


Fig. 63

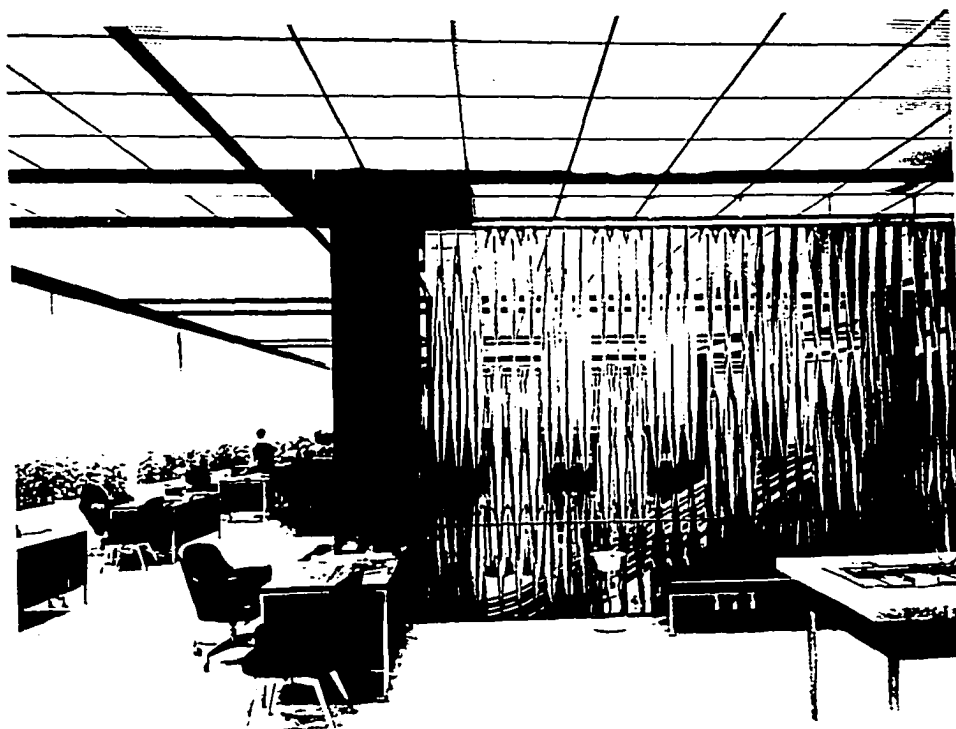


Fig. 64





Fig. 66



Fig. 67

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Note: This bibliography attempts to enumerate the written accounts of Henry Dreyfuss's work and significant contemporary commentary on the same in a comprehensive manner. It also contains a number of publications on the history of design worthy of note for their theoretical and contextual contributions. Emphasis has been placed on Dreyfuss's own accounts of his work, attempting to provide a resource for researchers looking for significant references in regard to specific clients. Throughout, "Dreyfuss Collection" refers to the Henry Dreyfuss Collection, Industrial Design Archives, Cooper-Hewitt Museum Library, Smithsonian Institution, New York, New York.

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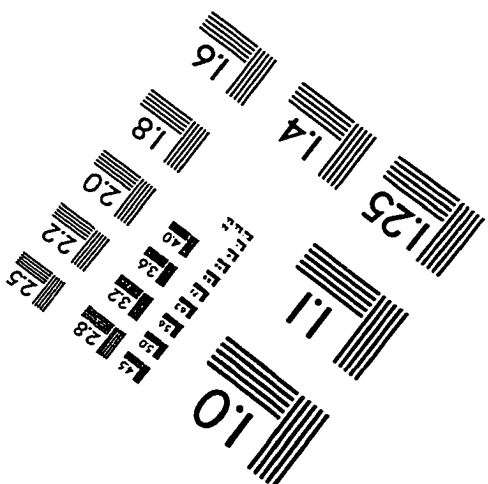
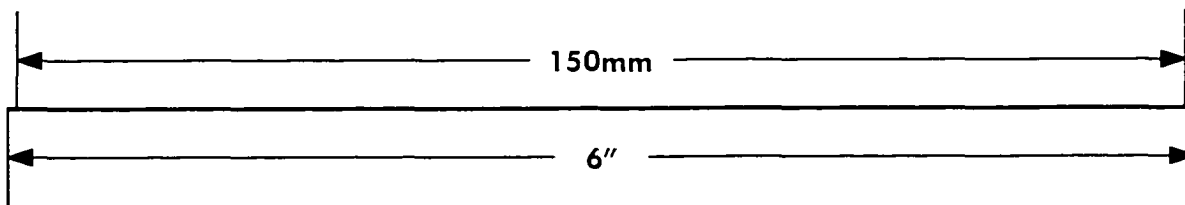
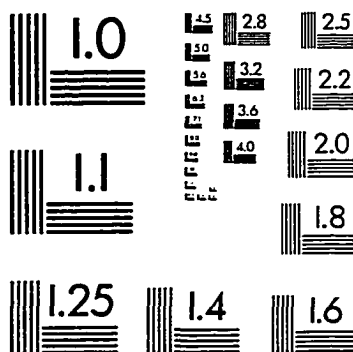
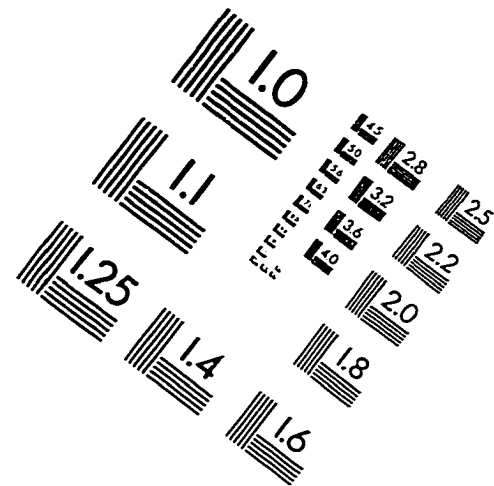
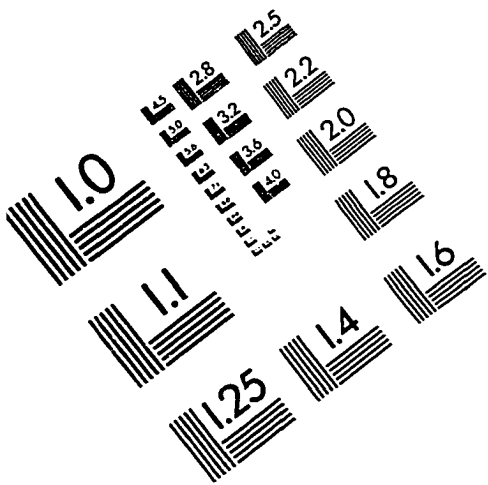
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