THE EVOLUTION OF WASH DAY

In America, particularly in pioneer days, Monday was wash day, and so it is today in thousands of homes. Did the custom develop out of an ancient past in a foreign land in which a water supply was available only on Monday? Is it a matter of mere convenience? Or is it, perhaps, a matter of pride in getting the washing on the line while the laboring hours of the week are yet young? At all events there is keen rivalry among many housewives to see who can first display the weekly wash.

The washing of clothes has been a familiar process since the time of Adam and Eve; only in modern times and in modern lands have the methods employed materially changed. In China, in Italy, in Spain, in Portugal, and even in Germany the winding streams were long used as wash tubs. Rocks beside the streamlets were used as washboards. Clothing might be laid on the bank and whipped with bamboo switches or beaten against stones or logs for the purpose of cleaning and drying. Mark Twain witnessed the peasants of Europe washing their clothing in the streamlets, but he is reported to have said that India was the only place where he had ever seen men "trying to saw wood with a shirt." In Bombay it is no unfamiliar sight for the tourist to see women attach soiled clothes to a rope and tow them behind a sailboat, thus giving them a whirling motion in the water to cleanse them.

To clean clothes one needs two essentials — water and some kind of agitation to force the water through the clothes. But the success of this washing process is greatly facilitated by the use of soap or other substances that will help dissolve the grease and dirt which cling to the gar-

ments. Especially in this machine age is soap a necessary ingredient of wash day.

The standard washing equipment before the days of the machines was the humble washboard. This might be, and often was, only a board or a piece of wood with a series of ridges or ribs cut across it. Later the wood was faced with metal or with glass to make smoother ridges free from splinters. With the upper part of this washboard leaning against the side of the tub containing soiled clothes, water, and possibly homemade soap, the pioneer woman rubbed the garments one by one across the ridged surface, applying soap between rubs. Leaning over the tub and rubbing the clothes for a large family was a back tiring job and the men who broke the prairie sod with oxen to pull the plow worked no harder than their wives at home.

Besides, the garments had also to be wrung out by hand, no small task when one considers the weight and thickness of home-woven sheets, blankets, and wearing apparel. Water often had to be carried from a distance or lifted from a well by means of a bucket fastened to a rope or a well sweep. Sometimes in the winter snow was melted for wash water, furnishing fine soft water, but this required much labor and exposure to cold. Consider also the problem of drying the wash in the winter time on the Iowa prairie, with snow underfoot and a biting zero wind freezing the damp fingers of the housewife.

In modern life we bring the river into the house, heat the water, add a bit of soap for softening and cleaning purposes, and then contrive some electric or steam driven device to force the water through the soiled fabrics. Other power appliances are used for drying and ironing, and the task of cleaning and pressing the clothes is soon completed.[1]

[1] *How the World Washes* in the *World Today*, Vol. XIX, pp. 949–956; *Electricity in the Home* in *The House Beautiful*, Vol. XLVI, pp. 254, 271, 275.

WASHING MACHINES

In the United States there are more than forty factories manufacturing washing machines and clothes wringers. In the State of Iowa alone twenty-four hundred people are employed in this industry. These Iowa laborers are paid more than three million, six hundred thousand dollars a year for their labor. The cost of raw materials used by the washing machine industries of Iowa aggregates approximately eleven million dollars annually, while more than nine million dollars is added to the value of the finished product through the manufacturing process. Indeed, twenty million, eight hundred thousand dollars is a conservative estimate of the value of the washing machines manufactured in Iowa in a single year.[2]

The modern washing machine has, for the most part, developed since the decade of the nineties. Yet inventive persons were aware of the need of labor saving devices in this work and many patents were obtained for washing devices before that date. Indeed, the first American patent issued for a washing machine bears the date 1805, and more than one hundred and forty such patents were granted by the year 1857.

Washing machines as they have developed through the years have been of many patterns and designs. For the most part, however, they have conformed to five general types. One of these (and perhaps the earliest) was based directly on the washboard. In this machine a corrugated frame was suspended in a tub and the clothes were rubbed between it and the bottom of the tub by means of a handle.

The "dolly" type was also used at an early date. This consisted of a round wooden or metal tub with corrugated sides, inside of which was a wooden churner or agitator, somewhat resembling a four-legged milking stool. The

[2] *Biennial Census of Manufactures*, 1935, p. 1125.

legs of this stool served to whirl the clothes around in the water against the corrugated sides and bottom of the tub, while the hot, soapy water was forced through the fabric, effectively removing dirt from the clothes.

Another type known as "the vacuum-cup machine" secured agitation in a very different way. Inside the cover of a round tub were a number of vacuum cups, each resembling a large inverted metal funnel. These vacuum cups were driven up and down, forcing the water down and drawing it back, thus producing the agitation necessary to wash the garments in the tub.

The cylinder type washer was quite a different design. This consisted of a perforated wooden or metal cylinder or drum, placed inside of a larger metal container. Clothes were placed in the inner drum. A fire under the larger container heated the water to which soap was added. The drum holding the clothes was turned often enough to force water through the drum and this motion in the hot soapy water dislodged the dirt in from three to twenty minutes. Sometimes the cylinder was so arranged as to automatically reverse its direction at frequent intervals. Hot soapy water thus forced to swirl through the clothes was an effective cleaning agent.

Still another form of machine is known as the "oscillating type". This is a tub in which the clothes are swung back and forth through the water by a rotary motion which removes the particles of dirt.

Whatever the form or type of machine — there have been many forms — the principle is essentially the same. It is that of forcing water through the clothes. Any machine that will do this effectively has the first requisite of efficiency.[3]

Most of the many devices constructed for washing pur-

[3] *The House Beautiful*, Vol. XLVI, pp. 275, 276; Letter of Patent No. 8446, Patent Office, Washington, D. C.

poses prior to 1850 were designed on the rubbing or friction basis. In 1851 James T. King of Baltimore, Maryland, gave to the world his new "King's Washing Apparatus". This "apparatus" consisted of a cylindrical revolving boiler mounted over a small furnace. When the water was heated, the clothes were placed inside the boiler which could be turned by means of a small handle during the washing process. (This, it will be observed, is not essentially different in principle from the modern washer and the rotary power laundry of the present day.) By this operation, Mr. King explained, "one person (with an apparatus the revolving boiler of which is two feet long by two feet in diameter with its appurtenances) will do as much washing as 12 persons can do by hand in the same time and with less expense for fuel, soap, &c."

In presenting this machine to the public Mr. King confided that the "difference between this Apparatus and all other washing machines which have been invented (and there are more than a thousand that have been abandoned) is that they are all rubbing machines, their inventors having sought to accomplish their object by rubbing, and almost every principle of friction has been applied for that purpose.

"Now no one will dispute that rubbing the dirt from clothing by force must, to some extent, injure the fabric and destroy the buttons; consequently the principle on which they have founded their inventions was wrong, their machines were good for nothing, and are thrown aside as useless."

Mr. King did not hesitate, however, to extol the virtues of his own machine which, he said, "proceeds on a principle entirely different as any one at all acquainted with its philosophy will see at a glance. The clothes, while undergoing the process, are alternately in steam and suds; the

steam being saturated with alkaline properties, penetrates the fabric and neutralizes the grease, while the suds removes the dirt; this accounts for the rapidity with which clothing is washed by the machine" — all this in the year 1851.[4]

By the year 1858 patents on washing machine devices were being issued at a rate of more than forty a year. At that time Benjamin D. Morrell of Windham, Maine, devised a unique model. In this design the "rubbing board" could be adjusted — raised or lowered — "to suit the quantity and quality or texture of the clothes to be washed". Thus either a direct action of the rubber upon the clothes or simply the motion given to the water caused by the circular vibration of the rubber could be employed to remove the dirt from the clothes.[5]

Another improvement patented by William T. Armstrong of Sandwich, Illinois, consisted of "one or more inverted curves in an arched or curved rubber, arranged to work in a vat or box with a curved bottom." The rubber was equipped with "ribs" upon which the clothes to be washed were rolled or rubbed against the bottom of the tub. When the "clothes are opposite the inverted curve", said Mr. Armstrong, "they are partially released to allow them to absorb water, which is squeezed or pressed out by the arched portion of the rubber, carrying the dirt from the clothes, which has been loosened by the rubber."[6]

One of the most interesting of the early patented machines was one designed by Theodore G. Eiswald, of Provi-

[4] *Oskaloosa Daily Herald,* February 28, 1935; *Report of the Commissioner of Patents,* 1852, Pt. I, p. 351.

[5] *Report of the Commissioner of Patents,* 1858, Vol. II, p. 491, Vol. III, p. 602; *Senate Documents,* 35th Congress, 2nd Session, Vol. XII (Serial No. 986), p. 491.

[6] *Report of the Commissioner of Patents,* 1858, Vol. II, p. 496, Vol. III, p. 604; *Senate Documents,* 35th Congress, 2nd Session, Vol. XII (Serial No. 986), p. 496.

dence, Rhode Island. This consisted of two cylinders, one within the other. They were equipped with a crank, a belt and cross-belt "causing the two cylinders to rotate around a common center at the same time and in opposite directions." These are but a few of the designs of 1858. The washing machine industry was then, however, only in its infancy.[7]

In 1860 twenty-nine small factories in ten States were engaged in the manufacture of washing machines and wringers. The total annual product, however, was valued at less than $80,000. The largest annual output was in the State of Connecticut, where two factories employing a total of twenty men produced $18,000 worth of machines. No factories are listed in the census report as operating in Iowa at that time.[8]

By the year 1867 washing machines had become a reality and many were being used even in the Middle West, although they were for the most part manufactured in the eastern States. At the Iowa State Fair that year two washing machines were exhibited — "Doty's Clothes-washer" and "Richardson's Little Washer". The Doty washer consisted of "a rocking frame of slats suspended in a tub." By operation of the handle "the clothes were rubbed in sudsy hot water." It is said that three thousand machines were sold in Iowa in 1867.

The Richardson machine had more the appearance of a modern wringer than a washer. It "was a sort of a wringer set in a tub." Apparently the garments were washed by allowing them to soak for a time and then squeezing them between corrugated rollers. Hundreds of

[7] *Report of the Commissioner of Patents*, 1858, Vol. II, p. 495, Vol. III, p. 604; *Senate Documents*, 35th Congress, 2nd Session, Vol. XII (Serial No. 986), p. 495.

[8] *Eighth Census of the United States*, 1860, Manufactures, pp. 52, 113, 145, 163, 256, 284, 330, 418, 488, 544, 658.

these simple little machines were sold in the decade of the sixties. A "Universal Clothes-Wringer" was also exhibited at the State Fair in 1867. This also was used by many housewives in Iowa at that time.[9]

By 1870 washing machine manufacturing in the United States had come to be a million dollar industry. Small factories were operating in nineteen States and the total output was more than $1,300,000. Connecticut led with three factories employing a total of 111 men in this industry, and producing $348,900 worth of machines in a single year. Rhode Island ranked second with 72 employees and an annual output of $265,900 worth of machines. Pennsylvania and Massachusetts also made substantial contributions to the washing machine industry. At that time Iowa ranked twelfth among the States in this field — having but one small factory with three employees and an annual production of machines valued at $6000.[10]

During the decade of the seventies there was a slight decline in the industry in the United States, probably due to the depression of 1873, but by 1880 factories were reported operating in seventeen States with an annual production of $1,182,714 worth of machines. Connecticut still led in the value of finished products, although it was operating but two factories and its annual output was valued at $251,600. Rhode Island still held second rank, with Pennsylvania and Massachusetts following. Iowa had made considerable progress during this ten-year period. In 1880 it had seven factories, employing a total of thirteen employees and produced more than $21,000 worth of machines. Only ten other States in the Union produced more machines than Iowa.[11]

During the decade of the eighties the production of wash-

[9] *Report of the Secretary of the Iowa State Agricultural Society*, 1867, pp. 252, 253; Briggs's *Iowa Old and New*, pp. 366–372.

[10] *Ninth Census of the United States*, 1870, Industry and Wealth, p. 484.

[11] *Tenth Census of the United States*, 1880, Vol. II, pp. 82, 83.

ing machines more than doubled in value in the United States — having reached $2,489,175 in 1890. Machines were then being manufactured in fifteen States. The State of Pennsylvania had advanced to first rank in this industry, with an annual production of machines valued at more than a half million dollars. New York held second place with machines valued at $394,651. Iowa had risen to fifth place among the States in this industry — with an annual production of machines valued at more than $88,000.[12]

The turn of the century witnessed an additional increase in the washing machine industry in the United States, with a total annual production valued at $3,735,243. Pennsylvania and New York were still leading the States in this industry, while Indiana had advanced to third place. Missouri, Ohio, Michigan, and Illinois were also leading States. Iowa, however, had fallen behind. With a total production of machines valued at only $46,550, in 1900, Iowa held eighth place among the States.[13]

By the year 1910 washing machine and wringer manufacturing had come to be more than a five million dollar industry, and Iowa had advanced to a place of leadership, with more than a million dollar production annually. This was about one-fifth of all that were produced in the United States. Thus the production of washing machines in Iowa in 1910 was almost as valuable as the production in the entire United States in 1870. With the exception of Pennsylvania, Iowa by 1910 was producing about as many machines as any other two States in the Union.[14]

A decade later the washing machine industry had moved

[12] Data compiled from *Compendium of the Eleventh Census*, 1890, Vol. III, pp. 684, 702–861.

[13] *Twelfth Census of the United States*, 1900, Vol. VII (Manufactures, Part I), pp. 16, 52, 444.

[14] *Thirteenth Census of the United States*, 1910, Vol. VIII (Manufactures), pp. 43, 47, 69, 148, 153, 194, 199, 212, 268, 286, 319, 502, 517, 536, 786, 844.

westward. Illinois ranked first in production of washing machines, while Iowa held second place, with an annual production of machines valued at five million, eight hundred thousand dollars.[15] Iowa, however, was making rapid advancement in this industry. By 1933 Iowa held first place among the States of the Union, with an annual production of machines amounting in value to more than twelve million dollars. Since that time it has been the recognized "world center" of the washing machine industry.[16]

THE WASHING MACHINE INDUSTRY IN IOWA

Iowans interested in the patenting of washing machines appeared as early as 1859. In December of that year C. Carter, of Franklin, Iowa, obtained a patent on a very simple machine. It consisted of a corrugated washboard fastened in an inclining position in a wash tub (as the pioneer woman used it). Above the washboard and hinged to it was a sliding beam. Clothes placed between the washboard and the frame could be dipped in water and rubbed vigorously.

On the first of August, 1871, Isaac Adams of Montana, Iowa, obtained a patent for a washing machine which he had designed. In October of the same year, William Martin of Oxford, Iowa, obtained a similar patent. Four years later, in January, 1875, H. G. Williams of Hamilton obtained a washing machine patent. In the years that followed other Iowans exercised their ingenuity in constructing various types of machines.[17]

In 1900 Fridolph and Minnick of Villisca, Iowa, devised

[15] *Fourteenth Census of the United States*, 1920, Vol. VIII (Manufactures), p. 498.

[16] *Biennial Census of Manufactures*, 1933, p. 590.

[17] *Report of the Commissioner of Patents*, 1859, Vol. I, pp. 38, 716; *Senate Documents*, 36th Congress, 1st Session (Serial No. 1030), p. 678; *House Documents*, 42nd Congress, 2nd Session (Serial No. 1511), pp. 23, 159, 42nd Congress, 1st Session (Serial No. 1685), pp. 239, 416.

a novel machine. It consisted of a metal tub to be placed on a stove or range. Within the tub a basket was supported in such a manner that a space was left between its exterior and the bottom and interior walls of the tub. The tub cover supported an agitator consisting of interlocking bars, provided with pegs projecting like the legs of a milk stool. The upward extending shaft was capable of end movement to accommodate itself to the quantity of clothes in the basket. At its upper end the shaft carried a union meshing with a segment gear provided with an operating handle.

The dirt washed from the clothes by the agitator would sift through the sides and bottom of the basket to be drained out by means of a faucet in the side of the tub. This machine was of sufficient importance to gain wide recognition in an extensive description and picture published in the *Scientific American*.[18]

It appears that the first washing machines manufactured in Iowa were made in the decade of the seventies. After a period of two decades of comparative quiescence, great forward strides were taken in the industry during the years from 1900 to 1920. In more recent years the manufacturing of washing machines has been one of Iowa's outstanding industries.

A search of the records reveals that more than seventy different kinds of washing machines have been manufactured by some forty different manufacturing companies in at least twenty-five cities in Iowa. At first all machines were operated by hand power applied in various ways. At the beginning of the twentieth century women began to demand power washers and many standard machines built at first to operate by hand power were then put out equipped to operate by gasoline or electric power. If gasoline power was used, the engine might be a part of the washing ma-

[18] *Senate Documents*, 56th Congress, 2nd Session (Serial No. 4041), p. 142; *Scientific American*, Vol. 83, p. 260.

chine or it might be separated from it, attached only by a belt. Many new power machines also came into the market.

The following list[19] gives the Iowa cities in which washing machines were made, the name of the firm, and the name of the machine:

Boone

Queen Wire and Iron Works (Gazetteer, 1910, p. 1512)
The Noiseless Washer (Scrap-book, p. 230)

Burlington

Burlington Washing Machine Co. (Gazetteer, 1884, p. 1195)
Pettit's Magic Washer

Carroll

C. A. Mellott
The "Limit" Washer (Scrap-book, p. 210)

Cedar Falls

Du Mond Manufacturing Co. (Gazetteer, 1918)
"Klean Kwick" Vacuum Washer (Scrap-book, pp. 100,101)

Cedar Rapids

The Cole Washing Machine Co.
The Cole Washer (Scrap-book, p. 63)

Centerville

Ed. S. Cushman Co. (Gazetteer, 1905, 1912)
Laundry Queen Steam Washer (Scrap-book, p. 273)

Clarinda

Lisle Corporation (Gazetteer, 1933)

Charles City

M. H. Daley
The Play Spell Washer (Scrap-book, p. 202)

[19] These data were compiled chiefly from a *Scrap-book* loaned to the writer by The Brammer Manufacturing Company, Davenport, Iowa, and from copies of the *Iowa Gazetteer* for the years 1884 to 1918, inclusive.

The Daley Washer (Scrap-book, p. 51)
The World Beater Auto Washer (Scrap-book, p. 79)

Council Bluffs

The Novelty Manufacturing Co. (Gazetteer, 1903, p. 409)
U. S. Rotary Washer

Davenport

The Brammer Manufacturing Co. (Gazetteer, 1877 to date)
The O. K. Washing Machine (Gazetteer, 1903, and Scrap-book, p. 19)
The O. K. Rotary Washer (Scrap-book, p. 21)
The Gibson, Jr. (Gazetteer, 1937)
Davenport Washing Machine Co. (Gazetteer, 1910)
The White Swan (Scrap-book, pp. 247, 270)
Rural Power Washer (Scrap-book, p. 44)
Grand Electric Washer (Scrap-book, p. 45)
Excelsior Manufacturing Co. (Gazetteer, 1897, p. 413)
Excelsior Washer
Eureka Washer
S. McGranahan
The Acme Washer (Scrap-book, p. 248)
The Mack Washer (Scrap-book, p. 257)
H. F. Moeller (Gazetteer, 1884, p. 347)
Greenwood Washer
Schroeder and Rohwedder (Gazetteer, 1897, p. 417)
The Schroeder Round Washer
Red Jacket Manufacturing Co. (Gazetteer, 1904)
The Simplex (Scrap-book, p. 269)
Simplex Washing Co. (Gazetteer, 1905, p. 460)
The Simplex Washer
Voss Brothers Manufacturing Co. (Gazetteer, 1877 to date)

Ocean Wave (Gazetteer, 1905, and Scrap-book, p. 272)
Voss Piston Water Motor (Scrap-book, p. 201)
Universal Power Washer (Scrap-book, p. 63)
Voss Platform Power Washer (Scrap-book, p. 85)
Voss Electric Washer (Scrap-book, p. 72)
The White Lily Manufacturing Co. (Gazetteer, 1903–1918)
The Hummer (Scrap-book, p. 228)
The White Lily Power (Scrap-book, pp. 50, 52)
The White Rose (Scrap-book, p. 281)
The White Daisy (Scrap-book, p. 281)

Des Moines

J. Kiehle (Gazetteer, 1884, 1891)
Kiehle's Improved Washer (Gazetteer, 1891)
The C. S. Page Manufacturing Co. (Gazetteer, 1905)
The Page Washing Machine (Scrap-book, p. 261)
M. C. Randleman & Son
Gee Whizz Washing Machine (Scrap-book, p. 275)
Gee Whizz Manufacturing Co.
The Quick-an-Ezy Washer (Scrap-book, p. 239)

Dexter

Excelsior Thresher Tooth Co.
The Monarch Washer (Scrap-book, p. 225)
The Dexter Manufacturing Co. (Gazetteer, 1910)
The Dexter Washer

Fairfield

The Dexter Co. (Gazetteer, 1912)
The "Iowa" (Scrap-book, p. 111)
The Climax (Scrap-book, p. 112)
Sunny Monday (Scrap-book, p. 82)
The Dexter Power Washer (Scrap-book, pp. 46, 112)
The Dexter Electric Washer (Scrap-book, p. 111)

Grinnell

The Grinnell Washing Machine Co. (Gazetteer, 1912, 1916)

The Peerless (hand power) (Scrap-book, p. 203)

The G. E. M. Power Washer (Scrap-book, p. 55)

The Big 4 Washer and Wringer

Hartley

Fenner, Corrington & Co.

The Hartley Washer (Gazetteer, 1905, p. 767)

Keokuk

J. G. Henderson & Co.

The Practical Washer (Gazetteer, 1889, p. 1477)

Knoxville

Winters and Foidel

Tip-Top Washer (Gazetteer, 1891, p. 711)

Maquoketa

J. M. Thompson

Imperial Champion Washer (Gazetteer, 1884)

Newton

The Newton Disc Plow Co.

The Newdisco Power Washer (Scrap-book, p. 57a)

The One Minute Washer Co. (Gazetteer, 1905-1918)

The One Minute Washer (Scrap-book, p. 59)

Newton Washing Machine Co. (Gazetteer, 1912)

"Newton" Double Handle Washer (Scrap-book, p. 210)

Newton Electric Washer (Scrap-book, p. 55)

The Automatic Washer Co. (Gazetteer, 1912-1918)

The Automatic Washer (Scrap-book, p. 90)

The Maytag Co.

The Maytag Power Washer (Scrap-book, pp. 58, 77)

The Maytag Electric Washer (Scrap-book, pp. 77, 80, 82)

The Woodrow Washer Co.
The Woodrow Washer

Oskaloosa

Daisy Washing Machine Co.
Daisy Washer (Gazetteer, 1884, p. 801)
Woodrow Washing Co.
Woodrow Washer

Perry

The Globe Manufacturing Co. (Gazetteer, 1908-1918)
The Snowflake Washer (Scrap-book, p. 88)
Quicker Yet Electric Washer (Scrap-book, pp. 52, 88, 107
The Perry Washer Co. (Gazetteer, 1914)
"Perry's Pride" Hand Power (Scrap-book, p. 48)
At Last Washer Co. (Gazetteer, 1912-1918)
"At Last" Electric Washer & Wringer (Scrap-book, p. 60)
The Woodrow Washer Co.
The Woodrow Washer

Tama

W. F. Johnston
Double Action Washing Machine (Gazetteer, 1897, p. 913)

Traer

Kostlan Manufacturing Co. (Gazetteer, 1912)
Happy Home Washer (Scrap-book, p. 222)
"Two-in-one" Washer (Scrap-book, p. 222)
Swing Washing Machine (Scrap-book, p. 222)
Iowa King Washer (Scrap-book, p. 225)
F. K. High Speed Washer (Scrap-book, p. 222)

Vinton

A. Bliss & Co.
Summit Washing Machine (Gazetteer, 1884, p. 969)

Waterloo

National Metal Produce Co.

"Watermatic" Washer (Gazetteer, 1935)

Associated Manufacturers Co.

Amanco Power Washer (Scrap-book, p. 61)

Aside from this rather extensive list of factories and machines, it is said that washing machines have been manufactured on a small scale in more than a dozen other Iowa cities and towns. Among these are Belle Plaine, Clinton, Dubuque, Fort Dodge, Emmetsburg, Keokuk, Mount Pleasant, Mason City, Tipton, Villisca, Washington, and Webster City.

The story of a number of these Iowa-built washing machines indicates the changes and vicissitudes of this industry. From the records available it seems that the honor of establishing the first washing machine factory of a substantial character in Iowa goes to Henry F. Brammer of Davenport. Mr. Brammer was a native of Germany, a manufacturer of cigar boxes, who moved to Davenport in 1871. In 1876 he began the manufacture of washing machines. At this time several local carpenters in Davenport were experimenting with crude, square tub machines made at home for their own use. Soon Mr. Brammer designed a round tub machine. The tubs were made by a cooper and the castings were made at the Moline Stove Foundry. One of the early Brammer machines had a "reciprocating dolly" which was moved by a lever on top of the machine — the so-called "western" type. These machines were soon placed on the market and sold by jobbers under various trade names. In the *Davenport City Directory* of 1880 Mr. Brammer is listed as a "wholesale and retail manufacturer and dealer in washing machines and churns".

In 1895 John Schroeder secured a patent on a hand-power

rotary machine. Schroeder sued the Brammer Manufacturing Company for alleged infringement of patent, but before the suit came to trial, the Brammer Company bought the Schroeder patent for $20,000. Meanwhile various companies had infringed upon the Schroeder patent. This patent was sustained in the courts, however, and royalties amounting to perhaps $100,000 were paid to the H. F. Brammer Company as assignee of the patent rights. By 1900 the Brammer Company was operating on a large scale, manufacturing what was then known as the "O. K. Machine". An early advertisement of this machine says: "They're made to please. There's nothing weak about the O. K. — no springs to repair, no cheap pine to rot or warp, no complicated gearing to break or cause annoyance." This washer was later manufactured as a power machine. The Brammer Company was still operating in 1937, but was selling only a small washer called the "Gibson, Junior".[20]

In 1876 William H. Voss, a carpenter and wood carver of Davenport, made the first Voss machine. He did not rush a model of the machine to Washington for a patent. Instead, he inducted it into service in his mother's kitchen, where its usefulness was soon demonstrated. When it became apparent that time and energy could be saved, neighboring women became interested, young Voss began to manufacture machines for the market, and his mother became "his first sales manager".

The first Voss machine was a "Rocker". The inside of a rude box or stationary tub was corrugated with nailed-on strips of wood. The clothes were rubbed between this surface and another corresponding surface also corrugated. A little later a second type, a round-tub machine, was designed. This had a three-pronged dolly and was worked by

[20] Letter from George Braunlich, President of The Brammer Manufacturing Company, dated March 23, 1937; *Davenport City Directory*, 1880, pp. 50, 311; *Scrap-book*, p. 27.

a bar with cross handles on which two hands could be used.

The first Voss factory — "a little frame shack" — was established in 1877. As the business grew two brothers of Mr. Voss were taken into the firm as partners and in 1882 a larger factory was built. With the passage of time many improvements were made and many patents were received and utilized in making the Voss machine.

Following a steady development in the washing machine industry the "Ocean Wave" washer was patented in 1901. This was the best washer that had yet been made by Mr. Voss. But it was only the dawn of a new day in the washing machine industry. In 1905 the Voss Brothers began to build power machines. The first of these was run by water power and was called the "Voss Water Motor Washer". The gasoline engine and electric motor, however, soon supplanted the water-power machines. In 1905, too, business had attained such proportions as to obtain an order from abroad. A Voss washing machine — one of the "Ocean Wave" rotary hand-power type — was shipped to Europe. From that day to this business has steadily advanced until the Voss washing machines have now gone into more than a million homes.[21]

The modern Voss machine is equipped with an "Electrically Protected Safety Guard Wringer — Floating Agitation — Corrugated Tub" — indeed it is one of the leaders in the great washing machine industry.

As early as 1884 there were at least three other washing machine factories in Iowa that advertised their products widely. Unique among these was the Burlington Washing Machine Company at Burlington which advertised "Pettit's Magic Washer" in which the "Principle of Washing" was said to be "Practically Applied". Washing was done "by air and water forced through the clothes by means of

[21] Sheets's *The Thinker Who Turned Work into Play — A Tribute to Wm. H. Voss.*

Metal Suction Buckets operating as a pounder. No rubbing, no tearing". The finest fabrics and laces, and the coarsest goods, quilts, and carpets could be "washed with equal facility". Clothing put in the tub remained "without handling or stirring until clean and ready to be taken out". The machine covered a space twenty-six inches square and weighed fifty pounds. It was known for its simplicity and could "be operated by a child".[22]

In Oskaloosa the Daisy Washing Machine Company advertised the "Daisy Washer" as one that "supersedes all other four peg washers". At its side was "a weight or pendulum", so attached that by its use the hard washing could be done "with one-third less labor than by the old method". It had a corrugated zinc bottom, which was advertised as "the only common sense bottom". The machine as a whole was declared to be "a decided improvement" in the washing machine industry.[23]

In Vinton, A. Bliss and Company were manufacturing the "Summit Washing Machine". This was of the open top, rocker, hand-power type, advertised as being "no catch-penny humbug", but an efficient machine that "does all the work complete, with a great saving of labor, clothes and time".[24]

By 1891 Winters and Foidel at Knoxville were manufacturing the "Tip-Top Washer", guaranteed to do "All that is Claimed for it". If this machine "will not suit you", the advertisement reads, "it is no use to look any further. 'There could be no better.' " The manufacturers emphasized the fact that there was "no 'Cheap John' in its make-up". Instead, it was "a thorough, well-made machine, handy in all points. 'Handy to have about the house.' "

[22] *Iowa Gazetteer*, 1884, p. 1195.

[23] *Iowa Gazetteer*, 1884, p. 801.

[24] *Iowa Gazetteer*, 1884, p. 969.

In competition with the "Tip-Top Washer" and others, J. Kiehle of Des Moines was manufacturing the "Kiehle Improved Washer" advertised as the "Best in the World", warranted "to give Perfect Satisfaction or Money Refunded".[25]

In 1897 Schroeder and Rohwedder of Davenport declared that housekeepers and others who are judges "all agree that Schroeder's Round Washer is the very best washer ever offered to the American public.

"Its light running makes it the universal favorite, and no other washer in the market will run easier. A child from 8 to 10 years can turn this washer just as easily as a grown person.

"To try it is to be convinced of its superiority over all others. It makes washing easy."[26]

In 1898 the Hawkeye Incubator Company of Newton was engaged extensively in the manufacture and sale of incubators. Then it entered upon a new adventure — the manufacture and sale of washing machines. For a time a "ratchet slat" washer was made and peddled through the country. Although this venture was not successful, Fred H. Bergman, one of the members of the company, believed that the washing machine industry had a good future; and in 1905, under the leadership of Mr. Bergman, the company took up a newly patented machine — the "One Minute Washer" — and began to manufacture and market it. So successful was this endeavor that more than 9000 machines were sold the first year, and in 1910 production reached a peak of 48,000.

When hand-power machines went out of fashion, new models were designed to operate by gasoline engines or electric motor power. With these new models came im-

[25] *Iowa Gazetteer*, 1891, pp. 451, 711.

[26] *Iowa Gazetteer*, 1897, p. 417.

provements in construction. The original dolly type was followed by vacuum, cylinder, oscillating, and agitator models. The tubs were changed from wood to zinc, then to copper, and finally to porcelain enamel in attractive colors. Throughout the years business has increased and the "One Minute Washer" is one of the substantial and attractive machines on the market today.[27]

A recent advertisement of this company said:

"For nearly half a century, the name One Minute has been a symbol of quality washers all over the world. Today, over 2,000,000 satisfied users bear witness to the integrity of the One Minute name."

The "Laundry Queen Steam Washer", manufactured by Ed. S. Cushman and Company of Centerville was a unique little machine that was to be set on the stove like a wash boiler. It was highly recommended as a "Modern Steam Laundry brought right into your own home.

"Simply set this wonder machine on the stove, turn the crank occasionally, and at the end of 20 minutes your clothes are not only perfectly clean, but are thoroughly sterilized."[28]

The Newton Double Handle Washer, manufactured by the Newton Washing Machine Company, had two levers — one on either side — and was featured as the "Simplest, Strongest, and Best".

"Works like a Cross Cut Saw. One little boy or girl on each end WASHES FIFTY PER CENT FASTER with a given number of strokes of the Dolly than any Hand Washer on the market."[29]

[27] *The One Minute Manufacturing Company* in *Iowa Factories,* Vol. I, September, 1912, pp. 11–14; Briggs's *Iowa Old and New,* p. 371; *The Newton Daily News,* March 1, 1935.

[28] A recent advertisement of the One Minute Washer; *Iowa Gazetteer,* 1912–1914, p. 293.

[29] *Scrap-book,* p. 210.

In 1905 the Simplex Washer Company of Davenport assigned the following reasons why one should buy the Simplex:

> It is as good a washer as can be made.
> Its simplicity appeals to anyone who sees it.
> It is the least liable of any washer to get out of order, as there are no gearings or springs to break — we use hardened rollers on the "Simplex".
> It is highspeed. It gives a back and forth motion to every turn of the fly wheel, a point not to be found in any other machine; at the same time it runs easy.[30]

In competition with this machine, the firm of Fenner, Corrington and Company of Hartley was manufacturing the "Hartley Washer", which they declared was the "Highest Geared and Easiest Running Washer on the market."[31]

One of the men first interested in perfecting a washer that would run by its own power was M. H. Daley of Charles City, who had been manufacturing hand-power machines but abandoned these for one with a one-half horse power, two-cycle, air-cooled gasoline engine bolted to the frame under the tub.

Mr. Daley called his new machine "The World Beater Auto Washer". This was advertised as "The only Self Running Washer in the World . . . You give the crank a turn like an automobile and away it goes . . . Everybody wants a washer that will run itself . . . Just the machine the world has been waiting for."[32]

The "White Lily Electric Washer", manufactured by the White Lily Company of Davenport, was one of the early power machines on the market. It was not "a hand ma-

[30] *Iowa Gazetteer*, 1905, p. 460.

[31] *Iowa Gazetteer*, 1905, p. 767.

[32] *Scrap-book*, p. 79.

chine rigged up with a motor but a machine built for power purposes from the start." It advertised the "Lowest price for any machine on the market".[33]

The "G. E. M. Power Washer" made in Grinnell was a substantial, well-built machine — guaranteed to be strong and efficient. It was designed to meet "the increasing demand for a washer built expressly to withstand the wear and tear of the power drive". It was simple, strong, and easy running — "guaranteed to out last any three hand machines and to be far more efficient at all times."[34]

Another of the early power machines on the market was the "Sunny Monday Power Washer" manufactured by the Dexter Company at Fairfield. This machine had "no dangerous chain or shaft to the wringer — no awkward rocker arm at the side of the tub nor exposed rack on the lid". All the operating machinery was "so completely covered with smooth metal cases that any possibility of injury to the operator or tearing the wash" was avoided. Advertisements of this machine say: "The Sunny Monday Power Washer is a proven success . . . the result of long study and severe tests. Competent critics pronounce it the top-notch in power washer designing."[35]

The Dexter Company for many years has manufactured the "Dexter Power Washer" and the "Dexter Electric". These are equipped with modern devices to make them convenient, durable, and attractive. The company now has 20 acres of factory area, with 100,000 square feet of floor space. It has 230 employees, annual net sales of more than $1,300,000, and ranks among the leaders in the modern washing machine industry.[36]

[33] *Scrap-book*, pp. 50, 52.

[34] *Scrap-book*, p. 55.

[35] *Scrap-book*, p. 82.

[36] *Scrap-book*, pp. 46, 111, 112.

The "Snow Flake Washer" produced by the Globe Manufacturing Company of Perry was widely advertised as having been "Designed and Placed on the market as the Best Money and Brains could Produce" — a machine "thoroughly tested and tried" and one "that reduces first cost, yet lasts for years". The "Quicker Yet Power Washer" manufactured by the same company was guaranteed to "do a washing much cleaner, in less time and with less effort" than any other machine, if directions were followed.[37]

The "At Last Electric Washer and Wringer", made by the At Last Washer Company of Perry was an attractive model. A little folder extolling its merits said:

> Just Remember when you are going to buy an Electric Washer and Wringer, that the At Last Washer is Simple in Construction; the most Compact in Design; the Easiest to Operate; the Safest to Manipulate; the Hardest to Injure; the Quickest to Wash with; the most Powerful to Wring; and the Cheapest to Buy.
>
> You only have one life to spend here. You can run through with it in a hurry or can use At Last Washers to prolong your stay.
>
> If you put your strength against electric power you are selling your life pretty cheap.
>
> You can get a dozen At Last Electric Washers for the price of a tombstone. What do you say.[38]

In 1907 O. B. Woodrow, a bank clerk at Newton, became interested in an electrically operated washing machine. With the assistance of a mechanic and an electrical engineer he began to work on the problem. A wooden tub, of the type then used by the Hawkeye Incubator Company in making the One Minute hand-power machine was purchased and the three men remodeled it to make what is claimed to be the first successful electric washer.

As the industry grew, more capital was needed, and in

[37] *Scrap-book*, p. 88.

[38] *Scrap-book*, p. 60.

1913 the Automatic Electric Washer Company was incorporated with a capitalization of $25,000. In 1915 Mr. Woodrow withdrew from the corporation and the following year opened a factory of his own. Meanwhile the Automatic Company continued to grow and it now has nine buildings with 100,000 square feet of floor space in a modern four-story, concrete building. In 1926 all-metal, electrically operated machines were being sold at a price less than one hundred dollars. The Automatic Company employs 120 men and has equipment to produce more than one hundred thousand machines per year.

One of the officers of the Automatic Company has said that the "washers of the present have to be finished like a grand piano, to run like an automobile, and to sell without much profit." Building and selling machines upon this principle the Automatic Electric Washer Company has developed an enormous business and ranks among the leaders in this industry. In looking back over their history officers of the Automatic Company believe that they were: the first to manufacture electric washing machines; the first to sell electric washing machines under $100; the first to make a light weight all-metal machine; the first to use a radio network in advertising; and the first to use flying offices and to advertise by airplane.[39]

In 1916, soon after Mr. Woodrow withdrew from the Automatic Company, he organized and incorporated the "Woodrow Manufacturing Company" and continued his experimentation and efforts for the advancement of electric power washers.

In 1927 the Woodrow Company moved to Pella where it continued to operate for one year — moving to Oskaloosa in 1928. Associated with Mr. Woodrow were Charles Eveland and Carl K. Bergman. The plant established at Oska-

[39] *The Newton Daily News*, March 1, 1935.

loosa was designed to produce one hundred washers per day. By the year 1934 the Woodrow Company was selling $1,240,000 worth of machines annually and sales were steadily increasing.[40]

In 1893 Fred L. Maytag, W. C. and Fred H. Bergman, and George W. Parsons, an inventor, formed the Parsons Band Cutter and Self Feeder Company. The corporation had a paid-up capital of $2400, of which each of the Bergmans contributed $600 and Mr. Maytag $1200 — $600 for his share and an equal amount for Mr. Parsons. Making threshing equipment was seasonal work and about 1907 the firm began the production of hand washers. Mr. Maytag first bought out Mr. Parsons' interest and in 1909, he purchased the Bergman shares for $162,500. He then organized the Maytag Company, capitalized at $750,000. Meanwhile this company began the manufacture of hand-power washing machines, and Howard Snyder immediately set about to improve them. One of his early contributions "was a perfected power washer, with a swinging wringer which operated on a belt from an engine". This swinging wringer proved to be a great asset to the company. After much experimenting Mr. Snyder developed a washer in 1911 featuring an electric motor and the Maytag swinging wringer.

In 1914 the Maytag Company added to its products a washer operated by a two-cycle gasoline engine. This was especially attractive to farmers and increased very materially the sales of the company. Progress was rapid from that time on, with the promotion of all types of power washers. In 1917 the company "developed a cabinet type of cylinder washer, employing the principle of the mill race. In 1919 came the dolly type with the cast aluminum tub, and all metal divided wringer". Early in 1922, the Maytag

[40] *Oskaloosa Daily Herald*, February 28, 1935.

Aluminum Washer was introduced. This employed a radically new principle of under-water agitation called the "Gyrafoam" washing action. So popular did this new machine prove to be that during the twenty-two months following its first appearance, the Maytag Company advanced from twenty-sixth place in the industry to a position of world leadership, a position retained at the present time.

A simple and effective advertisement carried by the Maytag Company reads:

> When you consider the purchase of a washer, look beyond the figures on the price tag. The true value of any washer is the service and satisfaction it will give. The Maytag will be your choice because it leads in every comparison with any other make of washer.

The Maytag washing machine factory is now the largest in the world. Its thirteen buildings cover an area of eight acres, and have more than 400,000 square feet of floor space. It has 2000 employees and a capacity of 2000 machines per day.[41]

WRINGING THE CLOTHES

In the days when clothing was washed in the streams, the clean pieces were usually dried by laying them on the rocks or on the grass, leaving the air to take up the moisture. When the pioneer woman did her washing in the cabin by means of a washboard and hand power, she usually wrung the excess water from each garment by twisting it in her hands. Then she spread the clothing out to dry or hung it on a line. The wringing of large pieces of clothing or household linens by hand was no small task, but it was not until the time of the Civil War that American inventive genius seems to have paid much attention to this work.

In 1861 a simple type of clothes wringer was placed on the market. This consisted of two rollers mounted parallel,

[41] *The Newton Daily News*, March 1, 1935.

one above the other, with an adjustment to vary the distances between them. One end of the article to be wrung out was inserted between the rollers (which were held closely together) and one roller was turned by means of a handle; the second roller, being free to revolve, turned also as the garment passed between the two. Much of the excess water was thus extracted by pressure of the rollers. This type of wringer, with many alterations and many patents, continued to be operated by hand until the advent of power washers. The wringers were then attached to and operated by the same power that operates the washing machine. Indeed, in recent years they have become a substantial and vital part of the modern washing machine.[42]

As early as 1873 a centrifugal type of clothes wringer or drying device was patented. This consisted of a tub equipped with an inner basket or receptacle for the clothes. A crank and shaft were provided by which the basket was made to revolve rapidly. Much of the water was thus removed from the clothes by centrifugal force. This form of domestic wringer is similar in type to the large centrifugal extractors used today in commercial power laundries. Moreover, this type of construction is used today in some of the modern washing machines. A large number of washers, and probably all of those manufactured in Iowa use the roller type wringer.[43]

IRONING THE CLOTHES

The most essential part of laundry work has always been the washing and drying of the clothing or household linens, but it was also found desirable to avoid wrinkles. Shaking and folding did much to smooth out the flat pieces and

[42] *This is the Way We Wash Our Clothes* in *Laundry Age,* November 1, 1928, p. 38; *The International Encyclopaedia,* Vol. VII, p. 281.

[43] *Official Gazette of the United States Patent Office,* 1873, Vol. IV, pp. 200, 206–208, patent number 142,045.

presses operated by a turnscrew were effective for flat pieces, but it was early learned that heat was also useful in smoothing out the clothes.

Before stoves came into use, hollow irons, flat on the bottom, with a handle above, were used for pressing out clothing. Coals from the fireplace or pieces of metal which could be heated red hot and placed in the iron were used to provide heat. Irons of this type were brought to the Middle West by the first settlers, some of them at least coming from England. With the advent of the stove, solid iron flatirons were designed which could be set on the stove to heat. By using two or more irons of this type, one could be used for ironing while the others were being heated. Some of these irons had detachable wooden handles. Because of their weight, flatirons were also known as sadirons.

In 1873 an iron was designed which was fastened by a tube to a tea kettle and was heated by steam. Many other types of self-heating irons have been patented. In 1876 a sadiron was designed with a cylindrical gas chamber and a gas burner both of which were detachable from the iron itself. About the beginning of the century electric flatirons came into use and in more recent years the electric iron has become common wherever electricity is available.[44]

The ironing device, sometimes erroneously known as the "mangle", has had an interesting development. The word "mangle" comes from a Greek word meaning the axis of a pulley. The original ironing machine of this type and indeed the only true mangle was a weighted box, sometimes weighing several tons, moving on two rollers with a reciprocating action across a polished table of beechwood. The cloth to be ironed was wrapped around the rollers and the weight or pressure of the box smoothed out the wrinkles.

[44] *Official Gazette of the United States Patent Office*, 1876, Vol. IX, p. 772, 1901, Vol. XCV, p. 287, patent number 671,569.

Six folded sheets or twenty towels might be wrapped around each roller. No heat was used. The most prominent part of the machine was the pulley, and its axis or "mangle" ran clear across the machine. Hence the now discarded name "mangle".

In 1869 a patent was issued for a device which combined a "wringer" for drying clothes and a "mangle" for pressing them in a single machine. It consisted chiefly of two rollers constructed in much the same fashion as the ordinary clothes wringer. A part of each roller, however, was covered with rubber for wringing the clothes, and a part of each was of wood, this part being used to press the clothes. Heat had not yet been applied to the "mangle".[45]

The modern ironer of the roller type is both heated and operated by electricity. By the use of this type of machine the modern housewife can do a large percentage of her ironing and thereby save an immense amount of labor. Power laundries use steam pressure machines as well as electric ironers of various kinds.

POWER LAUNDRIES

With washing machines operating in millions of American homes, with electric wringers, and flatwork ironers in great numbers, home laundering has been made comparatively simple. Yet there are many housewives who prefer to be further relieved of the worries of wash day. To meet this increasing demand a great industry has developed in the operation of power laundries on a commercial basis. The story of this development is a separate and distinct chapter in the evolution of wash day.

In the decade of the forties commercial laundries were quite unknown. Strangely enough this industry seems to

[45] *Patent Office Report*, 1869-1870, Vol. II, p. 311, Vol. III, p. 728, patent number 91,794; *The Origin of that Word "Mangle"* in *Laundry Age*, May, 1937, p. 264.

have had its origin in the California gold rush. The summer of 1849 witnessed thousands of men without families rushing to California. But they went there to dig gold, not to wash clothes, and some sort of laundry facilities were needed. Few were the feminine hands at that time in that area. Men washed their own shirts or wore them unwashed. Some actually sent their clothes to islands of the Pacific — a matter of six months intervening between collection and delivery.

Out of this situation came the idea of a commercial laundry. Charles Mattee, a carpenter, is credited with having constructed the first operating plant. This was a crude twelve shirt washing machine, with which he connected a ten horsepower steam engine. Thus the first power laundry — the Contra Costa Laundry of Oakland, California — came into being. From this small beginning the Contra Costa has developed into a great present day metropolitan industry. Meanwhile, too, the laundry business of America has grown until it represents an annual turnover of more than $450,000,000.[46]

The first Federal census of power laundries was taken in 1909. At that time there were more than five thousand such establishments in the United States. These employed 124, 214 people, had a capital investment of $68,935,226, and an annual income for work done amounting to $104,680,086. By the year 1914 the number of employees had increased to almost one hundred and fifty thousand, and the annual income had advanced to more than one hundred and forty-two million dollars.[47]

During the years of its development there has been not

[46] *A Survey of Laundries and Their Women Workers in 23 Cities* (United States Department of Labor, Bulletin of the Women's Bureau, No. 78.), 1930, pp. 1, 2; letter from F. J. Huebsch, President of the Contra Costa Laundry, to the author, dated Oakland, California, May 18, 1937.

[47] *Census of Manufactures*, 1914, Vol. II, p. 847.

only a tremendous growth in the industry, but a very marked change in the character of the work done. Until 1915 laundering was chiefly a shirt-and-collar business, with a slowly growing commercial and family trade. Then came the home electric washer; and the laundryman, in order to compete, provided a wet-wash service with a pound basis of charge. From this have developed the rough-dry and finished family services, frequently on the pound basis of payment. The need for these new services is plainly shown by their rapid growth. According to facts presented in the laundry owners' magazine, *The American Outlook,* the family-bundle business done by the group of laundries reported showed an increase of 10.9 per cent in the first six months of 1928 over the same period in 1927. More than 70 per cent of the laundries reported an increase in this type of work.

A report made by the United States Bureau of the Census for the years 1909 to 1927 shows that during these years there was a tremendous increase in the money received for laundry work, with a much smaller increase in both the number of employees and the number of laundries. Thus with an increase of only 55 per cent in the number of laundries and an increase of 93 per cent in the number of employees, there was an increase of 349 per cent in the amount of money received for laundry work during these years.

These figures illustrate the result of two marked changes in the laundry industry, one in the character of articles laundered, the other in the way in which the work is done. The change in type of work, from men's linen, chiefly shirts, collars, and cuffs, to the inclusion of commercial work and family bundles that may be returned damp, rough-dried, or ironed, has greatly increased the volume of work without proportionate increase in the number of wage earners or plants. The second change is that from an industry run on

haphazard and individualistic lines to one operated by scientific methods.

The laundry industry, unlike other factory work, does not create a commodity from raw material and it does not own the material on which it works; rather, it renovates an already completed product. In other words, it receives pay for services, not for production; it competes not only with other laundries but with possible customers. In spite of the points on which it differs from other factory-run industries, the laundry industry has, however, followed them in its development. The best laundries are laid out on a production-line basis and operated much as highly specialized and systematized factories. Close attention is given to motion study and to time study. Every mechanical operation is carefully controlled as to time, temperature, materials, and other essential factors.

The laundry business is a year-round industry, not a seasonal one. Census figures on volume of business done in each month of 1925 by 3568 power laundries show an average variation of only 3.6 per cent. These figures indicate remarkable steadiness in the industry.

Formerly there was a demand that laundry work be done early in the week. This resulted in irregular hours for the employees. In 1912 a study of laundries showed 86.8 per cent of the workers as having two or more short days in the week and other days correspondingly long. At present there is little variation in daily hours except for the Saturday half holiday. Housewives have become accustomed to the idea that laundry work need not be done the first days of the week. Furthermore they now realize that to insist on the completion of the laundry work in the earlier part of the week means long hours for the workers and fatigue that is not compensated for by shorter hours later in the week.

This education has been accomplished in different ways:

sometimes by a lower rate for bundles picked up after Wednesday, sometimes by an explanation to the housewife, and sometimes, as in one leading plant, by an experiment. In this last case the plan was made necessary by a heavy snow that for some time made it impossible to visit each customer oftener than once a week. The results were so satisfactory that the management decided to run the laundry on a weekly-service basis. When notified of the change less than five per cent of the customers withdrew, and for a number of years this laundry has operated on a once-a-week-service basis.[48]

Every large laundry, however, is equipped for quick service in departments where speed is required. There is, for example, a large hotel and restaurant service that must be handled quickly. To meet this demand provisions are made whereby napkins and table linen collected on Monday morning can be washed, ironed, and delivered before the noon of the same day. When one considers the vast number of pieces of table service that must be handled in this manner it seems almost incredible that the work can be done with the skill and rapidity this service requires. Modern laundry equipment and coördinated labor, however, renders this task possible.

In the modern laundry, machinery has come to take the place of hand labor to such a degree that it may be said without exaggeration that the civilized world, especially in American cities, does its washing almost entirely by machinery. Even when articles require hand-laundering and the work is done in the public view by experts, machinery still figures as a prominent factor in the operation.

In a modern laundry the washing is done in large vats each consisting of two cylinders, one within the other. These are made either of metal or wood. The clothes are

[48] *A Survey of Laundries and Their Women Workers in 23 Cities*, pp. 2–5.

put into the inner cylinder (the walls of which are perforated on all sides) and the door then closed. Powdered or liquid soap is added and then hot water or steam is admitted. The outer cylinder is little more than a jacket for the inner one, and the space between them is very slight. The inner cylinder is made to turn continuously, first in one direction and then in the other, and the water can be changed without opening the doors. Thus the clothes get a thorough shaking up and renovating, and then a first, second, and third rinsing in hot or cold water. Fresh water is introduced through the valve connections on top. Clean water can thus be constantly dashed over the clothes, after the dirty water has been run off.

The cylindrical containers or vats are sometimes divided in compartments to facilitate the washing of different bundles or different kinds of clothes at the same time without their becoming intermingled. The cylindrical washer provides perfect washing conditions, without the rubbing process which is, in a measure at least, damaging to clothes. Damage to clothing washed in these machines depends largely on the kind of soap or bleaching substance used.

There are various ways of drying clothes in the power laundry. Usually the flat pieces and the common run of clothes are put through a large centrifugal wringer or extractor. This is a nicely adjusted machine that can wring clothes almost as dry as if exposed to the sun for a few hours. It has anything but the conventional appearance of a wringer. It is really a large copper bowl fitted into a larger iron bowl. The sides of the copper bowl are perforated with many holes. This extractor, as the inner copper bowl is called, revolves at the rate of a thousand revolutions a minute. When the clothes are put in this revolving extractor the water and moisture are thrown out through the perforations by centrifugal force. The water thus

ejected falls into the outer bowl of iron, and runs off below. This method of wringing the clothes has been found to be more economical, quicker, and less destructive to the materials than the old-fashioned way of squeezing them between two rollers.

Clothes may also be dried in a tumbler, which operates much as the cylindrical washer does, except that in it the clothes are exposed to hot dry air instead of water. A third method, used in the drying of lighter fabrics, consists of hanging the articles on a rack that revolves or travels on a moving mechanism within a heated room. In any of these methods, drying the clothes become something in the nature of "an indoor sport" instead of "an outdoor hazard". And withal the methods employed are most effective, as they extract the water without injuring the lightest fabrics.

Sometimes clothes go directly from the dryer to the ironer or pressing machines. Sometimes they require dampening or sprinkling, in which case they go into some form of patent sprinklers. After the clothes pass from the sprinklers they are allowed to "moult" for an hour, to put them in perfect condition for the ironers.

If clothes require starching there are several kinds of machines to facilitate this work. Some clothes require very little starching, and the machine for these is very simple and does little more than turn the clothes over a few times in the starch. Clothes that require the starch to be worked thoroughly in the materials, such as shirts and collars, are put in starchers, which actually knead the starch in the fabric as successfully as the housewife's hand could do it. The starchers are more simple in arrangement than most of the other laundry machinery. Some laundries are not provided with them and the work is all done by hand. Laundries that make a specialty of "dry washing" can easily dispense with the starching machines, for such clothes are merely

washed and dried and returned to the owners without being starched or ironed. Many housewives in cities prefer this method, having the starching and ironing done at home.

Whether clothes go directly from the washer to the ironer, or whether they are dampened or starched much of the material handled by the power laundries comes at length to the ironer. For this work the various types of machines are quite as numerous, quite as complicated, and quite as efficient as those found in other parts of the laundry work. Inventors have devised some sort of machine for ironing simply and quickly almost every article of human wear. Machines for ironing shirts, collars, sleeves, wristbands, yokes, cuffs, and similar parts of washable apparel have long been in use. Every time a new-fashioned article of dress is devised by a dressmaker, the inventors of laundry machinery find a new demand for their labor, and if the article has come to stay, some new wrinkle for ironing it quickly and simply will be invented sooner or later.

In a great many laundries fine hand work and finishing work is done by hand with an electric iron. But the great bulk of ironing is done by steam heated presses and ironers. Shirt-ironing machines are made to fit bosoms so perfectly that when the goods are finished one would hardly be able to distinguish the work from that done by hand. The turn-over collars are put through a special machine, which folds them over and straightens the edges to the required natural curves. Yokes, sleeves, and wristbands likewise have their separate machines which fit into them snugly and give in a few seconds the shape and effect that the hand-worker obtains only after a long period of skillful work.

Machinery for ironing has proved of the greatest benefit in doing up flat goods, such as handkerchiefs, pillow cases, sheets, napkins, and tablecloths. An immense amount of work can be accomplished in a short space of time by one of

these machines under the operation of a girl or woman. The modern flatwork ironer has been developed to such a point of perfection that it is capable of ironing all the flat goods of a large laundry as fast as they can be turned out of the washers and drying rooms.

The flatwork ironers are of all sizes, from those constructed for hotel use to the big fifteen-ton machines with rollers from seven to ten feet in length. The latter size of machine is only suitable for the largest laundry, but where the amount of work justifies the installation of one it well pays for the investment. It will turn out all the goods that several girls can feed to it. These articles are readily folded and made ready for delivery.[49]

The development of laundry equipment and machinery constitutes an important and interesting phase of the power laundry industry. Power washers, centrifugal extractors, steam and heated air dryers, ironers, rollers, steam presses, starching machines, list indicators, marking machines of a wide variety, and innumerable other patented gadgets, instruments, and devices have been designed to simplify the washing process.

In the decade of the seventies laundry machine patents were not uncommon, and with each succeeding decade the number of patents has increased. In the field of laundry markers alone there have been scores of patents. In 1906 C. W. Canine of Des Moines obtained a patent on a marking device. This consisted of "a plurality of type-setting cylinders, a plurality of similar type-wheels with different sized type gearing for connecting the cylinders and wheels, and means for actuating the cylinders to bring the selected type into printing position".

Unique in the field of present day laundry machinery is a gadget to produce an "invisible, indelible laundry mark".

[49] *Laundry Machine and Practice* in *Scientific American*, Vol. LXXXIII, p. 150.

This is done with a machine which imprints the name of the owner with a new, clear ink, which is visible only "under specially filtered G. E. mercury vapor lights". Thus the name can be written large and be readily visible to the marker, with the specially prepared light, but not visible to others in ordinary light. This is but one of the many modern inventions in this field, but it is typical of the advancement made in the power laundry industry.[50]

The question of sanitation in laundries is one of much importance and much interest. Upon first thought one might suspect that, with soiled clothing coming from many homes, disease germs might easily be spread through the laundries and be carried out into new areas. The surprising thing is that wide experience demonstrates that this is not the case. Soiled clothing is received into the laundry under conditions which seem to eliminate the spread of disease. Even markers of soiled garments seldom contract disease from laundry packages. Within the laundry every movement is one that tends to sterilize as well as clean the clothes.

Attempts have been made to sterilize clothes by passing an electric current through the water. This has been proven to be of no value. Heating the water, however, to a temperature of 180 degrees Fahrenheit or more for fifteen minutes "is sufficient to kill the hardiest of bacteria". In addition, soap solutions, even at temperatures as low as 104 to 120 degrees, have a real value for killing bacteria. Bleaching liquids, too, of the strength usually employed in the power laundry process is an excellent sterilizing agent. Indeed, Javelle water, used extensively in laundries, is an antiseptic which was successfully employed in the treatment of wounds in the World War. Moreover, the heat in

[50] For this patent, number 830,567, see the *Official Gazette of the United States Patent Office*, Vol. CXXIV, p. 367; *Business Week*, November 2, 1935, p. 29.

various types of ironers in the laundries is sufficient to kill any disease-producing germs.[51]

An interesting experiment was tried in the city of Waterloo, Iowa, during the influenza epidemic in 1918. When the epidemic broke out the laundries of Waterloo hesitated to take bundles of clothing from quarantined homes. As the emergency increased, public sentiment demanded that the laundries furnish service to such households. One of the large laundries specialized in service to afflicted families and handled thousands of bundles of linens from influenza patients, "but strange to relate, laundry employees were immune from the disease". The manager suggests that immunity might be attributed "to the chlorine fumes" constantly prevalent in the plant. At all events the experiment demonstrates that contagious diseases are not spread through operation of the public laundries.[52]

Power laundries are sometimes criticized for the use of acids in the cleaning process, also for the rough manner of handling clothes. A study of methods, however, shows that such criticisms are not well founded. Time was, in the decade of the nineties, when acids were used extensively, but not so today. Modern machinery, too, is designed to protect rather than to destroy even the lightest fabrics.

In 1925 publicity was given in Massachusetts to a statement that strong acids were being used in laundries. To ascertain whether or not the statement was true, scientific tests were made by outside chemists at a time and in a manner unknown to the proprietors of the laundry. The tests showed that the statement was a gross misrepresentation and that acids were not being used at that time. The test also showed that every precaution was taken against wear and tear in the washing process.

[51] *Manual of Standard Practice for the Power Laundry Washroom*, 1922, pp. 93, 94.

[52] Data obtained from H. O. Bernbrock, Waterloo, Iowa.

The committee which made this investigation reported in part as follows:

The clothing received from individual families is properly identified by a unique checking system, placed in separate nets, and washed in appropriate compartments in rotary washing-machines of the cylinder type. The clothes are not pulled nor rubbed. The soapy water, and later the various rinse waters, are forced through the fabrics, effecting a very thorough removal of dirt.

The machines are so constructed that there are no sharp corners or projections upon which there is a possibility of tearing the fabrics. A series of clocks and dials are used to control the washing and rinsing processes. Scientific care is exercised in the thorough removal of dirt. . . .

It is, perhaps, needless to say that the different varieties of goods are subjected to different cleansing processes. The process, which applies to linen and cotton, does not necessarily apply to wool and silk. Thick, heavy blankets, for example, are processed in a little different manner than are curtains. Each variety of textile has its specialized method of treatment.

The process of cleansing woolens not only quickly removes the soil from the material, but leaves them practially unshrunken, and of a soft, fluffy appearance.

Goods which show a nap are so treated that the original nap is soft and prominent, and not matted nor felted, as is often the case in the home laundries.

A centrifugal machine, or extractor, is used to remove the excess water from the clothing. These machines are far more gentle in their action than is the ordinary rubber-rolled wringer of the home laundry.

Not only the process of washing, but the process of drying sterilizes the clothing and fabrics, and it is doubtful whether any disease producing bacteria would stand the treatment given in the rotary washing machine. . . .

We have submitted goods to this laundry, subjecting them to chemical examination both before and after the washing processes, and in all cases have found them uninjured, well washed, and of excellent appearance. . . .

The soap-powder is of the highest quality and is free from any material injurious to fabrics. Soap is used in the granulated form

because of its easy solubility and the fact that it more quickly cleanses the clothing.[53]

What has been said of this Massachusetts laundry can in a large measure be said of most of the large laundries of America today. They are built and operated on the principle of rendering good and efficient service to the public.

In the advancement of the laundry industry, chemistry has played an important part. The layman is frequently not fully aware of the science involved in the washing process. He only knows that the most delicate fabrics may be sent to the laundry and returned clean and unharmed. He is not always appreciative of the fact that an extensive knowledge of science has been employed to remove dirt and stains — stains that might otherwise have permanently impaired the value of the garment.

The more common stains with which the laundryman has to contend are road tar and oil, iodine, ink, argyrol, grass, egg dyes, perspiration, tobacco, tea, blood, paints, mildew, berry, and certain cosmetics. To decide which one of the stains or combination of stains is on the garment requires the work of an expert. Chemists have studied these stains and the benefits of such studies are dispensed to the public through the operation of the public laundry.[54]

The laundry business, like many another enterprise, thrives and prospers according to the efficiency of the service rendered. Accordingly there is a constant alertness to serve the public and increase business at every opportunity. One method of increasing business in recent years has been the extension of efficient laundry service into rural communities. With the advent of the change from starched work to soft shirts and collars about 1914, laundries operating in

[53] *Now Comes The "Certified Laundry"* in *The Literary Digest*, Vol. LXXXIV, January 31, 1925, pp. 21, 22.

[54] *The Science of Washing* in *The Literary Digest*, Vol. LXXVII, May 26, 1923, pp. 78, 79.

many of the smaller communities were unable to meet the competition of the home work and also fulfill the demands made upon them. As a result many of them were discontinued. Those laundries were sometimes purchased by laundry companies of the larger cities. In such cases the machinery has been dismantled, laundry routes have been established, and the laundry, as such, transferred to the larger establishment. Sometimes the former owner of the smaller plant is given a position as routeman in his locality, to assist the larger company in the conduct of its business.

A single large operating plant has sometimes purchased several smaller laundries and established rural routes extending over a wide area, including many small towns.

To facilitate the work of collection and delivery, relay trucks may be used to transport bundles between the laundry and the smaller towns — thus giving the routemen full time in their local communities. If this is done, gasoline, lubricating oil, and other supplies and accessories may be purchased in large quantities and carried by the relay truck to the routemen. Delivery costs are thus reduced to a minimum and net profits are thereby increased.

This type of extension work does not contribute in a large way to the net income or the profits of the larger laundries. It does, however, extend widely the scope of service and it also contributes to the volume and even flow of business during the latter part of the week. Moreover, it carries its full share of the fixed costs, and helps to make the local business more profitable.

Illustrative of the older, larger, and more firmly established laundries of Iowa is the Waterloo Steam Laundry in Waterloo. This was founded by Mrs. Angeline Reed in 1879. It was incorporated as the Waterloo Laundry Company in 1914.

Before coming to Waterloo, Mrs. Reed purchased from

the Empire Laundry Machinery Company of Chicago, Illinois, one small boiler and engine, one rotary washing machine, one extractor, one ironer, one starch machine, and one laundry stove. The octagon-shaped stove was placed in the drying room where it answered the two-fold purpose of heating the flatirons and drying the clothes. In those pioneer laundry days, supplies were purchased in grocery stores and consisted very largely of bar soap, starch, and Mrs. Bower's liquid bluing. This business was moved to 718 Bluff Street and was later sold to Joseph Fortunski. At that time the work done consisted very largely of shirts, collars, and cuffs. By reason of lack of a good identification system, no effort was made to do family washings and those that were sent were accepted reluctantly.

In 1902 Henry O. Bernbrock of Quincy, Illinois, purchased the business from Mr. Fortunski. At that time the volume of business amounted to about $400 per week and the work required about sixteen people. In that year the first "Rough Dry" was placed on the market in Waterloo. The price was four cents per pound.

In 1907 the business was moved to Fifth and Jefferson streets to accommodate the growing volume. A large part of the business at this time was shipped in by express from the surrounding towns. In 1914 the business was incorporated under the laws of Iowa with H. O. Bernbrock, President, and A. J. Cornwell, Secretary. In 1919 a new three-story fireproof building 75x140 feet was erected.

All washings enter the building at properly equipped entrances. The bundles are then taken to the marking and sorting departments and then to the various wash rooms, where special machines are provided for the washing of different kinds of goods. From the time the laundry is brought to the door of the plant by the driver, until it is returned to him for delivery to the owner, the garments are

kept moving along by efficient employees and many labor-saving machines -- the total value of laundry machinery being more than $100,000.

This laundry uses about 50,000 gallons of water per day, obtained from its own deep wells. As an aid to the laundry service great quantities of soft water are needed and a water softener of large capacity has been installed. The plant uses about 30,000 pounds of chip soap each year.

The Waterloo Laundry Company maintains a tank yard with gas storage capacity of 30,000 gallons. Its coal consumption is about 2000 tons per year. Gasoline for use in its trucks is purchased in carload lots and averages about nine carloads per year. Cleaner's naptha, which is also purchased in carloads, will average about 25,000 gallons per year. The machinery is driven and pressing done chiefly by steam generated at the plant although electric equipment is used extensively.

This company has kept pace with the changes that have occurred in business during the past twenty years, and now in addition to full equipment for what is known as "Bundle Washing" the company operates departments for commercial flat work, family work, dry cleaning, and rug cleaning.

In point of size, hygiene, and sanitation, light and air provisions, efficiency of staff organization, and economy of operation, this plant ranks well among the leading laundries of the nation. In recent years the business has grown steadily and serves not only the people of Waterloo, but renders service to many communities in northeastern Iowa and extends its activities into southern Minnesota and western Wisconsin. The company maintains and operates its own garage with a full corps of mechanics.[55]

[55] The Waterloo Laundry Company operates some twenty rural routes and serves many small communities in Northeastern Iowa.— See Bernbrock's *Taking Laundry Service to the Small Town* in *Laundry Age*, January, 1937, pp. 27, 28.

Operating in the interest of the public as well as for the business itself, power laundries of the United States have developed to a high state of efficiency and have witnessed a tremendous growth. Particularly is this true in recent years — witness statistical figures for the years 1933 to 1935. The number of wage earners employed by these laundries in 1935 was 203,582 — an increase of 16 per cent over the number employed two years earlier. The total wages paid in 1935, exclusive of salaries paid to officials, amounted to $151,185,526. This was an increase of 19 per cent above the amount paid in 1933. The total amount of money received for laundry work in 1935 exceeded three hundred and sixty million dollars — an increase of 22 per cent over the amount received two years earlier.

When the first Federal census of the laundry industry was taken in 1909 Iowa ranked fourteenth among the States of the Union, with 181 power laundries. The annual income from these laundries was $2,063,451. By 1914 the number of laundries had been reduced to 176. But they had increased materially in size, and their business, then amounting to $2,882,005, had increased more than 39 per cent. Judged on the basis of the amount of money received for services rendered in 1935, Iowa ranked twenty-fifth among the States of the Union, with receipts amounting to $3,748,194. This latter figure includes only power laundries with an annual income of $5000 or more. Today power laundries large and small are found in some sixty cities of Iowa, and in the larger cities several laundries operate.[56]

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[56] *Census of Manufactures*, 1914, Vol. II, pp. 847–872; *Power Laundries* (U. S. Department of Commerce, June, 1937), pp. 2, 5, 6.