











Installation view, Wing One, featuring Fertile Goddess, Ishtar, and Kali place settings



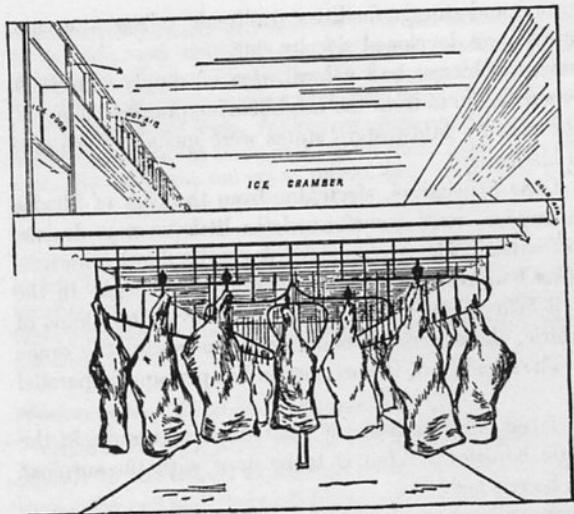


A29
A1 Lisboa
portagem
A20
Porto (Freixo)

V. de Andorinha
hospital

17





110. Swift's First Successful Storage Refrigerator. New York, 1882. After twenty years of failure, Gustavus Swift succeeded by careful planning in bringing chilled meat to the markets of a distant metropolis. 'The new departure depressed the market by three to four dollars the hundredweight.' (Harper's Weekly, 21 October 1882)

a more intensive widening of the railroad network began. 'It was in 1849 that the whistle of the locomotive was first heard on the prairies west of Chicago,' if only over a ten-mile stretch.²⁵ In 1850 a portion of the northwestern prairie in the State of Illinois as far as Galena was also brought in. In the 'sixties repeated spanning of the entire continent was successful. At the beginning of the 'seventies, the Chicagoans boasted of a train leaving every fifteen minutes.²⁶ In the same decade, the competing lines grew so powerful that a debacle ensued, with open warfare against the railroad companies.

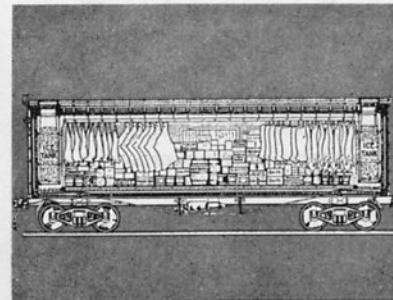
During the 'fifties, to escape the drawbacks of seasonal operation, summer slaughtering was introduced so far as was then possible in Chicago. This called for capacious, cool storehouses stocked with natural ice. Soon these wooden constructions appeared in every town where packing was carried on. In the early 'seventies, gradually began the introduction of refrigeration by artificial means.

The final overthrow of the local supply system came about only with the introduction of the refrigerator car.²⁷ The experimental period extended over fifteen years, 1867-82: from the first granting of an American patent in 1867, and from the moving of the first shipments between Chicago and Boston, to the decisive success of the marketing of slaughtered carcasses in New York.

²⁵ Webb, op.cit. p.222-3.

²⁶ Parton, op.cit. p.46.

²⁷ For further details see Harper Leech and John Charles Carroll, *Armour and His Times*, New York-London, 1938, pp.125-7.



111. American Refrigerator Car.



112. The Farmer and the Packer. (Courtesy J. Ryerson Collection, Chicago)

The problem was handled from the first patent²⁸ by a regulated air-circulation and by evacuating the warm air. Five years later, 1872,²⁹ the ice was moved from overhead into V-shaped containers at the end of the car. There were also attempts to effect self-cooling through the evaporation of water.

Meanwhile the Frenchman Charles Tellier³⁰ had succeeded in bringing fresh meat across the ocean on the ship *Frigorifique* (1876). In the ports, and even in Paris, American mutton could be obtained. The South Americans claim primacy in this invention for their countryman, Francesco Lecoq of Montevideo, who was closely associated with Tellier in Paris. Lecoq's refrigerating process was based on the evaporation of ether.³¹

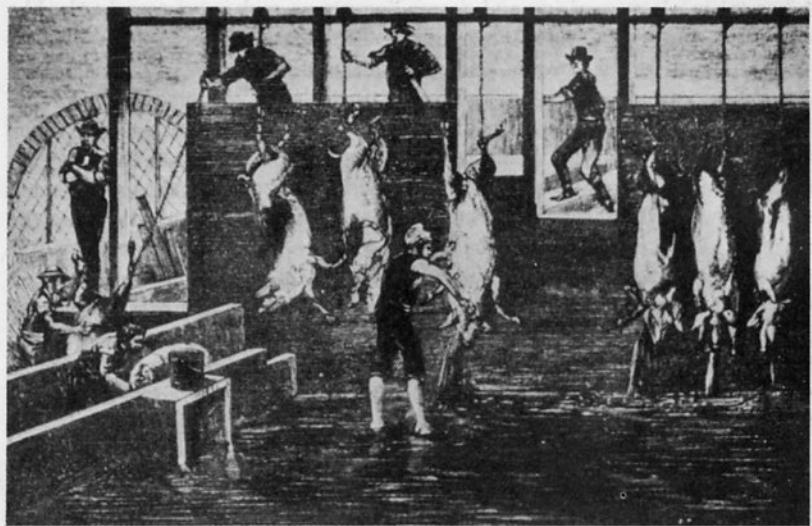
George Henry Hammond was the first packer to recognize the potentialities latent in the refrigerator car. Precisely when he sent his first carload from Chicago to Boston is not certain, but it was either in 1867 or 1868. Because

²⁸ U.S. Patent 71,423, 1867, J. B. Sutherland.

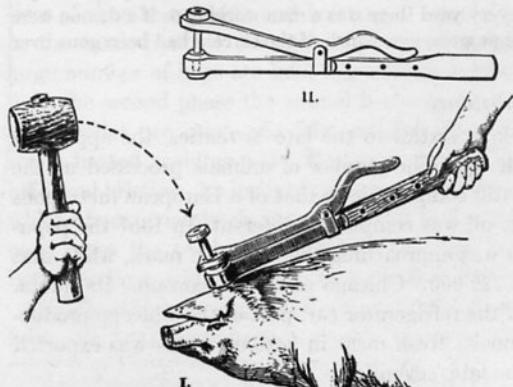
²⁹ U.S. Patent 131,722, 24 Sept. 1872, J. Tunstel.

³⁰ Charles Tellier, *L'Histoire d'une invention moderne, le frigorifique*, Paris, 1910.

³¹ Ramon J. Carcano, Francesco Lecoq. *Su teoria y su obra 1865-1868*, Buenos Aires, 1919. The French patent was granted to Lecoq 20 January 1866.

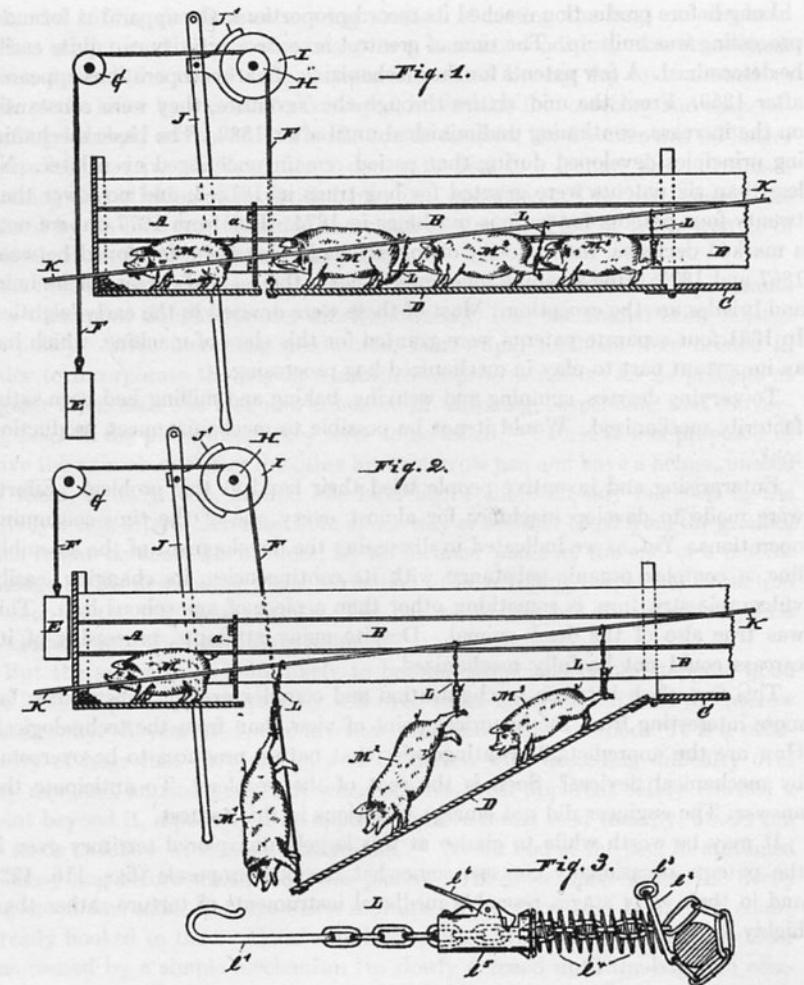


115. Slaughtering Hogs in Chicago. 1886. Hoisting by rope and pulley. (Scientific American, 21 August 1886)



Koch's Pig Killing Apparatus.

116. Koch's Pig-Killing Apparatus.
(Douglas's Encyclopedia)



117. Apparatus for Catching and Suspending Hogs. 1882. Here the living animal must be introduced into the 'disassembly' line. From the 1870's on when stunning was found too slow, devices were proposed to hoist the hog to the overhead rail without struggle: 'The hog M acts as a decoy for the others, and much time and labor are thus saved. The brake is manipulated to allow the trap D to slowly descend until the hogs are completely suspended, when they slide off on the bar K to the place where they are to be killed.' (U. S. Patent 252,112, 10 January 1882)

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SITE DE PAPY LOUIS
LA TRAVERSEE D'UN SIECLE







The authors did not avoid the issue: 'Now, what is the matter with domestic service? . . . We cannot in this country maintain to any great extent large retinues of servants. . . . Every mistress of a family knows that her cares increase, with every additional servant.' Their verdict is unequivocal: 'A moderate style of housekeeping, small, compact and simple domestic establishments must necessarily be the general order of life in America.'⁷ And finally they point to the solution: 'This being the case, it should be an object in America to exclude from the labors of the family all that can be . . . excluded out of it by combined labor.'⁸

Even today, one could hardly state the problem more trenchantly. By force of circumstance, reality is gradually moving toward this state. Sampling at random the views expressed around 1910, we learn that the servant problem is to be solved 'on the same plane as in other employments,' and as a direct result, 'we are gradually coming to the abolition of a permanent serving class in our homes.'⁹ Meanwhile the problem increasingly shifted into the psychological sphere. 'There is a very strong case against the presence of the permanent worker in the home. . . .' She forces 'psychological adjustment . . . on the homemaker and on the entire family. . . . In many cases the standard of the home is consciously or unconsciously made less simple or adapted to the expectation and demands of the worker.'¹⁰ All this points back to Miss Beecher's proposal of 1869, that housework should be divided up so far as possible among the members of the family. In 1915 more pressing reasons are given: 'The servantless household (by servantless is meant without resident workers) offers the only opportunity for a family to follow *the exact standards* . . . and enables a family cooperation and a chance for training the children.'¹¹ The prerequisites for such a solution were supplied only when mechanization made it possible to reduce manual drudgery to a minimum.

Organization of the Work Process

One must not confuse organization of the work process with the use of mechanized tools. Organization of the work process, it should be stressed, was underway before mechanized tools became available. These were not universal even in households of 1940. Household planning, then, began before household

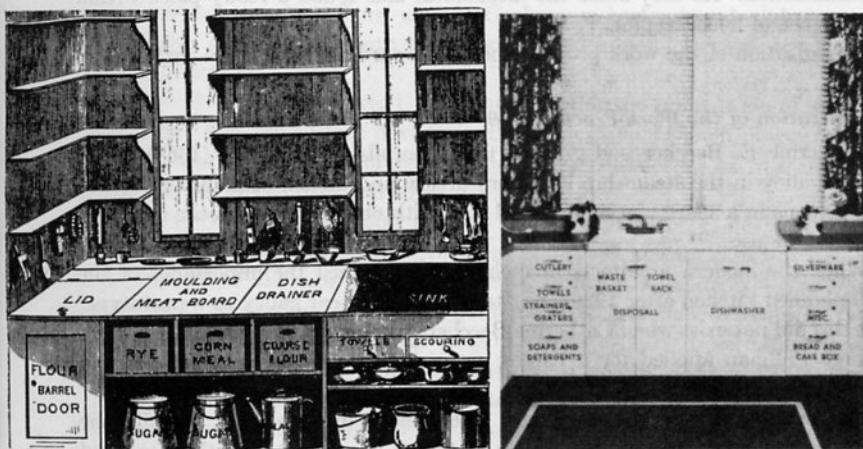
⁷ Catherine E. Beecher and Harriet Beecher Stowe, *The American Woman's Home*, New York, 1869, p.333.

⁸ Ibid. p.334.

⁹ Christine Frederick, 'The New Housekeeping,' *Ladies Home Journal*, 1912, vol. 29, no. 12, p.16.

¹⁰ Frederick, *Household Engineering: Scientific Management in the Home*, Chicago, 1919; first issued in 1915.

¹¹ Ibid. p.380.



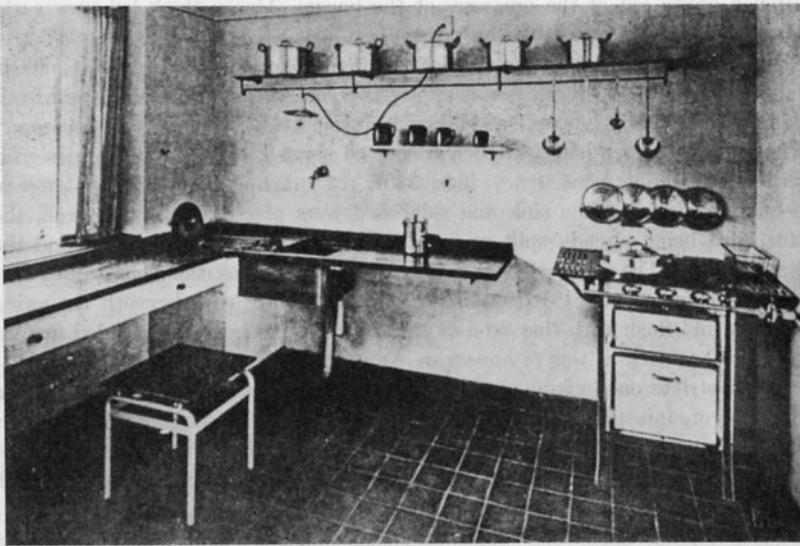
336. Continuous Working Surfaces: Preparation and Cleaning Center of Kitchen, by Catherine Beecher, 1869. *The tendency to view the housewife's work as a craft or a vocation arose in the New England Puritan environment.*

Well-lighted surfaces of minimal size at waist height, with storage center beneath. Drawers for rye and coarse Graham flour used in breadmaking. Lid of flour barrel fits flush with other surfaces. The molding board turns over to form a preparation surface over the sink. (Catherine Beecher, *The American Woman's Home*, New York, 1869)

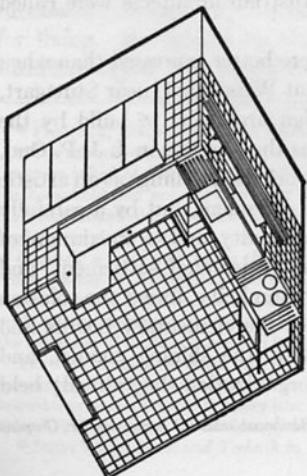
337. Continuous Working Surfaces: Preparation and Cleaning Center of Electric Kitchen, 1942. *In the mechanized kitchen of today, three working centers are acknowledged: storage and preservation; cleaning and preparation; cooking and serving. Two of these centers, storage-preservation and cooking-serving were clearly distinguished by Catherine Beecher in 1869, and treated as units. (Courtesy General Electric Corp., Schenectady, N. Y.)*



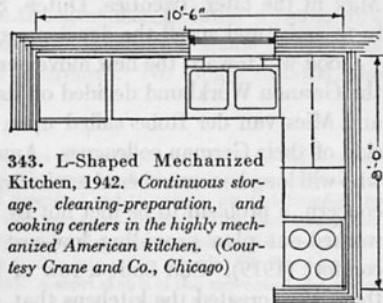
338. Continuous Working Surfaces: Kitchen, by Catherine Beecher, 1869. *The cast-iron range demands a protective zone and stands in a stove room apart. (Catherine Beecher, *The American Woman's Home*, New York, 1869)*



341. Continuous Working Surfaces: J. J. P. Oud, L-Shaped Kitchen, Weissenhof Settlement, Stuttgart, 1927. J. J. P. Oud, who carefully planned large flats for workers in Holland before 1920, brought his skill to the L-shaped kitchen of row houses at the Weissenhof experimental settlement. Although this low-cost kitchen seems to have little in common with the white-enamelled, mechanized kitchen of 1940, its organization embodied almost everything the manufacturers were later to offer in luxurious versions.



342. J. J. P. OUD: L-Shaped Kitchen, Weissenhof Settlement, 1927. Ground Plan. Continuous storage, cleaning-preparation, and cooking center.



343. L-Shaped Mechanized Kitchen, 1942. Continuous storage, cleaning-preparation, and cooking centers in the highly mechanized American kitchen. (Courtesy Crane and Co., Chicago)



344. Partially Continuous Working Surfaces: The Black Kitchen, 1930. Early use by the industry of wall-cabinets, base cabinets beneath working surfaces, and built-in sink. But they are still treated as isolated pieces of kitchen-furniture. The range does not fit into the surrounding units, nor is it integrated in the work process. (Courtesy Kitchen Maid)



345. Heterogeneous Equipment. Experimental Kitchen Used by Lillian Gilbreth, Brooklyn Gas Co., 1930. One of American industry's first attempts to rationalize kitchen work by studying movement and charting steps, and to arrange the miscellaneous equipment in a more compact way. Faced with the chaos then prevailing, the production engineer Lillian Gilbreth comments: 'The manufacturer must realize that he has little knowledge of what the housewife needs.' (Courtesy Architectural Forum)

Figure 2.

Taylorisation of the kitchen, contrasting a 'rationalised' layout with the 'usual' lack of order.

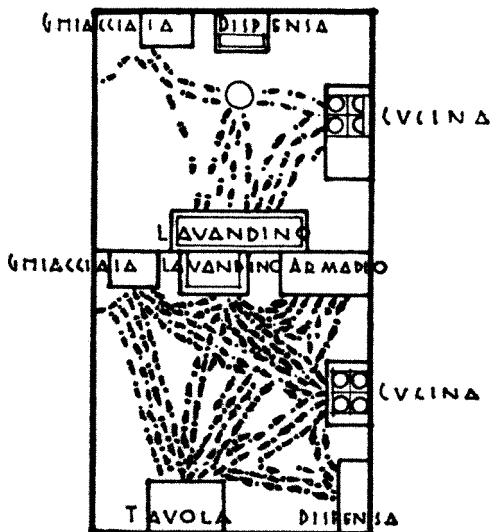
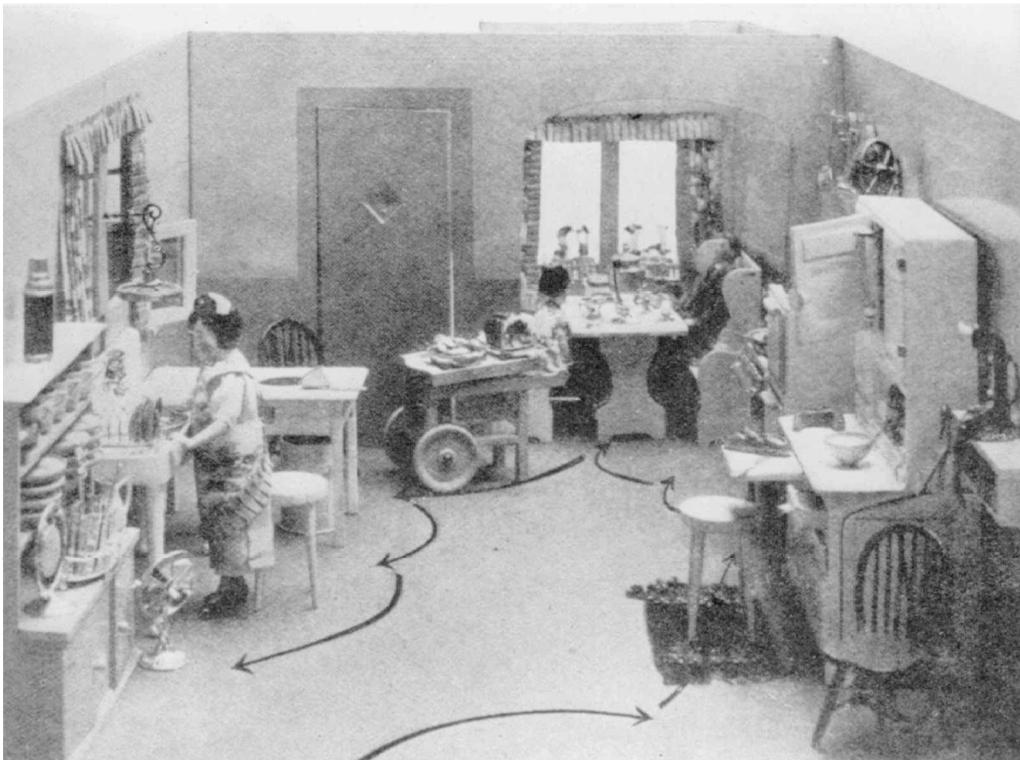
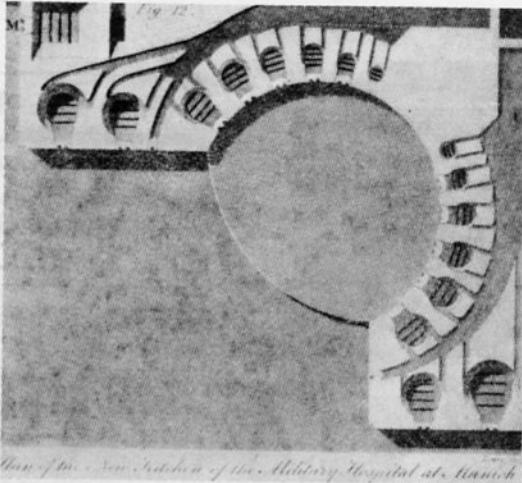


Figure 3. 'Efficient' kitchen according to Christine Frederick at the Congress in Rome, 1927.





348. RUMFORD: Oval Range for Military Hospital at Munich, Late 18th Century. The formation of the modern kitchen stove is connected with the growth of soup kitchens and other mass-feeding facilities. Rumford hollows his ranges in semi-circular or oval form, like roccoco *maisons de plaisir*. The cook does not have to move around the range, but can watch his pots while standing in the center. (Count Rumford, Complete Works, Boston, 1870-75, vol. III)

spread in Pennsylvania (he also calls it 'Holland Stove'). It was made of cast-iron plates. Using the same material, he formed an air box with cast-iron walls in which 'the smoke ascends and descends and heats the plates' (fig. 347). By this and other improvements he more fully used the escaping heat, and allowed it to radiate more equally through the room.³³

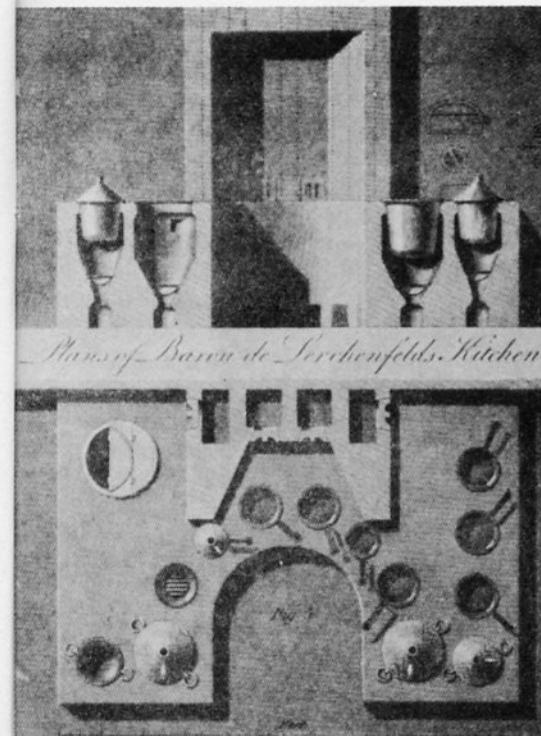
Benjamin Thompson, Count von Rumford (1753-1814), raised in colonial America, was a British officer, Bavarian statesman and general in chief, and, which is to the point here, one of the great late eighteenth-century physicists. We have already mentioned³⁴ Rumford's indirectly heated oven, designed for the kitchen of a workhouse that he founded in Munich, where the heat and smoke passed through a ramification of flues around the sunk-in saucepans.

Investigator of latent heat, inventor of the soups that still bear his name, author of an essay 'Of the Excellent Qualities of Coffee and the Art of Making It in the Highest Perfection'³⁵ (giving recipes and several designs of percolators

³³ It is rewarding to read Franklin's own description and the six methods he lists for artificial heating in his time; and interesting to note that he mentions to the disadvantage of the Dutch Stove that 'There is no sight of the fire which is in itself a pleasant thing.' And of the 'German Stove,' where the heat is piped in from another room, he remarks 'People have not even so much sight of the fire as in the Holland Stove.' Cf. Jared Sparks, *The Works of Benjamin Franklin*, London, 1882, vol. 6, pp. 33, 43, 44.

³⁴ Referred to in 'The Mechanization of Baking,' above.

³⁵ Sir Benjamin Thompson, (Count) Rumford, *Complete Works*, 4 vols., Boston, 1870-75, vol. 4.



349 a. Cross Section of Rumford's Range for a Bavarian Nobleman. Concentration of the heat source: sunken saucepans; with complex flue system heating the whole outer wall of the pans.

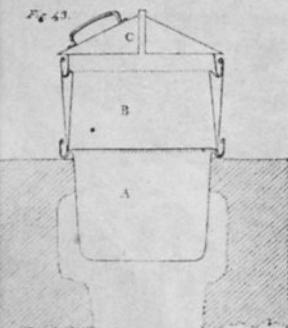
349 b. Top View of Rumford's Range for a Bavarian Nobleman. Same arrangement: the cook stands in the center.

still used today, and voicing the idea that coffee should become the beverage of the masses) Rumford, with his scientific experience, was indeed the man to perfect the range.

The social experiment of cooking for a thousand people daily in his Munich workhouse offered an excellent opportunity. Rumford also built large ranges for Bavarian aristocrats (fig. 349), for military academies (fig. 348), and for hospitals in Italy. All were shaped along similar lines: The cook did not walk around his pots but watched them from the center. For the range was hollowed in the same semicircular or oval shape as the small *maisons de plaisir* in the Park of Nymphenburg, where Rumford was a frequent guest. In form, these ranges were infused with the eighteenth-century spirit, and bore no resemblance to the towering monsters created by the nineteenth century. They are described

Of Cooking in Steam.

The following figure, which represents a vertical section of the apparatus, will show this contrivance in a clear and distinct manner:



350. RUMFORD: Sunken Steam-Saucepan.

