

Semiotic Narratives and French Home Appliances

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The study of semiotics, while accepted in anthropology, literary criticism, and even labor history, has yet to become accepted in industrial or technological history. In France, leading scholars have had some very deep and divisive disagreements over the use of semiotic analyses—many of the earlier promulgators of a semiotic approach used it to annihilate politics. A close ally of mine in Paris referred to the use of the term *semiotics* as equivalent to “using a sledgehammer to swat a fly.” In order to sidestep some rather superfluous battles, I will instead use terms such as *symbol* and *image* in this presentation. While the structuralist legacy of semiotic studies in literature presents grave problems for historians, largely because of the inability of structuralist approaches to explain change, a semiotic or imagematic analysis of technological objects offers ways to grapple with cultural influences on the social construction of technological objects. This paper will first combine semiotic approaches with more materialist and sociological analyses, and with an analysis of narrative construction. Then, using the framework of a semiotic narrative, we will analyse the disjuncture between the technological narratives and social practices of domestic modernization in Interwar France.

The past few years have seen a vast expansion of the dimensions of the debate concerning the relationship between technological artifacts and their social, cultural, economic, and political contexts. Technological determinists (in an admittedly caricatured description) argued that tools make the man and that technological artifacts, along with their intrinsic technical attributes, structured societies in specific ways.² The causal arrows thus ran from artifacts (or artifactual systems) to societies. The artifactual text (as it were) was presumed to determine the social context, then once a new context was created, the initial artifact became an integral part of that new context. Underlying many versions of economic or technological stage theories, such as those of Marx or WW Rostow, was an implicit notion of new technologies becoming integrated into changed contexts, or new stages. The shift of an artifact from text to context was also a key step in the development of ‘technological momentum,’ as Thomas Hughes has defined it.

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² The most explicit exposé of this position is, Robert Heilbroner, “Do Machines Make History?,” *Technology and Culture* VIII:3 (1967). In David F. Noble, *Forces of Production: A Social History of Industrial Automation* (New York: Knopf, 1984), pp. 144-147, the author characterizes technological determinism as a form of naive neo-Darwinism.

While this determinism has justifiably been criticized for overstating and even reifying the determining role of artifacts, they have made us sensitive to certain inexorable technical demands of certain artifacts and systems. As Hughes implies, the light bulb in itself implied a power supply system, and such a system obviously could not violate certain laws or electrotechnology, nor could it credibly be built as a set of tiny generators each linked individually to output devices. Hughes also fruitfully suggests that not only did the integrated electrical power supply system demand the integrated enterprise to operate it, in return, once that model of enterprise became dominant within the sector, it built systems corresponding to its structure.³ Certain technologies do have specific inescapable 'demands,' yet once those demands are met, the structures then become linked to the technologies in a mutually-reinforcing systems.

Extreme social constructionists of technology largely inverted the technological determinist paradigm, arguing, as Wiebe Bijker, that if artifacts don't physically dissolve outside of their social context, they are nonetheless largely meaningless. The example of a random cola bottle among African tribesmen and the amusing meaning attributed to it in the film, *The Gods Must Be Crazy*, underlines how the meaning and usefulness of an artifact is largely determined by the matrix of cultural identifications, economic structures, and social forces into which it is enmeshed. Indeed, Bijker persuasively argues that after a battle over the meaning and function of fluorescent lighting, a set of dominant social groups determined the shape and application of that artifact.⁴ However, few would wish to claim that a social context entirely determines an artifact; no social force could change the threshold voltages and temperatures needed to achieve fluorescence in a lighting tube.

We can fruitfully move the debate a step further by moving first to the obvious compromise, arguing that the process of determination requires that causation move both directions, that the artifactual text and the social context mutually interact. When couched in general terms, this first step is not particularly helpful, for it can't really tell us when what constructs what, or why. It has no large-scale predictive value, but when applied to

³ Thomas P. Hughes, "The Evolution of Large Technological Systems," in Wiebe Bijker, Thomas P. Hughes, and Trevor Pinch, eds. *The Social Construction of Technological Systems* (Cambridge, MA: MIT Press, 1987), pp. 51-82, see also his *Networks of Power: Electrification in Western Society* (Baltimore: Johns Hopkins University Press, 1983). Hughes gives a precious opening for a social constructionist argument by arguing that a technological system is simultaneously artifactual and social—he is thus far from being a technological determinist.

⁴ Wiebe Bijker, "The Social Construction of Fluorescent Lighting—An Effort to Integrate the Analyses of Social Shaping and Social Impact of Technology," paper presented for the International Workshop on the Integration of Social and Historical Studies of Technology, 3-5 September, 1987, Enschede, The Netherlands (as revised, Spring 1988: author thanks author), and "Relative Social Groups and Interpretive Flexibility: Examples from Bicycles, Bakelite, and Fluorescent Lighting," abstract of a paper presented at the SHOT/HSS meetings, Raleigh, NC, 29 October-1 November, 1987.

specific, empirical studies such as those by Thomas Hughes on power systems or by Madeleine Akrich on cable TV interfaces, it represents a formidable analytic framework.⁵ In pursuing a more generalizable framework, we should recognize that the synthetic pair of artifact and context have an interactive and ultimately dialectical character. Why dialectical? Need we revive old marxist saws? Beyond a symbolic tip of the hat to German philosophy, dialectics offers a tool to understand the structural contradictions and process of resolution between artifacts and contexts. A structural contradiction, such as air pollution concerns with autos, forces a movement toward adjustment of both artifacts and contexts, resulting in changes to both. A good example of this is suggested by the recent evolution of personal computers, in which the diffusion of computing power seemed—and the perception sometimes bordered on paranoia—to challenge centralized managerial power within the firm. (It should be noted that part of the perceived contention over power was based on a linguistic confusion between technical computing power, instructions per second, and real social power, the ability to impose one's will). Managers have sought to reconstruct centralized power through the dual introduction of local area networks—an adjustment of the artifact—and by the often gender-based reshaping of power relations around computing between data-entry and programming or analysis. Another advantage of a dialectical approach is that it fruitfully blurs the facile distinction between production and consumption, in which the former reflects attributes of the artifacts and the latter reflects the context. If artifact and context are dynamically related and ultimately inseparable, we cannot make sense of either independently of the other.

The overall notion of dialectical construction allows us to discuss how certain material characteristics of specific artifacts (such as minimum economic scale and required operating temperatures) limit the range of possible invented artifacts, and how specific social/cultural contexts prestructure what can be invented and what characteristics those inventions take. Ruth Cowan, for example, implies that the predominant pattern of nuclear families and a gender division of household labor largely predetermined the physical shape of refrigerators. Nonetheless, once the contours of what a refrigerator would look like were set, other social forces (the gas and electric industries) and technical requirements (heat transfer rates, etc.) determined the specifics.⁶

Nonetheless, a purely dialectical approach suffers from the disease inherent in most kinds of structural analyses: the individual wills of historical actors are annihilated and they ultimately act according to externally-driven laws of, as it were, neo-Newtonian social mechanics.⁷ David Noble's managers, for example, develop technologies to deskill

⁵ Hughes, *Networks of Power*, and Akrich, "Semiotic Scenarios: Configuring the Cable TV Interface in France," paper for inclusion in proposed volume, *Material Discourse: Essays on the Meaning of Human Artifacts*, R. Frost and B. Pfaffenberger, eds.

⁶ Ruth Schwartz Cowan, *More Work for Mother* (New York: Basic, 1983), Chap. 5.

⁷ One can also well criticize the *di* part of *dialectics*, arguing that dialectics offer inherently only a bivariate explanation and leave little room for multi-causal explanations. A similar problem is

workers because inexorable economic forces compel them to do so.⁸ Overly deterministic historical models obviate the need for real, human actors. More subtly, home appliances which are designed within a context of gender divisions of labor within nuclear families take specific forms because alternative designs (which would perhaps reflect collective laundering by both men and women) probably do not even cross the minds of the designers because imagination itself is structurally precluded by dominant social norms. The cultural context sets the frames of imaginative process, and it is tempting here to adopt Gramsci's notion of cultural hegemony to explain the formation of those frames.⁹ However, neither a mechanical structural determinism nor a prestructuring of consciousness can explain processes of inventing artifacts and contexts when clear choices are available and artifacts and contexts related to them are not yet routinized or naturalized. We shall later in this presentation examine a case of this sort, the invention of housewives and household appliances in interwar France, but first we must also recognize that structural analyses do not give sufficient attention to the *dynamics* of determination.

Indeed, what really drives the process of technological-contextual change? Using an elegant resource mobilization model, Bruno Latour has shown how facts and artifacts are shaped by contention (and, we might add, implicit negotiation) among competing individuals and social networks.¹⁰ Facts and artifacts become established, stabilized, or closed in a process of adjustment which reflects the respective power of the contending social forces. The process can be diagrammed this way¹¹:

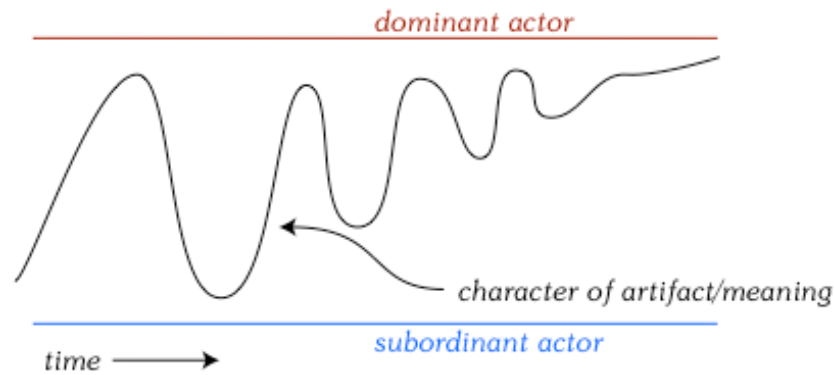
reflected in the figure, drawn from Bruno Latour, below. Multi-causal explanations would offer an invaluable set of tools, yet conceptual and practical problems preclude their use. Indeed, some sort of chaos theory as applied to social science could offer resolutions, but that field of inquiry will require decades before reaching fruition.

⁸ David F. Noble, *Forces of Production: A Social History of Industrial Automation* (New York: Knopf, 1984).

⁹ Such an approach would parallel that of Bijker, with similar efforts to denote "relevant social groups" as those who set the agenda of what questions can and cannot be posed—Bijker refers to this process as setting the technological frame; see *infra*.

¹⁰ Bruno Latour, *Science in Action* (Cambridge: Harvard University Press, 1987), Chapter 3.

¹¹ Bruno Latour, "How to Write *The Prince* for Machines as Well as Machinations," paper for the Seminar on Technology and Social Change, Edinburgh, 12-13 June 1986.



We can, I hope, cautiously extend Latour's model by averring that the parties involved in negotiations need not be aware either of their implicit calculus of resource mobilization, or of the possibility that they are actually negotiating—indeed, the dominant language of heroic scientific discovery of objective truth tends to obscure the reality of the negotiating process in the actors' own minds. Bryan Pfaffenberger has vastly expanded this framework in two ways, first by pointing out that the symbolic side of the contention is as important (or more important) than the material side, and by showing us that there are very real psychological forces operating behind what he has characterized as the adjustment of meanings and content of artifacts. Personal computer mavens adjusted both what they understood PCs to be as well as the artifacts itself (consequent to redefining their social purpose and context) in response to their inability to develop a self-validating alternative meaning for PCs and to their alienation from the social mainstream which followed.¹² Pfaffenberger incisively explains the adjustment process within a framework of symbolic contention, a point to which we will return later.

Wiebe Bijker has elegantly shown how we can study the process of defining artifacts by way of analyzing 'relevant social groups' which contend to shape artifacts and their meanings. Thus, while Latour delineates the mechanisms shaping artifacts and meanings, Bijker helps us to define the actors explicitly. However, Bijker limits actors to social human beings.¹³ There is no reason why we cannot invert his framework, as Latour does, to discuss how technical characteristics of artifacts help to shape social relations. We can well understand, for example, that in thermal electrical power production, optimal operating temperatures and pressures have less impact on plant placement and hence, social geography, than do input fuels or output voltages.

Bijker and Madeleine Akrich have valuably contributed the notion of closure, that at

¹² Bryan Pfaffenberger, "The Social Meaning of the Personal Computer: or, Why the Personal Computer Revolution was No Revolution, *Anthropological Quarterly* (1988), pp. 39-47.

¹³ *arts. cit.*

some point, contention over the meaning and material attributes of artifacts and contexts ceases.¹⁴ In different contexts, Akrich and I have shown how closures generate black boxes, the interiors of which are generally judged not to warrant (or to defy, in the case of outsiders) reopening. In an earlier paper, the present author used the example of how the automotive carburetor, which attained design and social closure early in this century, remained a black box, unquestioned and only incrementally reconsidered for decades (with the exception of hot rodders), only to be reopened during the fuels crisis of the 1970s.¹⁵ By this token, then, and as Akrich also contends, closures are only provisional, and shifts in material or social conditions can jimmy open black boxes once thought closed. But there are limits: the space shuttle and the space program behind it remained a black box to the public and to Congress until the Challenger disaster, but the smaller black box of the shuttle's technical attributes (and with it, Morton Thiokol's role) was the only box opened by the disaster. The military-industrial-technical-scientific complex successfully parried efforts to reopen the box of either the shuttle program itself or that of the larger space program.¹⁶

The the frontier in social construction technological studies lies, I believe, in understanding the non-rational and non-objectivist aspects of the processes through which artifacts are constructed. Further, we need to recognize that the invention process embraces not only artifacts but the social terrain arrayed about the imagined artifacts. As I shall later show, social presumptions about women's 'natural' roles and symbolic contention over the content of 'womanhood' compelled an odd coalition of bourgeois reformers, Catholic conservatives, and small industrialists to invent simultaneously home appliances, housewives, and factory workers—all while appliances were viewed as totems of attainment.¹⁷ Before we get there, however, we must first examine the psycho-symbolic dimension of constructing artifacts and humans.

Michael Smith has shown with respect to the space and Atoms for Peace programs how artifacts can have more importance as propaganda items than as actual, functional instruments—proposing to atomically blast a massive aqueduct from the upper Missouri basin to the arid inter-mountain region was an absurd proposition, but it probably helped

¹⁴ *art. cit.* Bijker, and Madeleine Akrich, "How Can Technical Objects be Described?," Colloque de Twente, 3-5 septembre 1987.

¹⁵ "The Mechanical Marianne: Democracy and Progress Talk in Twentieth Century France," in *Philosophy and Technology*, ed. Langdon Winner (forthcoming, Kluwer Publishers, 1992).

¹⁶ For an amusing study of the space shuttle accident investigation, see Richard P. Feynman, *What Do YOU Care What Other People Think? Further Adventures of a Curious Character* (New York: Norton, 1988).

¹⁷ See Robert L. Frost, "Rationalizing Interwar France: Wiring Together the Modernization Coalition," conference paper, Society for the History of Technology meetings, Madison, Wisconsin, October 1991.

to make the public accept nuclear technology, just as "feminizing" the Bomb made it less threatening.¹⁸ In like fashion but from a more structuralist perspective, Jean Baudrillard has argued that the interrelational configuration of domestic technologies can impart a false sense of functionality.¹⁹ To borrow from Barthes, artifacts can take on mythic attributes, and the discourse concerning them can focus more on their illusory mythic content than on their concreteness.²⁰ Along these lines, Mary Douglas sees an even more sinister agenda: "Goods [or artifacts] are now seen to be the medium, ... threads of a veil that disguises the social relations under it."²¹ Again, we needn't assume that real social relations are consciously or conspiratorially obscured; within the framework of mythologized objects, images become realities. As I have argued elsewhere, the giving of technological gifts is more important from the symbolic angle than from the functional one.²² Dad gives junior a Commodore 64 to stress the importance of technological mastery and to underline the father's position as provider and rearer of children for market society, even if junior will only play Megaroids. American teens gave their mothers Vegamatics not for their functionality (which was doubtful), but because they were marketed as the appropriate way to signify a child's deference toward and admiration for his or her 'modern' housemom.

Nonetheless, we must not picture technological images as mythological entities floating in static space, explaining change as structuralists would, by references to collisions among object-images or contradictions between images and functions. Constructivist psychologists and anthropologists have shown us that people commonly understand change in terms of chronological succession, as narratives or stories.²³ I realize

¹⁸ Michael Smith on Atoms for Peace, paper presented to the Society for the History of Technology, October 1986. On feminizing the Bomb, see Smith, "If Atoms could Talk: Ventriloquism, Gender, and Domesticity in Nuclear America," paper for inclusion in proposed volume, *Material Discourse: Essays on the Meaning of Human Artifacts*, R. Frost and B. Pfaffenberger, eds. Similarly, one can argue that proposals in the early 1980s for the Midgetman missile, a cute little fellow who will live just down at the end of Main Street in Anytown, USA, help to domesticate an otherwise remote and, as many perceive it, malevolent technology.

¹⁹ *Le Système des objets: la consommation des signes* (Paris: Gallimard, 1968), p. 21-23.

²⁰ Roland Barthes, *Mythologies* (New York: Hill and Wang, 1972)

²¹ Mary Douglas and Baron Isherwood, *The World of Goods* (New York: Basic Books, 1979), p. 202.

²² "The Politics of Technological Change: Labor and Technological Innovation in French Electrical Power," *Technology and Culture* XXIX:4 (Fall 1988).

²³ See particularly Theodore R. Sarbin, ed., *Narrative Psychology: The Storied Nature of Human Conduct* (New York: Praeger, 1985); see also Hayden White, "The Value of Narrativity in the Representation of Reality," *Critical Inquiry* 7 (Fall 1980), pp. 5-27. Robert Neimeyer writes that personal construct psychology, "depart[s] from the environmental determinism of radical behaviorist formulations and the intrapsychic determinism of classic psychoanalysis" (*The*

that this begs the issue of the distinction between precedence and causation, but in image construction and the reification which is a critical part of the process, image-objects are capable Of *causing* events, and narratives used to explain the past can be projected to envision and plan the future.²⁴ The simplest example is in advertising: buy X brand of computer, impress the boss, win a promotion, gain the sexual validation of attaining a personal secretary, buy the goods which will make the family stable, etc—the purchase of an artifact-as-symbol initiates a scenario (or script) which resolves palpable and imagined personal problems. Computers will set you free, and presumably, if you're a man who never learned to type, you somehow needn't worry about banal keyboarding skills. Finally, the meanings of symbol-scripts are also subject to contention, negotiation, and adjustment. All relevant social groups must recognize a legitimate convergence of symbol-scripts if an artifact or context is to be implanted. The script offered by the computer firm above must in some way coincide and, over time, be negotiated with that of the person who is presumably validated in this process. Advertising thus functions as a mediator in an implicit negotiation process, translating one script into an accessible set of images and adjusting (usually second-guessing) the script to strive for convergence. Unilateral scripts often cannot successfully impel artifact-context syntheses to closure—unless their promulgator has sufficient power to enforce a closure around his or her meaning.

Equipped with these observations, we can now lay out an alternative approach for explaining how individuals and social forces shape technological artifacts and matrices (*systems* is often an overstatement), and dialectically, how artifactual matrices shape societies. The invention of meanings for artifacts can be explained by recognizing first, that actors are not necessarily acting consciously as they construct objects and artifacts—the architects who designed the massive breeder reactor at Creys-Malville, I am confident, did not *intend* to construct a technological icon of such sheer scale and complexity that the average observer feels belittled and, hence, deferential toward the technostructure which oversees French nuclear power. Many observers are, however, belittled.

To extend the example of the breeder (and we shall not mention the Freudian and phallogocratic implications of the term), contention over nuclear power is also contention over scenarios. To supporters, the nuclear system represents an integral part of a national path toward French energy independence and, by the development of proven nuclear hardware, to expand high-tech export markets. Together, these will provide for global technological leadership, national prosperity, and happy, electrically-warmed and video-

Development of Personal Construct Psychology (Lincoln, NB: The University of Nebraska Press, 1985), p. 2). Many constructivists would also concede that narrative constructions often use succession rather than more sophisticated conceptions to explain causation.

²⁴ A capsule summary of the method is: James C. Mancuso and Theodore R. Sarbin, "The Self-Narrative in the Enactment of Roles," in T.R. Sarbin and Karl Scheibe, eds., *Studies in Social Identity* (New York: Praeger, 1983), pp. 234-253, especially 235-237.

entertained families.²⁵ The nuclear apparatus invented a nuclearized society as they invented nuclear hardware. Each component of the nuclear 'system' functions as an integral part of that scenario. By contrast, critics describe a self-serving 'techno-fascist' elite bent on using the language of expertise to dispel criticism, and on creating an armed security force to defend power systems, characterized as the new fortresses of the technocratic élite.²⁶ The goal of the 'techno-fascists' in this campaign is to render the public somnolent, docile, and unfit to criticize the old bourgeoisie dressed in its new zircon and silicon clothes. Finally, the sheer scale of France's nuclear 'system' demonstrates to the public who has won in that battle: the nucleocrats mobilized artifacts (the hardware of the system), finances (massive state subsidies), language ('experts' capable of technological-economic leadership), images (heroically massive and complex monuments to 'progress,' operated by white-coated, apolitical engineers), and scenarios (a credible path toward a chrome-plated, prosperous national future). We should mention in passing (with due credit to Michaël Smith) that the functional and political success of nuclear power has spilled over into a very broad acceptance of nuclear weaponry. Lacking resources which were in any way the measure of the promulgators, the opposition lost, but the nucleocrats did reshape their system slightly to preserve their legitimacy and appearance of openness: the structural contradiction between an undemocratic nucleocracy and the democratic traditions of the French polity demanded, beyond verbal attention, artifactual responses. The visitor center at Creys-Malville is solar heated, and the power company did build a solar power complex in the Southwest of France. Were we to re-examine the diagram drawn from Latour that we used above, placing the nuclear establishment on the top, the trajectory of meaning would have a sharp, ascending slope littered with nuclear and non-nuclear power system artifacts, along with the rhetoric of failed resistance.

But so far, we have only shown how social forces constructed France's nuclear system; we need now to understand that nuclear artifacts have also shaped French society. At the outset, citing the capital-intensive and labor- and fuel-parsimonious 'facts' of nuclear generation, *Électricité de France* has defined electrical base load to have a very low marginal cost. They thus sell bulk power very cheaply to industrial consumers—while aluminium producers abandon the Columbia basin in the US, they remain and expand in the Rhône basin. Aluminum producers thus at the same time become supporters of the nuclear effort, making the processes of promulgation and reception of nuclear technology inextricable. The cooling water requirements of nuclear plants demand that they be placed on large-flow rivers; the Rhône and Loire valleys enjoy relative prosperity while the coal centers of the North and the oil-terminal cities decline or stagnate. Again, in time, economic activity realigns to the new configuration of power, and constituencies develop to support it. This process is not unlike the 'momentum' which Hughes describes.

²⁵ Such are the images and languages of Jacques Leclercq, *The Nuclear Age: The World of Nuclear Power Plants* (Paris: Sodel, 1987): nuclear power in book form adjusted to fit the coffee table.

²⁶ André Gorz, *Ecology and Politics* (Boston: South End Press, 1980), pp. 99-113.

I have used French nuclear power as an example because it is so approachable. Most of the actors were aware of their formal positions (though again, they may have been pursuing agendas about which they remained unaware) and, despite security predilections, the debate was rather open and explicit. More subtle and interesting for our purposes was the contention over the invention of household appliances, housewives, the modern family, and domesticity in France during the 1920s and 1930s. In that situation, an implicit coalition formed around an agenda favoring the introduction of mass production and mass consumption, and that coalition developed several versions of a modernization scenario.²⁷ Oddly, despite the fact that the scenarios were quite attractive and seem to have enamoured a large part of the French public, few firms rationalized production and few families purchased major home appliances. It is this very disjuncture between technological prescriptions and quotidian practices that will X-ray the vitality of a semiotic-narrative analysis of technological objects.

The First World War profoundly affected traditional French ways of doing things, from managing industry, to reshaping workforces and redefining gender roles. In particular, the Great War not only brought a vast number of recruits into the mass social environments of the army and war production archipelago, it helped finally to assure the subordination of local popular culture to mass national culture.²⁸ As a part of this process, many women began to work outside their traditional jobs in shops, fields, textile mills, and homes, and became full-fledged industrial workers. They moved out of highly paternalistic work environments into modern and often Taylorized workplaces. Not only did they learn the traditional modes of industrial resistance very fast—they were among the leaders of the wave of wartime wildcat strikes—they also learned to enjoy personal control over their own incomes, life outside of traditional familial controls, and the power to define their own futures.²⁹ Women's industrial pay levels far surpassed those which they had formerly enjoyed, yet they remained below those of the men whom they had replaced.

Women's industrial employment deeply worried French men, who almost universally agreed that women had to be purged from their jobs as soon as peace arrived. Not unlike the fears associated with Rosie the Riveter later in the US, French males feared a masculinization of women, downward pressure on wages, erosion of patriarchal authority, and falling birth rates. Even leaders of France's General Confederation of Labor (CGT) demanded that women be forced back to their old familial and paternal

²⁷ See my "Rationalizing Interwar France..."

²⁸ To abuse the terms and arguments of Eugen Weber (*Peasants into Frenchmen*, Stanford: Stanford University Press, 1976), the Great War, in 'massifying' French society, served to turn peasants and traditionally domesticated women into participants in mass society. Best on France during World War I is Patrick Fridenson, J-J Becker, et al., eds., *1914-1918, l'autre front* (Paris: Les Editions ouvrières, [Cahiers du Mouvement social, no 2], 1977).

²⁹ See Laura L. Downs, "Women in Industry, 1914-1939: The Employers' Perspective," doctoral dissertation, Columbia University, 1987, Chapter 2.

environments as part of efforts to defend pay levels and femininity.³⁰ Patriots and Catholics had long bemoaned France's low birth rates, so they reiterated calls to force women back to their 'natural' roles as mothers living under patriarchal authority.³¹

Nonetheless, a massive *ratissage* of women was no easy matter for the French economy. The death or disabling of almost two million young men created a gaping hole in the labor force. Even massive imports of foreign laborers could not solve the problem, for ethnic and linguistic barriers and prejudices kept immigrants out of many jobs. In addition, many French men abandoned farms, small shops, and domestic service and picked up better paying, more cosmopolitan industrial jobs. Women were needed to replace men in such jobs, and many jobs were re-gendered as a consequence. Though many seemed to believe at the time that women had been massively run out of the paid labor force (and there was a slight drop in women's employment), for the most part, postwar shifts entailed a recomposition of women's work.³² As paperwork activities expanded, a number of *petite bourgeoisie* moved into office work, and (violating the old Veblenist vision of ladies of leisure) middle class women began to validate themselves in new economic roles.³³ Interestingly, modernist reformers (who undoubtedly understood the need for pink collar workers) reluctantly accepted middle class women's employment, while Catholic activists decried it, arguing that such labor only yielded unnecessary money which was ultimately squandered on vain consumption items at the expense of childbearing.³⁴ In any event and despite rhetoric to the contrary, after careful calculations Catholic social activists had to concede that about 30% of France's population lived on the absolute margins, making wives' paid labor essential.³⁵

³⁰ Jean-Louis Robert, "La CGT et la famille ouvrière, 1914-1918: Première approche," *Le Mouvement social* (1981).

³¹ Marie-Monique Huss, "Pro-Natalism in the Interwar Period in France," *Journal of Contemporary History* XXV:1 (1990): 39-68.

³² On women's labor in interwar France, see Catherine Rhein, *Jeunes femmes au travail dans le Paris de l'entre-deux-guerres*, thèse de 3e cycle, Université de Paris VII-Jussieu, 1977, Marie-France Lamberieux-Chapet, "Les ouvrières pendant l'entre-deux-guerres (1920-1936)," thèse de DEA, Université de Paris VII-Jussieu, 1982, and Sylvie Zerner, *Travail domestique et force de travail: ouvrières et employées entre la première guerre mondiale et la grande crise*, thèse du doctorat, 2 vols., Université de Paris X-Nanterre, 1985.

³³ For a fascinating study of the modes of training middle class women to do office work, see Annie Sornaga, "La dactylo: de l'apparition des machines à 1930," mémoire de maîtrise (histoire), Université de Paris VII-Jussieu, s.d.

³⁴ P.J. Dassonville. "L'activité féminine dans le domaine de la Restauration familiale." *Dossiers de l'Action Populaire* (10 Oct 1927), p. 14, and C[ecile] Jeglot. "La jeune fille et le malaise moderne," *Dossiers de L'Action Populaire*. (25 juin 1926), pp. 5-8.

³⁵ anon. "Les deficiences économiques de la Famille, leurs causes," *Dossiers de l'Action Populaire* (15 août 1929), pp. 1-4. (Rapport de la France présentée au Congrès de l'Union Catholique

The contradiction between numbers and perceptions, seen clearly in the wide belief that women's paid employment had substantially declined, was sharpest with respect to female domestic workers. Their numbers in Paris had dropped only .4 % between 1906 and 1921, while the total population of France fell over 5% in the same period.³⁶ The 'crisis of domestics' *did* entail a sharp drop in male domestics,³⁷ and presumably, as women domestics took on tasks once done by men, they no doubt began to demand commensurate pay and respect. Indeed, the heart of the crisis was one of authority: after the war, domestics were much less willing to accept the old condescensions and pay levels. They became uppity. In their few public pronouncements, ladies of the leisure class often bemoaned the pretensions of their insouciant and greedy domestic employées,³⁸ and began to seek a technological solution to their social problem. In addition, few of the ladies were willing to have, as it were, dirty, non-Francophone foreigners around their homes, tempted by promiscuity while in the presence of nice bourgeois children.³⁹

Many French citizens concluded that Allied technological prowess (rather than, for example, German exhaustion) had won the Great War, and that the inventive push of the war could be turned to peacetime uses after the war. Just as Taylorism, rationalization, and invention had provided the necessary productive edge for victory, a technological magic bullet, particularly a Fordist shift toward mass production and mass consumption, would solve deep-seated class tensions.⁴⁰ A possible end to class perspectives deeply

internationale de service social en avril 1929, signed: Ecole Normale Sociale). Apparently Prof. Edouard Fuster concluded similarly in his courses on family budgeting at the Collège de France in 1923-24: anon. "Les Conditions sociales de l'existence d'une famille ouvrière," *Dossiers de l'Action Populaire*, 10 décembre 1928, p. 12.

³⁶ Martine Martin ("Femmes et société: le travail ménager (1919-1939)," thèse de troisième cycle, Université de Paris VII, 1984, p. 24) indicates a drop in female domestics nationwide of 11.2% between 1906 and 1921, but I have chosen Paris-only figures to omit rural-agrarian domestic workers, many of them farm helpers. For overall population numbers: République Française-Assemblée Nationale, *Journal Officiel*, 31 juillet 1921, pp. 345-359.

³⁷ anon. "L'«embourgeoisement» des ouvriers et paysans français," *Dossiers de l'Action Populaire* (10 janvier 1925), p. 5.

³⁸ For example, Louise Ménager, "La blanchisserie moderne," *Catalogue officiel du Salon des Appareils Ménagers*, 1924, p. 36, AN côte 850023/65, and Mme. André Corthis, cited by Gaston Picard, "Mesdames, êtes-vous 'Arts-Ménagères?'," *L'Art Ménager* (mars 1927), p. 24.

³⁹ A. They. "Ce que peuvent pour la famille les catholiques des professions," *Dossiers de l'Action Populaire* (10 juin 1925), p. 36. Promiscuity was, indeed, a preoccupation of Catholic writers when they inveighed against women working in factories; see, for example, anon., "Budgets ouvriers. Le Travail et la Famille," *Dossiers de l'Action Populaire*, 25 octobre 1923, p. 18.

⁴⁰ Ernest Mercier, "Le Redressement Français," Speech to the Comité National d'Études, 28 janvier 1926. pamphlet (Paris: Comité National d'Études, 1926). See also Yves Cohen, "Le système de la pratique: Un organisateur-directeur, Les automobiles Peugeot, 1917-1939," *Actes du*

worried some Communists who, along with CGT-U militants, feared that the working class' allegiances could ultimately be bought.⁴¹ The Parti Socialiste and the CGT affirmed taylorism as an effective strategy for a reformist path to a technocratic socialism. Not unlike Mercier, Mattern, and others, they linked mass production to popular consumerism.⁴²

Modernism and the rhetoric of progress constituted a new social language and increasingly replaced references to tradition as modes of social legitimation, and this linguistic shift was as important as the new political agendas in implanting modernist ideology.⁴³ On a personal basis, this meant that social positions could be validated by control over technology or a taylorist accession to positions where mental powers were

GERPISA 2 (numéro spécial: "Travail et automation dans l'industrie automobile," 1986), 3-23 and Ernest Mattern, *Création, organisation et direction des usines* (Paris: Dunod, 1926), Introduction. For a broader discussion of technocratic ideology in interwar France, see Richard F. Kuisel, *Capitalism and the State in Modern France* (New York: Cambridge University Press, 1981), Chap. 2.

⁴¹ Paul Vaillant-Couturier in *Bulletin Communiste* (2 sept 1920, p. 4), wrote, "Ce qui est le véritable crime quotidien du prolétariat, c'est qu'au lieu de vouloir supprimer la classe qui l'opprime, il s'efforce par tous les moyens d'en faire partie. Une fois que l'ouvrier sera petit bourgeois, petit propriétaire ou petit patron, cette classe continuera de le pressurer, mais sa pauvre aisance l'incitera à changer de camp et à se déclarer l'allié de ceux qui continuent de le voler en le flattant." An unnamed author in *Information sociale* (20 mars 1924) wrote, "Le ménage ouvrier ne sait plus aujourd'hui comme dans le passé supporter la misère. L'amélioration indéniable du salaire y a introduit un bien-être accru dont personne aujourd'hui ne veut consentir sans aucun prétexte à retoucher rien, ce prétexte fut-il justifié par un motif de grève." The response of the Communist Unified General Labor Confederation to rationalization at Citroën in 1927 was that capitalist rationalisation was a contradiction in terms, given the anarchic character of the market economy. See the press clippings and strike meeting reports in AN série F22 190: Ministère de Travail, *Rapports des Grèves* (1927). This attitude can no doubt be traced in part to Lenin's enthusiasm for taylorism. On the CGT-U and PCF, see P. Saint-Germain, "La chaîne et la parapluie," *Révoltes logiques 2* (1976), pp. 87-104.

⁴² Madeleine Rebérioux and Patrick Fridenson, "Albert Thomas, pivot du reformisme français," *Le Mouvement social* 87 (April-June 1974), entire; Martin Fine, "Hyacinthe Dubreuil: Le Témoignage d'un ouvrier sur le syndicalisme, les relations industrielles et l'évolution technologique de 1921 à 1940." *Le Mouvement social* 105 (1977), entire; Jules Moch, *Socialisme et rationalisation* (Bruxelles, L'Eglantine, 1927), entire, esp. pp. 54-62 and 78-79; articles of Léon Blum in *Le Populaire* 23 avril – 10 mai, 1927; and anon., "L'Organisation scientifique de travail," *L'Atelier: revue mensuelle de documentation ouvrière et sociale* 34 et 35 (octobre et novembre 1926), pp. 550-562 et 612-626.

⁴³ See my "Images of Progress: Technology as Productive and Domestic Science in France, 1920–1960," conference paper, History of Science Society annual meetings, Raleigh, NC, October 1987.

used to supervise machine-aided manual labor. A critical aspect of this vision was a symmetry between a worker's command of modern machinery at work and a housewife's pursuit of domestic science at home.⁴⁴ Just as industrial rationalization was to liberate workers from the drudgery of industrial work, domestic rationalisation would liberate women in the home. Despite a raft of publications and incitations on the need for industrial rationalization, however, French businessmen and the political class largely refused to buy into the new mythology.⁴⁵ Similarly, annual home shows (Salons des Arts Ménagers) presented domestic modernisation in the glossiest of terms and millions attended, but few of the major appliances were actually purchased.⁴⁶ Indeed, the technological future scenarios had many cultural but few material icons, and the scripts had to be presented essentially unilaterally.

Demands for a higher birth rate, for preventing women from endangering male wage rates, for developing clean, warm and happy homes which would keep husbands away from bars, and for a new, technologized vision of national culture converged to reinvent French women and the French family. Inferring an ideology of radical feminism drawn from flappers and public figures such as Isadore Duncan, familialist ideologues of the right and center freely (and apparently unilaterally) invented new visions of domestic 'feminism' against an invented issue of the flapper or the modern woman.⁴⁷ Catholics

⁴⁴ Michelle Perrot, "Histoire de la condition féminine et histoire de l'électricité", in *L'Électricité dans l'histoire, problèmes et méthodes, Actes du colloque de l'Association pour l'histoire de l'électricité en France, Paris, 11-13 octobre 1983* (Paris: Presses Universitaires de France, 1985), p. 177. The monthly articles of Paulette Bernège in *L'Art ménager* between 1930 and 1939 incessantly stressed this link.

⁴⁵ Major organizations that advocated industrial rationalization were the Société d'Encouragement, the Organisation Française de l'Organisation Scientifique de Travail, and the Bureau International de Travail. On the reluctance to affirm the new productivist discourse, see Kuisel, Chap. 3, though Kuisel would blanch at the term, *mythology*. The question of the extent of industrial rationalisation in interwar France is at the center of a current controversy among economic historians, particularly Patrick Fridenson, Maurice Lévy-Leboyer, Yves Cohen, Georges Ribeill, and the present author.

⁴⁶ On the Salon des Arts Ménagers attendance, see Archives nationales côte 850023/3 [versement du CNRS: Salons des Arts Menagers]. *Larousse ménager*, which appeared in annual editions starting in 1926 exemplified the boldest prescriptions for domestic modernization. By contrast, the catalogs of BHV (held at the Bibliothèque Forney, Paris) and of Printemps (held at the Bibliothèque Historique de la Ville de Paris) present very few innovative domestic appliances. Given that at BHV in particular, retailing and advertising space were allocated according to sales revenues, we can conclude that sales of innovative domestic appliances was minimal (interview by author with M. Benoit, Secrétaire Générale du BHV, 13 juillet 1990).

⁴⁷ Gaston Picard, "Mesdame, êtes-vous. 'Arts-Ménagères'," *L'Art ménager* (mars 1927), pp. 24-26; Pierre Drouard, "Le bien-etre à la campagne," *VIe Catalog du Salon des Arts Ménagers* (1929), 890-891, 926; Emilie Lefranc, "Au Centre Confederal d'Education Ouvrière les femmes

promised freedom and dignity for women in revalorized domestic pursuits, with childbearing at the center of their lives. Secular reformists promulgated domestic science as a pursuit in which women could apply the chemistry and physics learned in the lycée to cooking (which was, in place of *gastronomie*, dubbed *gastrotechnique*).⁴⁸ Further, scientific housework would simultaneously liberate middle class women from the tyranny of their domestics and, by minimizing familial maintenance tasks (assumed to be entirely a feminine pursuit), it would also free them to enjoy personal development in the arts and similar feminine diversions.⁴⁹

Domestic appliances were to be the essential icons of the new familial and gender order. They were also envisioned by many to provide the functional means for liberating women and rebuilding the family. In their report on the future of the family, the Northern Catholic Employers' Association vaunted the future of appliances in the home and the pivotal role of science and electricity in that environment:

Electricity is everywhere. In order to have a rural factory, construct a building, tap into a nearby power line, and install the machinery using multi-purpose motors. What steam once did, electricity can redo. A little science can be distant from normal life; a lot of science can remake it.⁵⁰

For laic reformers, appliances were the necessary mechanical counterparts to domestic science, and just as taylorism valorized middle class, white-collar work by giving mental workers technical and managerial control over manual workers, the modern housewife would become a domestic manager, ordering around her mechanical slaves.⁵¹ The image of 'mother's enslaved helpers' recurred constantly in appliance advertisements in the 1920s, replete with black-faced, elfin, or genie-like anthropomorphisms of machines. However, lest one fear the invasion of the home by 'inferior' races, have no fear, said a housewife:

viennent à nous," *Le populaire de Paris*, 11 octobre 1936.

⁴⁸ Such was the title of the cooking section of the 1928 catalogue of the Salon des Arts ménagers; the leading advocate of *gastrotechnique* (and it de facto inventor) was a Dr. Edouard de Pomiane, who regularly offered public workshops on "La Cuisine, l'art et la science." He also wrote *La Cuisine Pour La Femme Du Monde* (Paris: La Société, 1932), a cookbook for the modern woman on the run, and his famous *La cuisine en dix minutes*, which was released in its latest American edition in 1978.

⁴⁹ The writings of Paulette Bernège most explicitly laid out this position, see, for example, Paulette Bernège, *Si les femmes faisaient les maisons* (Paris: Mon chez moi, 1928); and Bernège biographically, see Archives nationales côte 850023, carton 193.

⁵⁰ L'Association des Patrons Catholiques du Nord, "Ce que le Patronat désire faire pour la famille," *Dossiers de l'Action Populaire*, supplement documentaire au numéro du 25 avril 1924, p. 5.

⁵¹ A. Papillon, "L'Aspirateur de poussière," *Catalogue officiel du Salon des Appareils Ménagers* (1924), p. 22.

...[appliances] have their poetry. Because a machine is even pretty—at the Aviation Exposition, I have admired beautiful motors. A motor, it is an entire life-image! Wow, and compared to these great mechanisms, the humble little machine, the electric broom or the vacuum cleaner, will confer their poetry to the woman who uses it. Life in the home will improve where the little machine has done its duty. No more squabbles with the servant girl! Your eighth art will in the future assure domestic peace!⁵²

With such a rich set of images for the future of French women and the French family, festooned with appliances and the imagery of technological culture, one would have expected closures both of the appliance-artifacts and the new social definitions. Yet closure remained elusive. I locate that failure in two related conundra: there was little genuine negotiation among interested parties as each party constructed independent prospective narratives about how to reach the future, and such scenarios conflicted among themselves and with the artifacts, and with the material context as well. Let's first look at the scenarios and the means necessary to achieve them, then the artifacts.

The Catholic domestic scenario can be guessed from what has been noted above: while appliances were far beyond the financial reach for the mass of working class families, housewives could first improve family life by pre-industrial efforts to learn hygiene and budgeting, and by encouraging moral- and work-discipline. Greater efficiency in housework would free up the housewife's time and allow her to take in more garments to finish, children to babysit, etc. She could then afford time-saving appliances which would free her time for more work to take in, thereby allowing the family the financial wherewithal to afford a large family. Finally, a clean and well-lit home with a well-stocked dining table at the center would encourage the hubby to stay at home, thereby assuring familial financial security and moral virtue.⁵³

Secular reformists affirmed a more technocratic future narrative. Supporters included Ernest Mercier, the utility megamanager, Louis Locheur, the chief of industrial mobilization during World War One, Jean-Louis Breton, head of the wartime Office of Invention and founder (in 1923) of the annual home appliance shows, and Paulette Bernège, France's top promoter of taylorist practices in domestic and office work. This milieu dreamt of a prosperous, classless society liberated from drudgery and free to pursue cultural enrichment, an amalgam of citizens liberated by applied science. Domesticated technology would, in time, assure social peace.⁵⁴ The prospective narrative set by these

⁵² Mme. Corthis, quoted by Gaston Picard, *art. cit.*, p. 25.

⁵³ "Ce que le Patronat desire ...;" Marie Boutier, *La Jeune ménagère pratique*, (Paris: Hachette, 1927); the articles regularly contributed by Boutier to *L'Art ménager* consistently make this point.

⁵⁴ Clement Vautel, "Au bonheur des dames," IIIe Salon des Arts Ménagers, *Catalogue officiel* (1926), pp. 4-5; E. Labbe, "Pour l'enseignement menager," IIIe Salon des Arts Ménagers, *Catalogue officiel* (1926), p. 10; memo by M. Grignon [aide to Poincaré], re: meeting w/ M.

circles contradicted the goals in a sense, because their audience was almost entirely the middle class, particularly the emerging white collar workforce. Working class families did not have sufficient incomes to become systematic purchasers of domestic technologies and the way the elite and the new white collar class framed domesticity, it was a long way from working class culture and tastes. A key part of the secular reformist vision was the Fordist synthesis of productivism and consumerism, made possible by technological leadership and broad public consent to the rule of experts. Consent to Taylorism, industrial rationalization, and a new gender division of labor would ultimately make the fruits of progress available to all, excepting, presumably, the new immigrant sub-proletariat. Dr. L. Lapique, a Sorbonne professor wrote:

This is a question of a genuine social revolution because, before domestic technics, when everything was done by hand, the life of leisure [at home] was only possible for slaveholders. Today, the crisis of domestic labor is plaguing us, but it's only the result of democratic progress. The development of domestic arts is essential for an increasingly egalitarian society.⁵⁵

Prospective narratives for the missionaries of familial technology included marketing items to those who could afford them, lowering production costs by rationalization and standardization and thereby broadening the social base for familial technology, and finally, using the market as a mechanism for selecting which artifacts would best serve human purposes. All of these steps would revalorize women's domestic labor through control over technology and make her warm, clean, and well-lit home the ideal refuge from the pressures of the competitive society of progress.⁵⁶

Nonetheless, these two dominant scenarios of familial and feminine liberation largely ignored negotiation with several essential parties, domestic appliance producers, the appliances themselves, and potential *maîtresses de maison*. In Breton's annual domestic appliance fairs, the *Salons des Arts Ménagers*, manufacturers were encouraged to present novelty each year.⁵⁷ These demands for rapid changes in aesthetic surface had

Richemond (President of Caisse de Compensation de la Seine), 19 octobre 1927, Archives nationales côte 39 AS 3993/2: Groupement des Industries Mécaniques et Métallurgiques de la Région Parisienne, and dossier on natalism in *Papiers d'Albert Thomas*, Archives nationales côte 94/AP, carton 374.

⁵⁵ AN Series 850023/3 *Salons des Arts Ménagers*, *Arts Ménagers* (publicity brochure, Paris: SAM, 1949 [?]. non-paginated. In the same brochure, Henri Queuille, a longtime cabinet member, argued that Taylorized housework was the only solution to the crisis of family life.

⁵⁶ Pierre Mac Orlan, "La maison... ..Miroir du temps," *L'Art ménager* (mars 1927), p. 19. According to one author, the technologized housewife would become a veritable engineer: anon. "Notre 'Salon'...", *Volts: Revue d'Informations de la Société Als-Thom* 91 (janvier-février 1937), p. 3.

⁵⁷ Loose document and attached form letter from Paul Breton, *Sécretaire-générale* of *Salon des Arts*

an important part to play in promoting the novelty of 'progress,' yet they undoubtedly encouraged manufacturers, who were already facing very limited markets, to squander money on aesthetic surfaces and annual model changes. Lacking the facilities and experience in flexible mass production techniques, the determination to change models frequently discouraged the adoption of more modern production techniques that could have reduced production costs and expanded markets.⁵⁸ Part of the preoccupation with the surface of the objects can be explained by the ideologues' assumption that a large part of appliance purchasing was capricious, that women ignored the functional side of such artifacts. While aesthetics may have been useful in winning over husbands (particularly with their concern that spouse not be defeminized by the hardware), women seemed to be rather more hard-headed. For example, after several years of presenting appliances as simple photos, Birum-Lutra discovered that the only way it could meet the contradictory gender agenda was to present a line drawing. Its floor polisher ad in 1928 textually described a heavy, industrial-strength machine, weighing about 50 kg, which had the power to do the job, thus appealing to the functionalist sense of the wife, yet its line drawing presented a well-coiffed, high-heeled woman deftly manipulating the polisher with one hand—a clear appeal to the husband. The two images could not materially be placed in a photograph. Interwar appliance manufacturers seemed so preoccupied with aesthetic surfaces that bespoke the good life of the future that the objects' purpose in prescribing the future seems to have overwhelmed their functionality as home maintenance devices.

The prescriptions of home appliances as icons of the future became unilateral scenarios for appliances. Facing a largely mute public, it was that set of unilateral and non-negotiated meanings that succeeded over domestic sales. Manufacturers could only correct or adjust artifacts and presumed contexts based on sales, yet appliances and the energy required to run them remained too expensive for mass consumption. Birum-Lutra's polisher cost the equivalent of six weeks' of a skilled worker's gross pay.⁵⁹ The cheapest

Ménagers, urging annual model changes to exhibitors, 15 May 1928, AN côte 850023/3.

⁵⁸ The frequency of model changes is obvious from examining the appliance advertisements of the interwar era in France. In addition, there was a very large number of manufacturers in a panoply of small shops, particularly in the Paris region and in Lorraine. The only major mass producer of appliances was Thomson, yet its designs—even to the level of its production tooling—were imported from General Electric in Schenectady, New York; see anon., *Historique Thomson. Le Groupe de 1893 à 1977*, unpublished internal history (Paris: Thomson, 1979): Tome I: Jacques Mars, "Essai de monographie de la Compagnie Française Thompson-Houston" (1937), pp. 15-22, 93; Thomson Board of Directors' meeting minutes, meeting of 7 août 1919, Thomson archives. It does appear, however, that Calor managed to develop its own designs and tooling for home appliances: François Robert, "Gestion du personnel et esprit-maison dans une entreprise lyonnaise entre 1913 et 1955," Research Report No. 25, Centre d'Etudes de l'Emploi (51, rue de la Chaussée d'Antin, Paris), June 1989.

⁵⁹ Polisher price from Birum-Lutra advertisement, Salon Catalogue of 1928; wage assumption from anon., "Budgets ouvriers. Le Travail et la Famille," *Dossiers de l'Action Populaire* (25 oct

vacuum cleaner offered by Mors, a major producer, cost about one month's pay. Even vacuum cleaners, items with respectably large markets, had not become closed as single-function machines. A 1923 ad offered a vac which could, at the flick of a switch, blow air and, accordingly, be used to blow dust from cracks, dry hair, spray perfume, or atomize insecticides.⁶⁰ A lack of standardization also prevented artifactual closure. Heat, gas, wood, coal, and briquets competed with each other and with electricity, itself expensive and supplied in dozens of different frequencies and tensions, with countless different plug configurations. One firm assumed that energy standardization would converge on methane, so it offered a home gas-manufacturing plant which used gasoline for feed stock. Another surmised that gasoline itself would become the basic fuel and thus offered gasoline-fired clothes irons.

All of these marketing efforts collided with relatively closed wallets, for as incomes rose slightly in the 1920s, popular expenditures on the margin went to replace bread with meat and vegetables on the dining table, and to purchase better and more clothes.⁶¹ Big ticket items remained financially inaccessible, and when some firms offered sales on credit, religious groups denounced the practice as deceitful.⁶² Manufacturers thus remained in a small-market bind. Markets were not large enough to justify mass production, yet the high costs resulting from not adopting mass production techniques precluded an expansion of the market.⁶³ Potential users of their products thus had still less input into the shaping of the artifact.

In the final analysis, however, the scenarios of the modernists and Catholics may have succeeded on an imagematic level. By the late 1920s and even through the Depression, when fantasizing mass appliance purchases would have indicated mental derangement, attendance at the Salons exceeded 500,000 people. Clearly, the vast majority bought nothing, and paid the five francs' admission for the vicarious experience of someone else's path to the future, not to ameliorate the present in a functional sense. The narratives seemed to have worked, not in the '20s or '30s, but after the Second World War, when the inventions of appliances, domesticity, and housewives finally intersected

1923), p. 3, and inflated based on Statistique Générale de France statistics.

⁶⁰ Louise Cariou, "Cents mille visiteurs dans deux baraques: C'était le premier salon en 1923," *Contact* [périodique de la FNAC] 116 (mars 1971), p.6.

⁶¹ Jean Fourastié et Françoise Fourastié, "Le Gendre de vie," Chapter XIII in Alfred Sauvy, *Histoire économique de la France entre les deux guerres*, Vol. III (Paris: Economica, 1984), pp. 212.

⁶² anon. "L'Art de faire des économies," *Dossiers de l'Action Populaire* 10 février 1920, p. 12.

⁶³ This can be considered the economic version of the famous prisoner's dilemma scenario in game theory: manufacturers wanted employers—other employers—to pay well so that there would be sufficient markets for mass production, but few individual employers were willing to forego the profit that low wages yielded

with reality.⁶⁴ Closure occurred, but only after vast adjustments of political economy, industrial policy, social relations, and gender role definitions. Mother's Day today represents a peak marketing season as children and husbands buy appliances for Mom and the wife.

⁶⁴ Indeed, this really did not happen until the 1960s, given the preoccupation of postwar planners to concentrate economic resources on investment rather than consumption. The experience of *Électricité de France* was indicative of this approach; see Robert L. Frost, *Alternating Currents: Nationalized Power in France, 1946-1970* (Ithaca: Cornell University Press, 1991), chapters 3-4.