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ORIGINAL ARTICLE

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# Rationalization, working conditions and living standards in postwar Japanese coalmining communities

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## Abstract

After 1945, unionization, the introduction of a new wage system, a huge effort by experts to understand the social and biological lives of miners and their families, the introduction of a new form of solidarity, and closer monitoring of the health of mining community members contributed, along with the development of the welfare state, to the formation of a more stable community around the mines and a more secure life for a new generation of miners recruited en masse just after the war to replace Korean and Chinese forced labor. Yet there is also more to the story than the narrative of a social compromise driven by rationalization and productivity policies that generated an inexorable, universal Fordist virtuous circle leading the working class to security. A close look at the social history of postwar mining communities highlights the divide between the growing stabilization of miners' lives with the advance of the welfare state and the increasing physical and economic risks they faced with the advance of the industry's rationalization policies driven by the decline of Japanese coal.

**Keywords:** Japan, Mining, Rationalization, Wages, Living standards

## Maintext

### Rationalization, working conditions and living standards in postwar Japanese coalmining communities

Two narratives run side by side in Japan's post-war labor historiography. One is that, starting in the 1950s, labor relations gradually entered a period of supreme liberal capitalism dominated by consumer values and a standardized way of life. Militant labor unions were marginalized, putting an end to worker autonomy as employer and state rationalization policies came to the fore.<sup>1</sup> On the other hand, some historians argue that it is wrong to say the labor unions were completely defeated and that the cooperative unions should be acknowledged for their achievement in raising working class living standards.<sup>2</sup> This historical debate analyzes the process of the development of Japanese workers' social citizenship based mainly on the balance of power between labor and employers in the postwar period. Other research, more focused on the spread of knowledge, technologies and policies, demonstrates that a powerful process of change in the way the workers worked, were managed and lived had been in motion since the prewar period.<sup>3</sup> It contends that this transformation of the economic boom

period cannot be explained solely in terms of the balance of power between labor unions and employers. It was also a process that very much involved government and management technologies and complex linkages with the advancement of industrial democracy.<sup>4</sup>

A powerful process of rationalization can be found at the center of the process of raising working class labor conditions and living standards in industrializing Japan. Rationalization policies, covering as much labor management as the working population's everyday lives, took a particular turn in the 1930s driven by the need to overcome the impact of world recession along with the development of new production and management technologies, labor sciences, new medical knowledge, social surveys, and social developments. WWII imposed constraints on workers' lives and saw the quiet return of primitive forms of labor, such as forced labor, but the rationalization process did not stop. It was even consolidated in some ways.<sup>5</sup> Following the war, however, and a few years of social unrest, the "power-knowledge" system, to borrow Foucault's terminology, which produced this rationalization process resumed its course. Experts on the knowledge and technologies developed during the interwar period now had to consider the balance of power between unions and employers, but they finally appeared to achieve the goal they had set themselves decades previously. A self-reinforcing virtuous circle of high productivity and rising living standards generated high growth. Yet was the rationalization process in itself associated in a more complex manner with the development of living standards and the risks to which workers were exposed?

The mining industry is a very interesting case to take to explore this hypothesis further. Coalmining was a key industry in Japan's economic development. At the end of WWI, the industry embarked upon a high-speed process to modernize its technology and labor management system. Basically, the sector stepped up its direct management of the workforce and promoted mechanization. Labor historian Hiroshi Hazama<sup>6</sup> describes this development at the large mines in four stages: 1) *Ukeoi hanba sei*: recruitment through an intermediary, working under the supervision of an intermediary, and daily life under the supervision of an intermediary; 2) *Chokkatsu hanba sei*: recruitment through an intermediary, directly supervised labor, and daily life under the supervision of an intermediary; 3) *Sewayaku sei*: recruitment under direct supervision, and work and daily life under the supervision of an intermediary; and 4) *Chokuyōsei*: recruitment under direct supervision, and labor and daily life under direct supervision. The timing of this last stage ranged from the 1930s to just after World War Two, depending on the mine. The transition to direct management was obviously associated with the introduction of new technologies, which compelled employers to control skills more directly. The 1930s saw the gradual introduction of mechanized drilling and a shift from the room-and-pillar system (*tanchūshiki saitanhō*) of extraction to the longwall system (*chōhekishiki saitanhō*). Under the former system, miners worked in pairs - usually a man and a woman - carving out "rooms" and leaving "pillars" of coal to support them. With the gradual shift to the longwall system, groups of miners large enough to be accompanied by a foreman, the mine hierarchy's direct representative, worked a much larger coalface. At the beginning of the 1950s, the large Japanese mines made another very important technological transition with the introduction of what was called Kappe mining (*Kappe saitan*). Steel pillars (*kappe*) with horizontal extensions held the ceiling in place on a larger section, leaving more room in front of the coalface. Heavier

machinery such as shearing blades could therefore be used to slice left and right along the seam. Behind the blade, there was also room for a continuous conveyor belt to transfer the coal. The miners' jobs were transformed as a greater division of labor developed and new skills were needed.

This transformation brought with it changes to the miners' lives that were no less remarkable. Prior to WWII, despite the largest mines' rationalization of their management system as of the early 1930s, coalminers remained a particularly despised population living in highly insecure conditions with labor unions virtually absent from the workplace. However, after 1945, as this article will show, unionization, the introduction of a new wage system, a huge effort by experts to understand the social and biological lives of miners and their families, the introduction of a new form of solidarity, and closer monitoring of the health of mining community members contributed, along with the development of the welfare state, to the formation of a more stable community around the mines and a more secure life for a new generation of miners recruited en masse just after the war to replace Korean and Chinese forced labor. Yet at the same time, especially following Korean War economic boom (1950–1952), out of line with the rapid economic growth experienced by Japan as a whole between 1955 and 1973, the industry faced a number of problems: a temporary economic downturn in 1953–1954 and 1958–1959, but more importantly, the high price of Japanese coal compared with international competitors and its gradual replacement with oil as the main energy source. The rationalization policies consequently contained not only modernization measures, but also cost-cutting measures to regain competitiveness. Growing mechanization and redundancies had adverse effects on both labor conditions and the everyday lives of the mining communities, which were experiencing the economic, social and cultural transformations of the economic boom period at the same time.

Our analysis of the paradoxes of this period is based mainly on Kyūshū's mining industry, despite the fact that the vast majority of postwar mining industry studies focus on Hokkaidō considering Kyūshū's mining to be flagging and in fast decline as of the late 1950s. Yet it is precisely this fast decline, coupled with the wide range of mines that coexisted in this region, that makes this case especially interesting. Indeed, the situation of the Kyūshū mining industry was particular because of the presence of many small and medium-sized mines, which were more immediately vulnerable to the problems of the coal industry. However, the two mines that will be studied in more detail in this article were part of larger mining groups (Meiji and Mitsubishi) in coal basins other than Kyūshū, and have experienced rationalization policies, working conditions and living standards problems comparable, to some extent, to those in Hokkaidō, Ube and Jōban. We rely largely on historical material from Kyūshū National University's "Archives on Postwar Coalmining Management" (*Sengo tankō keiei shiryō*), especially material on the Mitsubishi Hashima mine (1048 workers in 1964, closed in 1974) in Nagasaki prefecture and the Meiji Hirayama mine (663 workers in 1965, closed in 1972) in the Chikuhō coal basin (Fukuoka prefecture), but also use material on other mines and secondary sources.

### **Reconstructing mining communities after the war**

After the war, one of the most important issues on the agenda of mining companies and the government was the rebuilding of the mining workforce. The number of

miners had fallen after the war due to the departure of many Chinese and Korean miners.<sup>7</sup> To restore production, the government launched an emergency plan to hire 133,730 miners in 1945 and 105,700 through to the end of 1946. In fact, the priority plan for coal (*keisha seisan*) meant that the number of miners rose much faster than expected and reached a high of 469,000 workers in January 1948, surpassing the war period peak. Given the high mobility rate of these new miners, the main concern became to stabilize them. For this purpose, mining companies tried to develop their knowledge of miner's everyday life and started conducting regular social surveys. Starting in July 1947, the Coal Industry Confederation (*Sekitan kōgyō renmei*) took regular surveys of mining households' budgets in 50 mines across the country (about 170 households of miners working inside the pit and around 400 households of miners working outside). Their budgets displayed certain characteristics: a huge share of household income was directly earned from work for the mining company; the share spent on housing, including water and electricity, was very low; and their nutrition became stable as of the end of the war.<sup>8</sup> Those surveys were regularly conducted until the 1960s and could go into great detail over the households' everyday spending habits. One survey was conducted from August 30, 1961 to September 3, 1961 based on housewives' responses in several mining communities. One of these housewives reported that her family of five people (the father aged 41 years old and the mother 35 years old), living in company housing owned by a large operating mine, had a monthly income of 25,000 yen and food expenditure of 12,579 yen, i.e. an Engel index<sup>9</sup> of 50.3%.<sup>10</sup> Housing was free, the company replaced the tatami mats every two years, the public baths were free, and electricity was free up to 35 kw. The father received 10% of his income from his wife for his personal use (cigarettes, sake, pachinko, etc.). The wife bought 5 dl of sake on payday, but the father bought it with his pocket money the rest of the time. The eldest daughter loved *kyōdō* and 3000 yen of equipment had been purchased with the bonus. For the youngest boy, 10 yen was spent in snacks on Sundays and 5 yen on ordinary days. A family at another mine had a monthly income of 38,000 yen and food expenditure of 16,500 yen, i.e. an Engel index of 43.4%. The survey suggested that life was similar to white-collar employees (*saraliman*).<sup>11</sup> The cultural aspect of miners' lives also attracted attention. In 1964, a joint management-union survey into the daily lives of coalminers was carried out at a Kyūshū mine of 737 employees. Day shift pit miners working on the coalface spent 603 min earning a living on a Friday, 628 min meeting their physiological needs, 6 min on household work and 197 min on their cultural life. Of the cultural activities, they spent 126 min watching television and 14 min reading the paper or chatting with others. This television viewing time was much higher than for factory workers who watched television between 41 and 100 min. Factory workers listened to the radio and read newspapers more, while miners no longer listened to the radio since 96% of them had a television. On workdays, time spent on union activities amounted to zero, but came to 48 min on days off.<sup>12</sup>

This social expertise has developed in parallel with social policies that have helped to reshape the daily life that the surveys were trying to understand. A key measure was the massive housing building project that would modernize company housing still relying on traditional *nagaya* (long wooden row housing), where families usually lived in one or two rooms and had to share outside toilets. In January 1946, the government enacted regulations for the extraordinary building of housing for coalminers (*Rinji*

*Tanko rôdôsha jûtaku kensetsu kisoku*). The plan was to build 5380 housing units in 1946 and 40,000 in 1947. In actual fact, a total of 125,121 dwellings were built through to March 1949. However, this represented just 27.3% of the 458,000 mineworkers at that time.<sup>13</sup> Although old *nagaya* continued to be used, general material conditions nonetheless improved dramatically and equipment, such as televisions, sometimes even topped the national average. The labor unions were usually involved in managing the company housing. At Mitsubishi Hashima, the labor union created the Commission on Hashima Company Housing (*Hashima shataku kyôgikai*) to make proposals to improve the living conditions of union members.<sup>14</sup>

Food distribution was also an important pillar of the miner stabilization policy. Trade unions played an important role in the implementation of this pillar. In a climate of food shortages, one of the first labor union demands at the end of 1945, in addition to a wage rise and an eight-hour working day, was for a rice distribution system. In some mines, such as Mitsubishi Bibai, the newly established union rapidly took effective food distribution measures, which immediately attracted workers.<sup>15</sup> The government soon set an additional ration of rice for coalminers. At Mitsubishi Hashima, union and employer liaised closely with the Nagasaki Departmental Committee for Essential Food Distribution in Coalmines (*Nagasaki ken tankô kô shuyô shokuryô haikyû shingikai*) and they worked together assiduously to save this additional ration from the government's plans to axe it in the second half of the 1950s. Employers feared that cutting the ration would encourage additional pay claims.<sup>16</sup>

Indeed, employers saw the purpose of welfare programs and education campaigns, sometimes developed with labor union collaboration, as rationalizing the way mining households managed their budgets and preventing unnecessary spending, as they had done in the interwar period.<sup>17</sup> The mining companies were among the first to develop the New Life Campaign (*Shinseikatsu undô*), "A popular movement based on a spirit of community solidarity (*kyôdô rentai*), whose purpose was to raise the rational, moral and cultural level of everyday life, to advance the welfare of each individual and build a healthy society easy to live in."<sup>18</sup> Jôban coalmine (Fukushima prefecture) was actually the first, along with two other mines (*Nippon kôkan and Asô sangyô*), to develop it, and most mining companies followed suit in the latter half of the 1950s. The campaign focused in parallel on the workplace where it advocated health and safety, cleanliness, solidarity, punctuality, a more pleasant environment and an end to pointless formality, and the family where it also worked to improve family communication, nutrition, clothing and housing, and saving and household budget management with the distribution of accounts books and the end of bad habits.<sup>19</sup> At Mitsubishi Hashima, various slogans were introduced such as, "Work as you should, for a comfortable life," (*Dekasegi o yoku shite, yutaka na seikatsu*) and, "Think of tomorrow with today's money," (*Hashita no hi no tame ni to omoe, kyô no kane*).<sup>20</sup>

Given the food distribution problem, the ideals of the rationalization of life and the construction of a new community-based solidarity, the cooperatives became important players in the mining communities' everyday lives. Many buying clubs were formed by residents or workers immediately following the Japanese surrender. Their mission was to procure food for members from farms or factories. They developed at an incredible speed and the Consumer Co-operative Act (*Shôhi seikatsu kyôdô kumiai hô*) was enacted in 1948 to regulate their operation. In the 1950s, worker-oriented cooperatives



were created under labor union patronage to conduct economic activities to meet the workers' needs. A Central Federation of Coalmining Cooperatives (*Tankô seikatsu kyôdô kumiai chûô rengôkai*) ran relatively large stores, in comparison with generally smaller retailers, providing a wide range of food and consumer goods in mining communities prior to the advent of supermarkets.<sup>21</sup> Daily goods distribution was no longer so much in the hands of the mining companies, as had been the case. Consumer coops also worked to advance welfare in general. Organizations such as *Chûôrôfukkyô* created by the main union federations at that time (*Sôdômei*, *Sanbetsu kaigi*, *Zenrôren*, and *Nihon kyôdô kumiai dômei*) had a clear brief to advance miners' standards of living. In the late 1950s and early 1960s, for example, it campaigned for the employee pension system to be supervised more by the workers themselves.

Mutual insurance and savings plans also developed in the 1950s, helping to free workers from loans at exorbitant rates and countering the development of traditional organizations like the *mujin* or labor bosses, which thrived on the back of the consumer society. Indeed, in 1954, the Committee of the Wives of Miike Coalmine (*Miike tankô shufu kyôgikai*) conducted a survey that revealed that many miners went into debt just to make ends meet. In 1955, a larger survey on 10,094 mining industry workers found that 43.5% of them were in debt. The Committee and the union therefore decided to launch a campaign for the "revolution of everyday life" (*seikatsu kakumei undô*) to combat waste, gambling and loan brokering.<sup>22</sup>

The move to develop mutual insurance in the mines was part of a broader national movement. The Workers' National Federation of Mutual Aid and Consumer Cooperative Unions (*Zenkoku rôdôsha kyôzai seikatsu kyôdô kumiai rengôkai*) or *Rôzairen* was established in Osaka in 1954 and approved as a consumer cooperative by the Health Ministry in 1958. In January 1954, 55 mining unions in the department of Nagasaki, counting 33,378 members, subscribed to the fund for a total of 3,226,000 yen. At the same time, a Labor Fund created in 1950 grew extremely rapidly, providing financial services to improve workers' living standards and promoting joint action by labor unions, consumer cooperatives and other workers' organizations. Around one-third of the fund was used to finance workers in their daily lives (consumer credit) and 15% funded housing. For example, Mitsubishi Hashima workers had the option of a housing purchasing plan offered by the Labor Fund of the Department of Nagasaki (*Nagasaki rôdô kinkô*).

### **The modernization of the wage system**

In addition to the welfare policies of the government, mining companies and labor unions, wage reform in the early postwar period was a way to make a clear break with the low-wage model characteristic of labor relations in the Meiji period and to enter a new era of rationalization, improved working and living conditions, and high productivity. In a speech at the inauguration of a branch of the Research Center on Labor Sciences at Mitsubishi Bibai mine (*Mitsubishi bibai rôdô kagaku kenkyûjo*) in 1948, Teruoka Gitô, the leading figure in labor sciences in Japan since the 1920s, advocated introducing a minimum wage, saying that, "To date, mine management has been dominated by technical and economic sciences with hardly any regard for human sciences. In the mines, curative medicine to repair damaged organs and bodies has been left by the wayside. In the mines, men do not attach any importance to humanity (*ningensei*)

... To respect humanity in the mines, we need to develop a science that deals with men. The Research Center on Labor Sciences at Mitsubishi Bibai mine needs first, based on the fundamentals of a human science (*nigensei ni kan suru kagaku*), to improve the working conditions of men, raise the standard of living and improve productivity.”<sup>23</sup>

It was not until the early 1960s that a minimum wage was introduced in the mining industry, as we will see below. However, just after the war, labour unions were able to establish themselves as major actors in the process of improving the living standards of miners, as they were able to negotiate a wage calculation that was more based on workers' needs. Prior to World War II, pay was generally based on the miner's ability to meet a production target usually fixed unilaterally by foremen (*ukeoi chingin sei*). Following the war, collective wage agreements were signed setting a larger fixed component. On 14 May 1948, a collective wage agreement was signed between the Tanrō miners' union and the Sekitan kōgyō renmei coal mining professional association, whose negotiations had begun in October of the previous year.<sup>24</sup> This collective agreement generalized a wage model where the fixed wage was much higher. The preamble insists in the first sentence on living wage (*seikatsukyū*):

“Employers, in order to rebuild the coal industry,... recognise the need to guarantee the daily lives of miners and the labour unions recognise the need to rebuild the coal industry by democratically increasing production in mining companies.... Basically, the salary that will have to be paid should be sufficient to enable workers and their families to have a decent life”.<sup>25</sup>

At the Mitsubishi Hashima mine, for example, the wage was calculated for one part according to a fixed sum based on the individual characteristics of the worker, and for another part according to a production objective. In 1957, in this mine, the average daily wage in 1957 for a miner working directly on the coalface (*saitanfu*) was 812.82 yen. This sum was made up of a variable component of 333.65 yen on average pegged to a production target (*ukeoikyū*) and a fixed component (*koteikyū*) made up of a basic wage (*kiteikyū*) of 180 yen, an age-based wage (*nenreikyū*) of 28.48 yen, a seniority-based wage (*kinzokukyū*) of 19.27 yen and a skills-based wage (*shinōkyū*) of 233.34 yen. In addition, there was a family allowance (*kazokukyū*) of 28.32 yen. At Meiji Hirayama, the average daily wage of a miner working directly on the coalface was 888.20 yen, with the variable part pegged to a production target (*ukeoikyū*) amounting to 458.82 yen, the fixed component to 398.40 yen, and the family allowance to 60.98 yen.<sup>26</sup>

Although the labor unions were unable to abolish the part pegged to a production target, they were able to limit its variation. Management and the union evaluation committee calculated the production target before the final wage negotiations on the basis of past production and “standard production” (*hyōjun sagyōryō*). At Meiji Hirayama Coalmine, a Wage Commission (*Chingin senmon iin kaigi*) made up of an approximately equal number of management and union representatives negotiated an overall sum and defined a distinction between “direct miners” working inside the shaft (*kōnai chokusetsu fu*), “indirect miners” working inside the shaft (*kōnai kansetsu fu*), “adult men” working outside the mine (*kōgai seijin danshi*), and “protection employees” (*hogo kōin*). A standard wage (*hyōjun chingin*) was set for each category. “Direct miners” earned the standard *ukeoikyū* sum if they met the production target.<sup>27</sup> The unions did everything they could to prevent competition between the miners. In Miike, where not all the coalfaces were equally productive, a miner rotation system (*ribansei*) was



introduced in the 1950s.<sup>28</sup> At Hokkaidô's large mines, the coefficient of variation between miners on the same team could not be more than 1.2.

The coalmining labor unions managed to impose a national minimum wage in 1962, three years after the 1959 Minimum Wages Act was passed following the "social dumping" accusation levelled against Japan, which impeded Japan's accession to GATT (General Agreement on Tariffs and Trade). A 1960 study of the Japanese mining industry as yet without a minimum wage showed that wages stood at just 12.4% of US mining industry wages. Food prices in Japan represented 69% of those in the US and the food purchasing power of American workers was several times higher than in Japan.<sup>29</sup> In September 1961, labor unions Sôhyô and Tanrô presented a document entitled, "For a change of direction in coal industry policy" (*Sekitan sangyô seisaku tenkan ni kan suru yôbô*), asking the government to consider the special case of the mining industry and its dangerous labor conditions, and to set a minimum wage of 60 yen per hour, 480 yen per day, and 12,000 yen per month. One of the unions' purposes was to prevent a drop in wages being triggered by the rationalization policy. In October 1961, the Ministry of Labor asked a commission to work on the issue. In December of that year, the commission visited Chikuho for three days to meet employers and miners' unions. The unions felt that wages in the coalmines were too low considering the harsh working conditions. However, the employers' associations maintained that wages were not low and that, given a unionization rate of 90%, there was no need to interfere with wages in the industry. Uncertainties in the industry regarding the rationalization plans made it inadvisable to introduce a minimum wage.<sup>30</sup> Despite this opposition and following further surveys and commission deliberations, a minimum wage of 16,000 yen was set for the coal industry in October 1962. The case was particular in that the minimum wage was set nationally for the entire industry. The largest mining companies were bound to bring it into effect as of April 1, with the other mines having another two years to apply it.<sup>31</sup>

As a matter of fact, although labor union activism helped stabilize workers' lives with the reform of the wage system, miners already benefited from a number of measures such as pension plans, leaving payments (*taishokukin*) and insurance for industrial accidents and occupational diseases even before 1945, giving their lives a certain amount of security. At the beginning of the American occupation, insurance for industrial accidents and occupational diseases was improved and unemployment assurance added to the social security system.

All these new institutions changing the everyday lives of members of the "coalmining society" (*tankô shakai*), to borrow the expression from historian Ichihaha Hiroshi, appeared in an environment of an increasingly clear gender-based division of labor. The household budget was becoming more dependent on the male breadwinner. Although, the male breadwinner's wage in the cities accounted for 82.5% of the household budget on average, the proportion in the case of pit miners was 95.1%.<sup>32</sup> In the district of Takashima, which included the two coalmining islands of Takashima and Hashima, the labor force participation rate for women aged 15 and over stood at just 23.25% in 1965 while the labor force participation rate for men was 86.64%. Although there were few women on the labor market, they were active in all kinds of associations dealing with different aspects of community life such as *Shufukai* (Association of Housewives), *Fujinkai* (Association of Women), *Kazoku kyôiku gakkâyû kenkyûkai* (Association for the Study of Family Education), and *Takashima-chô kyôiku iinkai* (Committee of

Education of the District of Takashima), which offered classes and other activities on educating children.<sup>33</sup> In 1953, *Shufukai* helped draft a manual at Bibai mine on how to change everyday life (*Seikatsu sesshin jisshi yôkô*) to eliminate unnecessary expenses and irrational practices. This manual set out a number of objectives: simplifying ceremonies, weddings and funerals, reducing expenditure on clothing, food and housing, increasing savings and ending high-interest *mujin* practices. A number of concrete recommendations were made to make savings on the costs of weddings, births, funerals, celebrations, departure ceremonies, seasonal or occasional gifts, donations (which needed Committee approval) and visits to the sick and wounded. Hygiene advice was also given along with information on the development of eugenic practices suggesting a prenuptial medical examination with the future husband.<sup>34</sup>

The huge amount of expertise on mining communities and the development of many new institutions by the state, labor unions, associations and employers no doubt contributed to reforming the domestic economy of a coalmining working class despised in the prewar period as “*nonde kutte chan*” (those who only drink and eat) and to advancing their standard of living and assimilation into middle class social norms. However, the process of rationalization that was arguably one of the main driving forces behind these developments was far from unambiguous. Employers invested a great deal in managing the health of miners and their families, but this rationalization of the biological life of their employees was mainly for the ulterior motive of raising productivity. Health tended to be subject of a difficult trade-off between cost and return on investment.

#### **The ambiguities of the health management rationalization process**

With the development of social hygiene in the interwar period, the management of workers' health was seen as concerning the entire living community indiscriminately. It was not until after the war that public health surveys and measures were stepped up in the mining communities. For example, a survey was conducted on eight pit miners and three people working outside the pit at Yûbetsu coalmine in Hokkaidô in March 1952. It measured sleeping time, working time (including transport), extra-work activities and the energy spent on these activities. It used methods developed by the Research Center on Labor Sciences (*Rôdô kagaku kenkyûjo*), which had conducted several surveys during the war on mineworkers' nutrition and metabolism. It was calculated that the energy spent by the miners varied between 3743 and 2863 cal. All extra-work activities, such as listening to a record, were also taken into account. The distribution of energy expenditure was 15% for sleep, 20% for extra-work activities, and 65% for work. The survey studied calorie intake at different meals, but also different nutrients and vitamins. It concluded that four of the eleven workers studied had an insufficient calorie intake, with this intake varying greatly from one person to another at 2464 to 5231. This difference was explained by the difference in alcohol consumption among miners, especially just after receiving their pay. On average, calorie intake was higher for pit workers (3365) than for those working outside the pit (3081). It was found that the miners left a lot of food uneaten, raising the need to focus on quality as much as quantity. A number of deficiencies were also found such as calcium, vitamin A, protein, fat, and vitamin D. There was also a shortage of certain foods: fish, eggs, and green vegetables.<sup>35</sup>

Demography in the mining communities was also a subject of great interest for the experts. Life tables were constructed comparing miners' life expectancies with the general Japanese population for a certain number of Kyūshū mines in the 1950s and early 1960s.<sup>36</sup> Sexual behavior also came under close scrutiny. For example, a survey on contraception was conducted in a Yamaguchi coalmine in August 1953. Birth control questionnaires were distributed to participants in information meetings. The questionnaires asked the age of the man and woman, their level of education, their monthly income, the number of children, the number of deceased children, the number of natural miscarriages, the number of abortions, and whether or not they used contraception. The survey showed a positive correlation between the level of education or income and the use of contraception and abortion. A total of 37% of the women who were high school graduates had had abortions and 32.7% used contraception. The authors concluded that it was difficult to consider contraception as the only means of birth control given the level of abortion.<sup>37</sup> Children's physical development came also under closer scrutiny. At Mitsubishi Hashima, despite the island's tiny size, the emphasis was placed on physical exercise. The Takashima Education Committee (*Takashima-chō kyōiku iinkai*) compared the island children's growth with the Nagasaki department as a whole and found that a Hashima girl's height, sitting height, weight and chest size were all clearly above the department average while the boys were closer to the average.<sup>38</sup>

As in the pre-war period, germs were considered a major threat. Employers have successfully conducted campaigns to prevent infectious diseases such as dysentery. The Mitsubishi Hashima newspaper, *Sumi no hikari* (*Light of the Coal*), covered the message put across by the Hygiene Management Section (*Eisei kanri ka*) at the Seventh Labor Hygiene Week in October 1955, stating that the workers' good health was the most important factor for productivity whereas there were many cases of dysentery in the population and everyone should wash their hands regularly.<sup>39</sup> And dysentery and tuberculosis were indeed rolled back on Hashima. Cases of tuberculosis diagnosed by collective screening campaigns fell from 46 in 1955 to 4 in 1962.<sup>40</sup> In 1956, there were 127 cases of dysentery, representing an incidence of 2.49%. By 1960, this number had fallen to just 18 for an incidence of 0.33%. On the neighboring coalmining island of Takashima, the drop was even more spectacular, from 652 (6.28%) to 75 (0.63%) over the same period.<sup>41</sup> In August 1957, *Sumi no hikari* also started publishing seasonal campaigns. It provided advice for good "summer hygiene": do not drink unboiled water, do not eat food with a funny smell, do not eat or drink too much, do not eat or drink just before going to bed, wash hands to avoid dysentery, protect against flies and mosquitoes to prevent infectious diseases, protect against Japanese encephalitis, do not expose yourself to direct sunlight and wear a hat, get enough sleep, wear warm enough clothes in bed to avoid catching cold, and go to bed early to rise early.<sup>42</sup>

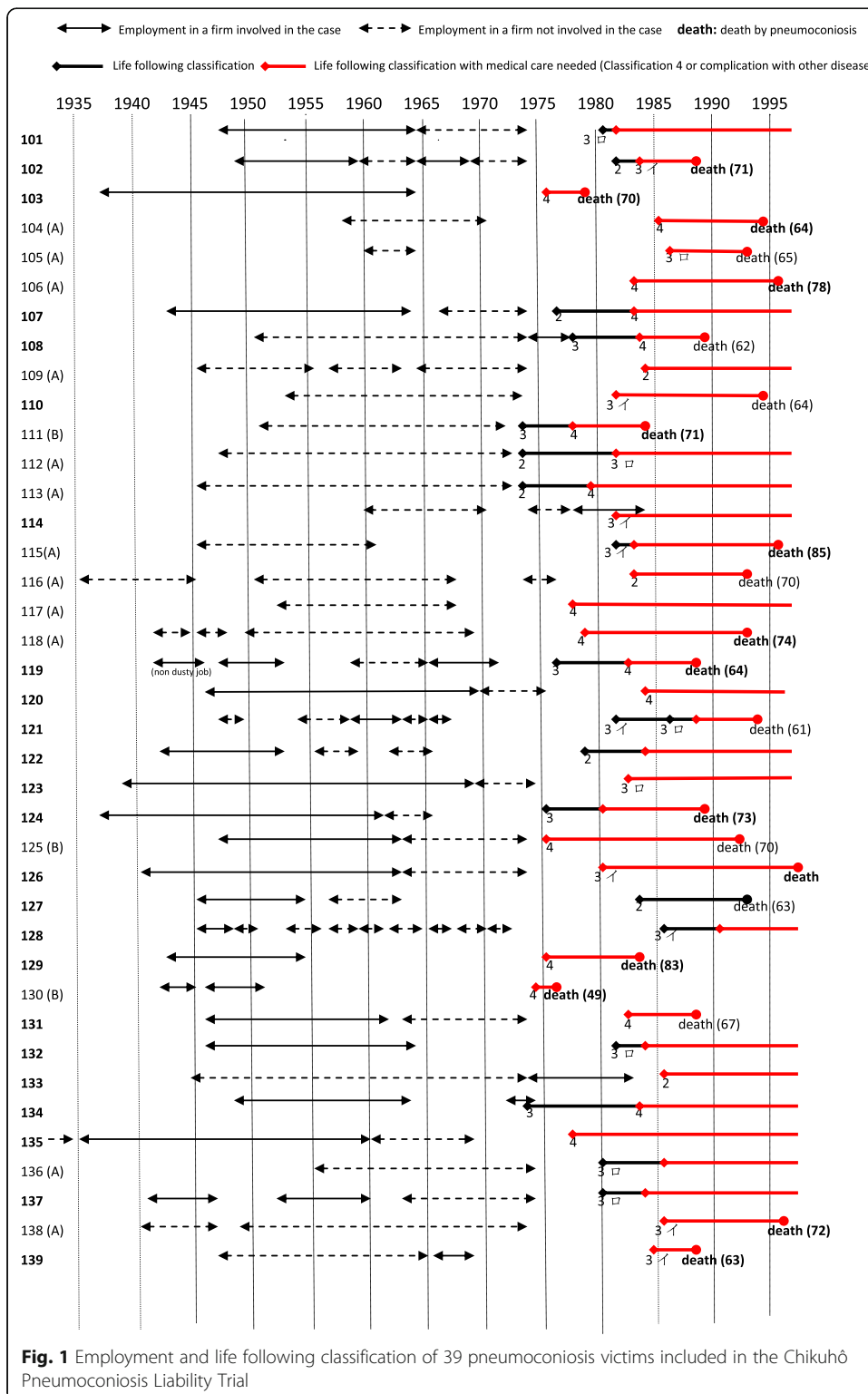
Studies were conducted on occupational diseases as of the interwar period. Prompted by the International Labour Organization, labor science experts and doctors accumulated a large body of knowledge – especially on pneumoconiosis starting in the interwar period.<sup>43</sup> Some of this knowledge reached beyond the confines of expert circles and specialized journals, spurring the labor unions to campaign for a law to be enacted and keep miners informed of their progress with their action. In April 1950, *Zenshin no hata*, the Mitsubishi Takashima coalmine labor union's newspaper, published an article entitled, "Keihai: what is eating up miners' lungs" (*Keihai: mushibamareru kōnaifu no*

*hai*). The column established a clear connection between the mechanization introduced by the rationalization policies and a deterioration in occupational health.<sup>44</sup> *Sumi no hikari* informed workers of the passage of the Silicosis Act in 1955 and campaigned for workers to have regular check-ups and not to wait for the first symptoms before seeing a doctor.<sup>45</sup> The 1955 Silicosis Act (*Keihaihô*) and the 1960 Pneumoconiosis Act (*Jin-paihô*), which also covered anthracosis, established screening procedures and introduced a compensation mechanism for the diseases. Following the Pneumoconiosis Act, labor union Tanrô led a campaign for collective agreements to be signed. For example, a collective agreement was signed in December 1962 between Asô coalmine and the company union (*Asô kôgyô rôdô kumiai rengôkai*), providing for miners who had to be transferred to a job outside the mine to be entitled to 90 days' mining wage at the time of their transfer. This collective agreement also provided for masks to be supplied free of charge to miners in jobs exposed to dust stipulated in the Pneumoconiosis Act, on the condition that they took care of them.<sup>46</sup> New company hospitals were also built and public industrial accident hospitals (*rôsai byôin*) were set up in cities near the mines.

However, despite those new institutions, there is evidence that miners continued to fall victim to a great number of diseases, with too few cases recognized and compensated while the mines were in operation. A close look at the statistics on the number of workers receiving Workers' Accident and Disease Compensation turns up serious signs of underreporting when comparing the number of cases diagnosed in just one hospital specialized in occupational accidents and diseases (*Rôsai byôin*) with total silicosis compensation. The *Iwamizawa rôsai byôin* hospital was located near Hokkaidô's Yûbari coalmine district where the mining industry employed some 17,000 people in 1960.<sup>47</sup> Starting in the mid-1950s, as many as 20,000 cases of pneumoconiosis were diagnosed in this hospital alone, with cases already at an advanced stage on admission to the hospital. Yet around the same time, from 1960 to 2000, just 35,651 victims of pneumoconiosis benefitted from the long-term compensation scheme nationwide.<sup>48</sup>

An examination of the Meiji Hirayama archives finds that very few silicosis cases were diagnosed in the early 1950s, and the few that were recognized as such were diagnosed at a very advanced stage. Yet a huge number of diagnosed tuberculosis cases may actually have been silico-tuberculosis. Following the enactment of the 1955 and 1960 laws, screening procedures were more careful to test for pneumoconiosis. Meiji Hirayama coalmine kept records of miners classified as victims of pneumoconiosis. Yet the Chikuhô liability suits<sup>49</sup> revealed that, in many cases, including in mines run by large companies, regular examinations did not take place at all or workers were not informed of test results. Statistics on the results of regular screening tests at Mitsui Miike show that the annual incidence rate stood at between 0.03% and 1.10% from 1949 to 1955. In 1956, following the enactment of the Silicosis Act, the rate jumped up to 3.54% as it took on board cases not screened before. However, thereafter it ranged from 0.3% to 0.77% between 1957 and 1964, much lower than would be expected. Mitsui Tagawa reported an even lower incidence rate of between 0.02% (1956) and 2.19% (1959).<sup>50</sup>

The Chikuhô lawsuit revealed the coalminers' disadvantage in the compromise embodied by the 1960 Pneumoconiosis Act, but it also generated a great deal of documents that provide clues about the victims' biographical details. We have drawn on these documents to reconstitute pneumoconiosis victims' individual trajectories (Fig. 1).



What is most striking about these individual trajectories is that very few cases were diagnosed during the period of employment. There was even usually a very long period between the end of employment and diagnosis. Many cases were diagnosed following the start of the lawsuits (1985). A large proportion of cases were detected at an already

very advanced stage. In most cases, treatment was needed immediately the diagnosis was made. These elements are indicative of the particular nature of pneumoconiosis whose clinical signs appear years, if not decades, after exposure to dust. However, this condition among older miners had long been known. The life tables on Miike’s miners drawn up by Haruo Mizushita (et al.) in 1953 (Table 1) show that survival ratios for pit miners were very similar to those for Japan as a whole for the 20-to-40-year-old and 40-to-55-year-old age brackets. However, for the 55-to-70-year-old age bracket, the survival ratio was just 48.3% compared with 62.3% for the nation. This was not due to a difference in the mining community’s living conditions, since the survival ratio of out-of-pit mining workers was even higher than the national average (64.4% vs. 62.3%). It is clearly associated with the particular working conditions of pit miners. When looking at life expectancy at 70 years old, it is found to be at 5.6 years for pit workers as opposed to 10.1 years for Japan as a whole.

Another survey, published in the *Journal of Industrial Medicine* in 1977, studied geographic lung cancer mortality patterns in Fukuoka Prefecture. It found high mortalities among males in the mining district of Chikuho. An analysis of the link between occupation and lung cancer mortality revealed regular, significant correlations between lung cancer mortality and mining and quarrying occupations in every census year after World War II. No other occupations were found to have such a long, consistent connection with lung cancer.<sup>51</sup>

As this study showed, a miner’s health was exposed to other work-related diseases than pneumoconiosis. These occupational diseases were indicative of the divide in the economic boom period between apparent progress with prevention and aggravation of the actual risk due especially to higher dust emissions generated by mechanization. Furthermore, lack of the most basic implementation of the procedures provided for by law combined with administrative autocracy denied workers their basic rights. This ties in with Rosental and Devinck’s thesis that silicosis can be interpreted as a “negotiated disease”, reflecting the weakness of the labor unions and the workers’ position in the face of the monopoly of expertise by industry and the administration.<sup>52</sup> Yet it also reflected a certain failure by the labor unions, able to win the 1955 and 1960 acts and collective agreements, but unable to put enough pressure on employers to really take pneumoconiosis measures. In fact, as of the late 1950s, labor unions were addressing mainly shorter-term risks: a rise in industrial accidents and explosions driven by the redundancy

**Table 1** Survey conducted in 1953 on the Survival Ratios and Life Expectancy of Miike miners

		Survival Ratio (percentage)					Life expectancy	
		0–5	5–20	20–40	40–55	55–70	0	70
Male	Total mine	92.5	89.6	94.5	88.1	52.8	59.3	6.6
	Pit	92.3	89.5	92.7	88.6	48.3	57.3	5.6
	Out-of-pit	93.5	90.5	97.7	87.5	64.4	62.2	7.2
	Total Japan	92.5	90.5	93.0	87.8	62.3	61.9	10.1
Female	Total mine	93.2	91.4	93.6	90.0	77.5	65.8	10.9
	Pit	93.0	90.5	93.6	88.6	76.9	64.3	11.3
	Out-of-pit	94.3	92.6	94.6	93.2	78.0	67.9	10.7
	Total Japan	93.1	98.8	93.0	90.5	72.1	65.5	12.0

Survey conducted by Haruo Mizushita, Norio Motoda, Gen Shinjo, Kango Tanaka, Noburo Hata, Masatake Kawai, Chikashi Mizuno and Rintaro Kikuno in 1953



plan and labor intensification. Despite the mining communities' spectacular modernization and increase in living standards, in line with the dynamics of the economic boom period, miners were not only exposed to less visible risks such as pneumoconiosis, but also to growing, more immediate risks associated with the decline of coalmining starting in the late 1950s. Rationalization and increased productivity not only raised living standards and improved material security. They also intensified work, implying new risks.

#### **Rationalization, mechanization and accidents**

A study of Meiji Hirayama and Mitsubishi Hashima archives shows the central place of industrial accident records and management, with a view to welfare compensation, in the mining companies' administration of human resources in the economic boom period. This phenomenon tied in with the development of human resources management bureaucracy and increasing numbers of accidents. Implementation of TWI management<sup>53</sup> in most mines standardized the work process and widely circulated the safety guidelines booklet. Accident prevention required miners to respect strict procedures. Yet this had adverse effects. When accidents happened, workers were sometimes denied compensation on the grounds that they had not respected the procedures, even though the accident was actually caused by too fast a work pace due to mechanization and understaffing.

Indeed, mechanization, but also the lay-off plan that cut the number of miners, had a huge impact on the work pace and this labor intensification drove up the rate of accidents.<sup>54</sup> A 1967 article in the *Journal of Labor Sciences (Rôdô kagaku)* reported that the rate of fatal accidents in large mines had risen from 3.89 per million working days (man shift) in 1958 to 11.4 in the 1962–1965 period. In the 1955–1964 period, Japan's rate of deaths from accidents at work, i.e. the number of deaths per 30,000 days of work in Japan, was four times higher than in Great Britain, six times higher than in the Netherlands and twice that of Germany. Japan posted 26 accidents killing ten people or more between 1955 and 1964 as opposed to just four in Great Britain, three in Germany and six in France. The difference was even more pronounced when looking at the number of deaths per 1 million tons of coal extracted. This rate stood at 13.07 in Japan between 1953 and 1962 compared with 1.57 in Great Britain, 2.70 in France and 2.93 in Germany. The article's author put it that Japan's coalmines were especially dangerous because of the tertiary seams. However, social and economic conditions were the main reason for this high rate of accidents with working time often exceeding ten hours, rapid mechanization, work intensification, handling of heavy materials such as steel pillars, growing outsourcing and low pay.<sup>55</sup> Meiji Hirayama coalmine archives show that it was not rare in the 1960s to find miners working three to four months in a row without a single day off, including Sunday.<sup>56</sup>

The 1960s were also marked by the 458 deaths at Miike in 1963 and the 237 killed at Yamano. Kamata Satoshi believes that the Miike explosions of 1963 and 1965 were the direct result of management's victory over and replacement of militant unionism following the 1959–1960 movement. One of the Miike slogans was indeed "*teikô nakushite anzen nashi*" (Without resistance, no more safety). Following the events, the number of sub-contracted workers increased significantly. The cause of the 1963 accident – coal dust accumulation on the conveyor – can be put down to the reduction in

worker numbers, but also to a breakdown in pit solidarity and communication: the sub-contracted workers had warned of the problem, but the permanent miners did not listen to them.<sup>57</sup>

The workers felt the deterioration in the situation. In 1964 and 1965, the Research Center for Labor Sciences conducted a survey funded by the Ministry of Education on 2000 workers in nine mines ranging in size (six on Kyūshū, one on Honshū, and two on Hokkaidō). Asked about the rationalization measures in the industry and their effects on labor, 53% felt that the workload had increased, 33% that the work had more taxing, 24% that management checks had become stricter, and 12% that fatigue had decreased.<sup>58</sup> When the workers were asked why industrial accidents occurred, the most frequently chosen reason was the priority placed on increased production over safety. A lapse in miners' attention and compliance with safety rules came in just second and third place. Moreover, many of the workers' individual responses criticized the lack of union action in this area and the lack of labor inspectorate effectiveness. Some even accused their management of hiding the reality of accidents from inspectors.<sup>59</sup>

The downturn in miner safety needs to be understood through the lens of the rationalization measures that implied a decline in working conditions, but also in economic security. As well documented by corporate archives and liability lawsuits, workers who were the object of accidents and occupational diseases were not always recognized as victims with a right to compensation. And labor unions usually did not defend such miners, who were generally dismissed because they were no longer able to work as they used to. They were simply no longer part of the company anymore. For example, looking at the files on miners leaving Meiji Hirayama from January to March 1964, many of them give sickness as the reason for dismissal. Although most of them refer to a "disease not in relation to work" (*gyōmugai shippei*), the young age of many of these miners raises serious doubts as to the real nature of the diseases. These doubts are shored up by the extremely high number of applications for compensation refused by the company, pointing to its reluctance to recognize disease and injury as being work related.<sup>60</sup> Furthermore, when families applied for compensation for the carbon monoxide poisoning that left many miners permanently disabled, as was the case ten years after the 1963 Miike explosion, the labor union did not move and left the initiative to outsiders like activist lawyers, some of whom had worked on the Minamata poisoning case.<sup>61</sup>

The proliferation of these new hazards appears to be in complete contradiction to the general postwar trend of raising miners' living standards and economic security. Yet this situation has to be understood in the light of the particular labor market situation in the mining industry.

### **Employment insecurity and deterioration in living standards**

Even in the large mines, the postwar labor market situation was far from stable. Employers faced a number of setbacks in the early 1950s. In 1949, the occupation authority stopped the reconstruction aid given following defeat. Mining suffered again after the Korean War. Even after the start of the boom period in the mid-1950s, competition from foreign coal and petrol put pressure on the industry. Against this backdrop, rationalization meant not just modernization, but cost cuts. As a basic ingredient of

Fordist growth, rationalization was a tool used to standardize, stabilize and secure the labor force, but it also implied the emergence of new risks and new economic uncertainties for workers and their families.

The appearance of new technologies such as “*kappe* mining” raised productivity. This increased the risk of accidents and gave the labor unions a hard challenge, as they had to fight to keep production standards that would not drive down wages. For example, a 1953 survey on this issue shows that Nikkan Takamatsu coalmine’s labor union called a 24-h strike in February 1952 in response to the previous year’s introduction of the new *kappe* system as part of a rationalization plan. The union asked for a downward revision of standards, since *kappe* technology had been identified as leading to falling wages. The union believed that, with the system in its pilot phase, it was hard to predict productivity and that to set a production standard could therefore mean a pay cut. The union argued that a fixed wage system (*kôteikyû*) needed to be adopted to ensure the standard of living in the mining industry. However, when the technique was introduced, management considered there was no need to change the *ukeoikyû* wage system that had prevailed under the old system.<sup>62</sup>

In fact, statistics show that although the average wage in the mining industry was higher than in other industries just after the war, it grew more slowly from the beginning of the 1950s and ended up lagging behind. In June 1959, for example, the average male wage for Miike was 28,106 yen as opposed to 30,258 yen on average for Fukuoka Prefecture.<sup>63</sup> As noted at the beginning of this article, following the 1959 Minimum Wages Act, the mining industry was one of the last to introduce a minimum wage in 1963 and mines that did not belong to the 18 leading companies had a further two years to enforce it. Furthermore, although the “standard wage” became largely dictated by stable factors such as skills, age, seniority and family situation, it had to be topped up with overtime work to really meet the needs of mining households. In the case of Meiji Hirayama, most miners worked overtime generally 20 min to an hour on ordinary workdays, but most overtime work was done by working all weekend.<sup>64</sup> It is astonishing to see how much the wages of pit miners working directly on the coalface varied from one month to the next depending on the number of days they worked.<sup>65</sup> An explanation of the highly uneven number of workdays each month may be found in the employers cutting working time to adjust production, but could also be due to miners sometimes getting caught up in a vicious cycle. Having lost money due to sickness or injury because of overwork, they may have tried make up the loss on their return to work by working overtime just to find themselves again sick or injured. In 1963, Mitsubishi Hashima’s Human Resources Director reported to a management committee meeting (*keiei kyôgikai*)<sup>66</sup> that there was too much unnecessary overtime due to excessive absenteeism. And it was precisely because there was too much overtime that there was such high absenteeism.<sup>67</sup>

At some large mines like Miike, following the great conflict of 1960 and the labor union’s defeat, the mine dropped the more stable remuneration system based on miner rotation across the productively divergent coalfaces (*ribansei*), which it had adopted under union pressure. It replaced it with the former *ukeoi* system, which pegged wages to production targets and encouraged competition among miners.<sup>68</sup> Yet the overall deterioration in working conditions in large mines was also due to a growing number of non-regular miners working even on direct mining work. In September 1950, Meiji

Hirayama had 1108 regular miners (*zaiseki*), 428 regular employees working outside the pit, and no temporary miners (*rinjifu*) or sub-contracted workers (*ukeoifu*) in the pit. The 174 temporary workers there were worked outside the mine. By January 1965, there were just 415 regular miners and 124 regular employees working outside the pit. Where the number of regular miners had fallen, 58 sub-contracted workers were now working at the mine, including 55 directly at the coalface. There were six temporary workers, although they were assigned to tasks outside the mine.<sup>69</sup> The pit also employed day laborers (*hiyatoi*). Many of them worked every day of the month, sometimes two teams in a row.<sup>70</sup> The mine companies also used subsidiaries (*kogaisha*) to extract the remaining coal from old, less profitable seams. All extracted coal was sold to the parent company. At Mitsubishi Bibai, for example, the advent of sub-contracting saw most miners retired from Mitsubishi, with many former regular miners working after retirement until they could claim their pension at 65 years old. Mitsubishi miners' children and workers from other companies were also subsequently recruited. In 1960, subsidiary *Kita bishi sangyô* counted 714 miners made up for 20% of miners' children, 20% of retirees and 60% of workers from the outside.<sup>71</sup>

Where job insecurity was on the increase at the large mines and their subsidiaries, working and living conditions at the smaller, locally owned, low-capital mines working networks of shallow galleries had never come anywhere near the larger mines' standards. For example, even after the war, many women still worked in the pit despite a legal ban on it. A 1954 survey found that wages were set entirely by the *ukeoikyû* system. Pay was pegged exclusively to meeting the standard target. There were no fixed components. And targets were not counted solely on the basis of the number of baskets (*hako*) brought to the surface. The volume of coal ultimately counted also depended on the amount of good and bad ore in the minercarts. The supervisor tested (*kentan*) a portion of coal to be counted for the pay, which raises the question as to the fairness of these tests.<sup>72</sup>

Matthew Allen conducted an oral history study of Chikuhô, showing that the owners of these small mines knew they were soon going to have to close down, so they tried to get "what they could while they could". Miners could not leave the pit until they had produced their daily quota. Consequently, "There were a lot of caves-ins where one or two people were killed at a time, mainly through carelessness caused by exhaustion ... When someone was sick the company would send two or three of the overseers to drag the man out of bed and send him down the mines. If he wouldn't go, he was beaten."<sup>73</sup> And the outside police seldom intervened in these violent episodes, choosing to regard this daily violence as a 'company matter'.<sup>74</sup>

The closure of these small mines brought massive unemployment. A 1955 survey by Tanrô union's Kyûshû Industrial Sciences Research Center (*Tanrô Kyûshû sangyô kagaku kenkyûjo*) of 815 households of unemployed miners from Kyûshû SME found that miners in many small mines about to close were sometimes working almost for nothing and did not receive their due pay when they were laid off. Some small mines reopened, but only to offer very low wages and long working hours. According to the survey, 22.1% of people at work had less than seven meals a week, 28.7% less than 14, and 21.2% less than 20, with just 27% having 21 meals a week. For family members at home, these figures were respectively 35.1%, 33.4%, 17.8% and 13.6%. Average calorie consumption was an estimated 2000 cal, less than the recommended daily intake of

2400 cal. Taking the consumption of sugar as a good indicator of living standards, only 70 of the 815 surveyed households consumed sugar. In terms of housing, 71% of families with an average of 4.8 people lived on less than 10 tatami mats. This makes for an average of 1.81 tatami mats per person compared with 2.79 tatami mats per person in Tokyo, where accommodation was not particularly spacious. A total of 51.7% had houses that were not protected from the rain, and 16.9% had no electricity because they had not yet been paid or because the mine had closed. Growing numbers of schoolchildren did not have lunch, an umbrella for rainy days, or schoolbooks. Malnutrition had adverse impacts on the children's health. In the primary school in the mining town of Higashi Matsuura in Saga department, 45% of the 55 children who did not have lunch were underweight, 65% were anemic, 51% had angular cheilitis, and 26% had keratosis pilaris.<sup>75</sup>

In December 1959, the Medical Faculty of the University of Kyūshū conducted a survey on living conditions in mining communities in Chikuhō. The survey focused on public well water quality in districts where mines had closed, and revealed that 86% of the districts had problems finding safe, clean water. Groundwater could not be used as pollution from the mine made it hard to prevent bacterial contamination. So surface water or rainwater was usually used, but it was not kept separate enough from the toilet points. The wells used for drinking water bred infectious disease and were behind the large number of people infected with parasites.<sup>76</sup>

At the end of the 1950s, with conditions in these former mining communities seriously deteriorated and public policies inadequate, a national solidarity movement grew up under the name of "*Kuroi hane undō*" (Black Feather Movement) in reference to much older red feather movements that gave a red feather to every person who gave charity for those in need. The movement, backed by media images of children suffering from malnutrition, collected more than 39 million yen.<sup>77</sup> In left wing circles, Chikuhō became a symbol of destructive capitalism, giving birth to a new literary movement, *sākuru mura*, which published such literary journals as *Underground Battlefield* (*Chika sensen*) and *Mining Nagaya* (*Tankō nagaya*) in the 1950s. Its most famous member, Ueno Eishin, a former miner himself, gave many interviews and had *Owareyuku kōfutachi* (The miners put to flight) published by the prestigious Iwanami publishing house in 1960. The book delved in detail into the misery of the lives led by the Chikuhō miners, who were still paid in private currency that risked becoming worthless if the mine went bankrupt and where the unemployed sometimes had to sell their blood to survive.<sup>78</sup>

Obviously, as Ogino<sup>79</sup> has shown, workers in large mines and small mines came under such different management practices following the rationalization movement of the 1930s that they could no longer be considered as belonging to the same social class. Shimazaki Naoko's research on the Jōban case, on the other hand, has shown how the redundant worker re-employment policies developed in the 1970s mainly for the larger mines were based, sometimes successfully, on the experience built during the first period of mine closures in the 1960s, which mainly concerned the smaller mines.<sup>80</sup> However, what is certain is that for miners in general, whether from small or large mines, the industrial transition meant a drop in their standard of living at a time when Japanese society was experiencing the fastest economic growth in its history.



## Conclusion

The case of coalmining sheds an interesting light on the two dominant narratives in the social history of Japan's economic boom period. Labor unions and grassroots associations in coalmining communities were not passive in the process of the stabilization and standardization of miners' lives. Consumer cooperatives and housewives' associations, for example, were active alongside employers and outside experts in "molding Japanese minds", to borrow the expression from historian Sheldon Garon,<sup>81</sup> and raising mining working class living standards to bring them closer to the middle class way of life. Labor unions also managed, up to a certain point, to negotiate a more stable wage form. To put it more broadly in Foucauldian terms, civil society played its part in shaping the prewar "power-knowledge system" set in motion to raise workers' living standards that generated real change in the postwar period. It is indeed an oversimplification to reduce the economic, social and cultural changes in mining communities to the dashing of workers' hopes of autonomy by a growing "neo-Gramscian" hegemony regarding the value of capitalism. Yet there is also more to the story than the narrative of a social compromise driven by rationalization and productivity policies that generated an inexorable, universal Fordist virtuous circle leading the working class to security. A close look at the social history of postwar mining communities highlights the divide between the growing stabilization of miners' lives with the advance of the welfare state and the increasing physical and economic risks they faced with the advance of the industry's rationalization policies. This divide can be explained in different ways, by the fact that there were always big differences between the large and smaller mines or by the particular characteristics of diseases such as pneumoconiosis and cancer that tended to be invisible as long as the miner was working. Yet there are other factors directly associated with the rationalization policies' ulterior motives. Progress with managing the health of workers in the large mines was naturally always as much for the purpose of control and selection as protection. However, in the late 1950s, with the uncertainties of an industry in widespread recession, the rationalization policies started to change from being processes where experts and employers endeavored to balance short-term profits with long-term labor force retention and reproduction. Rationalization turned into a cost-cutting, redundancy, and mechanization exercise conducted for short-term results with inadequate security measures. In this respect, labor movement developments certainly had their role to play with active, aggressive labor unions in the 1940s and early 1950s and more submissive or defensive unions in the 1960s, focused not so much on working conditions as defending jobs. In an environment of rapid industrial restructuring, none of the worker defense strategies available to the unions was able to meet the aspiration of greater security that the workers may have had at this time of high growth and widespread rising living standards. Of course, many miners moved into growth industries and left coal basins. This has generally occurred as part of a well-organized reallocation process. An OECD report by McKersie and Seugenberger found that in the Japanese coal industry, during the period when employment rose from over 100,000 to 37,000 between the second half of the 1960s and the early 1970s, 80% of displaced workers were reassigned to new tasks in the same conglomerate groups.<sup>82</sup> However, as the research conducted by Fujimi Junko and Shimazaki Naoko in *Joban* showed, it was far from being an easy experience for the miners and their families.<sup>83</sup> Indeed, for these miners, precisely because they had been settled in more stable communities where their families could benefit from a wide range of social services that



made them part of the new middle class, and because an exit strategy was usually tantamount to social downgrading, before the mines closed, there was usually no alternative other than to accept labor intensification and its risks and the partial lowering of their living standards.

## Endnotes

<sup>1</sup>Gordon Andrew, *The Wages of Affluence: Labor and Management in Postwar Japan*, Cambridge, Harvard University Press, 1998. Hyōdō Tsutomu, *Nihon ni okeru rōshi kankei no hatten*, Tōkyō, Tōkyō daigaku shuppankai, 1971.

<sup>2</sup>Kume Ikuo, *Disparaged Success: Labor Politics in Postwar Japan*, Ithaca, Cornell University Press, 1998.

<sup>3</sup>Garon Sheldon, *Molding Japanese Minds: The State in Everyday Life*, Princeton, Princeton University Press, 1997. Sugayama Shinji, *Shūsha shakai no tanjō*, Nagoya, University of Nagoya Press, 2011. Takahashi Hirohiko, *Senkanki Nihon no shakai kenkyū sentā - Ōhara shaken to Kyōchōkai*, Tōkyō, Hakushobo, 2001.

<sup>4</sup>Saguchi Kazuo, *Nihon ni okeru sangyō minshushugi no zentei*, Tōkyō, Tōkyō daigaku shuppansha, 1991.

<sup>5</sup>Thomann Bernard, *La Naissance de l'Etat Social – Travail, Biopolitique et Citoyenneté dans le Japon Impérial*, Paris, Presses de SciencesPo, 2015.

<sup>6</sup>Hazama Hiroshi, *Nihon rōmu kanrishi kenkyū*, Tōkyō, Ochanomizu shoten, 1978.

<sup>7</sup>Korean and Chinese miners, whose numbers in 1937 amounted to only 6000 individuals, or 3% of all miners, were 133,000 in 1945, for 34% of the mining workforce. Yamaguchi Asuka, « Senji tōseiki no sekitan zōsan to shizai mondai », in Sugiyama Shinya, Ushijima Toshiaki (ed.), *Nihon sekitan sangyō no suitai*, Tōkyō, Keiō daigaku shuppankai, 2012, p. 49.

<sup>8</sup>K. Kusuda *Sekitan kōgyō*, « Rōdōsha no seikatsu jitai », *Rōdō tōkei chōsa geppō*, Vol. 4, No. 4, April 1952.

<sup>9</sup>The Engel index measures the the proportion of income spent on food.

<sup>10</sup>In 1960, the average national Engel index stood at 41.6%. However, the fact that the index in mining communities was higher than the national average does not point to a lower standard of living than the rest of the Japanese population considering that the share spent on housing was very low.

<sup>11</sup>Imamiya Tamie, “Tankō jūtaku seikatsu chōsa hōkoku – Shokuseikatsu o chūshin to shite”, *Fukuoka gakugei daigaku Kurume bunkō kyōiku kenkyūjo kenkyū kiyō*, n.12, march 1962, pp. 15–16.

<sup>12</sup>Shimoyama Fusao, “Tankō rōdōsha no seikatsu jikan – Chūshō tankō ni okeru jirei chōsa”, *Rōdō kagaku*, Vol. 42, No. 5, 1966, pp. 392–404.

<sup>13</sup>Sugiyama Shinya, “Keisha seisan’ kōsō to shigen rōdōryoku shikin mondai”, in Sugiyama Shinya, Ushijima Toshiaki (Ed.), *Nihon sekitan sangyō no suitai – Sengo Hokkaidō ni okeru kigyō to chiiki*, Tōkyō, Keiō gijukudaigaku shuppankai, 2012, pp. 79–84.

<sup>14</sup>Sengo tankō keiei shiryō Hashima 5532–5539

<sup>15</sup>Mitsubishi Bibai tankō rōdō kumiai, *Tankō ni ikiru – Tankō rōdōsha no seikatsushi*, Tōkyō, Iwanami shoten, 1960, pp. 136–138.

<sup>16</sup>Archives Mitsubishi Hashima B 219–221, *Shokuryō kankei shorui tsuburi*, *Kyūsanrō*, 412

<sup>17</sup>See Gordon Andrew, “Managing the Japanese Household: The New Life Movement in Postwar Japan”, *Social Politics*, Summer 1997, p.262

<sup>18</sup>Nagasaki ken shinseikatsu undô suishin renmei honbu, Kigyôtai, shinseikatsu undô no susumikata, p.1. Sengo tankô keiei shiryô Hashima 5591–5620

<sup>19</sup>Op. cit., pp. 4–5.

<sup>20</sup>Sengo tankô keiei shiryô Hashima5514=5531

<sup>21</sup>Sengo tankô keiei shiryô Hashima5540=5556

<sup>22</sup>Tanaka Tomoko, “Sengo no Miike tankô ni okeru rômu kanri to rôdôsha no teikô ni kan suru kenkyû – Miike tankô ga naihô shita mondai ni chakumoku shite”, *Bukkyô daigaku daigakuin kiyô Shakai fukushigaku kenkyûka hen*, No.38, March 2010, p. 60.

<sup>23</sup>Teruoka Gitô, “Tankô rôdô no rôdô jôken ni kan suru kenkyû e no hassoku ni sai shite”, *Rôdô kagaku*, Vol. 24, No. 23, April 1943, pp. 1–5.

<sup>24</sup>For more details see Shimanishi Tomoki, *Nihon sekitan sangyô no sengoshi*, Tôkyô, Keiôgijuku daigaku shuppankai, 2011.

<sup>25</sup>Henmi Shigeo, *Tankô rôdô undô no gendankai in Rôdô mondai chôsa*, Sangyô kokkan to rôdôsha kaikyû: sekitan yama o chûshin toshite, Tôkyô, Chûô rôdô gakuen, 1949, p.252.

<sup>26</sup>*Nihon Sekitan kôgyô keieisha kyôgikai, Kôin chingin seido yôran*, 1957.

<sup>27</sup>Sengo tankô keiei shiryô, Meiji Hirayama 6486–6496(“Archives on post war coal-mining management, Meiji Hirayama”)

<sup>28</sup>Tanaka Tomoko, “Sengo no Miike tankô no okeru rômu kanri to rôdôsha no teikô ni kan suru kenkyû – Miike tankô ga naihô shita mondai ni chakumoku shite”, *Bukkyô daigaku daigakuin kiyô Shakai fukushigaku kenkyûka hen*, No. 38, March 2010, p. 60.

<sup>29</sup>Fujimoto Takeshi, *Nihon ni okeru saitei chinginsei mondai (3)*, *Rôdô kagaku*, Vol. 36, n.7, July 1960, pp. 347–354.

<sup>30</sup>“Sekitan kôgyô no saitei chinginsei ni kan suru chûkan tôshin ni tsuite”, *Kyûyô geppô*, Vol. 16, n. 5, 1962, pp. 4–7

<sup>31</sup>Isobe Kiichi, “Saitei chinginsei no mondai”, *Nihon rôdô kyôkai zasshi*, Vol. 4, No. 12, Dec. 1962, pp. 13–16.“Sekitan kôgyô no saitei chinginsei ni kan suru chûô saitei chingin shingikai no tôshin ni tsuite”, *Kyûyô geppô*, Vol. 16, No. 11, 1962, pp. 1–9.

<sup>32</sup>Ichihara Hiroshi, “Sengo Nihon tankô rôshi kankei no tokushitsu to ‘tankô shakai’ no keisei”, *Keiei shigaku*, vol.27, n.3, 1992, p.2.Ichihara Hiroshi, *Tankô no rôdô shakai-shi – Nihon no dentôteki rôdô shakai to chitsujo kanri*, Tôkyô, Taga shuppan, 1997.

<sup>33</sup>Sengo tankô keiei shiryô Hashima5474–5490

<sup>34</sup>Mitsubishi Bibai tankô rôdô kumiai, *Tankô ni ikiru – Tankô rôdôsha no seikatsushi*, Tôkyô, Iwanami shoten, 1960, p.186.

<sup>35</sup>Hokkaidô-ritsu shokuryô eiyô kenkyûjo, “Tankô rôdôsha no rôdôryô to eiyô ni kan suru chôsa”, 1952.

<sup>36</sup>Mizushima Haruo, Motoda Norio, Shinjo Gen, Tanaka Kango, Hata Noboru, Kawai Masatake, Mizuno Chikashi and Kikuno Rintaro, “Life Tables For An Iron Factory, A Coalmine And Agricultural Villages”, *Nihon jinkô gakkai kiyô*, A10-A24, March 1954. Shigematsu Takao, Ishizawa Masaichi, Morikawa Yukio, Kuratsune Masanori, “Life tables for the workers and their family dependents of the coalmining companies in Kyûshû for the year of 1961”, *Sangyô igaku*, Vol. 7, No. 1, January 1965, pp. 5–15.

<sup>37</sup>“Aru tankô rôdô kumiai katei o taishô to saseru sanji chôzetsu mondai ni kan suru chôsa”, *Nihon sanko fujin kagakukai - Chûgoku shikoku rengô chihô bukai zasshi.*, Vol. 3, No. 2, August 1954.

<sup>38</sup>Takashima-chô kyôiku iinkai, *Supôtsu shônendan katsudô no genjô*, Nov. 1965.

<sup>39</sup>*Sumi no hikari*, 5 October 1956.

<sup>40</sup>*Sengo tankô keiei shiryô Hashima*5569–5579

<sup>41</sup>*Sengo tankô keiei shiryô Hashima*5540–5556

<sup>42</sup>*Sumi no hikari*, 8 August 1957.

<sup>43</sup>Thomann Bernard, “Nihon ni okeru shokugyôbyô shikkan toshite no keihaishô: sono ninchi to hoshô e no nagai dôtei” (in Japanese), *Ôhara shakai mondai kenkyûjo zasshi*, No. 609, July 2009, pp. 34–46. Bernard Thomann, “L’hygiène nationale, la société civile et la reconnaissance de la silicose comme maladie professionnelle au Japon (1868–1960)”, *Revue d’histoire moderne et contemporaine*, No. 56–1, 2009/1, pp. 142–176.

<sup>44</sup>*Zenshin no hata*, 5 April 1950

<sup>45</sup>*Sumi no hikari*, 5 October 1955, 5 October 1956.

<sup>46</sup>Unpublished document

<sup>47</sup>Kimura Kiyonobu, Nakano Ikuo, Takeuchi Hiroshi, Sakai Ichiro, Igarashi Takeshi, Kojima Jun’ichirô, “Coal Workers’ pneumoconiosis in Japan, *Japanese Journal of Occupational Medicine and Traumatology*”, Vol. 53, No. 3, 2005, pp. 123–127.

<sup>48</sup>We use unpublished Ministry of Labor statistics provided to us by NGO The National Network of Labor Security and Hygiene Centers (*Zenkoku rôdô anzen eisei sentâ renraku kaigi*).

<sup>49</sup>On December 26, 1985, 84 victims and 39 deceased victims’ family members, supported by a group of lawyers associated with other high-profile cases such as the Minamata pollution suit, filed a lawsuit against the government and six major mining companies. On July 20, 1995, Fukuoka District Court ordered the six mining companies to pay 1.97 billion yen in damages for 104 pneumoconiosis patients who had worked at the mines, but did not recognize the government’s liability. Following settlements with Mitsubishi, Sumitomo and Furukawa, an appeal hearing by Fukuoka High Court on July 19 2001 ordered the government and three companies to pay some 1.91 billion yen in compensation to former coalminers. On April 27, 2004, the Japanese Supreme Court ruled against Nittetsu Mining and the government and awarded a total of 566 million yen in damages to the plaintiffs.

<sup>50</sup>*Kaku kôgyôjo betsu jinpai (keihai) yûshokensha sui hyô*, Archives on Chikuhô lawsuit, Chôdai 11 gôshô.

<sup>51</sup>Shigematsu T, Yamasaki M., *Sangyô Igaku*. 1977 Jul;19(4):182–8.

<sup>52</sup>Rosental Paul-André, Devinck Jean-Claude, “Statistique et mort industrielle. La fabrication du nombre de victimes de la silicose dans les houillères en France de 1946 à nos jours”, *Vingtième Siècle. Revue d’Histoire*, No. 95, July–September 2007, pp. 75–91.

<sup>53</sup>The Training Within Industry (TWI) program was created during WWII by the United States and was transferred to Japan during the American occupation period (1945–1952). In Japan, this program to improve job training and working methods was very well received by enterprises. In the Training Within Industry (TWI) program, there was in particular an important job safety program that was used by many Japanese coal mine enterprises.

<sup>54</sup>Studies in the 1960s and 1970s also showed that the increasingly deep mining exploitation of coal seams were reasons of the increase in underground labor accident. Kuroiwa Tadaharu, Nakamura Shoji, Kikuchi Akira, « Mitsui sunagawa ikkô ni okeru tansô no kôzô chôsa to kore ni kizuku gasu tosshutsu hassei yôin no kôsatsu », *Journal of the Mining and Metallurgical Institute of Japan*, Vol. 81, No. 932, 1965, pp. 1031–1038. Mori Noriyasu, Isobe Toshiro, Kameda Ikuro, « Tankô ni okeru shindô to shingen-iki ni kansuru kenkyû », *Nihon kôgyôkaishi*, Vol. 90, No.1033, 1974, pp. 167–173.

<sup>55</sup>Fujimoto Takeshi, “Saikin ni okeru tankô rôdô saigai”, *Rôdô kagaku*, Vol. 43, No. 5, 1967, pp. 273–297.

<sup>56</sup>Coal mines have traditionally suffered from a higher rate of absenteeism from work than in other industries. What the mining companies’ archives and a number of interviews with former miners in the Chikuhô and Miike basins (carried out in autumn 2017) have shown us is a very significant irregularity, with a succession of months where there are almost no rest days and months where one only works a few days. There is also a very large variation between individual miners.

<sup>57</sup>Kamata Satoshi, *Tankô (Zenkiroku)*, Tôkyô, Soshinsha, 2007.

<sup>58</sup>Shinoyama Fusao, “Tankô rôdôsha no rôdô seikatsu to iken (I)- Rôdôsai saigai mondai o chûshin ni shita anketo chôsa no bunseki”, *Rôdô kagaku*, Vol. 42, No. 9, 1966, pp. 626–652.

<sup>59</sup>Shinoyama Fusao, “Tankô rôdôsha no rôdô seikatsu to iken (II)-”, *Rôdô kagaku*, Vol. 43, No. 3, 1967, pp. 172–193

<sup>60</sup>Kôin taishokusha meibo, January–March 1964, Meiji Hirayama, 15–6 61–68.

<sup>61</sup>Kamata Satoshi, *Tankô (Zenkiroku)*, Tokyo, Soshinsha, 2007.

<sup>62</sup>“Nittan Takamatsu ni okeru kappe saitan to chingin jisseki”, in Tokita Yoshihisa hen, *Kyûshû tankô rôdô chôsa shûsei*, Tôkyô, Hôritsu bunkasha, 1989, p. 67.

<sup>63</sup>Tanaka Tomoko, “Sengo no Miike tankô no okeru rômu kanri to rôdôsha no teikô ni kan suru kenkyû – Miike tankô ga naihô shita mondai ni chakumoku shite”, *Bukkyô daigaku daigakuin kiyô Shakai fukushigaku kenkyûka hen*, No. 38, March 2010, pp. 55–71.

<sup>64</sup>Sengo tankô keiei shiryô Meiji Hirayama 6871–6880

<sup>65</sup>Sengo tankô keiei shiryô Meiji Hirayama 6750–6760

<sup>66</sup>A joint labor-management committee that was created just after the war in most Japanese enterprises.

<sup>67</sup>Keiei kyôgikai 1963 Sengo tankô keiei shiryô, Hashima tankô, 5434–5443

<sup>68</sup>Tanaka Tomoko, *op. cit.*, p. 64.

<sup>69</sup>Meiji Hirayama 15–15, 216–219

<sup>70</sup>Sengo tankô keiei shiryô Meiji Hirayama 6750–6760

<sup>71</sup>Mitsubishi Bibai tankô rôdô kumiai, *Tankô ni ikiru – Tankô rôdôsha no seikatsushi*, Tôkyô, Iwanami shoten, 1960, p. 188.

<sup>72</sup>“Chûshô tankô ni okeru kentan kitei o meguru montaiten (Nov. 1954) – Nakashima kôgyô sanko no kaku tankô no bai”, in Tokita Yoshihisa hen, *Kyûshû tankô rôdô chôsa shûsei*, Tôkyô, Hôritsu bunkasha, 1989.

<sup>73</sup>Miner’s interview from Matthew Allen, *Undermining the Japanese Miracle*, Cambridge, Cambridge University Press, 1994, p. 84.

<sup>74</sup>Allen Matthew, *Undermining the Japanese Miracle*, Cambridge, Cambridge University Press, 1994, p. 111.

<sup>75</sup>“Tonden seikatsu ni aegu chūshō tankō no rōdōsha”, *Rōdō shūhō*, No 759, November 26, 1955.

<sup>76</sup>Myojo Tomomi, “Kuroi hane undo” no igi ni kan suru kōsatsu – Enerugī seisaku tenkanki ni okeru shakai fukushi no jittai o tōshite, *Nihon fukushi daigaku fukushi shakai kaihatsu kenkyūjo ‘Nihon fukushi daigaku kenkyū yōkō-gendai to bunka’*, No. 126, 9 2012, p. 83–105.

<sup>77</sup>Idem

<sup>78</sup>Ueno Eishin, *Owareyuku kōfutachi*, Tōkyō, Iwanami shoten, 1960.

<sup>79</sup>Ogino Yoshihiro, *Chikuhō tankō rōshi kankei shi*, Fukuoka: Kyūshū daigaku shuppan, 1993.

<sup>80</sup>Shimazaki Naoko, 2004 “Process for decision of reemployment of discharged coal-miners - Micro data analysis at the time of the mine closure of the Joban Coalmine K.K. in 1971”, *Proceedings of the Graduate School of Letters, Arts and Sciences, Waseda University*, No. 49, pp. 43–56

<sup>81</sup>Garon Sheldon, *Molding Japanese Minds: The State in Everyday Life*, Princeton, Princeton University Press, 1997.

<sup>82</sup>McKersie, R. B., Seugenbercer, *WM Job Losses in Major OECD Industries*, Paris, 1983.

<sup>83</sup>Fujimi Junko, Shimazaki Naoko (hen). *Tankō rōdōsha no heizan rishoku to kyaria no sai keisei: Kyū tokiwa tankō K. K. kōin no jūdan chōsa kenkyū*. Tōkyō: Waseda Daigaku ningen sōgō kenkyū sentā, 1998–2007.

#### Abbreviations

GATT: General Agreement on Tariffs and Trade

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#### References

- Allen, Matthew. 1994. *Undermining the Japanese miracle*. Cambridge: Cambridge University Press.
- Anonymous. 1962. *Sekitan kōgyō no saitei chinginsei ni kan suru chūkan tōshin ni suite*. *Kyūyo geppō* 16-5: 4-7.
- Fujimoto, Takeshi. 1960. *Nihon ni okeru saitei chinginsei mondai (3)*. *Rōdō kagaku* 36-7: 347-354.
- Fujimoto, Takeshi. 1967. *Saikin ni okeru tankō rōdō saigai*. *Rōdō kagaku* 43-5: 273-297.
- Garon, Sheldon. 1997. *Molding Japanese minds: The state in everyday life*. Princeton: Princeton University Press.
- Gordon, Andrew. 1997. *Managing the Japanese household: The new life movement in postwar Japan*. *Social Politics*: 245-283.
- Gordon, Andrew. 1998. *The wages of affluence: Labor and Management in Postwar Japan*. Cambridge: Harvard University Press.
- Hazama, Hiroshi. 1978. *Nihon rōmu kanrishi kenkyū*. Tōkyō: Ochanomizu.
- Henmi, Shigeo. 1949. *Tankō rōdō undō no gendankai in Rōdō mondai chōsajo, Sangyō kokkan to rōdōsha kaikyū: sekitan yama o chūshin toshite*. Tōkyō: Chūō rōdō gakuen.
- Hokkaidōritsu shokuryō eiyo kenkyūjo. 1952. *Tankō rōdōsha no rōdōryō to eiyo ni kan suru chōsa*.
- Hyōdō, Tsutomu. 1971. *Nihon ni okeru rōshi kankei no hatten*. Tōkyō: Tōkyō daigaku shuppankai.
- Ichihara, Hiroshi. 1992. *Sengo Nihon tankō rōshi kankei no tokushitsu to 'tankō shakai' no keisei*. *Keiei shigaku* 27-3: 1-33.
- Ichihara, Hiroshi. 1997. *Tankō no rōdō shakai-shi – Nihon no dentōteki rōdō shakai to chitsujo kanri*. In *Tōkyō: Taga shuppan*.
- Imamiya, Tamie. 1962. *Tankō jūtaku seikatsu chōsa hōkoku – shokuseikatsu o chūshin toshite*. *Fukuoka gakugei daigaku Kurume bunkō kyōiku kenkyūjo kenkyū kiyō* 12: 10-35.
- Isobe, Kiichi. 1962. *Saitei chinginsei no mondai*. *Nihon rōdō kyōkai zasshi* 12: 13-16.
- Junko, Fujimi, and Naoko, Shimazaki. 1998–2007. *Tankō rōdōsha no heizan rishoku to kyaria no sai keisei: Kyū tokiwa tankō K. K. kōin no jūdan chōsa kenkyū*. Tōkyō: Waseda Daigaku ningen sōgō kenkyū sentā.
- Kamata, Satoshi. 2007. *Tankō (Zenkiroku)*. Tōkyō. In *Soshinsha*.
- Kimura, Kiyonobu and alii. 2005. *Coal workers' pneumoconiosis in Japan*, *Japanese Journal of Occupational Medicine and Traumatology* 53-3: 123-127.
- Kume, Ikuo. 1998. *Disparaged success: Labor politics in postwar Japan*. Ithaca: Cornell University Press.
- kumiai, Mitsubishi Bibai tankō rōdō. 1960. *Tankō ni ikiru – Tankō rōdōsha no seikatsushi*. Tōkyō: Iwanami shoten.
- Kusuda sekitan kōgyō, K. 1952. *Rōdōsha no seikatsu jitai*. *Rōdō tōkei chōsa geppō* 4 (4).
- McKersie, R.B., and W.M. Seugenbercer. 1983. *Job losses in major OECD industries*. Paris.
- Mizushima, Haruo, Motoda, Norio, Shinjo, Gen, Tanaka, Kango, Hata, Noboru, Kawai, Masatake, Mizuno, Chikashi and Kikuno, Rintaro. 1954. *Life tables for an Iron factory, a coalmine and agricultural villages*. *Nihon jinkō gakkai kiyō*.

- Nihon Sekitan kōgyō keieisha kyōgikai. 1957. Kōin chingin seido yōran.
- Noriyasu, Mori, Toshiro, Isobe, and Ikuro, Kameda. 1974. Tankō ni okeru shindō to shingen-iki ni kansuru kenkyū. *Nihon kōgyōkaishi*. 90-1033 : 167–173.
- Ogino, Yoshihiro. 1993. 1993. *Chikuho tanko roshi kankei shi*. Fukuoka: Kyūshū daigaku shuppan.
- Rosental, Paul-André, and Devincq Jean-Claude. 2007. Statistique et mort industrielle. La fabrication du nombre de victimes de la silicose dans les houillères en France de 1946 à nos jours. Vingtième Siècle. *Revue d'Histoire* 95: 75–91.
- Saguchi, Kazuo. 1991. Nihon ni okeru sangyō mishushugi no zentei. In *Tōkyō: Tōkyō daigaku shuppansha*.
- Shigematsu, T., and M. Yamasaki. 1977. *Sangyō Igaku* 19-4: 182–188.
- Shigematsu, Takao, Masaichi Ishizawa, Yukio Morikawa, and Kuratsune Masanori. 1965. Life tables for the workers and their family dependents of the coalmining companies in Kyūshū for the year of 1963. *Sangyō igaku* 7-1: 5–15.
- Shimanishi, Tomoki. 2011. Nihon Sekitan Sangyō no sengoshi. *Tōkyō: Keiōgijuku daigaku shuppankai*.
- Shimazaki, Naoko. 2004. Process for decision of reemployment of discharged coalminers - micro data analysis at the time of the mine closure of the Joban coalmine K.K. in 1971. *Proceedings of the Graduate School of Letters, Arts and Sciences, Waseda University* 49: 43–56.
- Shimoyama, Fusao. 1966. Tankō rōdōsha no seikatsu jikan – Chūshō tankō ni okeru jirei chōsa. *Rōdō gagaku* 42-5 : 392–404.
- Shinoyama, Fusao. 1966. Tankō rōdōsha no rōdō seikatsu to iken (I)- Rōdōsai saigai mondai o chūshin ni shita anketo chōsa no bunseki. *Rōdō kagaku*. 42-9: 626–652.
- Shinoyama, Fusao. 1967. Tankō rōdōsha no rōdō seikatsu to iken (II). *Rōdō kagaku*. 43-3: 172–193.
- Sugayama, Shinji. 2011. *Shūsha shakai no tanjō*. Nagoya: University of Nagoya Press.
- Sugiyama, Shinya. 2012. "Keisha seisan' kōsō to shigen rōdōryoku shikin mondai", in *Nihon sekitan sangyō no suitai – Sengo Hokkaidō ni okeru kigyō to chiiki*, ed. Sugiyama Shinya, Ushijima Toshiaki, 79–84. Tōkyō.
- Tadaharu, Kuroiwa, Shoji, Nakamura, and Akira, Kikuchi. 1965. Mitsui sunagawa ikkō ni okeru tansō no kōzō chōsa to kore ni kizuku gasu tosshutsu hassei yōin no kōsatsu. *Journal of the Mining and Metallurgical Institute of Japan*. 81- 932: 1031–1038.
- Takahashi, Hirohiko. 2001. Senkaki Nihon no shakai kenkyū sentā - Ōhara shaken to Kyōchōkai. In *Tōkyō: Hakushōbo*.
- Takashima-chō kyōiku iinkai. 1965. Supōtsu shōnendan katsudō no genjō.
- Tanaka, Tomoko. 2010. Sengo no Miike tankō no okeru rōmu kanri to rōdōsha no teikō ni kan suru kenkyū – Miike tankō ga naihō shita mondai ni chakumoku shite. *Bukkyō daigaku daigakuin kiyō Shakai fukushigaku kenkyūka hen* 38: 55–71.
- Teruoka, Gitō. 1943. Tankō rōdō no rōdō jōken ni kan suru kenkyū e no hassoku ni sai shite. *Rōdō kagaku* 24-23: 1–5.
- Thomann, Bernard. 2009. Nihon ni okeru shokugyōbyō shikkan toshite no keihaishō : sono ninchi to hoshō e no nagai dōtei. *Ōhara shakai mondai kenkyūjo zasshi* 609: 34–46.
- Thomann, Bernard. 2009/1. L'hygiène nationale, la société civile et la reconnaissance de la silicose comme maladie professionnelle au Japon (1868–1960). *Revue d'histoire moderne et contemporaine*. 56-1: 142–176.
- Thomann, Bernard. 2015. *La Naissance de l'Etat Social – Travail, Biopolitique et Citoyenneté dans le Japon Impérial*. Paris: Presses de SciencesPo.
- Tokita, Yoshihisa. 1989. *Kyūshū tankō rōdō chōsa shūsei*. Tōkyō: Hōritsu bunkasha.
- Tomomi, Myōjo. 2012. Kuroi hane undo" no igi ni kan suru kōsatsu – enerugi seisaku tenkanki ni okeru shakai fukushi no jittai o tōshite. *Nihon fukushi daigaku fukushi shakai kaihatsu kenkyūjo 'Nihon fukushi daigaku kenkyū yōkō-gendai to bunka'*. 126: 83–105.
- Ueno, Eishin. 1960. Owareyuku kōfutachi. In *Tōkyō: Iwanami shoten*.

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