

# CHANGING INDUSTRIAL PARADIGMS

## SHIPBUILDING LABOUR MANAGEMENT SINCE 1870 IN EUROPE AND THE FAR EAST

BY

Thommy SVENSSON

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The emergence of a dynamic and quickly growing heavy industry in the Far East makes us realize, today more clearly than ever, that industrial competitiveness and economic growth are not stable and permanent factors<sup>1</sup>. History shows that the location of the world's leading industrial centres has shifted constantly during the past hundred-odd years.

One of the most illustrative examples is shipbuilding. Historically, this sector of heavy industry has been a vehicle for many nations' industrial performance at large owing to its importance for transport infrastructure, big employment and export-earning potential, large-scale purchase of products from other industries and role as educator of the skilled work force. Between 1870 and 1930 British shipyards dominated the world market; during the period 1930-1960 the centre of gravity shifted to continental Europe; and from about 1960 onwards Japan rose to a world-leading position. Today, there are signs that we have reached a new watershed, when substantial parts of shipbuilding capacity are being transferred to new countries.

How should these changes be explained? This article discusses a part of the answer to this question. It deals with three areas of industrial management: production, the labour market and personnel. A company's behaviour in these three fields can be labelled *labour policy*. This concept refers to a company's strategy with regard to: (1) design of the production apparatus in a technical and organizational sense within the framework of tensions existing between employers and workers; (2) recruitment of workers capable of handling this apparatus and the regulation of their numbers to shifting needs; (3) control of the workers' performance and stimulation of their incentive.

A company's labour policy is constantly framed and moulded by the interaction between employers and employees and their representatives. It is evident that in a historical perspective labour, as a collective actor, has had a profound influence on

<sup>1</sup> This is a revised version of a paper which was originally presented at the 4th International Shipbuilding and Ocean Engineering Conference, Helsinki, 7th-10th September 1986.

the formation of management strategies and thus played a crucial role in industrial failure and success.

A company's labour policy is interrelated to other areas of activity contributing to the company's competitive position : product development, marketing and selling, financing. All these activities are, in turn, dependent on a wider economic, social, political and cultural context, which is to a large extent delimited by the nation state.

This context changes partly according to its own intrinsic laws in a structural sense, but it is also influenced by political decisions, mainly at government level. A nation's industrial structure, labour market characteristics, collective organizations, legislative activities and industrial policies provide more or less favourable conditions for industrial performance at different points in time. They constantly frame the strategic decisions taken at company level, thereby tending to create quite distinct national models.

The argument in this article is that the choice of labour policy strategy has had a crucial influence on the shifts of gravity in shipbuilding during the past hundred years.

Britain, Sweden and Japan represent and exemplify three main historical phases in the development of world industrial shipbuilding. At different points in history they combined specific ways of production management, labour market management and personnel management into different and very distinct models. Each one was formed and elaborated during a period of long-term growth : the British in 1870-1914, the Swedish in 1920-1955, and the Japanese in 1947-1970. During the respective periods the models hardened into paradigmatic sets of values determining patterns of decision-making, technological choices, industrial relations and business behaviour. They can be labelled "skilled craftism", "productive materialism", and "rational commitmentism".

Each one of these models contributed originally to industrial growth. But at some point, it appears, its capabilities were exhausted. Being blind to its own assumptions and predictions, the paradigm tended to programme decisions impeding progressive adaptation to new circumstances, thereby contributing to industrial decline.

For those trying to disclose and understand the workings of these paradigms, reports written by industrial actors on intelligence visits to other countries are a good source. They reveal basic attitudes and confrontations between different ways of thinking. In this article, three sets of such intelligence reports will be used to highlight the problems inherent in the British, Swedish and Japanese shipbuilding models.

Let us start by taking a closer look at the British one, which dominated the scene up to around 1930.

### **The British model : "skilled craftism"**

In August 1871, some 250 Swedish shipbuilding workers — mainly platers, riveters and engineering workers — left Gothenburg onboard three steamers for



Northumberland in England. They had been recruited as strike-breakers to the shipyards in South Shields, Jarrow and Wallsend. They stayed there, clashing and scuffling with the English workers, for about a month before returning home.

There are a couple of English accounts of these workers' hardships on the Tyne, and a few recollections made by the Swedish workers themselves also exist. They illustrate two different work cultures in the shipbuilding centre and periphery at the time.

English supervisors complained about the foreigners' "blissful ignorance", about their negligence and lack of discipline. They were "rough and lazy", and it was necessary to keep an eye on them all the time. They drank excessive amounts of beer, even at work. By comparison, the English workers were reliable and quick at work; especially the older craftsmen, "respectable and trustworthy workmen as they are", making it an honour to do a good day's work.

The Swedes' attention, on the other hand, was caught by the English workers' trade unions: "they prevent others from taking the jobs". Each major trade had an organization of its own to which entry was restricted. The unions, being prepared to go on strike, upheld the rules of the trade which prescribed by whom, how and at what pace the work should be carried out. The Swedish workers were not accustomed to these organized trade practices. No trade unions existed at the Swedish shipyards. Gothenburg had not yet experienced any large industrial dispute. In fact, the first major strike in the town's history was staged less than a year later, in April-May 1872 at Götaverken, partly as a result of what the workers had seen in England<sup>2</sup>.

Britain was the cradle of modern shipbuilding. It was here that the economic, social, technical and political conditions first arose for production on a large scale of ocean-going ships made of iron and steel. The shipyards came to be concentrated in two areas: at the mouth of the River Clyde in Western Scotland, and at the Rivers Tyne, Wear, and Tees in Northumberland in Northeast England. It was here that the British model was fully developed during the closing decades of the nineteenth century.

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The clash between the two work cultures of Britain and Sweden in the early 1870s illustrates one of the major elements of the British model: the reliance on craft skill and organized craft discipline. This was the foundation of Britain's uncontested leadership in shipbuilding up to the Inter-War Period<sup>3</sup>. Let us now look at it more closely.

<sup>2</sup> Th. SVENSSON, *Varvsarbetare*, University of Gothenburg, Department of History, 1984. Mimeo.

<sup>3</sup> See S. POLLARD & P. ROBERTSON, *The British Shipbuilding Industry, 1870-1914*, Cambridge & London, 1979; E. H. LORENTZ, *The Labour Process and Industrial Relations in British and French Shipbuilding*, in: A. SLAVEN & J. KUUSE (eds.), *Development Problems in Historical Perspective: Report from the Scottish-Scandinavian Shipbuilding Seminar 1980*, Glasgow & Gothenburg, 1980; A. REID, *The Division of Labour in the British Shipbuilding Industry 1880-1920, with Special Reference to Clydeside*, diss. University of Cambridge, 1980. Mimeo.

Labour and technology are the two constituent parts of all physical production. It was management's task to combine them effectively. In industries suited to mass production, such as textiles, the main weight was laid on machinery. Long series of identical products made it possible to standardize working methods. The workers were assigned to simple operations which could be carried out by unskilled labourers, who were relatively easy to get at a low price on the labour market.

Shipbuilding was different. Production was not standardized. It was labour-intensive instead of capital-intensive. It was impossible for management to stipulate in advance precisely how the various work operations should be carried out. This had largely to be left to the workmen themselves. The tools were fairly simple and the work sequences had to be improvised as the ship took shape on the slipway.

The craft-nature of work was to a large extent a consequence of the character of the products. All ships were unique. The shape, outfit and capacity of each one was individually agreed with the ordering shipowner; not one ship was like another. But still, there is no doubt that British managers could have chosen to depend more than they did on machinery and supervision and planning from above. Scrutinizing their decision more closely, it becomes evident that they were very reluctant to make large investments. They consciously avoided investing in labour-saving technology any more than was absolutely necessary.

First and foremost, this was due to the unusually large fluctuations between good and bad years in shipbuilding. Machinery, buildings and tools had to be maintained and paid for when the order books were empty, while labour could be discharged at no cost. In addition, the power of the trade unions reduced many employers' interest in labour-saving technology. The result was that rather simple techniques, autonomous working gangs and labour-intensive methods became key elements of the British model.

The biggest practical problem was the constantly shifting volume of work for different trades. When the hull was built many platers and riveters were needed, who then became superfluous when it was time for the outfitting workers to take over, and vice versa. What, in this situation of recurring slack time and lay-offs, was to prevent the workmen leaving shipbuilding for work in more stable trades?

Let us look at the labour market on the River Clyde in Scotland at the turn of the century. At this time, ships were built at 30-40 yards located on both sides of the river mouth from the city of Glasgow down to Greenock. The size of the firms varied. There were two giants: John Brown's and Fairfield's, which employed 2,000-4,000 workers each. Seven firms had about 1,500 men at work, six had 500-1,000, and five 300-500. In addition, there were several smaller yards. Together the firms employed 21,000 workers in 1889, 27,000 in 1900, and 36,000 in 1913.

The whole estuary functioned as one single labour market integrating all the companies. It was quite feasible for the workers to take employment anywhere in the district. The main roads, the ferries across the river and the railway on both sides made it both physically possible and relatively cheap to change one's place of work

without moving house. Wage rates, working conditions and production techniques varied only slightly between the firms.

Accordingly, the workers moved constantly from one employer to another. The different trades succeeded each other as the building of a ship advanced. If the firm did not have a new one under construction at the right stage of production, the workers were thrown onto the labour market to look for work with other firms.

Investigations show that at least 50% of the shipbuilding riveters on the Clyde constantly moved between the yards. A change of employer could even take place between pay days each fortnight. The men moving were not just unskilled labourers, who were easily interchangeable, but first and foremost skilled tradesmen. Market forces ruled. This resulted in hardships when there was a general lack of work. But during boom periods the workers could play the employers off against each other and earn good wages by the standards of the time <sup>4</sup>.

This was a distinctly British situation. Other shipbuilding areas in Europe did not have access to labour markets of such proportions. In Europe it was common for the employer to try and retain a core of skilled, strategic workers. These were given work in some kind of complementary production at the firm when no ship orders were at hand. The European firms quite simply offered lifetime employment to about one fifth to one third of the labour force. On the Clyde, Tyne, Wear and Tees, however, the labour markets were so large that it was not necessary to use complementary production. The many firms served as work reservoirs for each other.

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The British employers' policy of hire and fire did create problems for the workers. The result was what the British called feast and famine. When many ships were on order, wages rose quickly. But during times of recession unemployment soared and wages went down, just as quickly as they had risen, for those men who were fortunate enough to still have a job.

This was crucial for the special type of trade unionism that emerged in Britain. The insecurity made a job, and thus the means of earning the family's living, a valuable commodity which it was necessary to protect. Trade unions were created in order to limit competition between the workers for jobs. By closely guarding the number of employment opportunities in the trade, no surplus of competent labour would be created. The unions strove to limit the number of apprentices who could be employed; they also maintained strict rules for how apprentices should be trained, and resisted all efforts by the employer to dilute craft requirements. Otherwise, more workers would become available in the labour market, and the value of the members' skills would decrease.

<sup>4</sup> S. PRICE, *Labour Mobility in Clyde Shipbuilding*, Glasgow, Scottish Development Agency, 1981. Mimeo.

But the unions did not only have to resist the employers. They also had to defend their interests against other trades, and tried to claim the exclusive right for their members to use certain tools and carry out certain work operations. This meant that they resisted changes in working techniques if they anticipated that these would jeopardize the number of jobs in the trade.

The result was the demarcation disputes. Different trades competed over the right to new types of operations. To take one example, it was traditionally the joiners who had the right to use planes and hammers and work with timber dimensions of  $1\frac{1}{2}$  inches or less, while the carpenters handled broadaxes and bludgeons and tooled larger dimensions in excess of  $1\frac{1}{2}$  inches. When the yards started to lay the decks of modern passenger liners, the job required the two sets of tools. Both trades claimed the right to carry out the task and there were stoppages of work which paralysed production. On the Tyne in the early 1890s, a period for which statistics exist, one big strike a month occurred for reasons like this, apart from smaller demonstrations and go-slow campaigns.

With hindsight, the protection of work and all the demarcation disputes can easily be regarded as irresponsible and irrational. They resulted in a lack of flexibility and obstructed the continuous upgrading of the production apparatus necessary to match competitors in the struggle for customers. But for the workers at that time, when unemployment was an ever-present threat leading to direct poverty, it was both a logical and rational reaction to the employers' policies. The struggle to control work was quite simply seen as an investment in a safer future.

Industrial relations of this type meant that the British model was imbued with conflict. It contained divergent outlooks which nourished antagonism between employers and workers, and disposed each of them to perceive the intentions of the other with suspicion and distrust. During the Inter-War era, when the period of growth was over for British shipbuilding and deep, worldwide depression was creating massive unemployment, this led to intensive confrontations giving rise to labels such as "Red Clyde".

During the years before the First World War, however, the conflict had had positive results for industrial performance and had greatly contributed to Britain's world-leading position in shipbuilding. The never-ending fight over work and work practices produced an institutionalized craft tradition of highly skilled workmen, who under normal circumstances took pride in doing a good job.

The trade unions laid the foundation of the competence that became the hallmark of British shipbuilding. Owing to the fact that entry to the various trades was restricted, to the rigorous apprenticeship system, and the unions' unceasing attentiveness to work practices, British shipyards were quite simply provided with a cadre of skilled workers with whom shipbuilders in other countries were unable to compete.

On the management side, this gave birth to ideas about the essence of shipbuilding that made people sniff at more standardized, "continental" production. The paradigm implied that a good shipbuilder should be able to build all kinds of beautiful

ships that customers might think of ordering, ships of good quality that were tailor-made, with the help of "good workmanship". Such competence was one of the major reasons why Britain produced more than half the world's tonnage between 1870 and 1914 – on the foundation of "skilled craftism".

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Britain's hegemony lasted until about 1930. Then the volume of production began to decline, a trend that was only temporarily reversed during the boom years immediately following the Second World War. In 1914 British shipyards held about 60% of the market ; in 1955 the figure had declined to 29%, and to 6% by 1970.

It was during this period that ship production was "industrialized". Technology became increasingly important and work operations increasingly standardized, making it possible to use tools and machinery more efficiently. Work organization was improved, productivity increased, and prices came under pressure.

British shipyards had difficulty adapting to these developments. "Skilled craftism" started to become obsolete ; the paradigm became increasingly dysfunctional, stultifying innovation and placing the industry at an ever greater disadvantage as regards cost and construction time in relation to its major competitors. For the difficulties that arose the workers blamed the managers, who in turn blamed the unions<sup>5</sup>.

British shipbuilding enjoyed a few years of grace, however, thanks to the well-established home market. Britain had a world empire with the largest merchant fleet of all. As long as the British shipowners made good profits, they continued to build their ships at home. The death-blow came in the 1950s, when the empire was lost. The fleet diminished and the profit margins narrowed. Big price differentials forced British shipowners to abandon the British yards. In 1959, the country became a net importer of ships for the first time ; that year for the first time British shipowners bought more tonnage abroad than foreign owners bought in Britain.

Finally, the crisis was evident to everybody ; British shipbuilders began to look more seriously at other shipbuilding countries' methods.

### **The Swedish model : "productive materialism"**

Sweden was one of the forerunners of the new type of production that had been gaining strength on the continent. In October 1959, a group of British employers and trade union representatives travelled to Gothenburg, under arrangements made by the British Productivity Council, to look more closely at the Swedish model.

This was a spectacular year for Swedish shipbuilding. The four biggest shipyards – Kockums, Uddevalla, Eriksberg, and Götaverken – ranked second, fourth, fifth,

<sup>5</sup> Cf. A. SLAVEN, *Growth and Stagnation in British/Scottish Shipbuilding, 1913-1977*, in : *Development Problems*, op. cit., pp. 45-46.

and eighth among the biggest shipyards in the world in the statistics of tonnage produced<sup>6</sup>. The reports written by the British visitors were coloured by what they believed to be their own problems at home, and illustrate a collision between two shipbuilding paradigms<sup>7</sup>.

The British *employers* noticed that the wage level was higher in Sweden than in Britain. But they estimated productivity by Swedish labour to be twice as high as that in Britain. The conclusion they drew was that this derived mainly from a different type of unionism. In Sweden, they wrote in the report, mutual confidence and a recognition of common interests among employers and workers created the flexibility and discipline necessary for high output. A visitor from Charles Connell & Co., Glasgow, stated :

Beyond all shadow of doubt, the most important factor assisting high productivity in the Swedish shipyards is unquestionably the enormous flexibility of the manual labour force ; and it is in this respect that they enjoy a tremendous advantage over their British counterparts. ... It is on the question of demarcation and lack of labour flexibility that we are at the greatest disadvantage when competing with Continental yards for ship orders.

This led to the inevitable conclusion :

The British Shipbuilding Industry could achieve a productivity level comparable to (*sic*) or better than Sweden given freedom from labour restrictive practices but until such time as an external influence is brought to bear upon the industry to change the parochial interests of many Unions and indeed Employers, such freedom is unlikely to arise.

This was the conclusion deriving from the employers' opinion as to why the British model had crashed, the words "external influences" being a paraphrase of the need for state intervention. It points ahead to the recommendations of the Geddes Committee eight years later<sup>8</sup> and the attempts at reforming industrial relations, especially after the creation of British Shipbuilders in 1977<sup>9</sup>.

Visiting *union officials* saw the same things as the managers, and agreed on many points. But they did not pay much attention to flexibility in work. Instead, they stressed the positive attitude of management towards workers and unions as one of the keys to the success of the Swedish model.

Kockums shipyard in Malmö, especially, came to stand out as an archetype of progressive personnel management. The company was approached by study delegations from far and wide during the 1960s and early 1970s. One of these was a group

<sup>6</sup> "Die grössten Schiffwerften der freien Welt. Bericht der Konferenz der Schiffbauabteilung des IMB, Hamburg, März 1960" (Archive of the International Metalworkers' Federation, IMF, Geneva).

<sup>7</sup> SEF/SRNA Archives, London, no. 4889B1.

<sup>8</sup> SEF/SRNA Arch. S.42/1-10.

<sup>9</sup> See J. MCGOLDRICK, *Industrial Relations and the Division of Labour in the Shipbuilding Industry since the War*, in : *British Journal of Industrial Relations*, 1983, pp. 197-220.



of ship stewards from Harland & Wolff in Northern Ireland. They noted, among other things, the following in their report <sup>10</sup> :

Communications to employees are considered extremely important and every means is employed to ensure that they are kept fully informed. In this, management recognizes that the trade union has an important role and responsibility to exercise. Unlike U.K. employers, Swedish employers not only recognize the role but assist by providing facilities so that it can be performed effectively.

There are passages in the report indicating their difficulties in understanding the close co-operation between labour and management in Sweden, used as they were to a more traditional type of antagonism between labour and capital at home. One of the ship stewards commented : "... the relationship is so good, that there must be something wrong with it, it's almost unhealthy".

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The British reports mention work studies and the detailed planning of production flow as major elements in Swedish production management. The basic idea was to organize work as rationally as possible. This was by no means a Swedish invention, but an American concept of "*ship-manufacturing*" put into practice for the first time in the U.S.A. during the First World War <sup>11</sup>.

The U.S.A.'s entry into the war in April 1917 was the starting signal for one of the biggest industrial ventures history had seen up to that point. An enormous shipbuilding programme was launched. In 1915, the U.S.A. had produced a total of 340,000 DWT. Five years later production ran at 5,700,000 DWT — an increase of 1700%. Kelly & Allen described the concept behind the success in 1918 in the following terms <sup>12</sup> :

The 'fabricated idea' quite simply means that you have a 'manufactured' ship, instead of a 'made-to-order' one, just as we have 'manufactured' cars instead of 'made-to-order' ones.

This differed from the British paradigm in three respects. *Firstly*, it concerned long series of identical ships, not individually made ones ; this implied a far-reaching specialization between the yards, where each concentrated on just a few types. *Secondly*, large parts of the production were moved out from the yards to other firms delivering prefabricated plates, profiles and other components ready for fitting ; the shipyards themselves were transformed into assembly plants. *Thirdly*, assembly work

<sup>10</sup> "Report on Visit to Kockums Shipyard, Malmö, Sweden, by Harland & Wolff Shop Stewards (1973)" (IMF arch., Geneva).

<sup>11</sup> H. WITH ANDERSEN, Industriarbeid og arbeidslivshistorie, in : *Arbeidslivsforskning i humanistisk perspektiv*. NAVF, Oslo, 1985, pp. 100-118. Cf. Id., *Fra det britiske til det amerikanske produksjonsideal: forandringer i teknologi og arbeid ved Aker Mek. Verksted og i norsk skipsbyggingsindustri 1935-1970*, diss. University of Trondheim, 1986.

<sup>12</sup> R. W. KELLY & F. J. ALLEN, *The Shipbuilding Industry*, Boston, 1918, p. 98.



was organized along "Fordist" principles based on W. F. Taylor's ideas of Scientific Management.

Work studies, production flow, planning and rational organization were the keywords ; it was a question of prefabricating single parts of the ship and then carefully planning and supervising the flow of these parts down to the slipways and outfitting quays.

Basically, it was an organizational concept, not a technical one. It was a matter of fitting old, established techniques into a new organizational form. When the war was over, however, the programme was closed down ; the concept was too inflexible for peace-time conditions. It required orders of large series of similar ships, and for this the market seemed not yet ready.

Swedish shipyards were among the first to apply the American concept in commercial shipbuilding. At two of the bigger yards, Götaverken and Kockums, it was put into practice early in the 1920s. It did not mean a change to mass production, but attempts were made to standardize materials, components and work procedures. As a result, the workers grew more accustomed to the tasks and were able to learn and develop more efficient working methods. In combination with closer and more accurate planning of the flow of materials from the shops to the berths, this brought about quite a substantial reduction in production time.

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One of the main preconditions for this development was the emergence of a new type of shipowner, in the Swedish case a group of smaller Norwegian shipping firms that created a niche for themselves in the burgeoning oil trade during the 1920s. They needed cheap tankers, were prepared to accept identical ships and become the major customer of the Swedish yards, making it possible to start producing in small series. As a result, Götaverken grew during the 1930s to be one of the biggest shipyards in the world. And the other Swedish yards tried to follow in its footsteps.

It was at the time of the Second World War that the concept of "ship-manufacturing" made a real breakthrough. Assisted as it was by a new technique, *electrical welding*, it became possible to mobilize the whole potential of shipbuilding technology on "Fordist" lines.

Welding was the springboard for *sectional building*, which rendered it increasingly possible to make hull construction more factory-like. This meant that construction of the hull was separated into several, parallel chains of production. Instead of erecting the frames on the berth and then fitting individual plates and profiles to them step by step, as had been done before, the hull was divided into sections constructed independently of each other and then lifted up and fitted together at the berth. In this way, the work could be carried out under better conditions, both the flow of material and work control could be made more effective and the cost of each ton of steel built into the hull considerably reduced.

Welding and sectional building multiplied the possibilities of standardizing work operations, making it economically viable to begin using time and motion studies on a larger scale. Thus, management had an instrument to simplify working methods, to create a more accurate basis for planning, and to determine piece-work rates contributing to increased work intensity. Welding and time and motion studies were mutually reinforcing; they were the cornerstones in the process of technological transformation that created the modern, ship-fabricating, post-war generation of shipyards.

The key was welding. The way in which it was introduced at the Swedish and British yards during the 1930s is a good illustration of the basic differences between the two paradigms<sup>13</sup>.

The potential advantages of the new technique, as judged by shipbuilding managers all over Europe at the time, were three in number:

Firstly, there was the possibility of *reducing the relative cost of labour*. Being a prerequisite for more factory-like production, welding offered big productivity gains by reducing the working-time needed for each ton of steel built into the ship. But this called for a long-term strategy. It would take several years to learn to build in sections, which also required large investments in cranes, buildings and storage areas.

Secondly, the new technique offered the more immediate possibility of *reducing the absolute cost of labour*. As it was easier to weld than rivet, it ought to be possible to pay less for welded than for riveted joints.

Thirdly, there was an opportunity to *reduce the workers' power over production*. In practice, it was the workers who controlled working methods in hull construction, methods which were passed on from man to man together with a craft code telling by whom, how and at what pace the work should be carried out. Welding could be introduced from above and so under the control of the employer from the start.

The set of paradigmatic values contained in the British model — labour-intensive production, made-to-order ships, craftsmanship — meant that only on rare occasions did British managers, when they tried to assess the new technique in the years around 1930, think seriously about the possibility of using welding as a vehicle to increase output per working hour. Instead, it was the other two possibilities that were decisive in their thinking.

The first proposal concerning the application of electrical welding was presented by the Shipbuilding Employers' Federation to the trade unions' joint federation in May 1933. It contained two major points.

Firstly, for the time being shipwelders should be paid by time rate according to the national minimum wage agreement. They could not be offered piece work until all aspects of the trade's status had been more closely investigated. By making this

<sup>13</sup> Th. SVENSSON, *Från ackord till månadslön*, Kungälv, 1983, pp. 233-252; J. MCGOLDRICK, *Crisis and the Division of Labour: Clydeside Shipbuilding in the Inter War Period*, Glasgow, 1980, pp. 44-63. Mimeo.

suggestion the employers intended to establish a low wage level, which the workers would have great difficulty in raising.

*Secondly*, no union should have an exclusive right over the new technique. Education and recruitment of shipwelders should be the prerogative of the employers. This stipulation made it possible for employers to reduce the considerable power of the Boilermakers' Society, which organized the riveters, by making room for other unions to expand into the hull construction sector, where the Boilermakers' Society was in control of work.

This was a confrontation policy, put forward in the depths of the great depression, when more than 50% of the shipbuilding workers were unemployed. It led to serious conflicts with the Boilermakers' Society, which forced the employers to retreat. Starting in April 1934, one yard after another signed local agreements with the Boilermakers' Society in which the latter, in practice, won control over both welding work and the level of payment.

The outcome was that the employers' interest in the new technique was weakened. They were not disposed to look for rationalization-profits by reducing the relative cost of labour in a longer time perspective. The end result was that British shipyards were very late in introducing welding on a larger scale. Indeed, some firms relied on riveting even in the 1960s, a time when other companies had been building all-welded ships for more than two decades.

Both riveters and to some extent platers were replaced by the new technique. At most European shipyards they constituted the most militant and best organized group of all workers. This was also true in Sweden, but here there were no fights when welding was first used in hull construction in 1935. This was due to the employers' willingness to reach an agreement about the new technique that allowed both parties to gain.

Thus, from the start, Swedish shipwelders were paid skilled workers' wages, despite the fact that the work was classified as only semi-skilled. Calculations indicate that the shipyards showed no immediate economic gain from the new technique<sup>14</sup>. Fearing that a harsh wage-reduction policy might lead to serious conflict, the employers were not prepared to jeopardize its real potential. Reducing the relative cost of labour would offer far greater profits in the years that lay further ahead.

Certainly there were disputes concerning the application of welding in the Swedish yards. Especially at the Gothenburg firms, where the Communist faction held a majority position in the workshop clubs during the 1930s and 1940s, piece-rate setting was seriously put to the test. However, it was never the technique as such that was disputed. On the contrary, most workers welcomed the earning opportunities that arose; it was the level of wages that was their main interest. Communist union representatives, just like the Social Democratic ones, accepted the fact that work changed as long as the level of earnings did not change to the disadvantage of the workers.

<sup>14</sup> K. OLSSON, *Från pansarbåtsvarv till tankfartygsvarv*, Kungälv, 1983, ch. F:7.

Consequently, welding was installed very quickly at the Swedish yards. The first ship to have welded shelving was the tanker "Basilea", launched at Kockums in April 1936, in which 32% of the rivets had been replaced by welded joints. And only four years later, in 1940, Kockums launched the first all-welded ship, the tanker "Bracconda", in which 97% of the hull was welded. Kockums was first, and the yards in Gothenburg followed closely after.

A similar policy is revealed by the introduction of time and motion studies at the Swedish yards from the late 1930s onwards<sup>15</sup>. Management made no attempt to reduce wage rates for operations that were studied; instead, on several occasions they raised earnings. In this way, the employers mobilized the workers in search of better methods of production. Historical experience showed this to be the best way of increasing competitiveness.

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The Swedish model advocated a continuous rationalization of production. One prerequisite was that both labour and capital acknowledged a common interest in increased productivity. In simple terms, this meant that employers and workers tried to co-operate on what was to be divided, and then negotiate, though sometimes also struggle, about how to divide it. This notion of a common interest had slowly started to develop in some firms during the 1920s and early 1930s; it materialized throughout the industry during the late 1930s, and matured into a doctrine during the 1950s and 1960s.

In some respects, this *doctrine of common interests* rested on a "privilege of backwardness". To find its roots, we must go back to the late nineteenth century when Gothenburg and Malmö still belonged to the shipbuilding periphery<sup>16</sup>.

We discussed earlier how British employers solved the problem of big fluctuations in the volume of work by relying on the well-integrated labour markets at shipbuilding centres such as the Clyde or the Tyne. The different yards functioned as work reservoirs for each other, making it possible to lay workers off when no work was at hand. This in turn disposed the workers to form protective unions in order to safeguard existing job opportunities.

In smaller shipbuilding areas such as Gothenburg and Malmö, or for that matter Kiel, Bremen, Rotterdam or St-Nazaire<sup>17</sup>, such a policy was not applicable. Here, skilled craftsmen, who were a prerequisite for profitable production, could not just be let out on the labour market in the hope that they would return when new work was available. Instead, many employers adopted a policy of trying *to tie them* to the

<sup>15</sup> SVENSSON, *op. cit.*, 1983, pp. 253-274.

<sup>16</sup> *Ibid.*, pp. 23-119 and 191-199.

<sup>17</sup> E.g. R. DUGAS, *L'industrie de la construction navale*, Paris, Conseil National Économique, 1930, p. 387.

company for good. They diversified production in order to create work reservoirs within the firm ; they provided various extra benefits, in some instances housing and community services ; and above all they paid them high wages by the standards of the time.

In this way a *segmented labour market* was created, comprising, broadly speaking, two types of workers. The first was the casual worker, who came and went according to the amount of work available. The other type was the core worker, who was offered lifetime employment, permanent work, good earnings, better housing conditions and higher social status.

These different labour market strategies had a decisive impact on the differences between British and Swedish shipbuilding unionism.

In Britain, the skilled workers formed trade unions very early by international standards, before socialism and its class-solidarity ideas had become a vehicle for the workers' struggle. This gave British unionism its distinctive features of job protectionism, decentralization, craft attitude and rivalry between different trades.

In Sweden, in contrast, the relatively privileged core workers had no immediate interest in forming unions, especially not at those yards where any attempt to organize was forcefully combatted by the employers. Here, unionization took place in the closing decades of the nineteenth century, at a time when socialism had emerged on the agenda. No self-evident leaders existed on the shop floor ; many core workers were even hostile towards socialism. The workers were to a large extent mobilized from outside by socialist activists representing an already strongly centralized movement guided by class-solidarity ideas. At the shipyards these activists mainly reached the younger, not yet established people belonging to the middle and lower echelons of the work force.

Minimum wages and, thereby, a reduction in big differentials was the issue around which mobilization was built. The major goal was to reduce social and economic divisions within the working class, while craft attitudes, mostly associated with the core workers, played a subordinate role. Practically all shipbuilding workers were gathered in one single union, the Swedish Metalworkers' Federation, represented in each large firm by a united workshop club comprising all the major trades. In this way, the struggle for higher and more equal wages became the prime, if not sole, union objective — not job protection as in Britain.

The union's concentration on raising its members' wages and living standards is illustrated by the disputes recorded at the yards. With very few exceptions all major controversies between workers and employers centered around the wage issue. Workers and union representatives interpreted all changes in working methods and the instalment of new techniques in terms of wages, and put up with resistance only when they feared that reductions in earnings were at hand.

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The Swedish model was founded on a strong, centralized trade union movement ; but a movement organized on a class basis, not on trade. With a few trifling exceptions all shipbuilding workers were gathered in one single organization, whose primary task was to carry on the struggle for better wages.

This put *piece work* in focus. It served not only as a means used by the employers to step up the intensity of work but also as a sharp weapon in the hands of strongly organized workers ; their intimate knowledge of work operations and sequences being used as a powerful resource both in daily price-bargaining on the shop floor and when carrying out the job.

Over and over again, especially after the war, *union representatives* demanded increases in the volume of piece work <sup>18</sup>. Thanks to their efforts, as much as 90% of the work at Swedish yards was done on a piece-work basis around 1960, this being the highest figure in the world <sup>19</sup> and one of the most important production factors in Swedish shipbuilding.

The workers' offensive wage struggle forced the employers into continually trying to improve production technology, methods and organization, and to farming out bigger and bigger portions of production to subcontracting firms <sup>20</sup>, in order to compensate for the steadily increasing absolute costs of labour. Accordingly, a self-reinforcing framework for rationalization was established. Workers and union officials fought to lay their hands on as big a piece of the economic pie as possible, and their strength forced management to upgrade production continuously. A bigger and bigger surplus was created, which could be negotiated and shared.

The workers' successful wage struggle, carried out in a disciplined way according to the rules specified by the doctrine of common interests, was a driving force behind the build-up of the large, postwar ship factories designed to manufacture heavily standardized tankers and bulk carriers in long series in the shortest possible time. In the 1950s large-scale sectional building started ; in the 1960s production lines were introduced and parts of the plate-handling process automated.

The Swedish shipyards became the most efficient in the world in standard-ship production. By the middle of the 1960s they had taken second place in the world statistics on tonnage launched ; at the same time they had the best paid group of workers of comparative size in the world outside the U.S.A. <sup>21</sup> — all on the basis of "productive materialism".

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The crash came in the 1970s, when yard after yard showed big deficits and had to be shut down. Following the decisions taken in 1985-1986 to close down Uddevalla and Kockums, nothing remains of large-scale Swedish shipbuilding.

<sup>18</sup> SVENSSON, *op. cit.*, 1983, pp. 275-287.

<sup>19</sup> "Bericht über die Löhne- und Arbeitsbedingungen, 1956-1962" (IMF arch., Geneva).

<sup>20</sup> J. KUUSE, *Varven och underleverantörerna*, Kungälv, 1983.

<sup>21</sup> "Löhne-, Lohnkosten und Kaufkraft im Schiffbau, 1960-1965, 1966-1971" (IMF arch., Geneva).



The common explanation given for this has, of course, been the deep, worldwide crisis. After the oil shock in 1973 an enormous overcapacity was created. All governments introduced large-scale subsidy programmes. Sound competition over remaining orders was prevented, hitting the Swedish yards especially hard because of their small home market.

This is not a sufficient explanation, however, of the breakdown. Sweden lost its whole share of the market, i.e. 8-10% during the 1960s, while Japan managed to keep its much bigger share. And South Korea, Taiwan and other developing countries increased theirs during the same period. Why?

Basically, because the capabilities of the Swedish model of "productive materialism" were exhausted around 1970. Reductions in working hours for series-manufactured ships failed to appear. It was no longer possible to compensate for the high absolute cost of labour by making production more efficient. Productivity suddenly levelled out, or even decreased. The first signs of this were to be seen during the latter half of the 1960s, that is preceding the downfall of the market.

The reasons were the same at all the major yards<sup>22</sup>. The meticulously planned flow of production and modern piece-rate setting, based on detailed and systematic work studies, broke down. Production flow became clogged; piece rates became inaccurate, ceased to function as an incentive-stimulating factor, led to continuous disputes, made it impossible to plan work or influence earnings — all of which caused a drop in working morale, higher turnover of labour and increased absenteeism.

This in turn made the yards more and more dependent upon subcontracted workers, the so-called "grey" labour firms. These had originally been used only for very special tasks and as a means to even out bigger fluctuations in the volume of work. Now they entered the workshops and building docks on a massive scale, costing the yards 30-60% more per hour — sometimes even up to 100% more — than normal labour and further contributing to the companies' deficits.

In fact, a similar syndrome was to be observed at about the same time at several other European shipyards<sup>23</sup>. This coincided with a general wave of workers' discontent and political radicalism leading to increased hostility between workers, unions and employers. The basic problem was that the relationship between fordist-inspired production and workers motivated only by economic gains was broken. Originally, management had tried to direct and control production by using indirect means, leaving room for considerable workers' autonomy in deciding work sequences and practices.

At the beginning of the 1960s, however, the point had been reached when a qualitative change was required if production was to be made more effective. Work operations were split up into pieces as small and rational as possible with, among

<sup>22</sup> SVENSSON, *op. cit.*, 1983, pp. 333-371.

<sup>23</sup> E.g. M. SCHURMAN *et al.*, *Rationalisierung, Kriese und Arbeiter. Eine empirische Untersuchung der Industrialisierung auf der Werft*, Bd. 1-2, Universität Bremen, 1981.



other things, the help of the MTM-system. Planning was laid almost entirely in the hands of a professional cadre of engineers and supervisors. The manual and intellectual sides of production were separated ; work became fragmented and instrumental. The workers tended to be reduced to isolated, interchangeable and purely economically motivated creatures, losing social contact and their emotional ties with work and company. When the piece-rate setting collapsed during the late 1960s, even materialist attitudes failed to motivate the workers to maintain high output. Productivity decreased. The capabilities of the model of "productive materialism" had been exhausted.

In the early 1970s, attempts were made to revise the labour policy, notably at Götaverken, Kockums and Uddevalla, as well as at several other shipyards around Europe. New, socio-technical forms of work organization were introduced, partly re-establishing an older type of autonomous group-working, in order to renew workers' interest in their tasks. Piece work was abolished for regular monthly pay. Union representatives were offered greater influence in the firms.

But these novelties were never given a chance to show their potential. With the coming of the oil crisis and the downfall of the tanker market, upon which the yards relied so heavily, Swedish shipbuilding collapsed. Large-scale confrontation and social unrest was prevented only because the State — as elsewhere in Europe — acted as a shock absorber, launching large-scale social plans to create new job opportunities in other, more promising lines of business<sup>24</sup>.

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To get an extra-paradigmatic perspective on these problems, we turn now to the Japanese model.

### **The Japanese model : "rational commitmentism"**

No industry illustrates Japan's "economic miracle" after the Second World War better than shipbuilding. When the ban on the construction of ocean-going vessels was lifted by the Supreme Command for the Allied Powers after the war, there began an astonishingly rapid expansion. Great Britain, which for a long time had been the world's largest shipbuilding nation, was overtaken in 1956 in terms of tonnage launched. By 1960 Japan had captured 20% of the market ; ten years later it produced half the world's tonnage.

In the late 1950s, when the Japanese challenge had become obvious, many European shipbuilders went to Japan on intelligence visits. In their reports one thing stands out above everything else : *the Japanese workers' commitment to their work*. As,

<sup>24</sup> B. STRÅTH, *The Politics of De-Industrialization : the Contraction of the West European Shipbuilding Industry*, London, 1987, esp. ch. 4.

for instance, one British shipbuilder noted from his visit to a number of Japanese yards in 1957<sup>25</sup> :

The Japanese workman seems to have a different attitude to work than the Scotsman — He does not seem to find that work is painful. There is no piece work in the yards and yet I noticed too many times for it to have been due to chance, that when the whistle blows a man carries on with what he is doing until he comes to a suitable juncture to break off. —

A picnic lunch with green tea is provided free by the firm ... Each firm has its hospital ... They appear to have a discount allowance in the shops ... Some workers seem to have a pension of some kind ... A firm never pays off its established workers ... The firm pays those that are working what it is reckoned it can afford and a retaining free to the unemployed ; in other words, the firm provides the unemployment benefit. —

A man, it may be gathered, stays with one firm all his life, if he does not wish to lose many benefits.

This illustrates a new form of confrontation between two management paradigms. The visitor concluded that the Japanese were so different in all respects : “I wish that I had been able to understand more of what I saw”.

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In 1985, I interviewed a number of former shipbuilding managers in Japan. They all belonged to the quite small and closely knit group of about 50 people who had been responsible for the “shipbuilding miracle” during the 1950s and 1960s<sup>26</sup>. The talks concerned the reasons for Japans’ success in terms of production and management.

The older gentlemen, with their customary politeness, mentioned that Swedish shipbuilding held a prestigious position in Japan ; it was Swedish ideas that they had copied and developed. At the end of the war, Swedish yards had been in the forefront of technology. Kockums, Eriksberg and Götaverken had been among the first to use electrical welding and sectional building on a full scale.

They related their adventurous journeys to Europe and the U.S.A. during the 1950s, to see and learn, and how they built up their yards using Swedish concepts in combination with American ideas about production lines reducing the need for skilled labour.

To this they added, apart from an initially low wage level, a production factor that had been underdeveloped in Western industries, viz. *an optimal social organisation* : a network of material and emotional structures that promoted the commitment of the labour force. This was a dimension of management that had been neglected by the increasingly taylorist-oriented Western enterprises.

<sup>25</sup> SEF/SRNA Arch., London, J1/2-3.

<sup>26</sup> Among others should be mentioned Prof. S. Motora, Nagasaki Institute of Applied Science ; former Vice President K. Hasegawa, Kawasaki Heavy Industries ; Dir. M. Akimoto, Mitsubishi Kakoki Kaisha ; Dir. I. Takezawa, Mitsubishi and Kobe Steel ; Chairman I. Yamashita and Adviser K. Hamano, Mitsui Engineering & Shipbuilding ; Pres. T. Nakamura, Sasebo Heavy Industries ; Tokyo, June 1985.

In recent years, Japanese management has attracted a great deal of attention in the U.S.A. and Western Europe, as the efforts regarding the social side of production have revealed themselves to be extremely successful. Much has been written about the methods used to foster affinities with the company: life-time employment, seniority promotion, extra welfare benefits, company housing, quality control circles, profit-sharing schemes, various forms of social intercourse, the recruitment system and its connections with the school system, and company education — all the things that have helped to produce “rational commitmentism”<sup>27</sup>.

There is no need to go deeper into this here. Suffice it to sketch the basic components of the model and localize it in relation to other management doctrines better known to a Western audience<sup>28</sup>.

Piece work and intensive supervision have been cardinal elements in these labour policy strategies, spearheaded by Scientific Management, postulating economic returns to be decisive as to workers' behaviour in production. Other doctrines, such as the Human Relations tradition and socio-technology, stress the workers' social and intellectual returns as a complement to the economic ones and advocate measures to increase their influence over work, satisfaction and subjective motivation.

Both these traditions limit themselves to activities *inside the company*. A model such as the Japanese one, however, does not stop at the factory gates. It includes elements of a social, cultural and ideological nature that *go beyond the company sphere*, in order to spur employees on to exert themselves to the utmost to reach the goals set by the company.

Broadly speaking, the Japanese model contains three major elements: (1) the offer of life-time employment for strategic parts of the labour force; (2) the establishment of private, company social services securing the employees' material existence and well-being outside their working life; and (3) the creation of social networks in and outside work, reinforcing the employees' emotional ties to the company.

In this way, employment becomes not primarily a contractual relationship, but a tie of family-like character, where the boundaries between working life and social existence tend to be erased. The strategy strives for more complete control over the employees' lives, where the company becomes a sort of imaginary clan ruled by the company heads.

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<sup>27</sup> E.g. W. G. OUCHI, *Theory Z*, Reading, 1981; R. T. PASCALE & A. G. ATHOS, *The Art of Japanese Management*, New York, 1981; H. KAHN & T. PEPPER, *The Japanese Challenge*, 1979; *East Asia*, vol. 2, Frankfurt, 1984; T. SHIGEYOSHI & J. BERGMANN (eds.), *Industrial Relations in Transition*, Tokyo, 1984; T. SHIRAI (ed.), *Contemporary Industrial Relations in Japan*, Madison, 1983.

<sup>28</sup> Th. SVENSSON, Japansk företagsledning och svenska bruk — en felande länk?, in: *Arkiv för studier i arbetarrörelsens historia*, 33, 1986, pp. 3-32.

Many observers, both Westerners and Japanese, believe that the Japanese model, with life-time employees being prepared to sacrifice their lives for the company, rests on a tradition going back to feudal times<sup>29</sup>. This is not correct, however. The model is, of course, founded on Japanese "traditions" in the sense that it results from a historical development process and might perhaps suit Japanese "values". But it is by no means the outcome of some kind of automatic process inherent in Japanese society.

To be sure, rudiments of the model were to be found in many companies at the turn of the century. It has, for example, been evidenced for the Yokusuka shipyard, as for Mitsubishi's yard in Nagoya<sup>30</sup>. Further efforts were made during the Inter-War period, but it was only after the Second World War that the model began to be systematically applied on a large scale by the leading companies, thereby setting a course for the industry at large. This was the result of a number of strategic and collective decisions taken by the leading companies and trade unions. There were alternatives, just as everywhere else<sup>31</sup>. A crucial moment arose just after the war, when the big industrial groups — Mitsui, Hitachi, Sasebo, Mitsubishi, Kawasaki, Sumitomo, Hokodate, Namura, Sanyasu — were challenged by widespread labour conflicts, union militancy and communist influences among the workers<sup>32</sup>.

It was necessary to suppress this opposition, as the Chairman of Mitsui Engineering and Shipbuilding, among others, said in an interview. It was necessary to tie strategic groups of workers to the companies and make them loyal ; to establish close co-operation between managers and workers ; to convince workers that they had the same interests as the companies ; and that both parties could gain from such co-operation.

The economic growth generated during the following decades and an accompanying increase in living standards gave legitimacy to and cemented the model. But even in the late 1950s reports can be found about "guerilla-style strikes" at the shipyards. In these reports the prospects of increased worker militancy was still seen as a possibility during the years to come<sup>33</sup>.

This background to the Japanese model is seldom mentioned in the flow of management literature advocating that Western companies learn from the Japanese system. History makes it clear, however, that the "rational commitmentism" model

<sup>29</sup> The most representative work in this genre is probably J. ABEGGLEN, *The Japanese Factory*, 2nd ed., New York, 1979. See also e.g. J. TAYLOR, *Shadows of the Rising Sun*, Tokyo, 1985. The view of Japan as a unique and culturally self-centered society is presented in purified form in R. BENEDICT, *The Chrysanthemum and the Sword*, Boston, 1946.

<sup>30</sup> See DORE, *British Factory, Japanese Factory*, Berkeley, 1973, pp. 375-403.

<sup>31</sup> A. GORDON, *The Evolution of Labor Relations in Japan : Heavy Industry, 1853-1955*, Cambridge, Mass., 1985.

<sup>32</sup> These conflicts are dealt with in J. MOORE, *Japanese Workers and the Struggle for Power 1945-1947*, Madison, 1983.

<sup>33</sup> SEF arch., London, J1/1-2.

was a product of a historically specific situation — just as the British and Swedish models had been.

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The Japanese model contains another important element, viz. *the dual structure of the labour market*. In several respects this resembles the segmented labour market to be found in many European shipbuilding areas at the turn of the century — only on a much larger scale.

The life-time employees at bigger firms, such as the shipyards, constitute a core of workers within Japanese industry as a whole. The ordinary workers live quite a different life in the smaller firms not embraced by “rational commitmentism”. Calculations from national statistics reveal that workers employed on a lifetime basis by the big companies constitute only about 30% of Japan’s total labour force, nearly all of them being recruited among young people who have just finished school or university. Those not offered such jobs have great difficulty entering the privileged section of the labour force and drift to the smaller firms that dominate the Japanese economy. Here, labour mobility is high and wages lower.

Differences between the two groups are reinforced by a fragmented trade union structure. The national trade union federations are generally bodies pushing various social and economic issues, while negotiations on employment, wages, benefits and working conditions are conducted at company level by company-based unions. There is no room for joint action over the whole industrial field.

The typical small firm is highly specialized, which is made possible by its relationship to a bigger company. In this way, shipyards have access to a large network of subcontracting firms which, in turn, frequently have subcontractors of their own. The workers in these subcontracting firms work either in their own shops or at the yard. Of the total shipbuilding labour force in 1983, 50% was made up of permanently employed core workers, 21% by subcontracted workers, and 29% by workers in so-called interrelated industries <sup>34</sup>.

The subcontracting system has given Japanese shipyards enormous competitive advantages. Firstly, it has been possible to place the prefabrication of many of the ships’ parts with highly specialized producers. Secondly, it has provided access to an elastic labour reserve, solving shipbuilding’s inherent problem of regulating the size of the labour force to incessant variations in the volume of work. Thirdly, subcontracted labour has been cheap. In the early 1970s, the Swedish yards had to pay 30-60% more per working hour for “grey” labour than for normal workers; the Japanese yards paid 30-50% less <sup>35</sup>.

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<sup>34</sup> *Shipbuilding in Japan 1983-1984*, Tokyo, Ministry of Transport, 1985, p. 8.

<sup>35</sup> J. BOHLIN, *Den grå arbetskraften och Göteborgsvarven*, University of Gothenburg, Department of Economic History, 1985, pp. 153-156. Mimeo.

The Japanese model was very successful for many years, though in the 1980's problems have arisen. Out of the 368,000 jobs in the record year 1974, some 148,000 had been lost by 1984. In other words, the work force was halved during a period of ten years, and tremendous amounts of building capacity was shut down.

In August 1986, further heavy cuts were announced. Sanko Steamship Co., the country's leading tanker operator, had gone out of business and most of the leading shipbuilders announced big losses. The 1986 reduction scheme proposed cutting capacity at each of the forty-four yards by 20%, leaving thirty-one of them — working with only one building dock — in great difficulties.

There have been problems providing employment for the large group of core workers and at the same time making use of the cheap system of subcontractors. The white-collar sector is becoming overextended. The seniority system implies that older employees block any chance of advancement when no new jobs are created. And it is becoming increasingly difficult to motivate the postwar generation. After the devastation of the war, the older generation was mentally disposed to subordinate its interests to rebuilding the nation. The younger generation, on the other hand, wants to lead a more independent life. In some circles the introduction of more refined bonus systems, or even piece work, is seriously being considered.

People are now discussing the dysfunctional aspects of the model. It was designed for a time of continuous expansion; it worked well when wages were comparatively low, production labour intensive and the labour market overheated. But wages have now become almost as high as in the U.S.A. and Germany. Accordingly, the model is growing increasingly inflexible.

Many managers are deeply worried. Before the 1986 reduction scheme was presented, the Government had envisaged consolidating the industry into ten groups. Now the Ministry of Transport talks about just five groups surviving. Matsuo Kanamori, Chairman of Mitsubishi Heavy Industries and former Chairman of Japan Shipbuilders' Association, has recently mentioned that just three groups may be as many as the sector can accommodate <sup>36</sup>.

Since the war, cheap government credits have always been the financial cornerstone of the shipbuilding industry. During the past few years, however, subsidies have gradually been reduced <sup>37</sup>. In other words, the government is pulling out. This is perhaps the strongest indication of all of the seriousness of the crisis.

The retrogression is affecting working morale. Managers fear workers' reactions, seeing increased antagonism in the years to come. There are fears of further shipyard closures that, just as in Europe, will affect whole communities and regions. There are stories about the Seamen's Union resisting attempts to develop new types of ships requiring smaller crews. This is one of the new business ideas. Since manning costs

<sup>36</sup> *The Economist*, 26/7, 1986.

<sup>37</sup> N. YOSHINO, *The Role of Government in Japan's Industrial Policy*, Paper for the 4th International Shipbuilding and Ocean Engineering Conference, Helsinki, 7th-10th September 1986.



are one of the keys to improved freight economy, companies hope to find a new high-technology market here. Practical tests have been carried out. By using satellite navigation and other kinds of advanced technique, they consider it possible to reduce manning to ten persons. But the Seamen's Union is opposing this ; jobs are already scarce. A more European-like situation seems to be approaching.

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In a historical perspective the Japanese model therefore seems to be just as conditional as the British and Swedish ; a product of a set of historical circumstances that do not last forever. The question is, whether its capabilities have already been exhausted. Will Japan have as great a problem in adjusting to new circumstances as Britain and Sweden did? Will Japan remain the world's leading shipbuilder, or will the industry gradually sink into obscurity — just as it has done in Britain and Sweden?

### Towards a new model?

Can we discern any elements of a new model for shipbuilding? One such element is perhaps *government policy*, i.e. politically decided reductions in the cost of production through subsidies.

Apart from its major military importance, shipbuilding has historically been a vehicle for national industrialization in general, owing to its infrastructural value, its export-earning potential and the big economic link-effects on other industries. This is why it has been made a key element in the development efforts of many so-called developing countries over the past decade.

A general feature of all the newly emerging shipbuilding nations is the central role played by government policy. Indeed, industrial policy played an important part in the Japanese "miracle", a kind of invisible hand providing a propitious framework for market activities. In the new countries, however, the hand is fully visible.

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One example is *Indonesia*, which has recently launched a big shipbuilding programme supported by large subsidies taken from oil incomes. The intention is to produce long series of coastal tonnage for the growing inter-island trade in the archipelago, but the government also has its eye on the international market in the years ahead <sup>38</sup>.

Another example is *South Korea*, which is the world's second largest shipbuilder today ; since 1975 its share of the world market has grown from 1% to 15%. They rely on low wage levels, high working-morale, and a strong alliance between state and industry. Both the whip and the carrot are used.

<sup>38</sup> Interviews Ir. R. Tabiat, Departemen Perindustrian ; Hamid Hadijaya, Departemen Perhubungan, Jakarta, June 1985 ; *Far Eastern Economic Review*, 8/11, 1984 ; *Indonesian Observer*, 1/6, 1985.



The whip is used against the trade union movement, which is strong by Asian standards<sup>39</sup>. The real strike figures are much higher than those presented to the public. Government representatives and employers make no secret of their desire to crush the labour movement. The hard anti-union legislation and the brutal methods used against militant union leaders are well known.

At the same time, the carrot is also a useful instrument. State and employers systematically try to foster consensus and common interests. The biggest shipyard, Hyundai Heavy Industries, which was completed in 1973, just like Samshung Shipbuilding & Heavy Industries and Daewoo Shipbuilding, have their own worker accommodation. They sell apartments in the immediate neighbourhood of the yards to employees at favourable rates. Moreover, a network of company social services has been built up. At the flagship Hyundai, there is a company hospital, company recreation facilities and company shops. And it runs its own education system from kindergarten to college which, as the management states in its public relations material, "makes a great contribution to the whole-person education of Hyundai families"<sup>40</sup>. This has now become a classic way of fostering committed workers. During the first expansive phase, in the latter part of the 1970s, the turnover of labour was around 50%. By 1984 the figure had been reduced to approximately 20%. Slogans are displayed all the time about quality control and efforts to increase productivity<sup>41</sup>.

The director of the Korean Chamber of Commerce said in the early 1980s that "the relationships between management and labor are like family relationships, not so-called 'labor contracts'"<sup>42</sup>. So far, the policy has proved successful. Even though the average real wage of the country's workers has increased by nearly 8% a year since 1971, labour costs remain comparatively low<sup>43</sup>. In 1985 at least some of the yards must have shown red figures in their books. But since then the Japanese Yen has appreciated by about 50% against the currency of South Korea. With labour costs accounting for about one third of the total cost of building a ship, South Korea's competitive advantages have been further increased<sup>44</sup>.

Is it here that we should look for elements of a new model? Or is it in *China*?

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In 1986, there were close to 300,000 shipbuilding workers in China<sup>45</sup>. Most of them work for the state shipbuilding group, China State Shipbuilding Co. This, one

<sup>39</sup> M. A. LAUNIUS, The State and Industrial Labor in South Korea, in : *Bulletin of Concerned Asian Scholars*, 16/4, 1984, pp. 2-10.

<sup>40</sup> *Hyundai Heavy Industries Co., Ltd.*, Ulson, (c. 1982), p. 63.

<sup>41</sup> *JAMRI Report*, no. 7, Tokyo, 1985, pp. 49 ff.

<sup>42</sup> *Korea Herald*, 13/1, 1983.

<sup>43</sup> *Major Statistics of Korean Economy*, Seoul, Economic Planning Board, 1982, p. 175.

<sup>44</sup> *The Economist*, 26/7, 1986.

<sup>45</sup> *General Overview of Chinese Shipbuilding*, Tokyo, JAMRI, March 1985 ; *Far Eastern Economic Review*, 16/2, 1984 ; 14/2, 1985 ; Interview with Senior Researcher Y. Yoshida, Japan Maritime Research Institute, Tokyo, June 1985.

of the biggest companies in the world, was formed in May 1982, the intention being to solve China's enormous transport problems, to create the infrastructure necessary for industrialization but also to produce for export in order to get the foreign currency needed to develop other sectors of industry.

China State Shipbuilding Co. has seven large yards, eleven medium-sized, and twenty-six small ones, most of which are located in the New Economic Zones of Shanghai, Tianjin and Guangzhou. At the beginning of 1984, the seven large yards employed some 71,000 people :

Dalian (Dalian)	16,400 employed
Hudong (Shanghai)	11,400 employed
Jiangnan (Shanghai)	13,000 employed
Shanghai (Shanghai)	10,000 employed
Zhonghua (Shanghai)	6,000 employed
Guangzhou (Guangzhou)	8,000 employed
Xingang (Tianjin)	6,500 employed

This can be compared to around 110,000 in the EEC countries and 150,000 in Japan for the same period.

The Japanese are the people who know the Chinese best and are, as a rule, the most well-informed about what is happening in China. To begin with, they thought it would take a long time for a Chinese venture in commercial shipbuilding to be realized. But today they see indications that China will achieve international competitiveness far sooner than they thought. Some Japanese shipbuilding experts consider the Chinese programme to be just as great a threat to established shipbuilding nations as the one Japan once constituted to Europe.

In technical terms the building up of Chinese shipyards does not constitute a major problem. Naturally, there is a need for engineering expertise and the work force must be trained and educated. But it is possible to speed up the process of learning with the help of foreign experts. Shipbuilding companies from all over the world are standing in line to sell their most advanced production technology, though they are perhaps selling the rope that will later hang them. But any income they can attract to reduce the big deficits in the established shipyards' books is urgently needed, irrespective of whether it just aggravates problems in future. The Japanese Government is eagerly encouraging this export of shipbuilding technology. In Japan, too, many parts of the shipbuilding industry are today regarded as a declining sector that, in a longer time perspective, will probably have to be given over to new countries. By giving assistance in shipbuilding, it becomes possible for Japan to get a footing in other, more promising markets in China <sup>46</sup>. A similar strategy is used by the Norwegians when they order Chinese-built ships even though their quality is still inferior to that of vessels built in established shipyards.

<sup>46</sup> Interviews with Dir. H. Sasaki and former Dir. M. Shashiki, Ministry of Transport ; Chairman I. Yamashita, Mitsui ; Tokyo, June 1985.

One of the most striking impressions the Chinese yards give to a Western observer is the way in which working life is organized. First and foremost, there is an amazingly large contingent of women. By tradition, shipbuilding has been a man's world ; the work culture has paid homage to manliness, toughness, strength and independence. Statistics show that close to 45% of the workers at the Chinese yards are women. As a rule, both husband and wife are employed by the company.

Another striking feature is the integration of work and life. Whole communities have been built up adjacent to the docks and shops. The yards provide housing for their workers, usually standard flats in four-storeyed houses. In addition, they have recreation centres, junior, intermediary and vocational schools ; hospital, day nursery and shops. At the yards around Shanghai up to 60% of all workers live in this way ; at more isolated yards workers are all gathered together. The turnover of labour is small, virtually nonexistent.

The families are tied to their place of work for good — husband, wife, and the children in schools and nurseries. Everything derives from the yard : material life, friends, leisure time. A sort of identity is created between self and work, to the benefit of production. Increased productivity is dinned into the minds of everyone ; good results and new targets are displayed on big notice boards.

Everywhere neat trees and gardens are kept. The people work together and stimulate each other. They have the Government and the biggest potential home market in the world behind them. The goal is to make China an industrially advanced and economically leading country.

The intention is to build up the infrastructure necessary for rapid industrialization ; but also to earn the foreign currency needed for investment in other industrial sectors. The programme rests on a thoroughly planned socialist economy ; in the overall national development plan deficits in one type of industrial activity are to be compensated by profits from others.

One thousand million people, more than a quarter of mankind — it is a question of a giant Government-directed experiment in social engineering. Is it also a new, potent model for shipbuilding?

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Earlier in history there have been many examples of temporary political intervention in the shipbuilding industry. This seems to have become a permanent phenomenon today. Has political skill and manoeuvring become a key to success? And is it only our paradigmatic values that prevent us from seeing the truth?