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Louise A. Tilly
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University of Michigan
330 Packard Street
Ann Arbor, Michigan 48104

"The woman worker," intoned Jules Michelet, "those profane, sordid words which no language will own, which no era before this age of iron would have understood -- these words cancel out all our so-called progress."² Michelet's complaint matches Charlotte Elizabeth Tonna's litany of a woman's decline and fall through work in a mill: The Wrongs of Woman. Michelet, Tonna and many other nineteenth-century observers had no doubt that the increasing employment of women outside the home had profound and pernicious effects on family life and private morality. That view still has plenty of proponents today. Most of today's students of industrialization agree that the effect was, and is, profound, even when they deny that it was wholly pernicious. Women's labor force participation is commonly supposed to have transformed family structure and demographic behavior.

But how? Many nineteenth-century commentators favored a straightforward moral-corruption argument. They worried about the immorality which resulted from women working in factories. In 1833, Peter Gaskell wrote of the "promiscuous and indecent intercourse of the sexes which is so prevalent," of the lack of moral discipline in factories which led to the relaxation of the "moral obligations which ought to exist between the sexes."³ At about the same time, the French physician Villermé was explaining that in Mulhouse, the term *mariage à la parisienne* referred to concubinage; it was, he said, a common practice among mill workers.⁴

Contemporaries complained that male and female roles were being reversed. "Many very early and improvident marriages take place," wrote an English commentator,

It is not an uncommon thing at all, because she can keep him without working, for a man to propose to a factory worker and be accepted. She works for the home afterward and he minds it. Why should he work when her wages are enough for both?⁵

The critics accused wives of neglecting housekeeping and of forgetting -- or never learning -- how to cook. In short, women workers foresook their conventional and proper place in the world. Thus they contributed to moral decay in general and to the destruction of family life in particular.

In retrospect, we have no difficulty detecting the cramped moralism and the inexact observation in these analyses. Factory work, for example, actually remained a relatively uncommon category of female employment throughout the nineteenth century, despite the anxious attention it attracted. Most women workers, in fact, were single; married women who did work, furthermore, tended to seek out non-factory employment. Premarital sexual relations were by no means a peculiar custom of factory girls; premarital sex was common among rural women and servants as well. The moral-decay focus on industrial employment was, at best, misplaced. Much the same criticism applies to subsequent moralists and historians who have seen the factory as the source of women's liberation or, more neutrally, as the source of major changes in feminine experience and family life.

What is surprising about the nineteenth-century views is not that they were widely held or that they were wrong. It is that they did not include their standard twentieth-century accompaniment: the view that the industrial employment of women reduced marital fertility. The absence of the fertility-decline argument flies in the face of twentieth-century common sense. Indeed, it flies in the face of twentieth-century reality. In contemporary industrial countries, fertility is inversely

linked to female labor force participation.⁶ Thus it is easy to conclude that female industrial employment actually depresses fertility. This common-sense interpretation gains credibility from the fact that in England the fertility of textile workers declined earlier than that of other groups of workers.

By the early decades of the twentieth century, the idea that female industrial employment depresses fertility was becoming a commonplace among the many observers who were trying to account for the visible decline in the birth rate. In 1914, Ethel Elderton noted that "the fall in the birthrate has been most marked where women are industrially employed" -- that is, in an area where there had been an increase in married women's paid employment. Yet she also showed that fertility in textile areas was high (and, in fact, rising) until 1877; only after that date did fertility fall rapidly and in a sustained fashion.⁷ Similarly, fertility was high until the 1870s or later in the industrialized textile areas of France: the Nord and Alsace-Lorraine.⁸

Recent historical studies of occupation and fertility have concentrated on mining areas, in which there were both clearly sex-linked employment patterns and high fertility. The work of Dov Friedlander and Michael Haines examines the common-sense interpretation that high fertility is linked, among other factors, with low levels of female employment. Friedlander compares fertility and other demographic indicators for coal-mining districts with the population of English and Welsh rural areas and with the total British population in the late nineteenth century. He finds that "coal-mining areas can be characterized as high in migration, nuptiality, fertility, mortality, and by [a] slow transition to the small-family system, in comparison with England

and Wales as a whole or with rural areas only."⁹ He finds similar demographic patterns in a comparison of nineteenth-century Gross Reproduction Rates for coal-mining counties and for England and Wales as a whole; the British Fertility Census of 1911 yielded similar results. Nuptiality and marital fertility had historically been higher among miners than among other occupational groups, and these measures declined more slowly among miners than among other populations.

Friedlander hypothesizes that two factors were chiefly involved:

1. the rapid expansion of heavy industry and the rising demand for coal, which made these areas very attractive for immigration from rural areas with labor surplus and, as a by-product, created an unbalanced sex ratio,
2. the kind of employment in this sector and the health risks involved. These limited women's employment opportunities and shortened men's effective working life, contributing to fast population growth through early marriage and high marital fertility.¹⁰

He concludes from his examination of demographic behavior and labor force patterns that miners were responding rationally to the socioeconomic circumstances in which they lived. Having many children maximized opportunities for the mine families to have wage-earning members throughout their existence as families. This behavior, he feels, was tightly related to the short work life of men and the few chances for women to contribute to family income. "Thus," he writes, "relatively early marriages and high marital fertility among the coal-mining population in England and Wales provided a kind of life insurance or a pension scheme particularly suited to their special occupational characteristics."¹¹

Michael Haines also argues for an economic interpretation of fertility differentials. He tests it on broader geographic evidence: from Germany, England, Wales, and four counties in Pennsylvania. Haines finds that coal-mining populations had higher fertility than most other

occupational groups in his samples of nineteenth- and twentieth-century populations. He sees the following as the important factors: "Males reach peak earning capacity at a relatively early age, child costs are relatively lower in mining areas, employment opportunities for women outside the home are often lacking, and the taste and cost structure of these communities is more rural than urban in the initial stages of development." These factors (plus male in-migration patterns which resulted in high sex ratios) led to early and relatively complete marriage in mining areas. His analysis of areal data for England, Wales and Prussia bears out his hypothesis of a positive relationship between high male employment in mining and high fertility; it shows a negative relationship between fertility and female employment outside the home.¹² His analysis of a household-level sample from four Pennsylvania counties confirms the higher fertility and larger completed family size for coal-miner-headed families, as compared with other occupational groups.¹³

The economic explanation of fertility differentials is very plausible. Questions remain, however, about the contribution of occupational structure to the whole process of change in fertility and family structure. In order to examine the importance of female labor force participation to fertility levels, for example, the inverse case must be examined: that of high employment of women. More generally, the connection between women's industrial employment and fertility must be examined historically to see:

1. how, in the short run, levels and characteristics of women's labor force participation affected family structure and fertility; and
2. in what ways, over the long run, changes in the level and characteristics of women's wage work were linked to declining marital fertility.

This paper approaches the two questions through the experiences of a pair of French industrial cities.

The two cases which provide the evidence for examining these questions are the textile city of Roubaix and the metal/coal mining city of Anzin. The period under examination runs from 1872 to 1906. Roubaix and Anzin recommend themselves for the extreme contrast between their urban economies and occupational structures; from that contrast resulted important differences in the levels and characteristics of women's wage work. In France, as in England, the textile town and the mining town were both at the leading edge of urban industrial growth. But they provided two distinct patterns of opportunity for women's wage work. In the textile town, there were many jobs for young women and children. In the metal/mining town, jobs were mainly for men and boys. Occupational segregation -- the fact that jobs were sex-typed and were held primarily by males or primarily by females -- was a powerful influence on labor force characteristics in the nineteenth century, as it is today. Much of the inter-city variation in women's labor force participation can be explained by the structure of demand shaped by urban economic activity and its labor needs.

Yet demand alone cannot explain the pattern of employment. The supply of labor significantly affects who works, and how. In the cases of Anzin and Roubaix, the supply side of the picture does not lie with individual workers facing the range of opportunities in the cities; it depends on the households in which these potential workers lived. Although in industrial cities the household lost much of its productive function, it remained the mediating unit between the economy and individual workers. Economic calculation on the household level allocated the time of household members to wage-earning, to reproduction and

child care, and to the management of consumption. Aggregate employment patterns varied as a consequence of occupational structure. Adaptive patterns within the household varied with opportunities and constraints in the urban economy.

The opportunities and constraints went beyond the occupational structure. They included the business cycle and the histories of particular industries: whether, for example, they had grown from urban concentration and increasing scale of production within crafts which were already organized on an artisanal basis, or had developed around new technologies and new organizational forms with little pressure from organized craftsmen. On the one side, then, were the age and sex distribution of the demand for urban labor, and its change over time with the vicissitudes of business. On the other were families composed of men, women and children -- potential workers all -- passing through a cycle in which the amount and kind of labor the household could supply altered significantly from one point to the next. The link between labor force and family was a series of household decisions to supply labor. The proletarian households in industrializing cities had few resources at their command except for their joint ability to earn wages.

Despite the differences in occupational structure, the household labor-allocation and fertility strategies were quite similar in the Anzin and Roubaix of 1872. Labor force participation by several family members was a standard pattern in both places. High fertility, with an eye to the production of future workers, was common. The labor-allocation and fertility strategies in both places changed for much the same reasons, although the outcomes were rather different. The greatest differences, as we shall see, were not in the strategies employed by families, but

in who bore the costs of those strategies, and how.

The analysis reported here examines fertility and occupation within households in Anzin and Roubaix, and traces how they changed over time. The paper proceeds in the following manner: First comes a brief history of industrialization in Roubaix and Anzin up to 1872.

This section also includes an analysis of occupational structure in 1872. The second section, on work and family cycle, compares how families allocated on the aggregate level. \wedge the wage earning labor force participation of wives and children over the family cycle in the two towns. The third section discusses aggregate demographic indicators. Levels of fertility and fertility patterns of occupational groups are the topic of the next section, which also examines the costs and benefits of fertility strategies of households in Roubaix and Anzin. The paper concludes with an examination of long run changes in women's work, household adaptive strategies, and their links with economic change over time.

Historical Background and Occupational Structure

Roubaix, in France's industrial department of the Nord, is a city of the nineteenth century. A Roubaisien poet hailed it, seemingly without irony, as a "city without a past in art, without beauty, without history."¹⁴ The church and the city hall on the Grand'Place, the monuments, all were products of the nineteenth century. Louis Reybaud, a mid-century observer of French industry, burred with enthusiasm about Roubaix: "only congratulations are in order."¹⁵ In 1864, the city archivist proudly called the city "the Manchester of France, for there is no more dedicated industrial center, none more progressive: the Roubaisien weaving industry creates, invents without relaxing, and what it doesn't invent, it perfects victoriously."¹⁶

Although it had a long history as a textile center, Roubaix began its rise to industrial prominence with the importation of new technology from England. Spinning machines were introduced in the Napoleonic period. Wars and dislocations slowed down the adoption of mechanization: the flying shuttle was only adopted in 1820, at about the same time that the first steam engines were installed in the spinning mills. Roubaisien entrepreneurs began to switch to wool production when their cotton industry hit a slump due to British and Alsacian competition in the 1820's. This proved a wise move, and the city's pride in its business sense was aptly summed up in its report for the Exposition of 1844:

We know nothing but manufacturing work in Roubaix: it starts with dawn, it ends after night has fallen...Occupations are common to husband, wife and children; no one is idle; idleness is unsupportable. In this town there is only one thought, one goal: produce and sell. Prosperity is the result, for the owner, for the worker.¹⁷

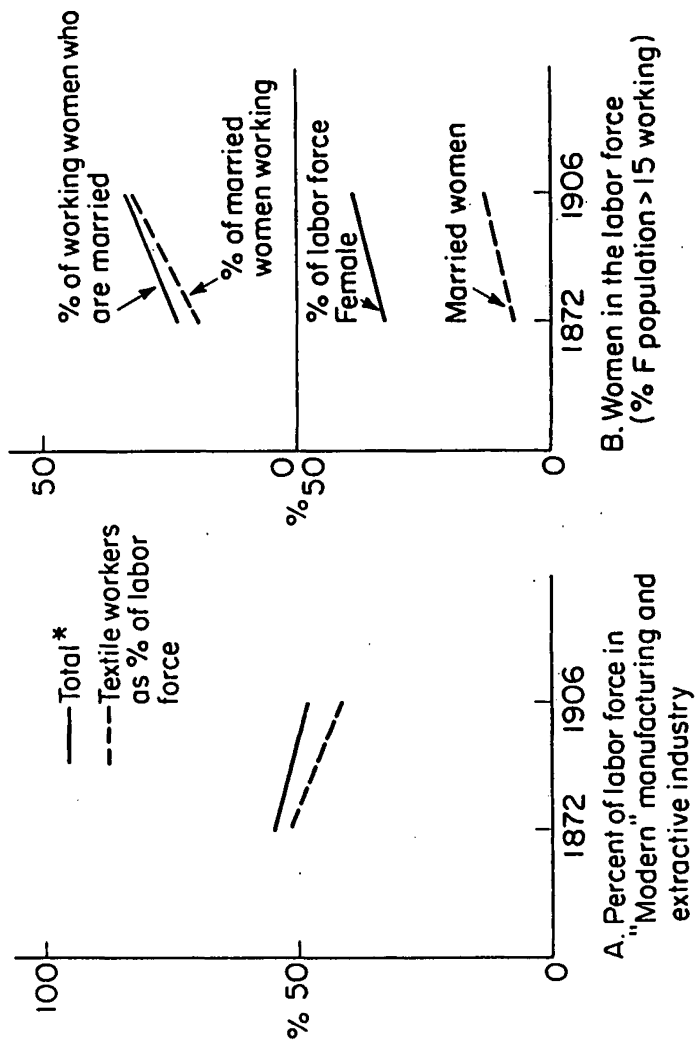
In the 1860's, Roubaix attracted thousands of Belgian migrants. In 1872, its population was 56% foreign born. Both Belgian and native French migrants came from areas where the old domestic textile industry was declining.¹⁸ They crowded into the characteristic housing of the industrial city: "forts", "cités" and "courées". These were row houses, sometimes back to back, almost always built in rows perpendicular to the street frontage. Even Reybaud, enthusiastic as he was about manufacturing in Roubaix, admitted that his visit to the Fort de Roubaix left him with a very sad impression. "The interior court common to all was a receptacle for sewage, for stinking water which could become the source of pestilence...an air of misery and abandonment reigned throughout."¹⁹ Thousands crowded into these bleak, uncomfortable, unsanitary tenements. In 1869, a report noted one courée only 2.1 meters wide,

22 houses deep and housing 123 persons.²⁰

Domestic weaving lingered on in the 1860's, but most textile production was mechanized and concentrated into factories by that decade. The chief fiber produced by then was wool, for the "cotton famine" of the United States Civil War years had completed the changeover from cotton begun in the 1820's. The textile industry employed 52% of the labor force, 54.5% of female workers.²¹ (Figure 1 compares labor force indicators for Roubaix in 1872 and 1906) The other important categories of female employment were domestic service (14.8% of the female labor force) and commerce and crafts (15.1% of which half were dressmakers.) Eighty one per cent of single females over 15 were employed, but only 17% of married women were. Over half of the married women who worked were textile workers. The rate of labor force participation of young people under 15 was high: 38.9% of girls aged 10-14, and 36.5% of boys worked. The textile town, with its factory wage work opportunities for males and females, with its limited range of jobs, jobs clearly separated from household location, was a "typical" industrial city.

Yet so also was Anzin, some forty miles to the south of Roubaix, just across the river from the old textile and lace-making city of Valenciennes. Coal had been discovered in Anzin in the eighteenth century by an exploring company financed by wealthy speculators. However, it developed rather slowly until mid-nineteenth century. The period from around 1850 to 1880 saw a vast increase in demand for coal in France. A period of prosperity and population growth for Anzin, as well as for the rest of the northern coal field,²² began. Much of this demand was generated close by. The textile industry around Lille (including Roubaix), for example, consumed much coal. So did metal

FIGURE 1: LABOR FORCE INDICATORS, ROUBAIX, 1872 AND 1906.



* Total excludes 12% unspecified in 1872, 13% in 1906

works, (chemical factories and large scale sugar beet refineries) in the Valenciennes area. Anzin and smaller mining villages attracted migrants to the mines and metal works. (One-third of the population of Anzin in 1866 was Belgian, and another quarter was born outside the Nord. The Belgians had most likely already been mine and metal workers, migrants from different areas than the domestic cloth industry workers who were flocking to Roubaix.)²³

The Anzin company, which owned and operated mines throughout the area, not just in the town, was celebrated by contemporary observers for its paternalistic policy toward its workers. Reybaud claimed that at Anzin, "responsibility is not a vain word; it is taken seriously by those who have accepted it....Literally, the company takes the mine worker at the cradle and accompanies him to the grave..." Schools, housing, medical care, jobs for family members and workers too old to continue as miners, pensions for retired workers, widows and orphans were all part of the package he described.²⁴ Vuillemin, another apologist for the mine companies, noted that about 37% of the workers of the Anzin company lived in company owned housing. These were small houses grouped in corons, rows or courts, usually with gardens attached. He proudly compared this housing with that in Roubaix, which was in short supply. Housing in Roubaix was built by speculators trying to make money rather than by a company solicitous of its workers.²⁵ Miners lived in housing clustered near the coal pits, which were topped by the characteristic pit frames and overshadowed by nearby slag heaps. A poet praising his home town of Anzin wrote these words, which echo the lines quoted earlier on Roubaix:

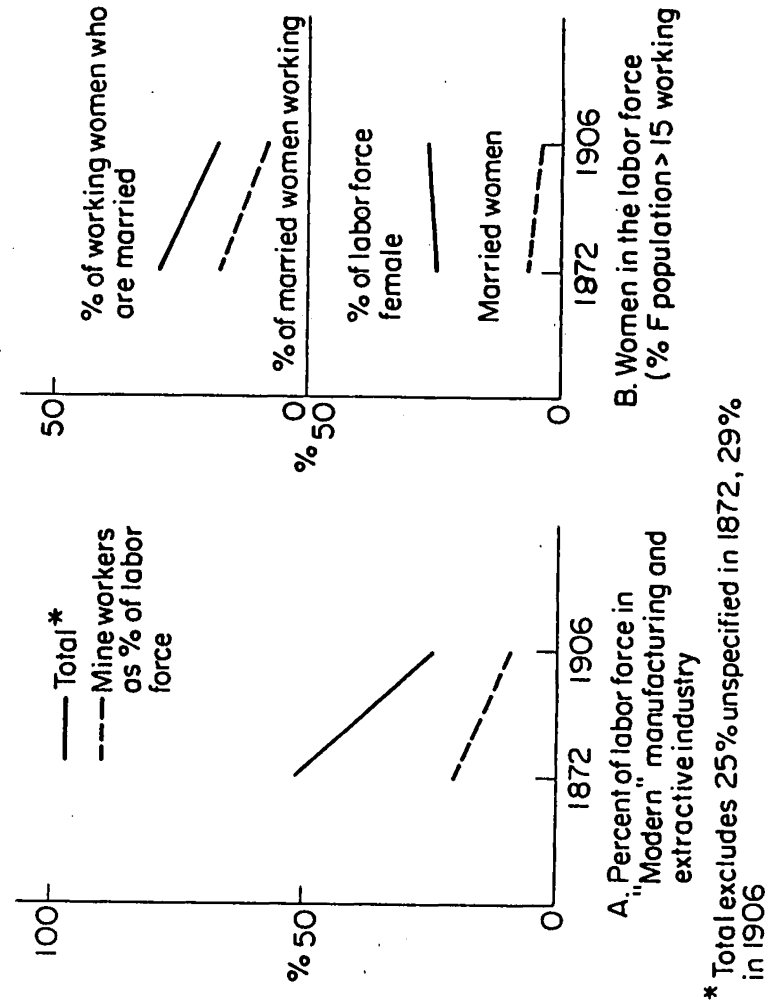
Your name is black, Anzin, as black as your face
 You have your heroes, but where is your history?
 (poem by Lucien Jonas)²⁶

Dirty, ugly, raw, new, lacking a political past, these two industrial cities nevertheless have their histories.

In 1872, twenty one percent of the labor force of Anzin was in mining, fifty one percent in combined metal and mining. These heavy industries were almost exclusively male-employing. (See Figure 2 for Anzin labor force indicators in 1872 and 1906.) Mining and metal working were the dominant industries of Anzin in 1872, but there had been some diversification of the labor force, as the pits near the city were exhausted and miners moved on. Consumer services such as stores and cafes also employed an important porportion of the labor force. The diversification resulted in more female employment than there had been ten years earlier. However, although a few miner's wives worked as storekeepers or cabaret keepers there was less employment of married women in mine households than in others.

In 1872, the ratio of male to female workers in Anzin was 3.3; in Roubaix it was 2.2. Thus a considerably smaller proportion of the labor force of Anzin than of Roubaix was female. Married women, however, were as likely to work in Anzin as in Roubaix. Over half the female workers in Anzin were in petty commerce and dressmaking: 14.4 per cent of the women who listed occupations kept cabarets and cafes, 33.7 per cent of them were dressmakers. Most of the married women workers (55 per cent) were to be found in these categories of work. Most married women who worked in Anzin, then, worked in a household production situation. Such work could be combined with other household activities, such as child care. This situation stood in clear contrast to that of Roubaix, in which most married women worked in textile jobs. Although in both cities most female workers were single, there were fewer employed girls in Anzin. Opportunities for children to work in Anzin were primarily

FIGURE 2: LABOR FORCE INDICATORS, ANZIN, 1872 AND 1906



for boys. More than 50 per cent of boys 10-14 in the sample for that year were employed, only 12% of the girls. Reybaud noted that girls could sort coal in and around the mines, and the cofus, girls dressed in heavy clothing, their heads veiled to keep the coal dust out of their hair, were known for the strength they developed hauling coal in baskets. Vuillemin felt there weren't enough jobs for girls, who could help their families with their wages and save for their own marriages, but he noted that there was "no notion of dishonour or of bad behavior which attached to such work."²⁷

Work and Family Cycle

The pattern and availability of women's and children's employment in both the industrial cities in 1872, and the family cycle of need, led to cyclical employment for wives and children. Long before Rowntree's influential description of the poverty cycle in York in the late 1890's, Reybaud had observed and described similar patterns among French textile workers. Family fortunes, he wrote, were closely tied to family composition. When a couple first married, they prospered, for both worked for wages. But then the babies came,

the household was full of young children who need supervision, cost money, and brought none in. Pregnancies and lactation diminished the resources the wife could contribute. The man carried the common burden practically alone. As the children grew, this situation improved; between 8 and 15 years of age, they stopped being a burden and became a resource; now all hands were occupied, and as small as their wages might be, they added a supplement to the budget that could not be disdained.²⁸

When the children moved out to set up their own households, the parents were again on their own. The parents' wage-earning capability declined, sickness and other crises overtook them, and misery again often ensued.

Reybaud described a similar cycle in the mine family. The couple

married young, when the man's salary was that of a learner, and his wife could add little to the family wage:

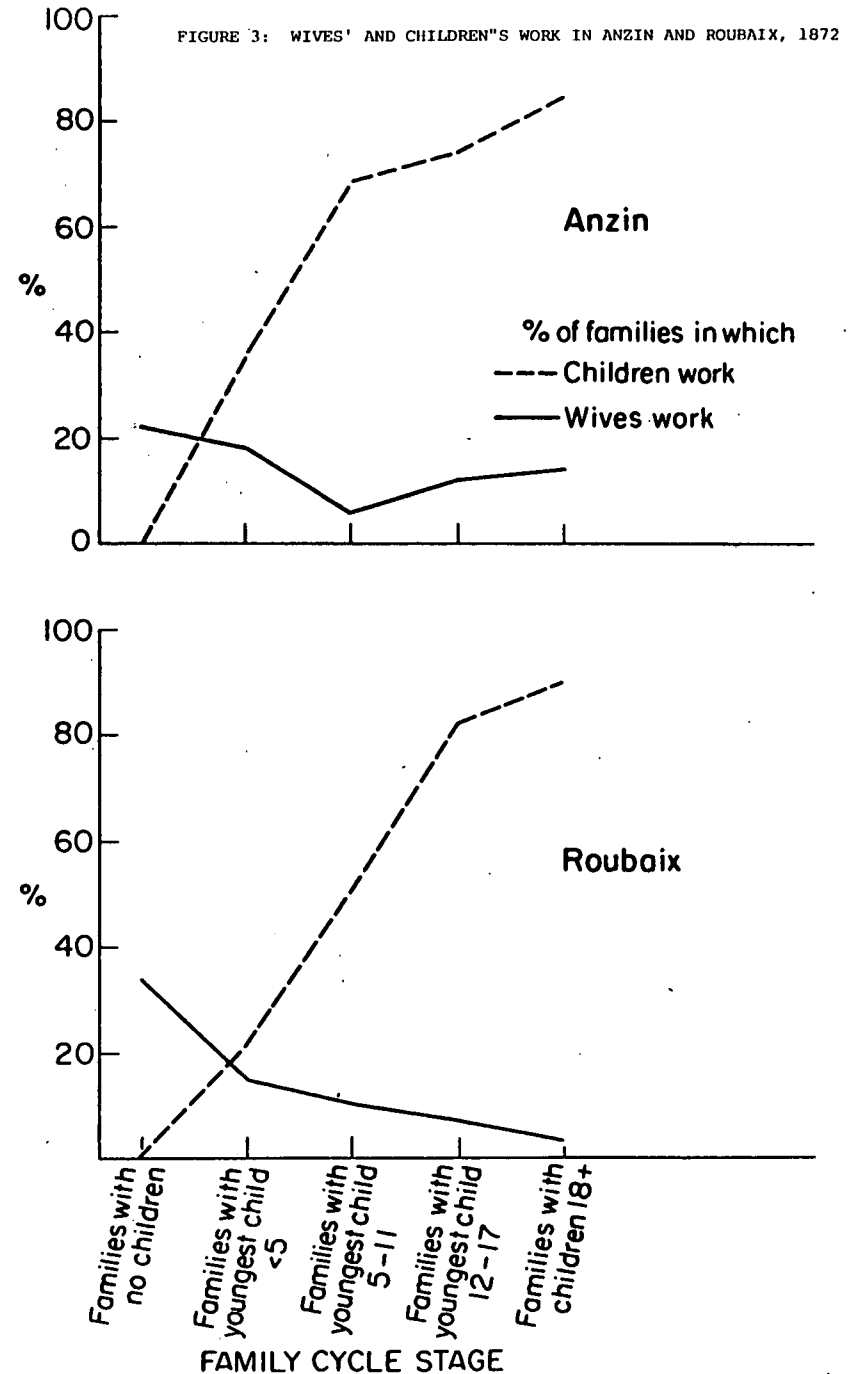
these are difficult years for the young couple...children arrive, practically always a large number, they are expenses without bringing in any compensation; the difficulty increases. In as little as nine or ten years, the situation improves. The man's salary is good, his wife can contribute more: the oldest child is admitted to the mines, the others follow. Instead of being a burden, the family provides a revenue, and so it goes until the girls marry and the boys do their military service.²⁹

Vuillemin used practically the same words: "the family is later a resource for the miner; all his children, or at least the boys, are certain to find work at age 12, remunerative work which improves the well-being of the household."³⁰ The balance among family members who were earners and those who were consumers determined family fortunes.

The "family wage economy" described here shared many characteristics with the "family economy" or household mode of production typical of peasant or artisanal productive units. The difference was money: greater importance of wages in cash, more extensive cash flows between family and market, larger monetary exchanges within the family. The increased proportion of wage earning workers and the decline of independent peasants and craftsmen which accompanied industrialization was strikingly evident in early industrial cities like Anzin and Roubaix. Men, women and young people could all earn wages. Commentators such as Reybaud, Audigance, and LePlay carefully recorded the monetary contributions of all family members in family budgets, which balanced income against outgo.³¹ But family economic calculation also took account of non-wage-earning activity, such as housekeeping and childcare. The contemporary observers who tell us so much about workers' lives recognized this, but they found it hard to calculate a money equivalent for contributions. Reybaud notes that his budgets only counted women's work

when it was in a mill, that is, when it earned wages.³² The separation of home and work not only made it hard to calculate a wife's contribution when she stayed home. It also made it difficult for her to earn wages. In families which farmed or did domestic industry, a wife could combine market work in the household with such housekeeping and child care that she did. In the industrialized cities, productive work was carried on elsewhere. The conflicting demands of home and work on married women were less acute in Anzin, where, although men's work was clearly industrialized, women's was not. In Anzin, in contrast to Roubaix, women worked in household production. Yet in both cities, the patterns of work over the family cycle tended to substitute wives and children for each other as workers.

Two variations on the course of a married woman's work life are shown in Figure 3. These graphs show the per cent of families in which wives worked in Anzin and Roubaix (solid line) by the age of the youngest child in the family. The dotted lines represent the percentage of families in which ^{resident} children (of any age) worked. In both Roubaix and Anzin, wives worked most commonly when there were no children at home at all. Roubaix, with its excellent opportunities for female employment, had more employed childless wives than did Anzin. In neither Anzin nor Roubaix did wives' work fade away with children under 5 in the household. This period, when most of the children were very young, was the time of greatest need for the household. Children were then consumers of food, but seldom contributed wages. At the same time, wives found it difficult to work for wages because of conflicting demands at home. The graphs show that the imperative of need kept many wives working in families of both cities as long as they had few wage earning children. This was true even when they had children under five.



Men's wages in the textile industry of Roubaix ranged from a high of 2.6 fr a day for wool combers or spinners to 2.20 for weavers. Women could make 1.80 combing, 1.60 spinning, but most of them were piecers, which was a job they shared with boys and girls, at 1.80 fr daily wage. A family of 5 needed two workers in order to meet its weekly expenses of 22 to 24 francs. Wages for ordinary workers and living expenses in Anzin were similar.³³ Miners, however, could earn better wages, as we shall see. The need for multiple wages in these families constrained ^{some} wives to put wage earning before child nurture in the family wage economy of Anzin and Roubaix.

As the curve of the percentage of families with working children climbed with the age of the children, the behavior of married women in the two cities diverged somewhat. In Roubaix, the percentage of families in which mothers worked dipped the more sharply. This was surely connected with the kind of work most wives did in Roubaix -- factory textile work was difficult to combine with household tasks and childcare. Children and mother traded labor force participation over the family cycle, with the mother retiring as children began to contribute wages to the family. Once children started to work, the mother's time was more usefully spent, from the point of view of the family, in feeding and providing other service for the increasing number of family wage earners. Thus the curve of families with wives working, although it declines when there are children under five in the family, is not at its lowest point then. We would expect it to be lowest at this stage if care of small children were a significant claim on the wives' time. Wives worked in these families in response to need (a high ratio of consumers to producers) rather than in response to reduced childcare

responsibilities. Such responsibilities, of course, would be lower as children grew older. Another aspect of the occupational structure of the textile industry was also important here. Jobs in the textile industry were primarily for young people, and women often did the same work, for the same wages, as girls. The wife who may have wished to work when her child was fourteen was unlikely to find work, as long as younger, more nimble persons were available for the job. Families needed wives' work when the ratio of consumers to workers was high -- which is when there were small children in the family. [^]At this was the time --- when she was young -- that a wife could find employment in textile mills.

In Anzin, families with wives working were about as numerous as those in Roubaix. However, the distribution of these families by family cycle differs in the two cities. The proportion of families with working wives declined steadily in Roubaix in each family cycle stage. In Anzin, there were proportionately more working wives in families with older children. The different forms of wives' employment are important. In Anzin, the majority of working wives worked in their own households, as storekeepers and dressmakers. Such jobs were not strictly age-typed, as were textile jobs. Nor did they require as much absence from the household as did the textile jobs of wives in Roubaix. In Anzin, small scale service and consumer industry made it possible for more wives to work even as their children were earning wages.

The situation of the mine family was special. Miners' wages in the years of the coal mining boom were relatively high. Some put them as high as 3.55 a day.³⁴ The miner was usually the only wage earner, at least until his sons followed him to the mine. Boys started to work at 10. The mine company's fringe benefits further helped make this pattern

of behavior possible. Although the family budget was strained with the arrival of children there were few opportunities for wives to work. The kind of work which women could find paid very little. Going out to earn wages reduced the wife's ability to carry on the domestic responsibilities on which her miner husband depended. These were responsibilities which in many ways furthered his ability to earn good wages. Food had to be prepared according to shift schedules; the miner's blackened clothing had to be laundered. The vegetable garden and small animals a wife raised were a contribution to the family's table. Hence, as long as there were other workers in the family, the mine wife rarely earned a wage. Her economic contribution to family well-being was servicing the wage earners and producing the next generation of wage earners.

In both industrial cities, then, and in both chief occupational groups, family economic calculations took the work of all members into account. These calculations strove to balance family composition, income and non-monetary contributions of all members with consumption. How they did this varied with the occupational structure and the demand for workers of given age and sex in industry.

Demographic Structure

Both industrial cities were prospering in 1872. They were continuing to attract migrants. Alsations displaced by the Franco-Prussian War and the consequent annexation of Alsace-Lorraine to the German Empire joined Belgians migrating to Roubaix. It is no surprise, then, that the population of both cities was relatively young.

TABLE I: AGE DISTRIBUTION, 1872

	Per cent of Population			
	<u>Under 5</u>	<u>Over 15</u>	<u>Under 30</u>	<u>10-29</u>
Roubaix	12.6	66.4	61.3	37.2
Anzin	9.1	67.1	62.0	41.7

The table of age distribution shows that the two cities were quite similar in the youth of their populations, but Roubaix had a larger proportion under 5. Anzin, on the other hand, had the higher proportion of population in the working years 10 to 29.

Despite the very different occupational structures, the two cities had similar overall sex ratios.

TABLE II: SEX RATIOS, M/F, 1872

	<u>Overall</u>	<u>Population over 15</u>
Roubaix	106	109
Anzin	105	118

The population of working age in Anzin, however, was more predominantly male than that in Roubaix. Marriage was not notably earlier in Anzin, but it was more complete. Both cities had relatively high marriage age, especially for males, as the small proportion of married males at age 20-24 shows.

TABLE III: PER CENT EVER MARRIED, 1872

	<u>Age 20-24</u>		<u>Age 40-44</u>	
	<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>
Roubaix	10.5	32.6	71.3	85.2
Anzin	8.8	27.7	94.8	100.0

The chief differences between the cities in demographic structure, then, were the near universality of marriage in Anzin, and the high proportion of persons under 5 in the population of Roubaix.

Fertility

The large proportion of the population under 5 indicates high fertility; that impression is borne out by all available measures. Crude birth rates were consistently high for both cities in the third quarter of the nineteenth century. Age-specific fertility ratios were calculated from the census sample in order to examine differential fertility by age groups and occupations.³⁵ This measure counts the number of children under 5 (living in families with both their parents), per thousand wives (by age groups), aged 20-49. The advantage of this age-specific child woman ratio calculated from the census sample is that fertility levels can be linked with individual and family characteristics; in this case, age of mother, occupation of mother, and occupation of father. This index also produces an estimate of average completed fertility to age 49 for women presently aged 20, if current age specific fertility rates were to continue through the next 30 years. The following results were obtained for 1861 and 1872.

TABLE IV: AGE SPECIFIC FERTILITY, 1861 and 1872

	<u>ROUBAIX</u>	<u>YEAR</u>	<u>ANZIN</u>
Total raw fertility	1013	<u>1861</u>	879
	824	<u>1872</u>	636
Total age standardized fertility*	1020	<u>1861</u>	856
	815	<u>1872</u>	575
Completed fertility estimate	5.9	<u>1861</u>	5.0
	4.7	<u>1872</u>	3.8

*Standardized by the age distribution of wives in Hareven and Vinovskis sample, Essex County, Mass. 1880.

Fertility is consistently higher in this period in Roubaix.

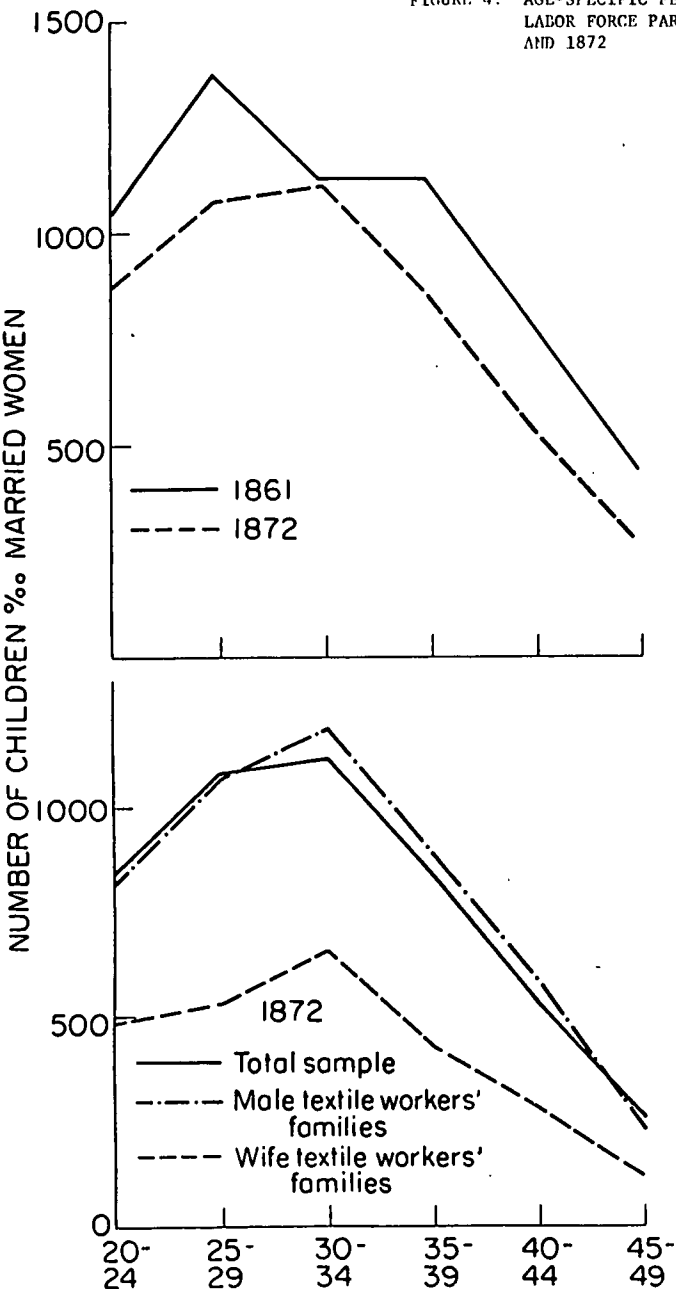
Age specific fertility ratios for the two cities in 1861 and 1872 are shown in the upper panels of Figures 4 and 5. Overall, the level of fertility went down at all ages between the two censuses in both cities. Over the eleven year period, child bearing became increasingly concentrated in the years under 30, which suggests that older wives were employing some means of fertility control.³⁶

Fertility ratios for selected occupational groups are illustrated in the lower panels of Figures 4 and 5.

In Roubaix, the fertility curve of the wives of male textile workers closely paralleled that of the total sample, except that it was somewhat higher in the 30 and over age groups. This is consistent with a late age of marriage, 27 or older, for wives of textile workers. Although fertility was generally lower in 1872 than in 1861, Roubaix families were producing large completed families. That was notably true of textile families; estimated completed fertility for wives of textile workers at 1872 rates was 4.8 children. The fertility ratio reflects mortality as well as fertility, since it counts surviving children, not children ever born. So true fertility was even higher. The opportunity, and indeed the frequent necessity for multiple family wage earners was a powerful factor in this kind of family behavior. The high rates of infant mortality in Roubaix, shown in Graph 6, suggest that textile families had to have large families in order for several children to survive to working age and begin contributing to the family wage fund.

Wives who were themselves textile workers had much lower fertility than the total sample, or than all wives of textile workers. The sharp

FIGURE 4: AGE-SPECIFIC FERTILITY RATIOS AND WOMEN'S LABOR FORCE PARTICIPATION, ROUBAIX, 1861 AND 1872



ROUBAIX 1872

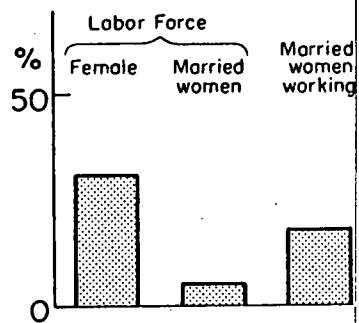
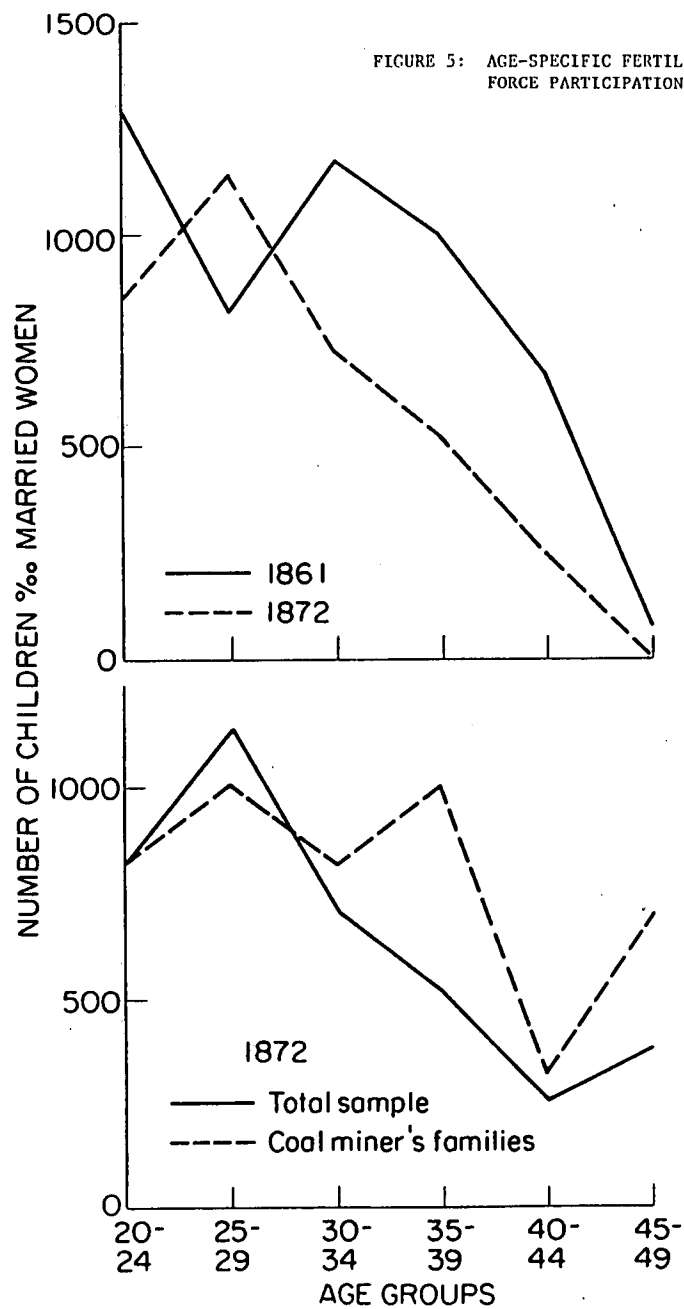
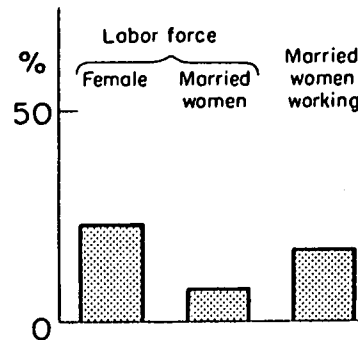


FIGURE 5: AGE-SPECIFIC FERTILITY RATIOS AND WOMEN'S LABOR FORCE PARTICIPATION, ANZIN, 1861 AND 1872.



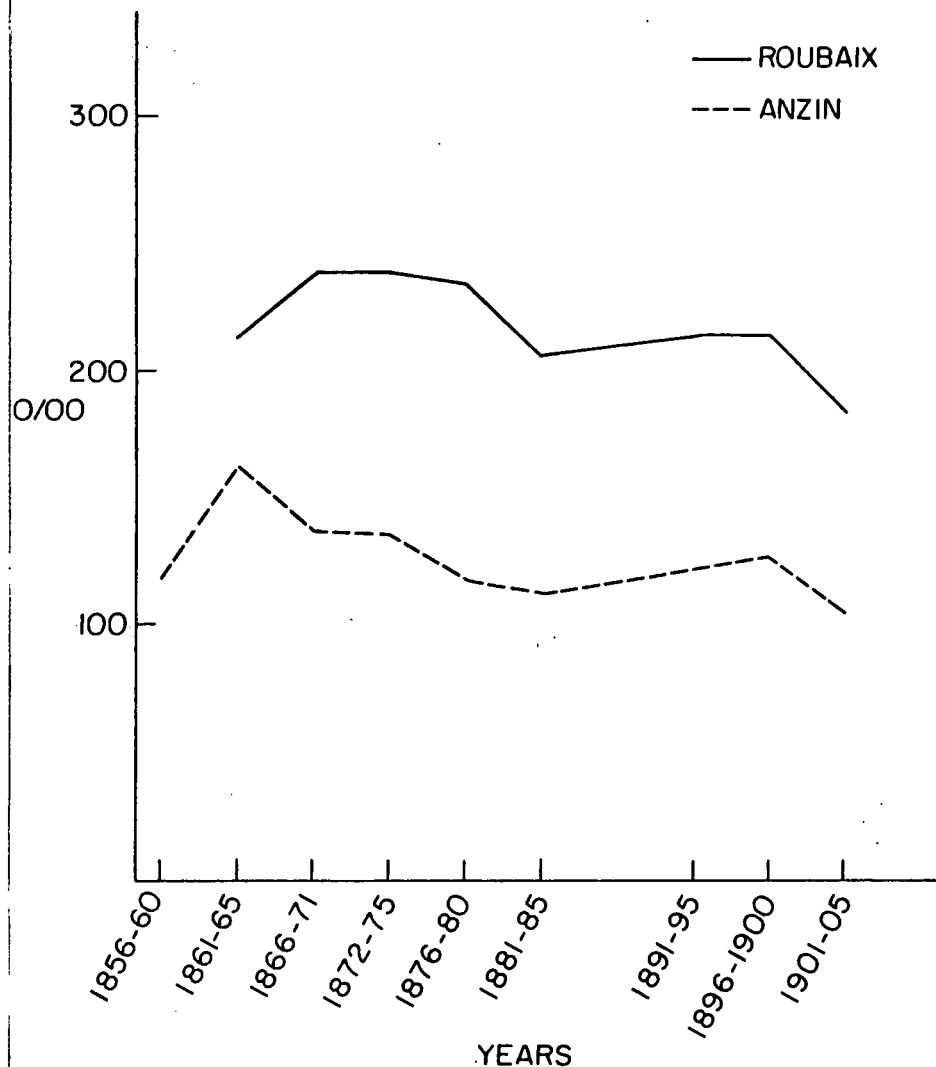
ANZIN 1872



peak in age group 30-34 echoes the total sample behavior, and presumably indicates the "catch up" effect of late marriage. What does the low fertility of textile worker wives mean? Wives could be working because they had few children, or they could be having few children because they were working. It is possible also that the fertility ratios for these wives were more inaccurate than those of other wives, because of differentials in the mortality of infants of working and non-working mothers. Most contemporary observers were persuaded that mothers who worked in factories lost more infants. Pregnant women standing on their feet all day at work in dusty mills were likely to have unhealthy babies. If the mothers returned to work soon after giving birth, the baby was not nursed. This also hurt its survival prospects, for safe alternative feeding methods were simply not available in the 1870's. The low fertility ratios for textile worker wives in Roubaix thus reflect higher infant mortality as well as lower fertility.

In Anzin, the wives of coal miners had higher total fertility and higher estimated completed fertility for wives aged 20 to 49 than did the sample as a whole. Miners' wives continued to bear children at a high rate throughout their fertile years, rather than at a reduced rate after 30, as did the total sample of wives. Mine families, then, appear to have been making calculations about children similar to those of textile workers' families. Even though infant mortality was much lower in Anzin than in Roubaix (as shown in Figure 6), it was much higher than that of France today.³⁷ Rates like these meant that parents in nineteenth century industrial cities who expected that some of their children would die before maturity were completely realistic. However, children's work opportunities were such that surviving children were welcome wage earners.

FIGURE 6: DEATHS OF INFANTS UNDER ONE PER THOUSAND BIRTHS



Women's Work, Children's Work and Fertility

Comparisons between Anzin and Roubaix show that several factors contributed to high fertility besides levels of female employment. The occupational structures of the industrial towns had different levels of female employment, but they were similar in that it was primarily single women who worked. Despite quite diverse opportunities for women to work, there were similar proportions of married women working in 1872. The kinds of work married women did were quite different. The wives of Anzin were unlikely to work, but the same is true of the wives in the textile town. Of those wives who worked, most had no small children in both towns. Wives with children who worked, worked even when they had small children. They worked less frequently as children in their households worked. The reason these wives worked was need. Eighty three per cent of working wives in Roubaix were wives of semi-skilled or unskilled workers. Sixty-six per cent of working wives were married to textile workers. In Anzin, 17.6% of the wives of non-mine workers were employed. (This compares with 17% employment for Roubaix wives.) However, only 10.5% of miners' wives worked. Where men's wages were better, fewer wives worked.

Wives' work in the textile city affected the care that infants received and contributed to the high infant mortality rates in the textile city. (It should be noted that Roubaix was located in a marshy area and like many new industrial cities, suffered from overcrowding and unsanitary conditions which likewise contributed to its high infant mortality.)³⁸ Textile families in Roubaix called on wives to act as producers and as reproducers, at least until their children replaced them as workers. The conditions of work in textile mills made this behavior costly in terms of infant lives. Opportunities for children's work were as important

in the textile families' calculations as was the work of wives. The prime industrial employment in Roubaix tended to hire young workers: 81.6 per cent of female textile workers and 49.3 per cent of male textile workers were under 30. Youth was characteristic of the labor force of Anzin also. 62 per cent of male mine workers in Anzin were under 30. Men and women had relatively short work lives in both the mining and the textile industries. In both industries, jobs were not only sex-typed but also age-typed. It was the age structure of occupations, which both modern industries shared, which led families to act in similar ways. They had many children because children could earn wages when they were young. The relatively short work-life spans of adults meant that surviving children were needed to help their parents as they approached old age. The higher infant mortality rates in Roubaix both contributed to and were a consequence of higher fertility there. The fertility ratios of coal miner-headed families and textile worker-headed families were consequently quite similar. Any possible effect of married women textile workers on fertility in Roubaix was small, for the number of wives who worked was low. The employment possibilities for children and young persons of both sexes in Roubaix encouraged families to maximize births.

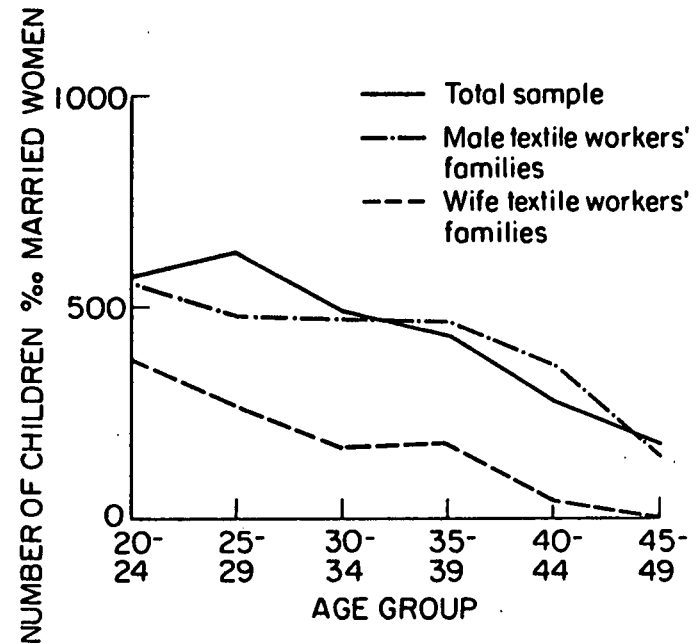
Among the miners of Anzin, opportunities for children to work and short work lives for adult males were associated with high fertility. In these families, good wages for men and the many demands on wives for household services meant that more mothers stayed home and did no paid work. Those wives who did work did so in their own household setting. There were fewer costs in terms of mothers' and children's health or lives in Anzin. Perhaps this is why, over the long run, mining families developed a life style which dictated the wife and mother's full time

involvement in the home and disapproved and even condemned any deviation from this norm.

The textile industry declined in the Nord as it did, indeed, in most of Western Europe in the 1880's. As the decline occurred, textile jobs no longer attracted eager migrants to Roubaix. Children's work was limited by protective legislation and compulsory schooling. More wives worked. Thirty one per cent of married women worked in Roubaix in 1906, almost double the proportion in 1872. Male workers and young workers with more choices found jobs elsewhere.³⁹ The cost to families of wives working, however, had diminished dramatically, for fertility was much lower in both the families of male textile workers and in those of wife textile workers. Figure 7 shows the fertility ratios for 1906 in Roubaix. There had been a substantial decline over 1872, in which textile workers' families closely paralleled the behavior of the total sample. Worker wives were again much lower. By 1906 infant mortality had declined also in Roubaix. As in Britain, increased wives' work was accompanied by declining fertility in textile areas. But these changes went along also with the decline of the industry itself and shrinking opportunities for children and for workers in general.

Anzin experienced fertility decline also by 1906. The census sample for that year contained a much lower proportion of miners and their families than did 1872, so few that the fertility ratio was not calculated for mine families separately. In the city, far fewer married women worked. The economic character of the city had changed as active mining moved further away. Opportunities for children's work had practically disappeared. Wives' work was not a factor in the decline of fertility in Anzin. The structure of opportunity in the city, and the disappearance of chances for children to work were more important

FIGURE 7: AGE-SPECIFIC FERTILITY RATIOS, ROUBAIX, 1906.



there.

The comparison of the cases of Anzin and Roubaix demonstrates that urban economic activity and the consequent occupational structure affect levels of women's employment. The characteristics of women's employment, in particular whether or not it is carried on in the household and its distribution between single and married women, affect family labor allocation and fertility strategies. But the opportunities and wages for children's work and adult men's work are also important considerations in such family strategies. The household was the site of decisions about who worked; it was the locus also of decisions about reproducing the labor force. The situation of the household as an entity, its composition and its range of employment opportunities; its hopes and expectations for the future were central to such decisions.

APPENDIX: ROUBAIX AND ANZIN

Census Analysis

All population data in this study are based on a 10 per cent sample of households from the French census nominal lists for 1861, 1872, and 1906 for Roubaix and Anzin. The folio size brochures of lists of names for each French commune were prepared for each quinquennial census from 1851 on. They include columns for address, name, sex, relationship to head of household, occupation, marital status (a check-off column -- s, m, w, -- not included in 1906), birthplace and nationality (for 1906 only). Households are numbered within houses and separated by heavy horizontal lines in the list. Each individual is listed separately.

Although there is undoubtedly uneven reporting of occupations, in principle all occupations of males and females of any age were reported. The 1872 census for Roubaix also systematically included an indication of nationality and birthplace for individuals, although there was no column designated for this information. The census nominal lists are a valuable source, for they link individuals to household, family, occupation and birthplace. The individual listing in household format means that occupational and other data can be taken into account not only for individuals per se but also for individuals as members of households and families.

All information from these nominal listings for all members of all the households in every tenth house was coded in a uniform manner. A copy of the code book may be obtained from the author.* A dictionary of occupations was derived from the titles of actual occupations listed. Occupations were classified by status and sector, and each occupational

*The code book is a modified version of the Comparative Cities Code Book, © R. Burr Litchfield and Howard Chudacoff, Brown University, 1976.

title was given a separate occupation number in addition. All individuals were also classified by their membership in a household (co-residential unit) and in families. Families were defined as married couples and their children or an incomplete set of persons formerly in such a group. Primary families were the families headed by the head of household. Secondary families were other families in the same household. An individual could be a member of both a primary and a secondary family in a household. Most analysis was done of primary families or households and is so designated.

Problems with coding and analysis arose from the facts that nominal lists were not all equally carefully completed by local census takers, and that information is not uniform over time.*

Designations were sometimes given only for head of household. This was the case for Anzin, 1861. Many occupational titles were vague and unspecific. In Roubaix, 1861, the occupational title for 55% of the women with listed occupations was "journalière", day worker. In the same city, 1872, there were hundreds of wives of head of household who were called "sa femme, menagère", (his wife, housekeeper) while an equal number were called simply "femme" (wife). It was not clear if the wives who were also entitled menagère had an outside occupation as housekeeper. (The title menagère was preserved in coding, and it turned out that the large numbers involved could not all have been servants.) The two

*Census nominal lists are found in both municipal and departmental archives for some census years in municipal archives only for most census years. Sometimes the lists in different depositories are not identical: for example, one may be alphabetized, while the other is arranged geographically. Also, one copy may be better preserved, or more legible than the other. The 1906 lists were found in the Departmental Archives of the Department of the Nord, the others (1861 and 1872) in the City Hall archives of the respective cities.

designations were simply the different styles of different enumerators.

The check off for marital status, which made that information clear in 1861 and 1872 was no longer present in 1906. Wives living with husbands were so labelled, and widows were frequently so designated. It was often not clear if daughters living in households with their parents and young women living alone were or had ever been married. They were coded unknown as to marital status, if they were over 15.

This is a study of cities, so it eliminates problems of rural-urban heterogeneity which rise with large ecological units. Roubaix and Anzin, it is true, were very different in size. Anzin (population 7090 in 1872) had about a tenth the population of Roubaix (75, 987). However, both cities had agglomerated populations, urban administrations, complex market connections. The other advantage of city comparisons which was important is that cities usually have better records, and they are better preserved, than small communities or rural areas. Published descriptive sources and contemporary newspapers and other accounts also are more likely to exist for cities.

FOOTNOTES

1. The research for this paper was funded by a Rockefeller Foundation Population Policy Grant, 1974-1976. The author wishes to thank Bob Liebman, Bill Roy, and Ted Fuller for programming assistance, R. Burr Litchfield for advice and for permission to use the Comparative Cities Codebook, and Charles Tilly for comment and editorial help. The findings were also discussed with Joan Scott, Miriam Cohen, Elizabeth Pleck, M.J. Maynes and members of a panel on Urban Social Structure at the Social Science History Association meetings, Philadelphia, October, 1976: Paul Hohenberg, John Modell, Lynn Lees, Ron Aminzade and Michael Hanagan. Many thanks to all for their useful comments.
2. Jules Michelet, La Femme, Second Edition (Paris: Hachette, 1860), 22; Charlotte Eloizabeth Tonna, The Wrongs of Women, in The Works of Charlotte Elizabeth Tonna, Vol. II (New York: Dodd, 1847).
3. Peter Gaskell, The Manufacturing Population of England. Its Moral, Social and Physical Conditions and the Changes which have Arisen from the Use of Steam Machinery, (London: Baldwin and Craddock, 1833), 28, 29.
4. Louis Villermé, L'état physique et moral des ouvriers employés dans les manufactures de coton, de laine, et de soie, (Paris: Renouard, 1840), 33.
5. R. Smith Baker, "The Social Results of the Employment of Girls and Women," N.A.P.S.Sc. Transactions, 1868, quoted in Margaret Hewitt, Wives and Mothers in Victorian Industry (London: Rockliff, 1958), 36.
6. See Glen C. Cain, Married Women in the Labor Force: An Economic Analysis, (Chicago: University of Chicago Press, 1966) and James Sweet, Women in the Labor Force, (New York: Seminar Press, 1973). The same argument has been made for developing countries by John D. Kasarda, "Economic Structure and Fertility: A Comparative Analysis," Demography 8 (1971), 307-317. A.J. Jaffe and K. Azumi, "The Birth Rate and Cottage Industries in Underdeveloped Countries," Economic Development and Cultural Change 9 (1960), 52-63, find that female participation in cottage industry with domestic production is not accompanied by lower fertility.
7. Ethel M. Elderton, Report on the English Birthrate, Part 1, England North of the Humber (University of London, Eugenics Laboratory Memoirs XIX-XX), (Cambridge: Cambridge University Press, 1914), 215-216.
8. Alexandre Faidherbe, "Etude statistique de la population de Roubaix (1469-1744-1893)," Memoires de la Société d'Emulation de Roubaix, Troisième Serie, II (1894-1895), 147-278, placed the beginning of sustained fertility decline in Roubaix after 1876. His monograph was written at least partly in response to concerns about "depopulation". He did not discuss economic or occupational correlates of fertility decline. See also Georges Franchomme, "Roubaix de 1870 à 1900," Diplome d'Etudes Superieures d'Histoire, University of Lille, 1960, and "L'évolution démographique et économique de Roubaix de 1870 à 1900," Revue du Nord, 51 (1969), 201-248, for aggregate demographic trends. Francis Ronsin, "Mouvements et courants neo-malthusiens en France," Thèse du IIIe cycle, University of Paris VII, 1974, 57-60, links the decline of fertility in Roubaix in the late 1880's and the 1890's with the presence of neo-malthusian propagandists. Etienne van de Walle, The Female Population of France in the Nineteenth Century, (Princeton: Princeton University Press, 1974), 392, 394, 416, 418, shows that fertility continued high in the departments of the Nord and Bas and Haut Rhin (Alsace-Lorraine) through the 1860's. See also R. Burr Litchfield, "Cotton Mill Work and the Fertility of Working-Class Families in Mid-Victorian Stockport," unpublished paper, Brown University, 1975.
9. Dov Friedlander, "Demographic Patterns and Socioeconomic Character-

istics of the Coal-mining Population in England and Wales in the Nineteenth Century," Economic Development and Cultural Change, 22 (1973), 40.

10. Ibid., 45.
11. Ibid., 51.
12. Michael R. Haines, "Fertility and Occupation. Coal Mining Populations in the Nineteenth and Early Twentieth Centuries in Europe and America," Western Societies Program Occasional Paper No. 3, Cornell University, 1975, 54, and passim.
13. Ibid., and Michael R. Haines, "Fertility, Marriage and Occupation in the Pennsylvania Anthracite Region, 1850-1880," Journal of Family History 2 (Spring, 1977), 34-37, 44, 52. Haines cannot test his hypothesis about the contribution of lack of female employment to high fertility with the household level data available to him. The United States census in this period reported occupation for married women and children inconsistently and listed very few employed married women anywhere.
14. Anonymous poet quoted on title page of Gaston Motte, Roubaix à travers les ages (Roubaix: Société d'Emulation, 1946).
15. Louis Reybaud, La Laine (Paris: Levy, 1867), 191.
16. Th. Leuridan, Histoire de la fabrique de Roubaix (Roubaix: Veuve Beghin, 1864), 156-157.
17. Quoted in ibid., 163-164, and Motte, op. cit., 46.
18. Motte, op. cit., 74. See also the population summary in the 1872 census nominal list for Roubaix and F. Lentacker, "Les ouvriers belges dans le departement du Nord au milieu du XIXe siècle," Revue du Nord 38 (1956), 7.
19. Reybaud, La laine, 208.
20. J. Prouvost, "Les courées a Roubaix," Revue du Nord 51 (1969), 316.
21. All labor force and demographic data, unless otherwise noted, are

- based on the 10 per cent sample of the nominal lists of the censuses of 1861, 1872 and 1906 for Roubaix and Anzin. See Appendix for further detail on these samples.
22. E.A. Wrigley, Industrial Growth and Population Change (Cambridge: Cambridge University Press, 1961), 24, and Marcel Gillet, Les Charbonnages du nord de la France au XIXe siècle (Paris, The Hague: Mouton, 1973).
 23. Summary of 1866 census nominal list found in Archives departementales du Nord (ADN) M 473.27.
 24. Louis Reybaud, Le fer and la houille (Paris: Levy, 1874), 181, 190.
 25. E. Vuillemin, Enquête sur les habitations, les écoles et le degré d'instruction de la population ouvrière des mines de houille des bassins du Nord et du Pas-de-Calais (Publié par les soins du Comité des houillères du Nord et du Pas du Calais [1872]).
 26. Poem found in mimeographed handout about Anzin available at its city hall.
 27. Reybaud, Le fer, 193, Vuillemin, op. cit., 21.
 28. Louis Reybaud, Le coton. Son regime, ses problemes. Son influence en Europe (Paris: Levy, 1863), 115.
 29. Reybaud, Le fer, 203.
 30. Vuillemin, op. cit., 20.
 31. Armand Audiganne, Les populations ouvrières et les industries de la France, 2 vols. Second édition (Paris: Capelle, 1860) and Frédéric LePlay, Les ouvriers européens. Etudes sur les travaux, la vie domestique et la condition morale des populations ouvrières de Europe, 6 vols. (Paris: Imprimerie imperiale, 1855).
 32. Le coton, 245.
 33. Roubaix wages in Reybaud, La laine, 393, and in the annual Rapports du Maire of the city, found in the municipal archives.

34. Reybaud, Le fer, 205; wage information available also in "Enquête parlementaire sur les conditions du travail en France," 1872-1874, section on the Charbonnages d'Anzin, Archives nationales (AN) C3019, and in Georges Michel, Histoire d'un centre ouvrier (Paris: Guillaumin, 1891), 168 ff.
35. Discussion of method for calculating and value of age-specific fertility ratios in Tamara K. Hareven and Maris A. Vinovskis, "Patterns of Childbearing in Late Nineteenth-Century America: The Determinants of Marital Fertility in Five Essex County Towns in 1880," unpublished paper, Clark University and University of Michigan, 1974, and "Marital Fertility, Ethnicity and Occupation in Urban Families: An Analysis of South Boston and the South End in 1880," Journal of Social History 8 (Spring, 1975), 69-93.
36. See John Knodel, "Family Limitation and the Fertility Transition: Evidence from the Age Patterns of Fertility in Europe and Asia," forthcoming, Population Studies, 1977, for discussion of the changing age patterns of fertility ratio curves as fertility control is adopted.
37. Infant mortality in English and Welsh coal mining areas, it should be noted, was higher than that in textile areas at the end of the nineteenth and in the early twentieth centuries. See (Great Britain) Local Government Board, Report by the Medical Officer on Infant and Child Mortality (London, 1910), 53.
38. Hewitt, Wives and Mothers, op. cit., reviews the literature on working wives and infant mortality. She concludes that although many studies of infant mortality in Victorian England were flawed, there was nonetheless good evidence to suggest that mothers' work outside the home seriously affected the chances of their infants' survival. See also May Tennant's article in Gertrude Tuckwell, Women in Industry from Seven Points of View (London: Duckworth, 1908) on the importance of breast feeding to reduce infant mortality.

39. Clara E. Collet, "The Collection and Utilization of Official Statistics Bearing on the Extent and Effects of the Industrial Employment of women," Journal of the Royal Statistical Society, LXI, Part II (June, 1898), 242, comments on this process in the English textile industry.