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# The Regional Development of Commercial Warehouses and Its Locational Bases: Focusing on the Tokai and Hokuriku Districts

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## CHAPTER I

## INTRODUCTION

## I-1 Subject and Purpose of Study

Following on the period of rapid economic growth that commenced during the first half of the decade of the 1960s, mass production and mass consumption were accompanied by a marked increase in the flow of commodities, and emphasis came to be placed on the functions of the distribution sector combining production and consumption, the two main aspects of economic activities. In particular, the advance of technological innovation and the diversification of consumption contributed to the further expansion of the role performed by distribution. Generally speaking, distribution is divided into two main parts: *shoryu* (the series of stages in trading activities that take place during the course of the transference of products from manufacturer to consumer); and *butsureyu* (the physical distribution of goods or commodity flow). Until now, business enterprises have placed emphasis on the former, and paid comparatively little attention to the latter. Furthermore, business enterprises dealt positively with the matter of the rationalization of

production processes, but remained relatively cool with regard to the improvement of physical distribution processes. In recent years, however, due to the improvement of transport systems, the accelerated promotion of sales and so on, business enterprises have become increasingly aware of the improved efficiency and dispatch of which the physical distribution system is capable; so much so that every business enterprise now considers the physical distribution system an effective means of acquiring the lead in the competition with other business enterprises (Nakada, 1984: Jerome and William, 1984). In particular, while manufacturing enterprises pursued rationalization by means of the reorganization of physical distribution facilities, on the one hand, they emphasized the build-up of delivery services from a marketing-oriented viewpoint. In other words, the physical distribution of goods, as practiced by business enterprises, sought to achieve a harmonious blend of two elements, those of rationalization and improved services, and as such, consequently came to form an important sector of business operations together with production activities. This newly developed awareness of physical distribution manifested by enterprises became even more marked, due to the increase in quantity of the flow of commodities and the advanced diversification of the commodities.



Physical distribution, as discussed here, consists of five functions, i.e., delivery, storage, cargo handling operations, inventory management, and data processing (Ichiki, 1988). Observed from the regional point of view, the functions of delivery and storage clearly reflect the characteristics of the region involved; hence they form an important subject for geographical studies. On the other hand, the functions of cargo handling operations, inventory management and data processing comprise major aspects of storage techniques and have very little to do with regional concerns. Delivery is, so to speak, the overcoming of the distance separating two locational points; storage is the adjusting of the time lag between demand and supply. That is, the former expresses the regional movements of freight, while the latter expresses the static nature of inventory management, where activities involve goods staying in one place.

Generally speaking, it is extremely difficult to grasp the overall route involved in the movement of freight from the production area to the consumption area. Hence, when undertaking geographic studies in physical distribution, an effective method of study is to consider the goods stored in the warehouse along with their points of origin and destination, with the stationary warehouse as a point of reference (Azumi, 1983). This paper, therefore, will focus on

the comparatively easily comprehended subject of stationary storage functions to clarify the attributes of warehouses. Reasons for taking up the warehouses as a subject of study are several. Firstly, the goods stored in any one warehouse and the character of the warehouse enterprises clearly reflect the relationships both goods and enterprises share with the region involved, and thus warehouses serve as effective indicators of the special characteristics of the said region. Secondly, an increase in the flow of goods resulting from the building up of mass production and mass sales systems leads to a marked increase in the number of warehouses and storage space at the strategic points of physical distribution to be described later. With the increased storage capacity and increased amount of goods consigned to storage, warehousing, out of all the functions of physical distribution, came to be regarded as one of importance. Thirdly, the location of a warehouse fundamentally consists of a place where commodities stay put, a place, moreover, coinciding with the strategic point in the commodity flow. Hence an investigation into the functions of warehouses requires an understanding of physical distribution activities and is significant in the study of physical distribution itself. Fourthly, in recent years, together with the increase in the number of warehouses, new types of warehouse enterprises, backed by

parent companies which have undergone diversification to a marked degree, have entered on the scene in increasing numbers. This situation speaks for the fact that businesses other than warehouse enterprises have also come to recognize the importance of the function of storage; an increasing number of overland transport enterprises or manufactures, among others, have added the operation of warehouses to their original line of business.

As stated above, warehouses are concentrated at points strategic to physical distribution activities, where commodities were at a stationary stage in the process of distribution, and form considerable varieties in sizes of warehouse concentrations. These accumulations of warehouses were mostly to be found in large cities or in the environs of the latter, and in or around medium-size cities. Warehouse in medium-size cities were relatively few, and most developed in accordance with the characteristics of the regions in which they were found. In this way, diverse types of warehouses developed in one region, leading to the increase in size of warehouse concentrations; and in answer to the growing demand for storage facilities, warehouse enterprises proceeded to advance into various parts of the country. Notably, in recent years, due to the increase in commodity flow, and the renovation of the means of transport and so on, changes have occurred in the areas moved into by

warehouse enterprises, and new concentration areas have been added to areas with already existing accumulations of warehouses, bringing about differences between the new and already existing areas. While these differences were most obvious in the three metropolises of Tokyo, Osaka and Nagoya and their environs, such differences could also be found in some medium-size cities. Besides, large-scale warehouse enterprises advanced into large cities and regions spread widely over the country, apart from the three metropolises and their environs. Thus, it is possible to learn something of the characteristics of those cities and regions into which these enterprises advanced. It should be noted that the regions penetrated were of different types, the choice of which region to penetrate depending on the character of the advancing enterprise. Hence a significant problem arose of clarifying the relationship between the character of an enterprise and the region penetrated by that enterprise. For this purpose, an analysis of the conditions attending on the advance also became necessary as well as a grasp of the region, because conditions for advance supposedly differed according to the region penetrated. Apropos of this, the relationship between the type of warehouse enterprise and the conditions pertaining to its advance into a region had also to come under scrutiny. Consequently, the first task to be approached here is an elucidation of the regions into

which warehouse enterprises have advanced, and the conditions pertaining to their advance.

Now, when warehouse enterprises start to operate in various regions they have moved in, the progress of their operation there would activate regional expansion of warehouses, leading to formation of concentrations in various regions. Especially, since the period of rapid economic growth in the 1960s, the progress of production technology, the improvement of transport systems, the improvement of the standard of living of consumers and so on, have attained remarkable levels of achievement. This resulted in the conspicuous transformation of, among other things, the sectors of production, transport and consumption, with which the warehousing business is, in one way or other, involved. The transformations in their turn stimulated the further expansion of warehouse enterprises into an increasing number of regions, each region then acquiring its own concentrations of warehouses. The establishments of warehouses were governed by sundry elements proper to the regions concerned with locational bases of warehouses reflecting regional characteristics. The character of a region could either work to the advantage of the warehouses established in it, or could prove detrimental, when it comes to relationship between the warehouses and the character of the region where they are concentrated. Acquiring an

understanding of the locational bases, incorporating elements either favourable or unfavourable, or both, to the establishment of warehouses in any one area, is another important aspect in the explication of commercial warehouses from the geographical point of view. With the above points in mind, the author here sets out to analyze, firstly, the regions into which warehouse enterprises have advanced and the conditions attending on the advance, and secondly, the locational bases of warehouses and conditions hindering the location of warehouses in a given area.

#### I-2 Past Studies and Problems Therein

The field of scholastic studies covering warehouses is actually that of commerce, and after World War II, a large number of detailed papers on the subject were published as parts of studies in physical distribution or commodity flow. The purpose of those studies was to investigate the compatibility between the reduction of physical distribution costs and marketing orientation. Important works on the subject include Nishimura (1973), Kubomura, Deushi and Yoshimura (1978), Tauchi and Murata (1981), Paul and Michael (1985); these studies included discussions on ways and means of dealing with the problem of the mutual contradictions arising from two conditions salient to the successful

operation of warehouses, that is, the prevention of the accumulation of surplus stock in warehouses, and the improvement of the set-up ensuring the prompt delivery of goods upon request -- a situation calling for a constant stock of goods to be kept on hand. From this point of view, the site selected for the location of a warehouse has to be one favourable to the adjusting of the two conditions, so that they no longer oppose each other. Here, the quantity of stock or the frequency of business transaction are deciding factors in the location of warehouses. Studies in commerce invariably examined the subject of warehouse location from the point of view of the quality of the service rendered and/or the profit motive; but where geographical studies were concerned this point of view omitted the all-important aspect of the relationship between warehouse and region. Besides, James and Jerry (1988) mainly aimed at the consignment aspect of warehousing operations in general, involving, for example, inventory management, cargo handling, data processing, an automated form of multi-level storage utilizing the limited spaces to the best advantage (*rittai hokan*), storage utilizing containers, packaging and so on; however, here too, a consideration of the regional aspects is missing.

Where the field of geographical research is concerned, very few studies have been given over to warehousing-related

subjects, or especially to the warehouse itself. Only three extant articles dealing with the warehouse are Sato (1965), Nakagawa (1969) and Hirai (1988). The first and second of these authors dealt with the distribution of warehouses, changes in warehouse functions and the development process of warehouses. The third author classified the types of warehouse in Atsugi city, Kanagawa Prefecture according to points of origin and destination, in order to achieve a grasp of their respective functions, and indicated the reasons for their expansion.

Apart from the above, some studies have taken up the functions of warehouses as part of physical distribution or commercial transactions, though none have dealt with the character of warehouses per se as the subject. The work of Hasegawa (1983) can be mentioned as this example, where warehouse functions are part of an organization plan of physical distribution system. The work of Hasegawa (1984) deals with the changes in quality of warehouses accompanying the improvement of physical distribution, the regional allocation of warehouses, and furthermore, the actual conditions of warehouses mainly in the Tohoku district. Kitamura and Terasaka (1979) compiled a large number of studies analyzing the regional structure pertaining to forms of physical distribution according to storage item, and pertaining also to transport systems, the means of the



transmission of information and so on. However, even in the above-mentioned works, there are almost no studies besides this author's providing a comprehensive discussion on the warehouse as subject.

Some other examples of related studies include a work of McKinnon (1989), which places emphasis on a consideration of physical distribution routes. The work goes on to point out that the routes are of two kinds, one involving the direct delivery of goods from factory to place of demand and the other involving the setting up of a delivery centre midway between factory and place of demand, though in recent years, in the effort to reduce costs, the intensified utilization of the delivery centres has greatly increased. Other pertinent articles are Nakagawa (1971), Shiokawa (1971, 1982), Hay (1979), and Takahashi and Shiokawa (1984). Of these, Shiokawa (1971, 1982) discusses warehouse functions as one part of the physical distribution process. Hay (1979) clarifies the relationship between the flow of freight and the region involved; this work is helpful in gaining an understanding of warehouse functions. In the case of Takahashi and Shiokawa (1984), the relationship between the office where commercial transactions take place, and the warehouses are examined from the locational point of view. The above covers an extremely small number of works which partially touch on the warehouse, but case studies are very

few. Moreover, while admittedly, existing studies have touched on the distribution, process of the development, or function and so on of warehouses, insufficient consideration has been given to the five problematical aspects delineated below.

Clearer understanding of the regional characteristics of the warehouse will be obtained through clarification of three problems: 1) In the case of commercial warehouses, analyses as seen from the consigner angle are non-existent. Numerous difficulties attend on the carrying out of direct enquiries or the gaining of an insight into the attributes of the consigner, or the points of origin and destination of the commodities consigned and so on. However, where certain aspects of this study are concerned, positive results may be obtained by the introduction of some considerations on the consigner, or instead, another method introducing other indicators of the warehouse. 2) The regions where warehouses are distributed differ according to the character of the warehouse enterprises concerned. In particular, when these differences occur, identifying the character of the parent company instigating the advance of warehouses into one region or other is important, but hitherto published papers do not include analyses made from this point of view. 3) Heretofore, regions examined in the context of existing studies have almost always been limited to a single

municipality area; studies over large areas or of two areas for the purpose of a comparative study are rare. For this reason, a general conclusion can seldom be arrived at.

4) The conditions attending on the advance of warehouse enterprises into new areas greatly differ, according to whether the areas in question are inland<sup>1)</sup> or port<sup>2)</sup> areas; moreover, the character of the warehouses themselves respectively show strong differences. However, no analyses have hitherto been made with regard to these important aspects. 5) Where the process of studies are concerned, the classification of types of warehouse enterprises or of the establishment of warehouses is almost non-existent, and an appropriate methodology has not yet been determined on.

Next, pertinent studies are consistently hard to find, in spite of the fact that, contingent on the rapid economic growth of the 1960s, important developments such as the remarkable regional development of warehouses and the forming of relationships between warehouse and region took place. It is because the paucity of available reference material compelled these studies to fall back on the carrying out of direct enquiries, the preparation of questionnaires and the personal compilation of pertinent data involving complicated work. For example, the basic numerical data pertaining to warehouse storage space by region were obtained by means of direct enquiries and long

hours of desk work. Furthermore, while the kind of commodities stored in any one warehouse served as a basic indication of the character of the region involved, a region-by-region grasp of the situation inevitably called for the more of the above kinds of investigative effort. Hence it could be said that the main reason for the scarcity of pertinent material was the enormous effort and legwork required to collect basic data and put it together.

### I-3 Method of Study

In carrying on the present investigation, the types of warehouses in operation will be described first. There were two main types, the commercial warehouse<sup>3)</sup> and the private warehouse<sup>4)</sup>, the latter being owned by the enterprise that used it. The present study is limited to a survey of commercial warehouses, for the following reasons. Whilst it is true that a study of commercial warehouses alone does not provide a complete view of the total situation of warehouses, commercial warehouses, located as they are in areas in accord with the business they handle, are the direct expressions of the production and consumption activities of those areas. Consequently, since they rely on consigners for their business, it is through the consigner

that an insight into the regional aspect of the demand for storage space is obtained, as well as enlightenment regarding the locational bases of warehouses. The so-called private warehouses were generally annexes of factories and wholesalers. They are restricted by the owner's line of business, which makes it hard to pinpoint their location at first hand. They were of many types, large in number and located at random over widely scattered areas, so that the extensive collection of research material on them, for the purpose of analyses was extremely difficult. In comparison, the commercial warehouses rely on a great many different consigners and are therefore open to investigation in many ways and from multifarious points of view; it is for these reasons, therefore, that this study is restricted to an analysis of the commercial warehouse.

According to a classification system<sup>5)</sup> devised for administrative purposes, there are three types of commercial warehouses: the general warehouse, the cold-storage warehouse<sup>6)</sup> and the pond for timber storage. Furthermore, the general warehouse is sub-classified into another four types of general warehouses classes 1-3<sup>7)</sup>, the open-air warehouse, the silo, and the dangerous goods warehouse. Numerically speaking, this study deals mostly with the general warehouse centering around general warehouses classes 1-3. Discussion of the cold-storage warehouse, which

came into prominence with the development of the cold chain system is omitted here, since it differs in character from the general warehouse; the former was generally limited to the storage of foods, and frozen foods at that, while the latter dealt with the storage of various goods including sundry goods. Hence it ensues that in contrast to the locationally restricted cold-storage warehouse, the general warehouse evinces a diversity of developments locationally, and is thus salient to the purpose of the present study.

Next, the method involved in the present study will be described. Here the commercial warehouse enterprise and the consigner form the main subjects of discussion since they were the main influences brought to bear on the relationships between the commercial warehouse (hereafter referred to as 'warehouse') and the region in which the warehouse was located. Referring back to the question of the distribution of warehouses discussed at the beginning of this study, whilst warehouses are generally concentrated in large cities and their environs, they are also to be found sporadically in medium-size cities in other regions; the demand for storage facilities is by no means limited to certain fixed regions, but occurs over relatively widespread areas. In view of this, a comprehension of the relationship between enterprise and consigner on the one hand and region on the other is felt necessary.

However, since consigners are basically of pre-eminent importance to the warehousing business, a great deal of competition takes place among the large number of existing warehouse enterprises, each of which is beset by concerns that consigners to its warehouses would transfer their freight to the warehouses of other enterprises. Hence there is a strong tendency on the part of warehouse enterprises to conceal the identities of consigners; this proves a hindrance when attempting to grasp the total situation involving consigners by means of direct enquiries. For this paper, then investigations are carried out utilizing whatever information was available on the attributes and characteristics of consigners, but mainly concentrating on the kinds of commodities consigned by the latter to warehouses. For the items stored in any one warehouse are important factors in the defining of the character of that warehouse, and taking them into consideration is considered an effective method in the development of the present study. The process of research also involves an examination of how the characteristics of a region are reflected in the items stored in a warehouse located in that region, and of the bonds formed between the respective points of origin and destination on the one hand and the warehouse on the other.

In order to examine the regional development of warehouses, the first step to be undertaken is the

clarification of the regions into which warehouse enterprises advance in the course of their expansion. An enterprise naturally advances with the purpose of looking out for demands for its services; but its choice of region differs widely, depending on what kind of enterprise it is. Or that is to say, since most warehouse enterprises emerge as a result of diversification on the part of a parent company, the choice depends on what sort of company the parent company is. That is, the choice between inland area and port area is determined by the character of the parent company, posing an important problem regarding relation between the warehouse and the region. For the purpose of study, therefore, the regions advanced into are divided into two basic and very different types, i.e., inland areas and port areas. Also, from the viewpoint of the development process of warehouses, there were wide divergences in the respective characters of inland and port area warehouses. Hence it is attempted to classify the types of warehouse enterprises and define their characters by category, using the parent companies and areas advanced into by the warehouse enterprises as points of reference. The second step is the clarification of the conditions of advance into new regions according to the type of advancing warehouse enterprise. The primary condition for the advance of an enterprise is the acquisition of client consigners; but the



fact that this first condition itself contains various shades of differences, according to the type of warehouse enterprise involved, will also be made clear.

Whilst another purpose of this paper is to explain the locational bases of the warehouse, it should be noted that the warehouse is, first of all, established at a place where there is a demand for storage space, and that this place coincides with a place strategic to physical distribution. Generally speaking, it is assumed that a transit area constitutes the strategic base for physical distribution; however, the starting point and the destination point of physical distribution, that is, the areas of production and of consumption, also respectively constitutes strategic bases for physical distribution. Enterprises attach importance to areas producing goods and areas where goods were sold or consumed in their physical distribution activities. In order to attain a systematic comprehension of the locational bases of warehouses, the types of warehouse location are first deduced by municipality. Since the warehouse locations coincide with strategic bases for physical distribution, they are classified into three categories from the viewpoint of physical distribution. Thus, three types of areas, i.e., production, transit and consumption areas lead to production, transit and consumption area warehouses. Next, in order to identify

which of the three categories of locations they came under in each municipality, lists of items in storage and the places of the origin and destination of commodities are utilized as points of reference. As mentioned previously, the storage items reflect the relationship existing between warehouse and region; moreover, the three categories of areas are highly significant from a regional point of view. Thus, both can be considered proper to geographical studies on warehouse location.

Next, the locational bases of warehouses will be analyzed by municipality, and in line with the three types of areas. In order to explain the bases as clearly as possible, a discussion of the conditions hindering the establishment of warehouses is added. Methods of study such as these are used because a number of the past case analyses proved effective (Azumi, 1984a). Such methods revealed the fact, for example, that in the case of the locational bases of production area warehouses, a large number of warehouses rely on the textile industry for consignments; on the other hand, warehouses relying on the motor car industry for consignments are extremely rare. In aid of a clear analysis, considerations on the differences in locational bases of warehouse, brought about by the different types of industries utilizing the warehouses, must also include investigations into the conditions hindering establishment

of warehouses. The other studies carry out analyses of locational bases of the warehouse, but rarely of conditions hindering the location of warehouses.

Due to the dearth of available statistics and reference material, the present study generally relies on information derived from the results of direct enquiries or answers to questionnaires addressed to warehouse enterprises and direct enquiries at prefectural Warehousemen's Association, or on the data found in the membership roster of the Japanese Warehousemen's Association. Partial information is obtained through direct enquiries among consigners. The period forming the background of this study is limited to the time following the period of rapid economic growth which took place mainly during the decade of the 1960s; as previously stated, it was following on the rapid growth period that, with the increase of the commodity flow and the changes in delivery systems, the regional development of warehouses became active and regional differences pertaining to the location of warehouses became increasingly evident.

The areas targeted for study in the present paper were within the Tokai and Hokuriku districts and comprised seven prefectures, Aichi, Gifu, Mie, Shizuoka, Fukui, Ishikawa and Toyama. Since various types of industries were located in these areas, as well as important ports and large and medium-size cities, it followed that production, transit and

consumption areas also had their places there; all of which aided in the elucidation of conditions attending on the advance of warehouse enterprises into new regions and of the locational bases of warehouses. Establishment of diverse industries, in particular, supposedly involves conditions hindering the location of the warehouses.

## CHAPTER II

THE PROCESSES INVOLVING THE DEVELOPMENT OF  
WAREHOUSES, REGIONS ADVANCED BY WAREHOUSE ENTERPRISES  
AND TYPES OF WAREHOUSE ENTERPRISES

## II-1 Development of Processes the Warehouse

According to the distribution of commercial warehouses in the Tokai and Hokuriku districts (Fig. 1), the target areas of this study, the city of Nagoya with a storage floor space of 340,000m<sup>2</sup> followed by Komaki City with 400,000m<sup>2</sup> have by far the largest storage spaces. Spaces of more than 100,000m<sup>2</sup> are found in Tobishima-mura and the cities of Shimizu, Yokkaichi, Hamamatsu, Fuji and Ichinomiya, indicating that the spaces are most closely concentrated in Nagoya and its environs, and in Shizuoka Prefecture. If these are the top-level spaces from the storage point of view, then the second level, consisting of medium-size storage floor areas of 50,000-100,000m<sup>2</sup>, are to be found in the five cities of Fukui, Shizuoka, Kanazawa, Tokai, and Obu. Six municipalities including Toyohashi and Toyama belong to the low level category of 30,000-50,000m<sup>2</sup> floor space. Municipalities with lowest-level spaces of 10,000-30,000m<sup>2</sup> are to be found somewhat unevenly distributed in the two prefectures of

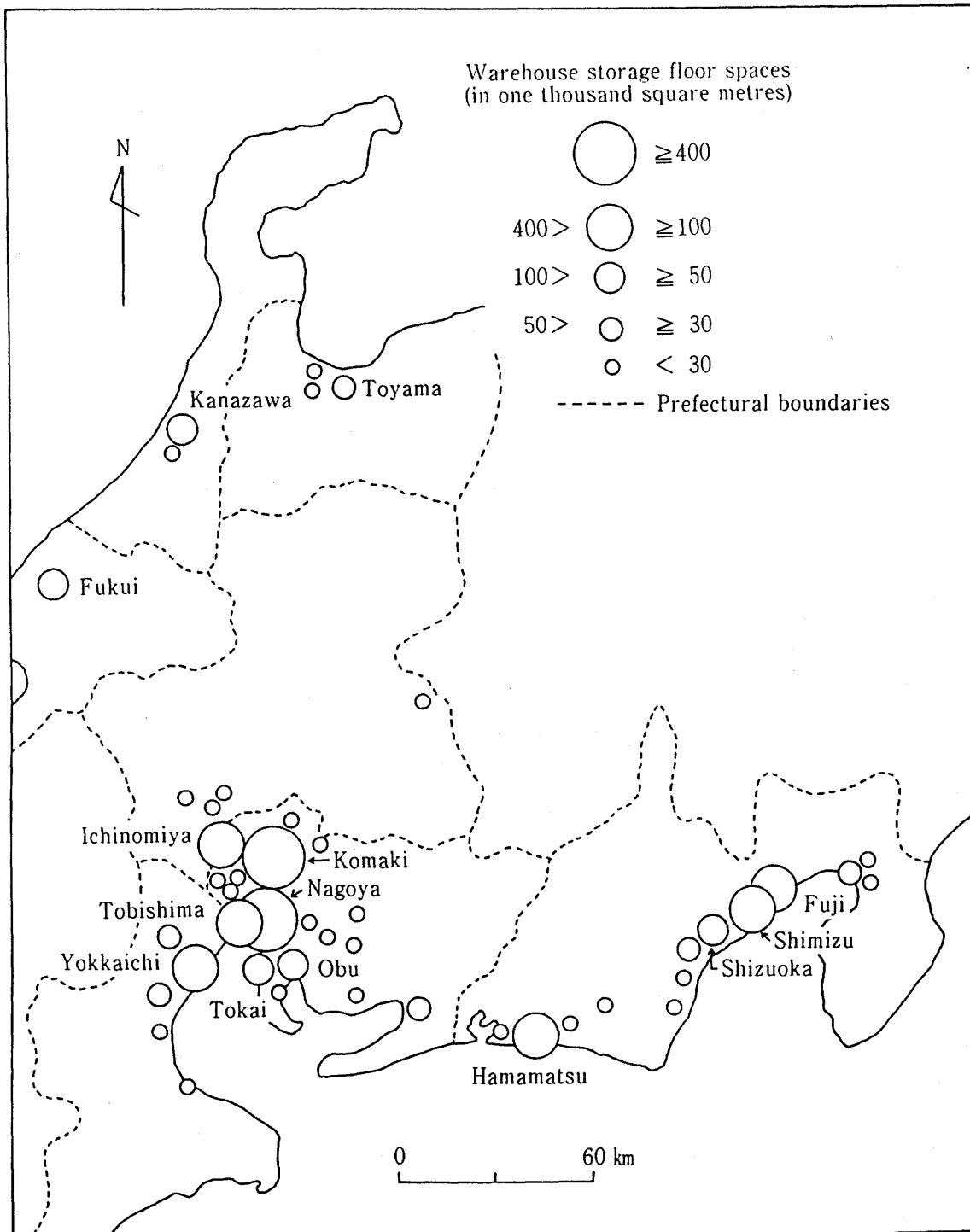


Fig. 1 Distribution of warehouses in the Tokai and Hokuriku districts by storage floor space and municipalities (1983)

Note: Municipalities with warehouses having storage floor spaces of less than 10,000m<sup>2</sup> are omitted.

(Source: Tokai District Maritime Transport Bureau, Ministry of Transport)

Aichi and Shizuoka. Hence it will be seen that, apart from the massive concentration in and around Nagoya, warehouses are distributed among medium-size cities as well. This study, therefore, in line with the above distribution attempts to clarify the development process of warehouses by dividing the area of investigation into two large parts, one comprising the city of Nagoya, and its environs and the other, medium-size cities.

#### (1) Nagoya City and Its Environs

The development process of warehouses in Nagoya and its environs will be observed at three different periods, i.e., the last stages of World War II, the beginning of the period of rapid economic growth, and the period following that of rapid economic growth (Fig. 2). In 1944, warehouses were concentrated in four wards within Nagoya City, i.e., Minato, Naka, Nakagawa and Nakamura Wards, with merely a small concentration found in Ichinomiya in the suburbs of Nagoya. Some of the warehouses located in Naka, Nakagawa and Nakamura Wards in the inland area of Nagoya, are urban warehouses<sup>8)</sup> storing consumption commodities. But a larger number of them were regional extensions of Nagoya port warehouses and were chiefly located at intervals along the Nakagawa Canal and the Horikawa, a situation which reflected

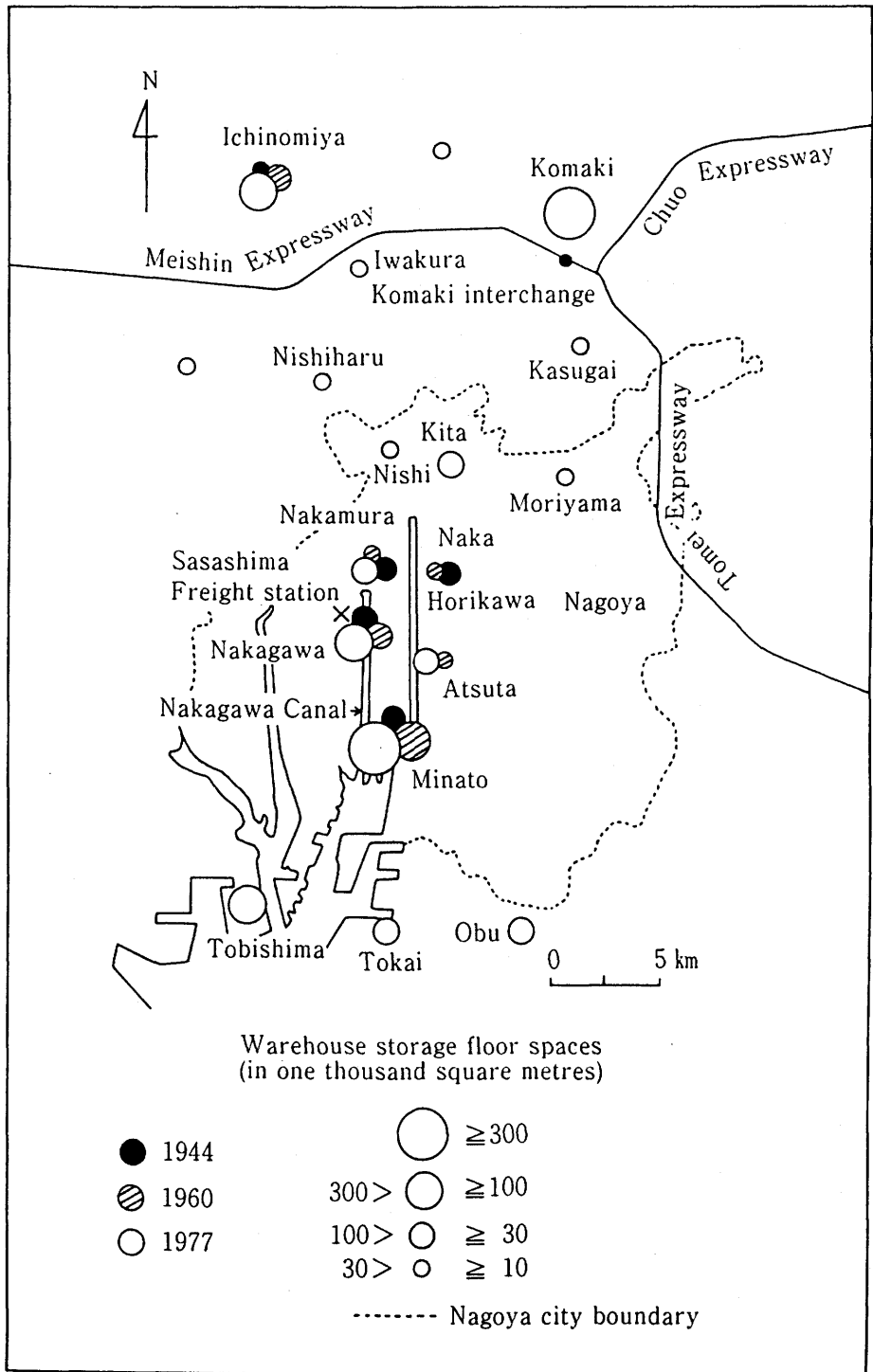


Fig. 2 Changes in the distribution of warehouse storage floor spaces by wards in Nagoya and by municipalities in the environs of Nagoya.

(Source: Tokai District Maritime Transport Bureau, Ministry of Transport)



the backwardness of Nagoya Port facilities (Azumi, 1978). However, the warehouses of Nakamura Ward were accumulated around Sasajima freight station where the Nakagawa Canal formed a juncture with the railway, thus performing the functions of both canal-side and railway station warehouses. In that early period, the location of warehouses was predetermined by ships and railways, which were then the chief means of transport. Where suburban areas were concerned, the only existing concentration of warehouses was located in the textile-producing area of Ichinomiya City, which had its own particular base unconnected with the locations of warehouses in Nagoya.

1960 saw an increase in warehouse storage floor space in Minato Ward, the port area of Nagoya in contrast to a marked decrease in the inland areas of Naka and Nakamura Wards, the storage floor space for the latter two having decreased by 5 percent and 50 percent respectively, in comparison with pre-World War II days. A large number of warehouses located in the both wards forming the main urban area were destroyed during World War II, and particularly in Naka Ward, which was largely a central area, the postwar location of warehouses posed a problem. Nakagawa Ward, however, was relatively fortunate where available land sites were concerned, and was able to increase its storage floor space by about 10,000m<sup>2</sup>. Furthermore, at this time, new

warehouses were constructed in Atsuta Ward, and since the latter comprised a densely built-up area adjacent to the central urban area, the more important of those warehouses were located along the canal at former factory sites. The storage capacity of warehouses in Ichinomiya was on the increase, though in the case of this city, most of the storage space was taken over by textiles. As it was, at this period, Ichinomiya comprised the only existing concentration of warehouses in the environs of Nagoya City. While this situation of limited warehouse concentrations lasted until about 1960, at the same time, there was as noted above, a comparatively large number of warehouses having port functions, albeit due to the insufficiency of port facilities, the latter type of warehouse did not confine their operations to port areas but also developed in inland areas, along the Nakagawa Canal.

By 1977 there was a marked expansion of the distribution areas of warehouses, particularly in Minato Ward in Nagoya City and in the municipalities of Komaki and Tobishima-mura. In the case of Minato Ward, the improvement of pier services of the port area facilitated the increase of warehouse storage floor space to four times the space available in 1960. In Tobishima-mura, which is actually an extension of the Nagoya port area, new warehouses erected in a zone of about 100,000m<sup>2</sup> prepared for that purpose, resulted

in the creation of a distribution centre<sup>9)</sup> and improved port facilities contributed to rapid increase of warehouses. Individual warehouses advanced into Tokai City under much the same conditions as in Tobishima-mura. From about 1965, the city of Komaki, situated inland and in the adjacent area to the north of Nagoya, became a strategic point for expressway traffic, and a truck terminal<sup>10)</sup> was also built there. There was a notable increase in the transformation of reclaimed paddy fields into sites for warehouse concentrations; in the short space of about ten years, storage floor space of over 300,000m<sup>2</sup> were gained in this way. Apart from the fact of favourable traffic conditions, suitable sites were easier to find there than in the urban areas of Nagoya, encouraging the advance of warehouses. Subsequently, a large number of rental warehouses were constructed by farmers, resulting in the accelerated formation of further concentrations of warehouses. Furthermore, in certain municipalities in the environs of Nagoya, besides Komaki, though the total warehouse storage capacity was small, the construction of new warehouses none the less took place. These municipalities included the inland cities of Obu, Kasugai, Iwakura, Nishiharu-cho and so on. As noted previously, Ichinomiya was the seat of a traditional industry native to the city, that is, textiles, and hence maintained warehouses whose function was the

storage of textile goods. However, by 1977, the warehouse storage capacity of Ichinomiya was surpassed by that of Komaki, the former becoming one-third of the latter. The warehouse storage capacity in Nakamura Ward showed an increase over 1960, primarily due to the increases by multi-level storage in the warehouses of a major enterprise referred to in this paper as A\_\_\_\_\_ Company.

Hence, in this period, important warehouse concentration areas included the four wards of Minato, Nakagawa, Nakamura and Atsuta, located in Nagoya, the two cities of Komaki and Ichinomiya, and Tobishima-mura; from the point of view of function, the warehouses involved had some aspects in common, but generally they differed considerably from one another. By 1977, the traditional warehouses of Nagoya had undergone changes in function owing to the increase of port area warehouses, an increase that in turn was instigated by the improved port facilities. That is to say, the functions of inland, canal-side warehouses were transformed into the functions of urban area warehouses. As a result, the regional divergence between the warehouses of Nakagawa and Nakamura Wards, both of which came to centre on domestic freight utilizing overland delivery, on the one hand, and those of Minato Ward and Tobishima, which relied on seagoing freight, on the other, became extremely marked (Azumi, 1978). In Komaki, due to the convergence of road traffic, the

warehouses chiefly stored production and consumption goods; thus their locational bases of establishment differed from that of the warehouses of Ichinomiya. Based on the above and classified according to the functions of the warehouses, the warehouse concentration areas are classified into two large divisions, port areas and inland areas respectively, which may be further sub-divided as follows: 1) Nagoya port area (hereafter referred to as 'port area'), 2) Urban area within Nagoya City (hereafter referred to as 'urban area'), 3) Ichinomiya area and 4) Komaki area.

The changes in warehouse storage floor space in the above-cited four areas after the period of rapid economic growth (Fig. 3), show that compared to the remarkable increases made in the port and Komaki areas, the urban and Ichinomiya areas appeared to be stagnating, or the pace of increase was slow. For one thing, from the 1970s, where the urban area was concerned, the overpopulated situation of the central districts was a factor inhibiting the increase of warehouse storage floor space; this was in contrast to the situation in Komaki. In the port area, the main reason for the remarkable expansion of warehouses from 1973 was the establishment of the collective warehousing centre within the Tobishima-mura distribution centre. The slowing down of storage floor space expansion in Ichinomiya commenced in the first half of the 1970s, and was related to the stagnation

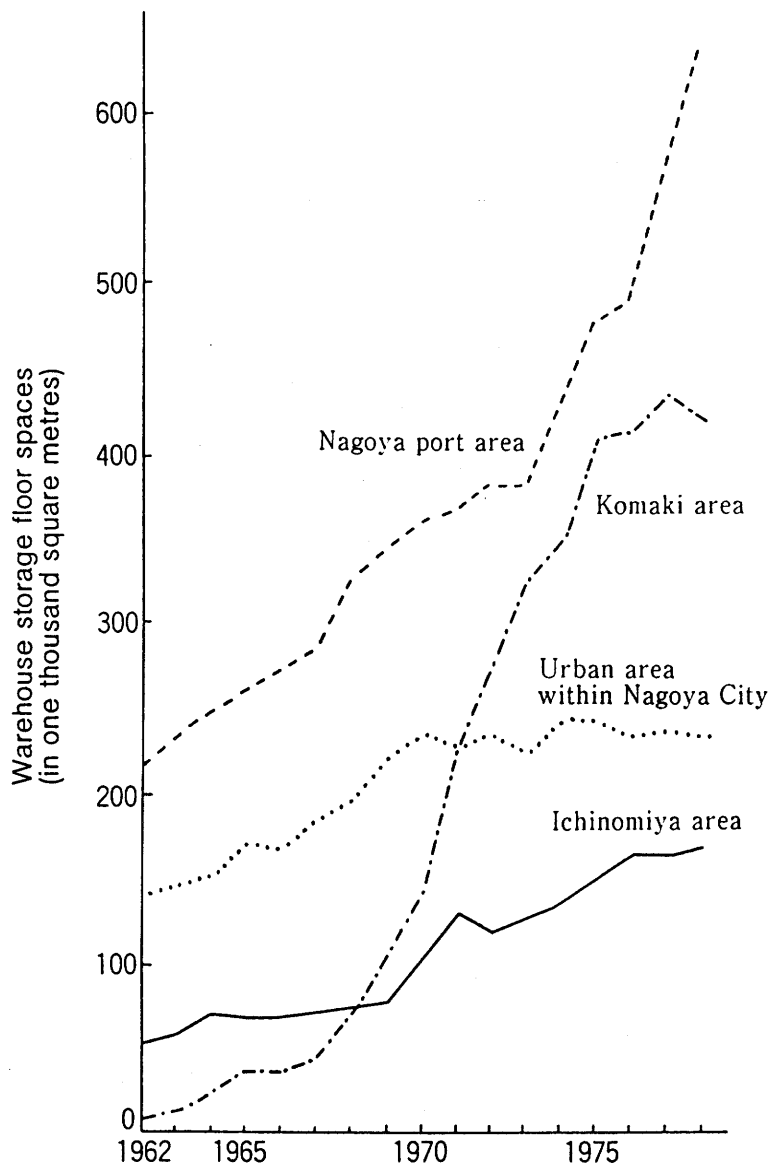


Fig. 3 Changes in warehouse storage floor spaces in four areas  
 (Source: Tokai District Maritime Transport Bureau, Ministry of Transport)

of the textile industry at that time; in this area, changes in storage floor space were subject to the fluctuations in prosperity of the local industries. One reason that Komaki's rate of storage space increase was the highest among the four areas in question, was that the warehouses in Nagoya had become too small and the latter city sought to utilize available spaces in Komaki for the building of additional storage facilities; another was that a large number of warehouses were constructed in Komaki that had no connection with the already existing warehouses in Nagoya. In the case of warehouse enterprises located in Nagoya, Komaki and Obu cities, quite a few are headquartered outside the local prefecture<sup>11)</sup>. However, only five enterprises headquartered in Nagoya moved into other prefectures. They are only of large scale enterprises with large storage space. As it was, the areas advanced into by Nagoya warehouse enterprises were small, and mostly limited to Aichi Prefecture. The warehouse enterprises based in the medium-size cities referred to above generally did not advance into areas outside the boundaries of the prefecture.

As a result, seen from the viewpoint of the development process of the warehouses of Nagoya and her environs, points to be noted are that it is possible to classify warehouse locations into two types, the port area type and the inland area type, and that their respective developments greatly

differ from one another. Apropos of the above, it is also possible to observe the regional contrast involving the character of warehouse enterprises and the locational bases of warehouses. With this in mind, the following sections will discuss the conditions attending on the advance into new regions by warehouse enterprises, and the locational bases of warehouses by type of warehouse.

## (2) Medium-Size Cities

Here the case of three medium-size cities of Yokkaichi, Shimizu and Hamamatsu will be taken up. The first two are port cities, the third is an inland city, hence it will be possible to clarify, along these lines, the differences emerging in the course of development of warehouses in these two types of cities. First, as regards the process of warehouse development in Yokkaichi, prior to World War II, there existed four warehouse companies in the city, and on the verge of the war's end, the total warehouse storage floor space comprised about 50,000m<sup>2</sup>; moreover, the storage space was concentrated in the port area. A marked increase in storage space commenced to occur from the first half of the 1960s, and the warehouses built during the 1962-73 period comprised over half the total number of warehouses. The reason behind this was the increase in industrial



production and port freight. To classify warehouse distribution according to the time of the establishment of the warehouses (Fig. 4), warehouses established before 1960 were all concentrated at port areas. After that, though a large number of warehouses continued to be built at ports, the inland location of warehouses became apparent, most of them being situated along trunk roads, and thus comprising a type of warehouse oriented to road traffic. The warehouse storage floor space figures for 1978 were approximately 230,000m<sup>2</sup>, out of which a high percentage of about 170,000m<sup>2</sup> was concentrated in the port area, in a situation echoing that of before the 1960s. In terms of the number of warehouses by size, there were large establishments of more than 10,000m<sup>2</sup> at six different places in the port area, the average storage floor space being 7,000m<sup>2</sup>; while for inland warehouses, there were three establishments of over 10,000m<sup>2</sup>, with an average of 5,000m<sup>2</sup>. Thus, the port area warehouses are larger in scale.

The warehouse business in Shimizu commenced in 1917, with the establishment of warehouses at port areas, where they continued to be concentrated throughout the years prior to World War II. By 1944, there were four warehouse companies providing a total of approximately 50,000m<sup>2</sup> of storage space. However, about 50 percent were destroyed in

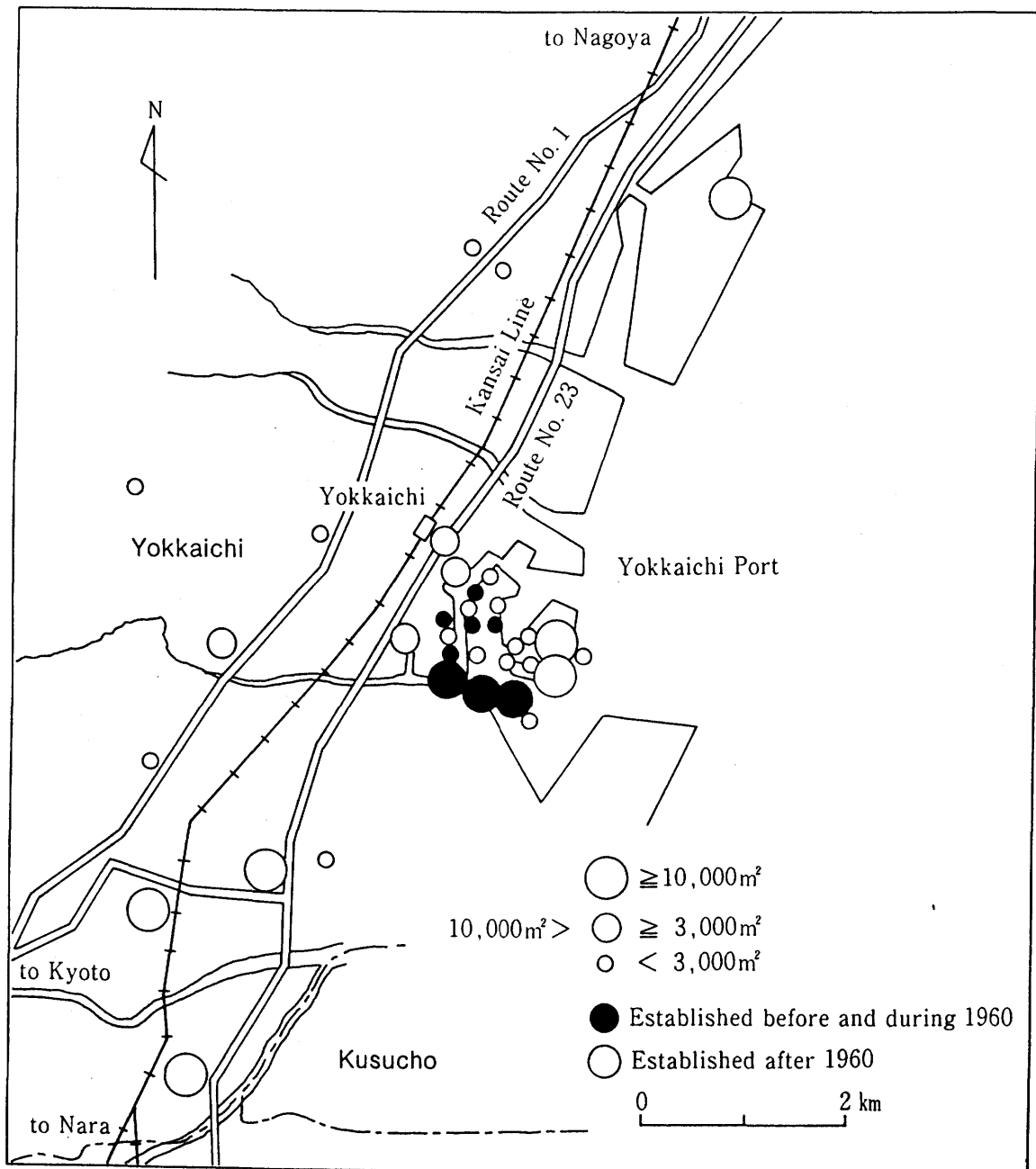


Fig. 4 Distribution of warehouses in Yokkaichi by period of establishment and storage floor space (1978)

(Sources: Tokai District Maritime Transport Bureau, Ministry of Transport, and direct enquiries by the author)

the conflagration set off by an air raid in 1945. Around 1950, reconstruction began in earnest, and along with the increase in seagoing freight, the warehouses rapidly re-emerged as port area establishments. In view of the distribution of warehouses by district and period of establishment (Fig. 5), an overwhelming 70 percent of the total storage space was occupied by port area warehouses. Moreover, the Muramatsu and Hinode areas together formed the largest zone to contain a concentration of warehouses. Even as far back as the early period of post-war warehouse reconstruction, this zone was the oldest, since most of the warehouses in it had been constructed prior to 1965. Moreover, the pre-World War II establishments that had survived the wartime air raids remained concentrated in either this zone or in adjacent districts. Going even further back to 1898, at the time of the opening of the port to foreign trade, this zone was the selected site for the carrying out of transactions relating to trading activities, and thus came to form the nucleus of Shimizu Port (Azumi, 1975a). In contrast to the warehouses of this traditional zone, the port warehouses of the Okitsu district were constructed only after 1965. Here, in 1973, a pier for the handling of containers was constructed, and the Okitsu district eventually became a second nucleus of Shimizu Port. Where inland regions were concerned, all warehouses were

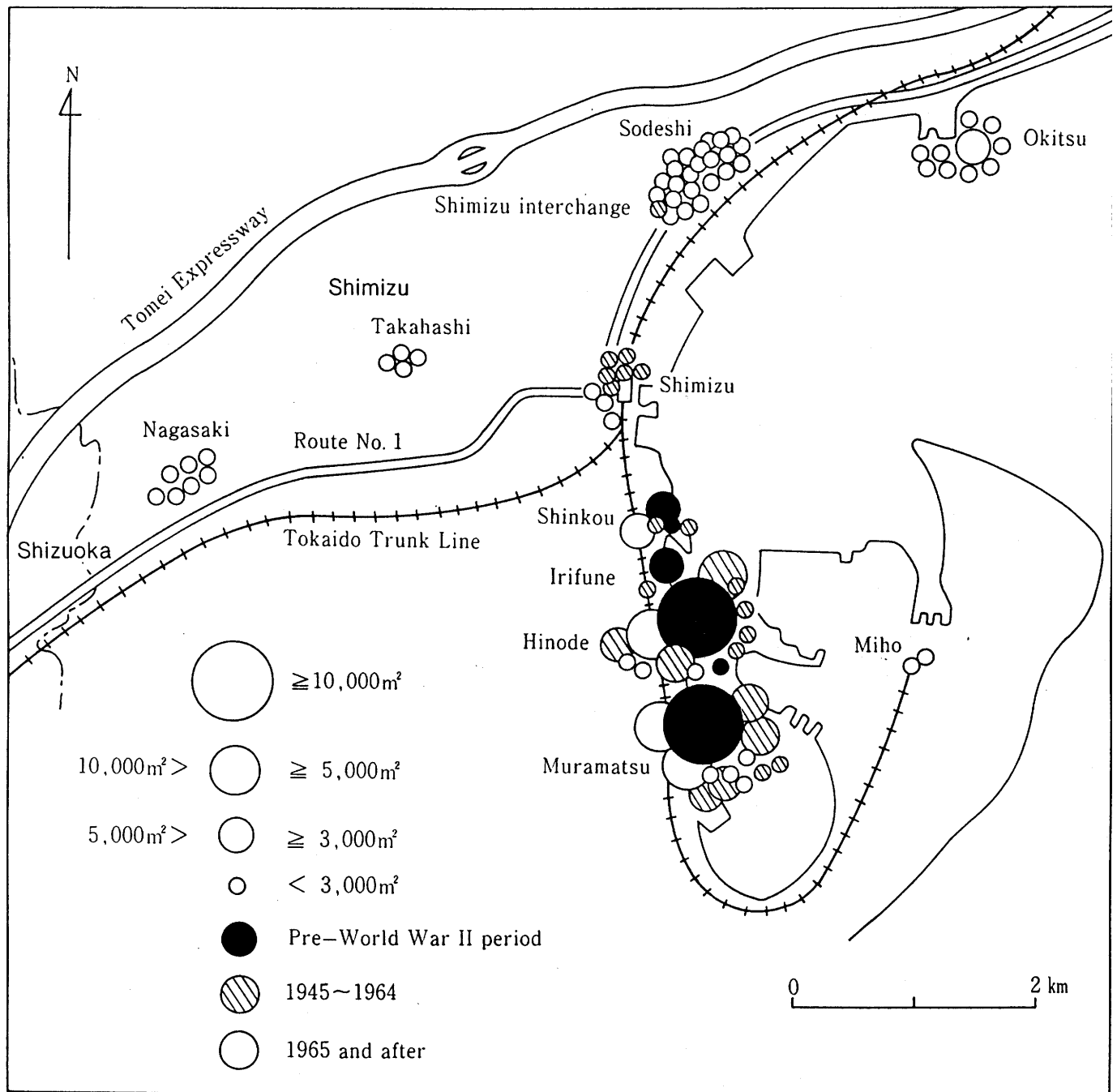


Fig. 5 Distribution of warehouses in Shimizu by period of establishment and storage floor space (1975)

(Sources: Tokai District Maritime Transport Bureau, Ministry of Transport, and direct enquiries by the author)

established after 1970, except for those in the vicinity of railway stations; most of the railway station warehouses of Shimizu were established before 1965. The warehouses which advanced along the National Highway, Route No. 1 into the inland areas included some that actually had the additional function of offsetting the shortage of port area warehouses; most of them were established during a short three-year period starting in 1973. Thus, inland warehouses perform supplementary or adjustment function as to port area warehouses.

Lastly, in the case of Hamamatsu City, the first warehouses were constructed in front of Hamamatsu Station in 1906, and until just before the end of World War II, four warehouse companies maintained a total storage space of 13,000m<sup>2</sup> concentrated in the vicinity of the station. This particular warehousing centre was almost totally destroyed by fire in an air raid, only one building or two being left to show that it had ever existed. The post-war period saw the commencement of warehouse reconstruction, again centering around the station; however, from 1965, what with the conspicuous development of road traffic on the one hand and what with the enforcement of new traffic regulations, the lack of available building sites for warehouses near the station, and the promotion of redevelopment schemes on the other, there was a marked increase in the location of

warehouses in areas other than the sites fronting the station. To observe the newly located warehouses by district and according to the time of establishment (Fig. 6), the warehouses located east of Hamamatsu Station and along Route No.1 were established between 1965-70; others subsequently appeared at the north of the Hamamatsu bypass and in the vicinity of the Hamamatsu interchange, during a concentrated period between 1971-72. Warehouses established after that were located in the vicinity of the new freight station at Nishi-Hamamatsu. In other words, in the case of Hamamatsu, the prevailing situation, involving road and railway traffic, greatly influenced the location of warehouses. Where storage capacity was concerned, there were no marked differences from the regional point of view; however, warehouses having relatively large storage spaces tended to concentrate near the Hamamatsu interchange.

Basically, the above process of warehouse development in Hamamatsu is of a type similar to those of Shizuoka, Fukui and Kanazawa cities. In other words, from pre-World War II times until around 1960, the warehouse concentrations in these cities developed around railway stations. From the first half of the 1960s, increasing urbanization, overpopulation of the areas close to the station, resultant traffic regulations and the lack of sufficient building sites for expansion were all factors contributing, as they

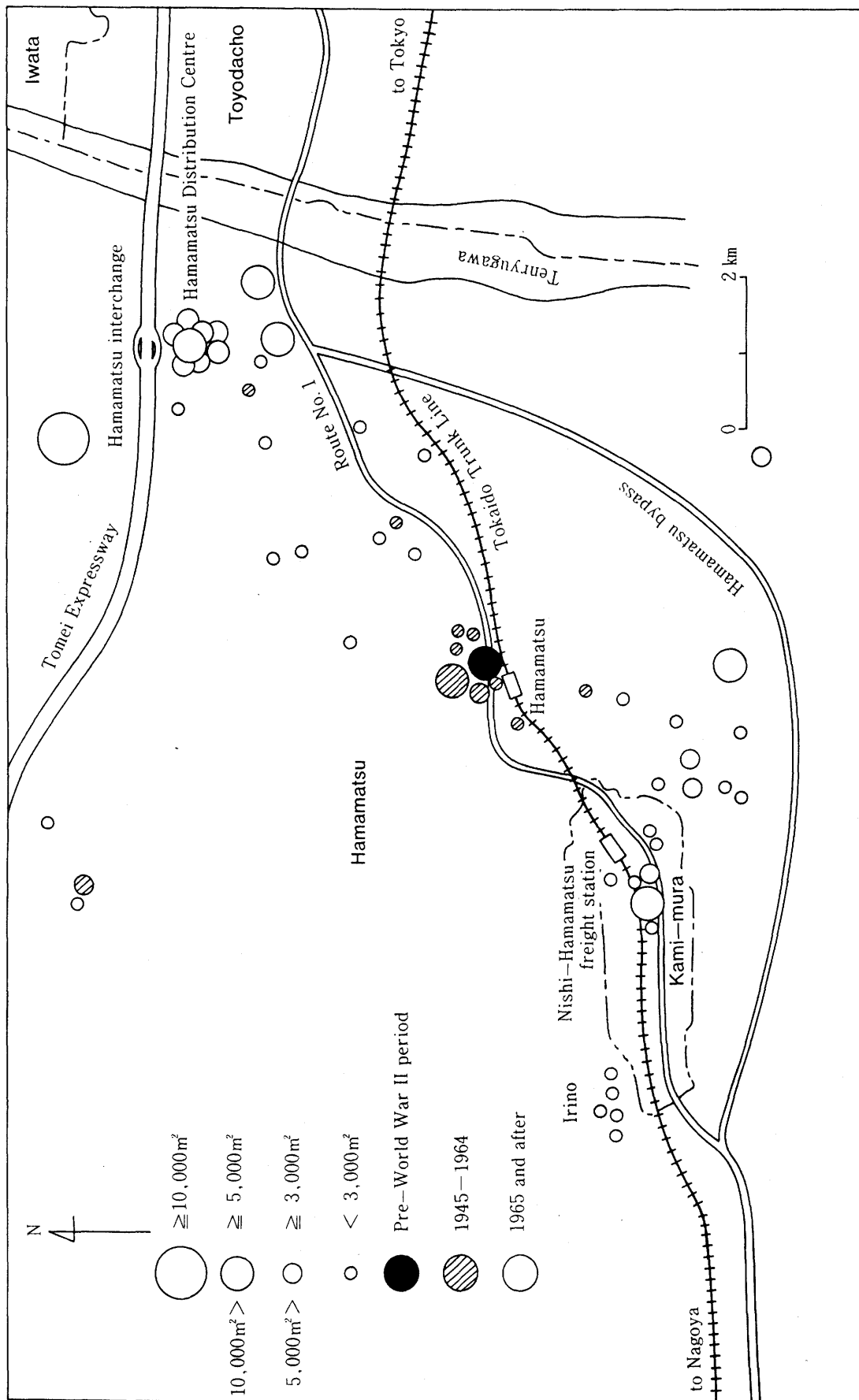


Fig. 6 Distribution of warehouses in Hamamatsu by period of establishment and storage floor space (1975)

Note: As Kami-mura (literally 'Kami village') is enclosed within the city of Hamamatsu, it is considered a part of the city of Hamamatsu. (Sources: Tokai District Maritime Transport Bureau, Ministry of Transport, and direct enquiries by the author)

did in Hamamatsu, to the difficulty of maintaining storage functions near railway stations. A similar rapid development of expressways and trunk roads took place at the same time and a large number of warehouse enterprises accordingly moved to the suburbs that were able to benefit from a vigorous road traffic system, while some of them moving into the environs of newly formed freight stations.

Certain aspects emerge from the above discussion: where the development process of warehouses in medium-size cities is concerned, it is possible to classify warehouse locations into two types, the inland city type and the port city type, and their respective developments greatly differed. Moreover, the above will lead to the regional contrast involving the character of warehouse enterprises and the locational bases of warehouses. With this point in mind, the next section will examine the conditions attending on the advance of warehouse enterprises into new regions and the locational bases of warehouses by type of warehouses.

#### II-2 The Character of Warehouse Enterprises and the Regions into Which They Advanced

The development process of the warehouses of the Tokai and Hokuriku districts was delineated in the previous section; and since it was the warehouse enterprises that owned, operated and determined the location of the



warehouses, this process constituted a regional expansion, no less, on the part of the warehouse enterprises. Moreover, regional differences pointed out in the previous section are considered to be derived from the differences in attributes of the enterprises, which answered the demand for warehouse storage space in each region concerned. Therefore, the regions advanced into by warehouse enterprises will be discussed from the viewpoint of the attributes of those enterprises. In this connection, in addition to the warehouse enterprises based in the Nagoya metropolitan region<sup>12)</sup> exercising large-scale warehouse operations in the Tokai and Hokuriku districts forming the subject of this study, the enterprises based in the Tokyo metropolitan region and the Osaka metropolitan region<sup>13)</sup> respectively, will be included in this discussion. Restriction solely to enterprises based in the Tokai and Hokuriku districts would limit the areas advanced into by them with the exception of some large-scale enterprises, as noted before, and would prove insufficient for the purpose of discovering the general characteristics of regions advanced into by warehouse enterprises, in connection with the attributes of enterprises. The larger areas of the Tokyo, Osaka and Nagoya metropolitan regions were considered in order to include a larger number of enterprises, appropriate for the purpose of grasping the general characteristics of the above-mentioned

regions advanced into. It should be noted that the warehouse enterprises coming under consideration here are only those having a storage floor space of 30,000m<sup>2</sup> or more<sup>14)</sup>, since as indicated above, lesser enterprises would not be useful as points of reference. They are divided into three levels of groups, i.e., over 100,000m<sup>2</sup>, 50,000-100,000m<sup>2</sup>, and 30,000-500,000m<sup>2</sup>. Four elements, consisting of storage floor space, site of the main office, time of establishment and parent company, are here denoted as the basic attributes of the warehouse enterprise. A study of these elements is helpful in clarifying the characteristics of regions advanced into by warehouse enterprises. Especially, the element of the parent company, as indicated in the first chapter, greatly influenced the choice of region into which a warehouse advanced.

First, areas advanced into<sup>15)</sup> will be examined by warehouse storage floor space and site of the main office. Of warehouse enterprises having a storage floor space of 100,000m<sup>2</sup> or more (Table 1), four were operating on in the Nagoya metropolitan region. The respective storage floor space percentages for each region advanced into were as follows: Tokai district, 76 percent; Kanto district, 25 percent; and the Kinki district, 9 percent; and of areas other than the place of the main office, the Kanto district

Table 1 Percentage of storage floor space of warehouse enterprises headquartered in the Tokyo, Osaka and Nagoya metropolitan regions with over 100,000m<sup>2</sup> storage floor space by district and type of area advanced into (1983)

Site of main office	Warehouse enterprise number	Warehouse storage space by district advanced into by warehouse enterprises (in %)									Type of area advanced into <sup>1)</sup>
		Hokkaido	Tohoku	Kanto	Hoku-shin'etsu	Tokai	Kinki	Chugoku	Shikoku	Kyushu	
Nagoya metropolitan region	1			12		88					II
	2	1		20		61	14	3		1	I
	3					100					III
	4			10		69	21				II
Tokyo metropolitan region	5	8	9	21	7	16	19	5	3	12	I
	6			25		22	46	1		6	◇
	7			31		17	40	1		11	◇
	8			49		15	36				II
	9	11		31		3	47			8	I
	10			68			32				II
	11		2	62	7		20			9	I
	12			100							III
	13		7	93							II
Osaka metropolitan region	14			29		8	63				II
	15	3	7	10		5	63	8		4	I
	16			4	12	3	76	5			◇
	17			12		16	50			22	◇
	18			22		35	43				II

1) I: large-size area type II: medium-size area type III: small-size area type

(Sources: Membership roster of the Japanese Warehousemen's Association and questionnaires prepared by the author)

had the highest percentage. The areas penetrated were divided into three types<sup>16)</sup> according to size, i.e. : large-size, medium-size and small-size area types; of the four enterprises headquartered in the Nagoya metropolitan region, one belonged to the large-size area type, two to the medium-size area type and one to the small-size area type. Of the nine warehouse enterprises headquartered in the Tokyo metropolitan region, the respective storage floor space percentages for each region advanced into were: Kanto district, 34 percent; Kinki district, 27 percent; and Tokai district, 14 percent; of areas other than the place of the head office, the Kinki district had the highest percentage. Of the nine enterprises, five belonged to the large-size area type, three to the medium-size area type and one to the small-size area type, three to the medium-size area type and one to the small-size area type; the number of enterprises belonging to the large-size area type; the number of enterprises belonging to the large-size area type was notably large. Of the five warehouse enterprises headquartered in the Osaka metropolitan region, the respective storage floor space percentages for each region advanced into were: Kinki district, 59 percent; Kanto district, 18 percent; and the Tokai district, 12 percent; of areas other than the place of the head office, the Kanto and Tokai districts had the highest percentages. Of the five

enterprises, three belonged to the large-size area type and the other two to the medium-size area type.

Next, of warehouse enterprises having storage floor spaces of 50,000-100,000m<sup>2</sup> (Table 2), six were headquartered in the Nagoya metropolitan region. The Tokai district occupied 95 percent of the total storage floor space; there were almost no advances into other regions, outside the place of the head office. Of the six enterprises, three belonged to the small-size area type, and the other three to the medium-size area type. Of the nine enterprises headquartered in the Tokyo metropolitan region, the respective storage floor space percentages were: Kanto district, 75 percent and Kinki district, 15 percent; there were almost no advances into regions other than these two. Of the nine enterprises headquartered in the Tokyo metropolitan region, six belonged to the medium-size area type, two to the small-size area type, and only one to a large-size area type. Of the four enterprises headquartered in the Osaka metropolitan region, the respective storage floor spaces were: Kinki district, 54 percent; and the Kanto district, 17 percent. Two of the enterprises belonged to the large-size area type and two to the medium-size area type.

Regarding warehouse enterprises having storage floor spaces of 30,000-50,000m<sup>2</sup> (Table 3), eight were headquartered in the Nagoya metropolitan region, and their storage floor

Table 2 Percentage of storage floor space of warehouse enterprises headquartered in the Tokyo, Osaka and Nagoya metropolitan regions with 50,000 ~ 100,000m<sup>2</sup> storage floor space by district and type of area advanced into (1983)

Site of main office	Warehouse enterprise number	Warehouse storage space by district advanced into by warehouse enterprises (in %)									Type of area advanced into <sup>1)</sup>
		Hokkaido	Tohoku	Kanto	Hoku-shin'etsu	Tokai	Kinki	Chugoku	Shikoku	Kyushu	
Nagoya metropolitan region	19					100					Ⅲ
	20				13	87					Ⅱ
	21			5		95					◇
	22					100					Ⅲ
	23			14		79	7				Ⅱ
	24					100					Ⅲ
Tokyo metropolitan region	25			74			26				Ⅱ
	26			41		15	23			21	◇
	27			62		21	17				◇
	28		12	88							◇
	29			90			10				◇
	30			81			19				◇
	31	6		38		23	29			4	I
	32			100							Ⅲ
	33			100							◇
Osaka metropolitan region	34			3	9		88				Ⅱ
	35	18		19		1	8		54		I
	36			19			81				Ⅱ
	37	3	1	19	20	9	34	4		10	I

Note: See note for Table 1.

(Sources: Membership roster of the Japanese Warehousemen's Association and questionnaires prepared by the author)

Table 3 Percentage of storage floor space of warehouse enterprises headquartered in the Tokyo, Osaka and Nagoya metropolitan regions with 30,000 ~ 50,000m<sup>2</sup> storage floor space by district and type of area advanced into (1983)

Site of main office	Warehouse enterprise number	Warehouse storage space by district advanced into by warehouse enterprises (in %)									Type of area advanced into <sup>1)</sup>
		Hokkaido	Tohoku	Kanto	Hoku-shin'etsu	Tokai	Kinki	Chugoku	Shikoku	Kyushu	
Nagoya metropolitan region	38					100					III
	39					100					〃
	40			11		89					II
	41		14			86					〃
	42			11		89					〃
	43					80	20				〃
	44	6	9	12	6	31	15	13		8	I
	45					100					III
Tokyo metropolitan region	46			100							III
	47			100							〃
	48			72				28			II
	49			100							III
	50			100							〃
	51	6		67			27				II
	52			100							III
	53		29	43		28					II
	54			100							III
	55			100							〃
	56			18			18	17		47	I
	57			54			41	5			II
	58			33		35	32				〃
	59	13		15			47			25	I
60			93			7				II	
61			100							III	
62			100							〃	
Osaka metropolitan region	63					100					III
	64					100					〃
	65					100					〃
	66			10		80	10				II
	67					100					III
	68					100					〃
	69					100					〃

Note: See note for Table 1.

(Sources: Membership roster of the Japanese Warehousemen's Association and questionnaires prepared by the author)

space percentage was 86 percent in the Tokai district; among these eight enterprises, apart from one belonging to the large-size area type, there were almost none that advanced into other districts; four of the enterprises belonged to the medium-size area type and three to the small-size area type. Of the seventeen companies headquartered in the Tokyo metropolitan region, the percentages for the respective storage floor spaces were: Kanto district, 76 percent; and the Kinki district, 10 percent; there were very few advances into other areas. Of the seventeen companies, nine advanced into areas within the place of the head office; as for location by size of region, the largest number, nine, belonged to the small-size area type, six to the medium-size area type and only two to the large-size area type. Of the seven warehouse enterprises headquartered in the Osaka metropolitan region, 98 percent were located in the Kinki district; six of the seven companies advanced into areas within the place of the head office; one of the enterprises belonged to the medium-size area type and the other six to the small-size area type.

From the above, it may be concluded that the larger is the increase in storage floor space, the larger the region advanced into. In connection with this fact, where the medium- and small-size warehouse enterprises headquartered in the Nagoya metropolitan region with storage floor space



of under 30,000m<sup>2</sup> are concerned, the large part of them are confined to the home prefecture, a fact which offers further clarification of the co-relationship of the warehouse storage floor space with the extent of the area advanced into. Moreover, compared with enterprises headquartered in the Tokyo and Osaka metropolitan regions, the areas of advance pertaining to the Nagoya metropolitan region-based enterprises are comparatively smaller. This difference, as discussed previously, confirms the fact that a comprehension of the general characteristics of regions advanced into by warehouse enterprises would be difficult to attain, if this study confined itself to warehouse enterprises headquartered in the Nagoya metropolitan region alone.

At this point, the area advanced into by warehouse enterprises will be clarified in view of the time of warehouse establishment<sup>17)</sup> and the character of the parent company (Table 4). Many older and more traditional enterprises belong to the large-size area type; in contrast, a very large number of new enterprises are of small-size area type; in other words, the size of a region advanced into depended on whether the enterprise doing the advancing was an old one or newly established. Where the parent company was concerned, two kinds come under consideration here: one where the parent company itself comprised a warehousing business (hereafter referred to as warehousing business),

Table 4 Period of establishment and parent company of warehouse enterprises headquartered in the three metropolitan regions by type of area advanced into (1983)

Unit: Number of warehouse enterprises (in %)

Types of areas advanced into		Large-size area type	Medium-size area type	Small-size area type	Total
Period of establishment	pre-World War II	9 (28)	14 (44)	9 (28)	32 (100)
	1945-1960	5 (17)	12 (41)	12 (42)	29 (100)
	1961 and after	1 (12)	3 (37)	4 (51)	8 (100)
Parent company	warehousing businesses	7 (16)	21 (47)	17 (37)	45 (100)
	port transport businesses	3 (23)	4 (31)	6 (46)	13 (100)
	manufacturing businesses	2 (50)	1 (25)	1 (25)	4 (100)
	overland transport businesses	3 (75)	1 (25)	—	4 (100)
	trading companies	—	1 (50)	1 (50)	2 (100)
	others	—	1 (100)	—	1 (100)

(Sources: Membership roster of the Japanese Warehousemen's Association and questionnaires prepared by the author)

and another where the parent company was a port transport business<sup>18)</sup> (hereafter referred to as port transport business). In cases where these two types of parent companies developed into warehouse enterprises, the areas into which they advanced generally belonged to either the medium-size area type or the small-size area type. In contrast, warehouse enterprises developing from manufacturing or overland transport businesses (hereafter referred to as manufacturing or overland transport businesses), mostly belonged to large-size area types extended widely throughout the country, as will be discussed later.

As previously discussed, notable differences in the character of warehouse enterprises became evident depending on whether they advanced into inland or port areas. Here the pattern evinced by regions advanced into will be classified into three types: first, inland areas (hereafter referred to as the inland area type); second, port areas (hereafter referred to as the port area type); and third, areas which contain approximately equal parts of inland and port areas (hereafter referred to as the inland-port area type); and considered in connection with the attributes of the advancing warehouse enterprises (Table 5). In view of the site of the main office, inland area types predominated for enterprises headquartered in the Nagoya metropolitan

Table 5 Site of main office, period of establishment and parent company of warehouse enterprises headquartered in the three metropolitan regions by type (1983)

Types of areas advanced into		Inland area type	Port area type	Inland & port area types	Total
Site of main office	Nagoya metropolitan region	13 ( 72)	5 ( 28)	—	18 (100)
	Tokyo metropolitan region	16 ( 46)	16 ( 46)	3 (8)	35 (100)
	Osaka metropolitan region	8 ( 50)	8 ( 50)	—	16 (100)
Period of establishment	pre-World War II	11 ( 34)	19 ( 59)	2 (7)	32 (100)
	1945-1960	20 ( 69)	8 ( 28)	1 (3)	29 (100)
	1961 and after	6 ( 75)	2 ( 25)	—	8 (100)
Parent company	warehousing businesses	27 ( 60)	15 ( 33)	3 (7)	45 (100)
	port transport businesses	—	12 ( 92)	1 (8)	13 (100)
	manufacturing businesses	4 (100)	—	—	4 (100)
	overland transport businesses	4 (100)	—	—	4 (100)
	trading companies	—	2 (100)	—	2 (100)
	others	1 (100)	—	—	1 (100)

(Sources: Membership roster of the Japanese Warehousemen's Association and questionnaires prepared by the author)

region. However, the percentages for inland types and port types were evenly split for enterprises headquartered in the Tokyo and Osaka metropolitan regions. Consequently, in comparison with those headquartered in the Tokyo and Osaka metropolitan regions, fewer enterprises have their activities centered on ports in case of enterprises based in the Nagoya metropolitan region. There was a tendency where the older the establishment, the larger the percentage of port area types involved. Port activities, as will be discussed later, were inclined to be easily ruled by regulations and business customs formed over a long period of time, and many of the warehouse enterprises involved in this sector were long-established enterprises.

Where the parent company was concerned, the warehousing business showed the highest percentage of inland area types, and naturally enough, considering their character, the port transport businesses showed the highest percentage of port area types. In comparison, all manufacturing and overland transport businesses were inland area types. With regard to the inland area type, unfavourable conditions caused by rules and regulations or traditional business were comparatively few; hence it was fairly easy for warehouse enterprises having warehousing businesses, or manufacturing and overland transport businesses as their parent companies, to penetrate into the inland area. In this manner, whilst

there was a good deal of activity taking place where moves into new regions were concerned, the choice of region was governed by the attributes of the warehouse enterprises making the moves.

### II-3 Types of Warehouse Enterprises

Classification of warehouse enterprises must reflect the characteristics of the areas advanced into by means of the clarification of the character of the enterprises. In this instance, it would be appropriate to carry out the classification on the basis of what kind of company the parent company of the warehouse enterprise in question was, and the fact of whether the advance took place into an inland or a port area. Classification of the warehouse enterprise by combining the parent company type and the area advanced into would lead to five types of combinations, i.e. :

- 1) warehousing business-inland area type;
- 2) warehousing business-port area type;
- 3) warehousing business-inland and port area type;
- 4) port transport business-port area type;
- and 5) manufacturing or overland transport business-inland area type<sup>19)</sup>.

There were twenty-seven companies coming under the heading warehousing business-inland area type, forming the largest category, numerically speaking. Their times of

establishment extend over a period beginning before World War II and continuing until after the war; the warehouses built after the war were relatively numerous, including among them three enterprises established after 1961. In view of the sites of the main office, seventeen companies have their head office located in a port city and ten in a city without a port. Here, the existence of an inland area type, though headquartered in a port city, should be noted. The reason for this was that when the port city was a large one, warehouses were concentrated in the inland areas constituting its hinterland. Besides this, there were enterprises advancing actively into inland areas of other cities while locating their warehouses in port areas as well. Of the category warehousing business-inland area type, only three companies were licensed operators<sup>20)</sup> of port transport businesses.

The companies in the category warehousing business-port area type numbered fifteen and their establishment dated back to a comparatively long time ago, nine of them having been built before World War II. In order for warehouse enterprises to form strategic bases at ports, it was necessary for them to have carried on business activities over a considerable length of time. Of the enterprises in this category, 87 percent possessed licenses for the performing of port transport business; some among them

advanced into important ports such as Kobe, Yokohama and Nagoya. The latter enterprises were generally limited to those that were once part of the pre-war zaibatsu combines or that had long traditions. For example, the Mitsubishi Warehouse Company and the Mitsui Warehouse Company were warehouse enterprises that had advanced into Kobe Port area In 1896 and 1898, respectively, and throughout the many years since then stored huge amounts of imported raw cotton, forming the basis of their businesses.

The port transport business-port are type category included twelve companies, and the enterprises in this category were also established at an early date. To list the business core ports of these enterprises, three centered on Yokohama Port, three on Kobe Port, two on Nagoya Port, two on Shimizu Port, one on Tokyo Port, and one on Kawasaki Port. All these ports were important with regard to foreign trade, handling large amounts of freight. Where the regions advanced into were concerned, enterprises in the port transport business-port area type category predominantly belonged to the small-size area type of area, where they formed strategic bases at specific ports, and had relatively few warehouses at other ports.

The manufacturing or overland transport businesses-inland area type included eight companies, which with one exception, came into being after World War II. Two of them



were established after 1961. Companies in this category developed nationwide operation; and moreover, since another two of this group of eight also expanded into combined land and sea transport businesses, they possessed port transport business licenses; however, their cases were exceptional. The number of enterprises belonging to category (3) were few<sup>21)</sup> hence discussion on enterprises of this category is here omitted.

Incidentally, it should be noted that small- and medium-size warehouse enterprises in the Tokai and Hokuriku districts having storage floor spaces of less than 30,000m<sup>2</sup> could also be divided into the five types denoted above. However, since the enterprises were small in scale, the areas advanced into by the enterprises concerned were predominantly small-size areas and moreover, of the inland area type. To illustrate this situation, two cities of Nagoya and Komaki will be taken up to examine the type of areal advance by small- and medium-size enterprises in these two cities, where the warehouse storage floor spaces were, respectively, less than 30,000m<sup>2</sup>. Of the total number of forty-six warehouse enterprises in Nagoya, forty-two were small-size area types, three were medium-size area types, and one was a large-size area type. Of the total number of thirty warehouse enterprises in Komaki, nineteen were small-size area types, nine were medium-size area types, and two

were large-size area types. In either city, small-size area types of enterprises were in the majority. With regard to the inland area type and port area type categories, Nagoya had twenty-nine inland area and seventeen port area type enterprises, while all of the enterprises in Komaki were of the inland area type; thus, in both cities, the inland area type of enterprise was predominant.

## CHAPTER III

CONDITIONS ATTENDING ON THE ADVANCE OF WAREHOUSE  
ENTERPRISES INTO NEW REGIONS

As noted before, the character of a warehouse changes greatly according to whether it advances into an inland or a port area, hence the division into these two types of areas. This chapter will analyze the conditions attending on the advance of warehouses into new regions, while at the same time keeping in mind the types of enterprises outlined in the previous chapter.

III-1 Conditions for the Advance of Warehouses into Inland  
Areas

## (1) The Securing of Client Consigners

It goes without saying that since the warehouse enterprise comprises an economic activity, its advance into new regions is motivated by profit. In order to gain profit, it is necessary for the warehouse enterprise to take active measures in order to answer a potential demand in the region it wants to advance into. In concrete terms, answering the potential demand is actually the realization of transactions with client consigners. Here, the ways and means in which the

warehouse enterprises secure consigners to advance into other regions will be pursued by the type of enterprises. Four enterprises belonging to the warehousing business-inland area type, two belonging to the manufacturing business-inland area type, and two belonging to the overland transport business-inland area type will be taken up.

First, the warehousing business-inland area type enterprises called here N\_\_\_\_\_ Company and T\_\_\_\_\_ Company (Table 6) will be considered. Both these establishments developed with Nagoya as their strategic base of operations, and later advanced into the 23 wards of Tokyo. Here some explanation is necessary with regard to the establishment of their new warehouses in Tokyo with reference to the consigners to their warehouses in Nagoya prior to their advance into Tokyo. It is generally accepted that, normally, newly established warehouses have difficulty in finding client consigners in their new area of operations. However, in 1970, when N\_\_\_\_\_ Company warehouses were first established in Tokyo, all but one of the consigners who approached them in Tokyo were the same consigners who had used the N\_\_\_\_\_ Company warehouses in Nagoya prior to the advance of N\_\_\_\_\_ Company into Tokyo. These consigners were engaged in the business of manufacturing, and the head offices of most companies were located in the 23 wards of Tokyo and also in Osaka City; moreover, they utilized nationwide storage facilities. In a

Table 6 Relationship of consigners to N—Company and T—Company warehouses with their already existing consigners during two specific periods

	Consigner number	Site of main office	Type of enterprise	Freight consigned for storage	Relationships with already existing consigners (○ indicates the existence and X the non-existence of a relationship)	Site of warehouses utilized by already existing consigners	
N—Company warehouses	1970 (year of establishment)	1	Tokyo	manufacturers	foods	○	Nagoya
		2	"	"	synthetic resins	○	"
		3	"	"	paper	○	"
		4	"	"	electric appliances	○	"
		5	"	"	electrical parts	×	"
	1983	6	Tokyo	manufacturers	electric appliances	×	—
		7	"	"	"	×	—
		8	"	"	"	×	—
		9	"	"	paper	×	—
T—Company warehouses	1966 (year of establishment)	10	Nagoya	manufacturers	kerosene stoves	○	Nagoya
		11	Osaka	"	textile products	○	"
		12	Tokyo	"	chemical goods	○	"
		13	Osaka	trading companies	textile products	○	"
	1983	14	Tokyo	manufacturers	textile products	×	—
		15	Kyoto	"	machinery	×	—
		16	Osaka	"	textile products	○	Nagoya
17	"	"	"	×	—		

Note: In the case of N—Company, enquiries were made with regard to warehouses in Shinagawa ward, Tokyo; in the case of T—Company, enquiries were made with regard to a collective warehousing centre also located in Shinagawa ward, Tokyo.

(Source: Direct enquiries by the author)

situation similar to that of N\_\_\_\_\_ Company, T\_\_\_\_\_ Company's client consigners at the start of its establishment in the 23 wards of Tokyo were the same consigners that had used the T\_\_\_\_\_ Company warehouses in Nagoya. Thus in this way, even when relocating in a new area of operations, connections from the old area were maintained. This is a basic condition for the establishment of a warehouse in a new area. On the other hand, warehouses newly established in one area or other also gradually developed client consigners who were not past connections; hence by 1983, the consigners to the warehouses of both N\_\_\_\_\_ and T\_\_\_\_\_ Companies were, with one exception, all new clients having nothing to do with the former consigners carried over from Nagoya.

The conditions for the advance of warehouse enterprises into new regions will be considered in regard to Y\_\_\_\_\_ Company and I\_\_\_\_\_ Company, warehouse enterprises of the same type as N\_\_\_\_\_ Company and T\_\_\_\_\_ Company (Fig. 7) discussed above. The head office of Y\_\_\_\_\_ Company was located in Yokkaichi, and with the latter city as its strategic base of operations, around 1935, the company began to advance into other regions; after World War II, it established new warehouses nationwide. At Yokkaichi, important consigners to Y\_\_\_\_\_ Company's warehouses from before World War II were engaged in the textile, chiefly woolen business; after the war, consigners involved in chemical industrial goods commenced

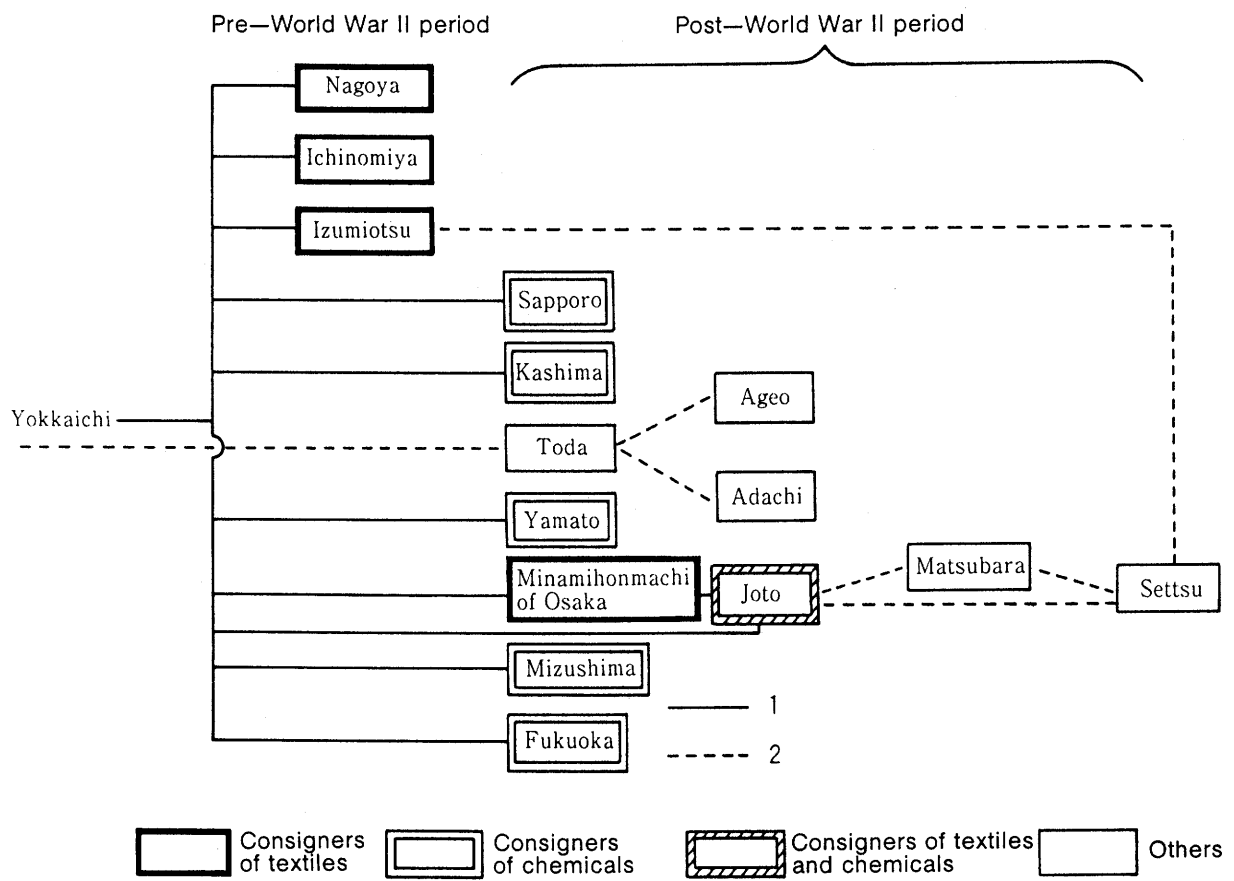


Fig. 7 Relation between consigners to Y—Company headquarters and branch warehouses at the period of the establishment

1. indicates that the consigners both to Y—Company headquarters and branch warehouses are identical. 2. indicates that they are not identical.

(Source: Direct enquiries by the author)

using the Y\_\_\_\_\_ Company warehouses. Both these consigners were acquired by the Y\_\_\_\_\_ Company warehouses due to the fact that Yokkaichi was a traditional port city<sup>22)</sup> and large quantities of imported wool had been passing through its ports from pre-World War II times, and to the fact that the post-war era saw the development of the petrochemical industrial complex along with the development of the petrochemical industry. Prior to World War II, while depending on consigners dealing with textile products the Y\_\_\_\_\_ Company warehouses at the same time advanced into Nagoya, Ichinomiya and Izumiotsu cities. Ichinomiya and Izumiotsu were production areas of woolen textiles, hence the company's advance was closely related to wool storage activities in Yokkaichi. Furthermore, with the coming of the postwar period of rapid economic growth, it proceeded to set up warehouse throughout the country. The advances into Sapporo, Kashima, Yamato, Mizushima of Kurashiki and Fukuoka were dependent on consignments of petrochemical products. In particular, the advances into Kashima and Mizushima, Kurashiki were occasioned by the fact that a petrochemical company located in Yokkaichi also had branch factories in Kashima and Mizushima, Kurashiki; these were targeted by the Y\_\_\_\_\_ Company, which found it convenient to have client consigners belonging to the same company. Y\_\_\_\_\_ Company was able to make further advances into Minami Honmachi in Higashi ward, and into Joto ward. As indicated in



Fig. 7, both these wards were in Osaka City, with consigners dealing in textile products in Minami Honmachi of Higashi ward and consigners dealing in the textile and chemical products in Joto ward providing storage business opportunities for Y\_\_\_\_\_ Company warehouses.

In contrast to this, in Toda City in Saitama Prefecture, new consigners having nothing to do with the Yokkaichi consigners were gained at the start of the establishment of a Y\_\_\_\_\_ Company warehouse there. After that, while maintaining Toda City as a strategic base of operations, the Y\_\_\_\_\_ Company warehouses moved further into Ageo City, Saitama Prefecture and into Adachi Ward in Tokyo. Advances of this sort were rare, but in the case of Toda, advance was made feasible by the strong demand for storage space. In the case of the client consigners to the warehouses of Matsubara and Settsu, they had moved to Matsubara and Settsu from Joto Ward and Izumiotsu, ensuing the movement of the warehouses. These consigners were newly developed by the warehouses without regard to their consigners at Yokkaichi.

With its main office located in Kyoto, I\_\_\_\_\_ Company had from the past consistently specialized in consigners dealing in textile products, and was now expanding over various regions of the country including Fukui, Kanazawa, Hamamatsu, and Okayama cities, and so on. These regions were for the most part textile-producing areas. The pattern of advance was such

that, when the demand for storage facilities on the part of already existing consigners dealing in textile products occurred in other areas, or when the demand increased to large-scale proportions, that I\_\_\_\_\_ Company warehouses would follow in the wake of these developments and move into the regions concerned. In other words, I\_\_\_\_\_ Company tended towards the storage of a specific kind of freight, and advanced into new areas where there was a demand for storage facilities by existing consigners. From this consideration of the regional advance of the warehouses of the four companies, N, T, Y and I, and the relationship between them and the consigners, it is concluded that a basic condition for the advance of warehouses of the warehousing business-inland area type enterprises is the existence of consigners, secured by the enterprises before their advance into a new region, on whom they can depend as a source of business in the new region.

Secondly, the case of M\_\_\_\_\_ Company (Table 7), a manufacturing business-inland area type of enterprise will be considered. It has headquarters located in Osaka, and belongs to a group of a large electrical appliance manufacturing enterprise. It is a firm specializing in storage and delivery with warehouses also in Komaki. Generally, companies of this type are known as distributive subsidiaries belonging to the manufacturing business group. From the 1970s to the 1980s,

Table 7 Establishment of M—Company warehouses (1983)

Warehouse number	Period of establishment	Warehouse site	Storage floor space (in m <sup>2</sup> )	Type of warehouse <sup>1)</sup>
1	1965	Sapporo	6,800	A
2	1980	Shiwa District, Iwate Pref.	9,700	〃
3	1972	Sendai	9,800	〃
4	1977	Niigata	2,200	〃
5	1979	Utsunomiya	11,000	B
6	1970	Soka	34,000	A
7	1981	Urayasu	33,400	〃
8	1962	Tokyo	11,300	〃
9	1980	Yokohama	8,900	B
10	1963	〃	15,700	A
11	1972	Komaki	14,400	〃
12	1975	Kusatsu	12,100	B
13	1973	Yamatokoriyama	21,500	〃
14	1975	Settsu	39,800	〃
15	1979	Ibaragi	5,900	〃
16	1970	Kadoma	24,400	A · B
17	1980	〃	11,200	B
18	1955	〃	16,200	A
19	1976	Okayama	2,600	B
20	1974	Takata District, Hiroshima Pref.	16,100	A
21	1977	Takamatsu	3,300	〃
22	1971	Chikushino	10,400	〃
23	1978	Fukuoka	3,300	B

1) A indicates consumption area warehouses and B indicates production area warehouses.  
(Source: Direct enquiries by the author)

M\_\_\_\_\_ Company distributed large warehouses throughout the country, which were divided into two types according to function; thus there were warehouses in consumption areas and warehouses in production areas. Since the company was part of the electrical appliances manufacturing enterprise conglomerate, the latter became consigners to the company, which advanced into the consumption and production areas that were strategic bases for the goods produced by the manufacturing enterprises. The warehouses of the consumption areas were dispersed over local core cities, besides the three metropolitan regions including Komaki. The warehouses of the production areas had the same functions as factory warehouses, and were, and still are, to be found in all parts of the country.

E\_\_\_\_\_ Company, which was also a manufacturing business-inland area type of enterprise, belonged to a large general electrical machinery manufacturing enterprises with its main office in the 23 wards of Tokyo; it made a successful advance into Komaki where it established large-scale warehouses. The latter were divided into two types according to function. One type had the function of a production area warehouse; its owners, the electric machinery manufacturers, were also consigners who used Komaki as a forwarding base for the nationwide shipments of products from its factories at Nagoya and Seto; the other, like the M\_\_\_\_\_ Company warehouses in

Komaki, had the function of a warehouse operating in a large consumption area centering on the city of Nagoya. Hence, while operating in the same region, the warehouses of E\_\_\_\_\_ Company had two different functions, which led to differences in the conditions of advance into new regions. For the first type, the condition was that the regions advanced into comprise strategic sales bases for specific consigners; for the second, that they comprise production areas.

Thirdly, F\_\_\_\_\_ Company, an overland transport business-inland area type of enterprise will be considered (Fig. 8). The F\_\_\_\_\_ Company, whose main office was based in Nagoya, was a truck transport enterprise covering a nationwide network of regular traffic routes; with warehouses in Komaki, Kanazawa and Shizuoka cities it also engaged in warehousing business. For this company, the basic conditions for the warehousing aspect of its business were that its warehouses be located in the large consumption or production areas covered by the regular traffic routes. The special character of this enterprise was that, with the consigners using the services of the truck transport enterprise and the consigners using the warehouses storage facilities being one and the same, transport and storage were incorporated into a single procedure. Moreover, depending whether consigned freight was incoming or outgoing, the bases of operation were separated into two parts, one for the collection of goods and one for the shipping of goods.

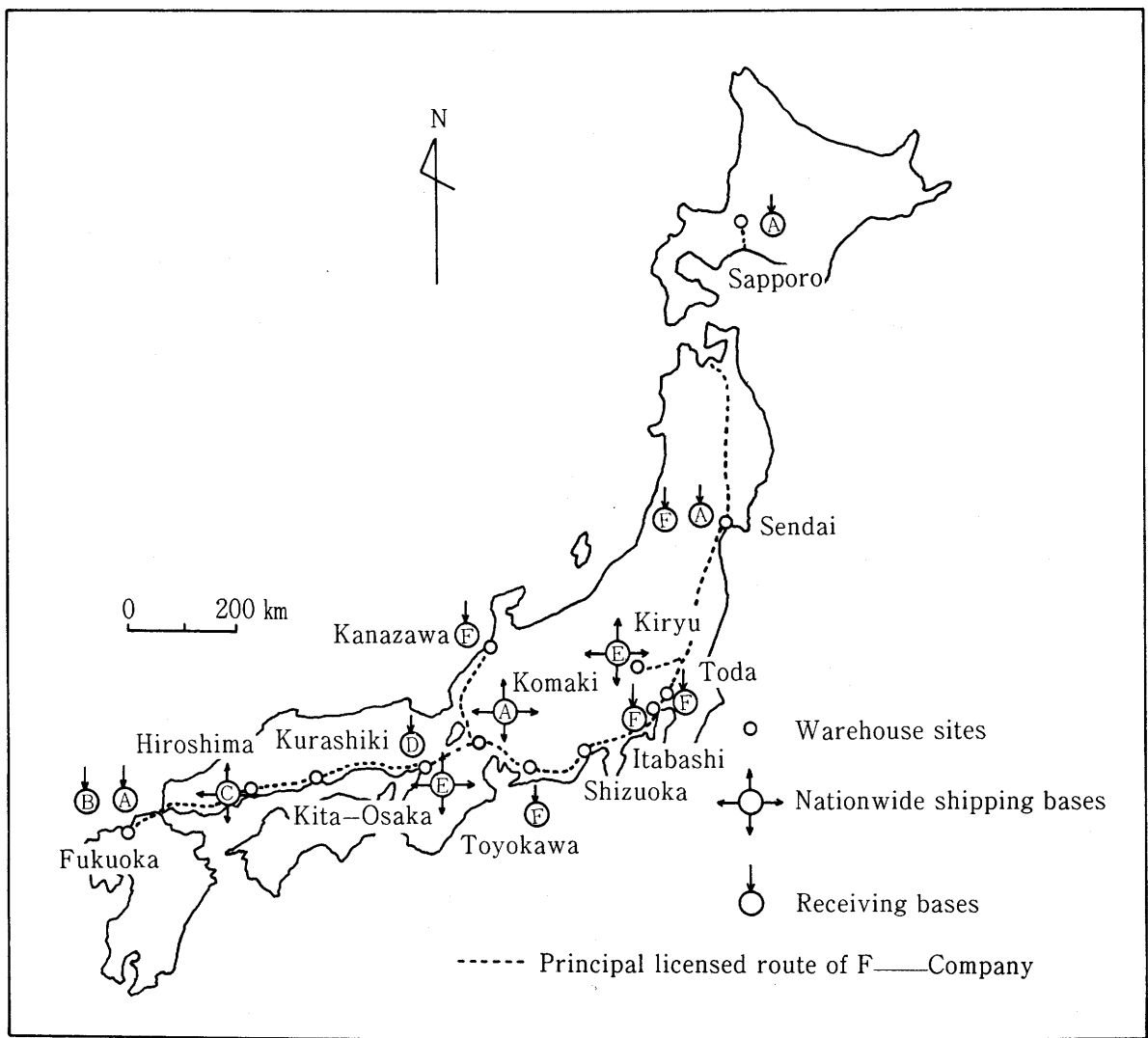


Fig. 8 F—Company's licensed route and distribution of warehouses (1983)

Note: A–F indicate major consigners; there are no important consigners in Shizuoka or Kurashiki.

(Source: Direct enquiries by the author)

For instance, consigner A uses the warehouses in Komaki as a forwarding base for the shipping of freight to all parts of the country, and uses the warehouses in Sapporo, Sendai, and Fukuoka, as collection bases. Hence, as noted above, the conditions of advance for this particular warehouse were that the consigner's areas of consumption and production be covered by the regular truck transport route, and that the consigners acquired should be those making use, at the same time, of both truck transport and storage facilities. In cases such as this, warehouses generally must depend on unspecific number of consigners.

In contrast, S\_\_\_\_\_ Company, an overland transport business-inland area type enterprise engaged in truck transportation, with its head office in Osaka, was advancing into various parts of the country; at the same time it was a chartered truck transport enterprise<sup>23)</sup> having the Hokuriku district as one of its strategic bases of operations. This enterprise developed by having as its mainstay the transportation of fibre for chemical synthetic textiles stored by a specific consigner and owner of an important factory in Nobeoka City in Miyazaki Prefecture. Accordingly, the S\_\_\_\_\_ Company warehouses advanced into Fukui where there was a demand for facilities for the transportation of chemical synthetic textile fibre, and into textile-producing regions such as the environs of Kanazawa, in search of fibre and

textiles to fill its storage spaces. Generally, overland transport business-inland area type enterprises advanced with their warehouses into regions where there were demands for the goods that they were commissioned, by specific consigners, to deliver; thus, they aimed at the gaining of a firm hold on specific client consigners by providing the combined functions of transport and storage. It is clear, therefore, that the conditions attending on the securing of consigners for the inland warehouse differ considerably according to the type of warehouse enterprise involved. Conditions for advance illustrated by the examples of eight companies prove to be similar to findings obtained from other companies through direct enquiries and suggest the common aspect of the basic situation.

## (2) Transportation and Land

Important conditions for advance into new regions, other than those having to do with the gaining hold of client consigners, are those of traffic and sites for the building of warehouses. Due to the rapid development of motor car traffic starting from around 1960, areas near the expressway interchanges or along trunk roads came to be selected as sites for the erection of warehouse buildings. A look into the environs of the three major metropolises reveals that the



warehouses are clustered round the junction of the Meishin, Tomei, and Chuo expressways and the National Highway, Route No. 41 in Komaki in the adjacent area to the north of Nagoya. Where the environs of the 23 wards of Tokyo are concerned, numerous warehouses have sprung up along the Tomei expressway, the Kan'etsu expressway, Route No. 17 and so on. In the case of Osaka, a new warehouse belt developed in the eastern suburbs and stretched north and south alongside the Central Loop Line and the Outer Loop Line (Fig. 9). The increase of warehouses near the interchanges in the environs of the three major metropolises and along the trunk road attested to the fact of the developments in traffic conditions. In particular, the concentration of warehouses in Komaki was greatly influenced by the advantages, accruing to the city from the point of view of its traffic situation, as noted above. According to the twenty-one warehouse enterprises in Komaki, out of thirty-five responses to the question regarding the reasons for their expansion, seventeen, or 50 percent, were that the locations involved comprised "strategic points for nationwide traffic" (Azumi, 1973), thus indicating the influence of traffic on the warehouse location.

With regard to land for warehouse buildings, land prices and dimensions are important considerations. Up to the mid-1960s, warehouse enterprises frequently set up "private" warehouses (*jika soko*) for their own use on land that was easy

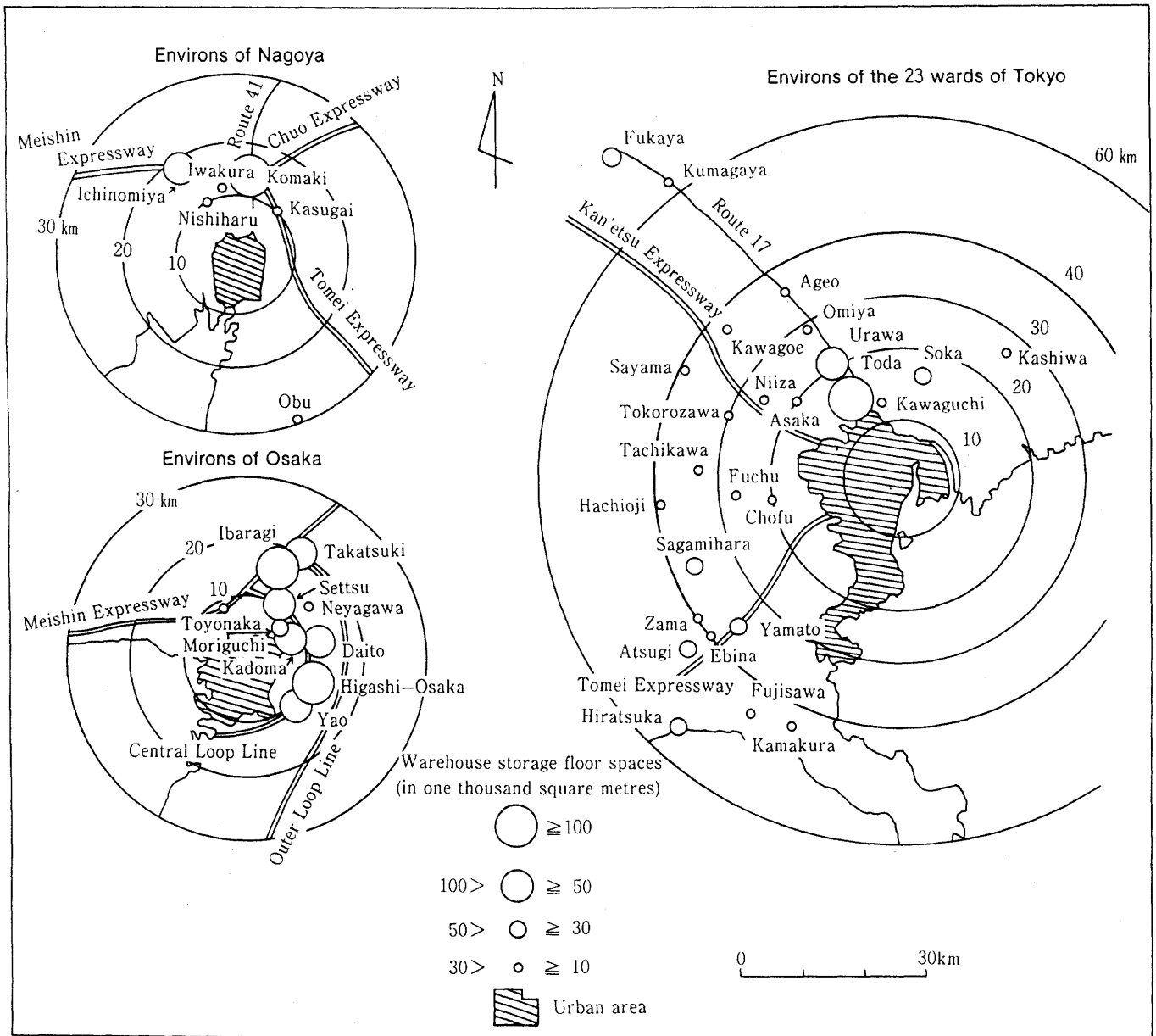


Fig. 9 Relationship between the distribution of warehouses and the road network in the environs of the three major metropolises (1972)

(Sources: District Maritime Transport Bureaus of the Tokai, Kanto and Kinki districts; the District Maritime Transport Bureau is part of the Ministry of Transport)

to obtain. Since then, however, the price of land located conveniently with regard to the traffic situation has greatly risen; moreover, the recent appreciation of land prices in general has made it extremely difficult for enterprises to build private warehouses for their own use. In this connection, a look at the example of Komaki shows that seven warehouses out of nine built before 1969 were privately owned by the enterprises that used them; but of the twenty-four warehouses located in 1970 and 1971, only seven were for the use of the enterprises which constructed them. In order to run a warehouse business, among warehouse enterprises the maximum price they could pay for land was said to be less than 300,000yen per tsubo (3.3m<sup>2</sup>) as of 1990. However, it was almost impossible to find land at this price in the environs of the three major metropolises. In passing, it should be noted that normally a warehouse requires a site of 10,000m<sup>2</sup> or more. Underlying all this was the fact was that, in their search for ways in which to make more efficient use of storage space, the warehouse enterprises exerted the utmost effort to avoid decentralization, and tried to build large warehouses in one location. However, consideration of this situation along with other conditions makes it more and more difficult to obtain warehouse sites in the environs of a city. In connection with this problem, as previously pointed out, from the first half of the 1960s, there was a marked advance of warehouses into the

environs of the three major metropolises. Here, in view of the relationship between the increased warehouse storage floor space in the warehouses located in cities in the environs of the three major metropolises and the distance of the peripheral cities from the metropolitan centres (Fig. 10), almost all of the peripheral cities which showed more than 40,000m<sup>2</sup> increase in storage floor space were situated within 20 km from the metropolitan centres; and the three peripheral cities showing warehouse storage floor space increases of over 80,000m<sup>2</sup> were located within approximately 15 km from the metropolitan centres. This indicates that the closer the peripheral cities to the metropolitan centres, the larger the increase in storage floor space in peripheral cities, and that the advance of warehouses into the periphery of metropolises was indicative of the importance attached to proximity to the metropolitan centres. Hence how to cope with these movements with regard to the rising price of land proved a more important problem.

As a means of dealing with the problem of land for warehouses, the establishment of rental warehouses owned by farmers or of collective warehousing centres have become increasingly active in recent years; rental warehouses resulted aimed at intensive use of farmland as well as meeting the warehouse enterprises' demand for the site. These

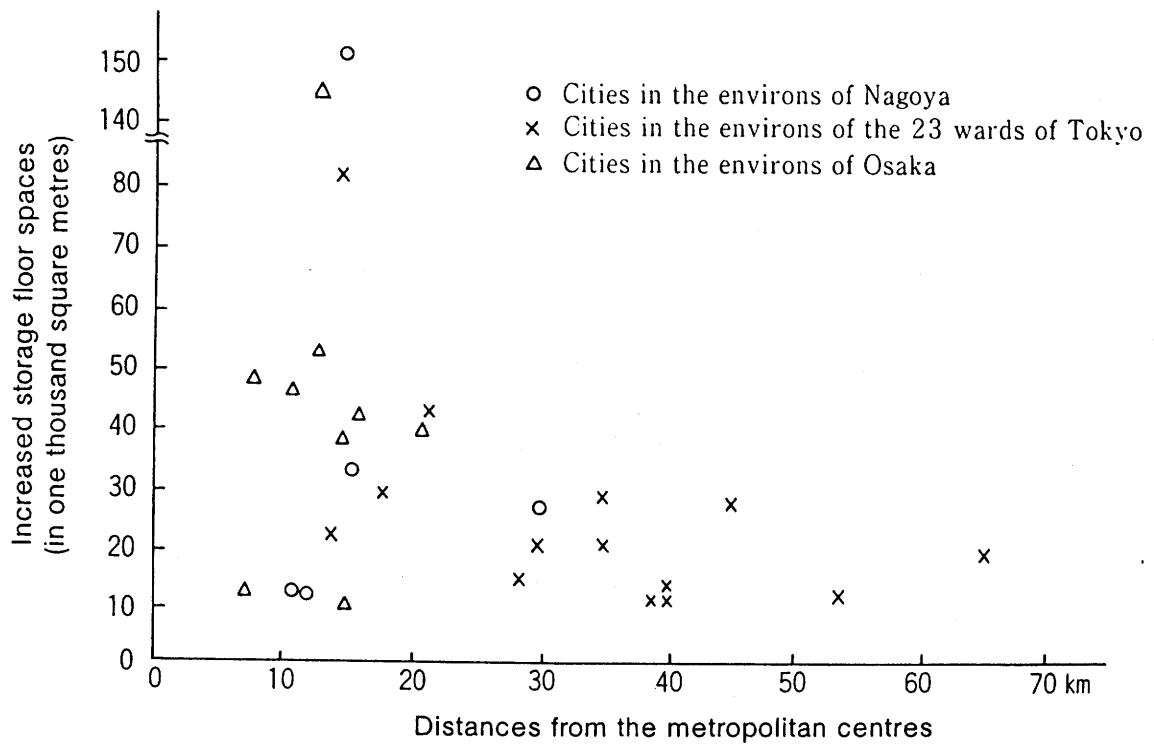


Fig. 10 Relationship between the increased storage floor space of warehouses located in cities in the environs of the three major metropolises and the distance of the peripheral cities from the metropolitan centres (1969–72)

Note: In this instance, only cities having an increase of over 10,000m<sup>2</sup> in warehouse storage floor space are considered.

(Sources: District Maritime Transport Bureaus of the Tokai, Kanto and Kinki districts, the District Maritime Transport Bureaus being part of the Ministry of Transport; and direct enquiries by the author)

activities revolving chiefly around the three metropolitan regions commenced to increase from around the year 1965, when land prices shot up to extraordinary heights. In Komaki, approximately 60 percent of the total number of warehouses were rental establishments<sup>24)</sup> owned by the farmers. The rental warehouses were of two kinds, one comprising warehouses owned by individual farmers and the other, warehouses each owned by a number of farmers, and referred to as farmers' collective rental warehouses; they were large in size<sup>25)</sup>, and often rented out to warehouse enterprises. The basis for the establishing of the farmers' collective rental warehouses was the common use of farmland by the farmers; however, the traditional attachment of farmers to the land often proved to be an obstacle in the way of utilizing it for warehouse sites. The example of Mitsubuchi of Komaki illustrates the manner in which the possessiveness of the farmers with regard to the land was overcome in order to open up a large plot for the building of a warehouse (Fig. 11) together with the construction process.

In the securing of farmland for the building of warehouses, it was most important to carry on negotiations with the farmers through the agency of a leader, also a farmer, who represented them. An important factor in persuading the farmers to agree to make their land available was that of increase in income realizable from the intensified use of the

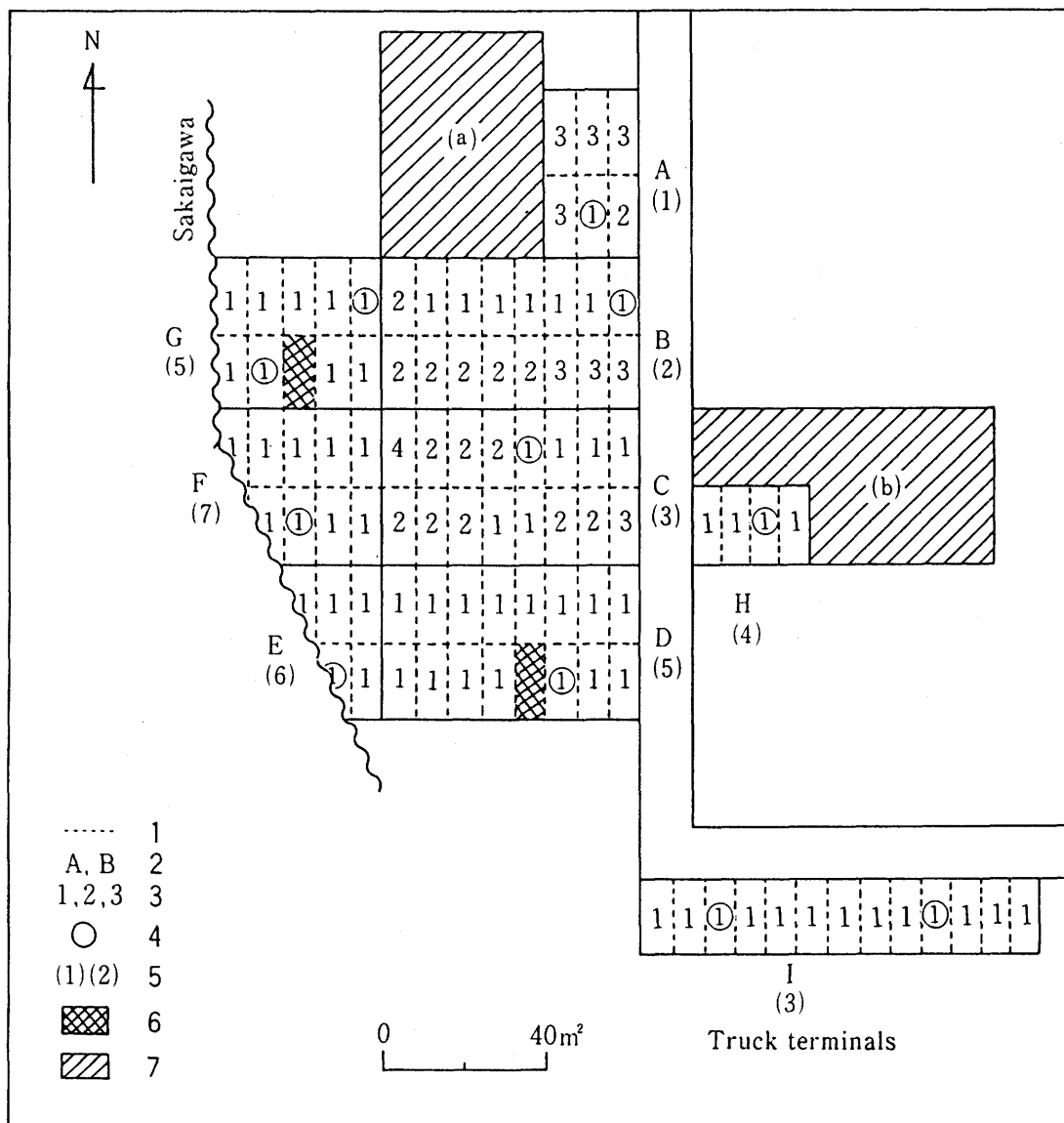


Fig. 11 Steps in the securing of farmland by parcel of land involved, in establishing farmers' collective rental warehouses in Komaki (1973)

1 : boundaries between parcels of farmland    2 : names of rental warehouses  
 3 : order in securing farmland    4 : parcels of land owned by initiator farmers  
 5 : order of construction of rental warehouses    6 : parcels of land acquired in exchange for other parcels  
 7 : warehouses owned by warehouse companies  
 (Source: Direct enquiries by the author)

land. According to direct enquiries carried out among sixty-nine farms households concerned in farmers' collective rental warehouse activities in the Oaza Mitsubuchi-Kawachiya Shinden, 40 percent of those farmers pointed out the underlying reason for the giving over of the land to warehouse sites was the low farm income based on rice and barley crops. Several farmers who were in favour of the building of warehouses on farmland assumed the leadership with regard to the project; they were exemplary people who had worked at farming for many years and had earned the trust of the local agricultural community. The steps involved in the acquiring of farmland for the warehouse sites first called for the leaders to approach the owner of the farm adjacent to their farms for the purpose of pursuing the latter to cede his farmland, setting off a process by which, eventually, the whole of the land in question would be secured. For example, in the case of Warehouse B, the farmer leader instigated negotiations separately with the owner of a parcel of land that did not lie alongside the road and with the owner of a parcel of land that did, as a result of which an understanding was reached with seven people, to begin with, followed by another six; and lastly three more, one of whom owned land facing the road. Thus the negotiations for the acquiring of a site for warehousing were concluded in three steps. The fact that in a village society with its territorial bonds, it was sometimes difficult for a small



number of dissidents to decline participation in a village project, in this case land for collective rental warehouses, was a factor in the realizing of a successful conclusion to the negotiations. The parcels of land owned by the farmer leaders were generally not aligned with the roadway, but was scattered over various places. In the beginning, when Warehouses A, B and C were built, the negotiations took up a good deal of time; but negotiations for later warehouses proceeded smoothly. It was understood that the stabilizing of the income earned by the farmers through the collective rental warehouse system, was made possible by the large profits<sup>26)</sup> accruing from the first of the warehouses to be built. That Warehouses E, F and G secured warehouse land at almost the same time as each other was because their land was located at some distance away from the more advantageous roadside locations, and therefore required less negotiation. When obstacles of some kind surfaced during the process of negotiations, matters were settled by the exchanges of parcels of land (*kaechi*), and Warehouses D and G each made use of this system as to one plot.

When farmers owning favourably situated land verging on a roadway, and farmers owning land away from the road and thus less favourably situated, came together under the same management, the former often underwent a good deal of psychological unrest as happened in the case of some of

Warehouses A, B and C. Again trouble arose when, as in the case of the site of the (b) company warehouse in Fig. 11, the length of the site was twice that of the width, which fronted on the road. Generally, though, the parcels of farmland proposed for use as warehouse sites were all treated as being of equal value, except for those with roadside frontage, in order that negotiations might proceed as smoothly as possible. After the farmland had been secured, a limited company<sup>27)</sup> responsible for the construction of the warehouses was organized by the farmers themselves, who consequently assumed the management of the warehouses. The underlying reasons for this system lay in the reluctance of the farmers to sell their land outright to the warehouse enterprises; they wanted to maintain ownership of the land because they considered land to be a safe asset, and they were also anxious to avoid renting the land because of potential disputes regarding leaseholds with warehouse enterprises. Moreover, the low income from agriculture depending mainly on rice and barley, the shortage of agricultural labour forces and, on the other hand, the possibilities offered by the loan policies<sup>28)</sup> of the Komaki Agricultural Cooperative and so on, were further influences on the promotion of the collective utilization of farmland by constructing warehouses therewith, and maintaining ownership of the land and is superficial. In short, agricultural backwardness and an advantageous position with regard to

traffic routes instigated a change in the economy of farm households. From the viewpoint of the warehouse enterprises, the difficulties encountered by them in the obtaining of land for their warehouses, caused them to look for an answer to the problem in the farmers' collective rental warehouse, thus contributing to the further promotion of the latter.

In recent years, collective warehousing centres<sup>29)</sup> have been established nationwide. These centres are incorporated with wholesaler's complex, truck terminals and so on, and function as parts of distribution service centres. There were six collective warehousing centres in the Tokai and Hokuriku districts. As regards their characteristics (Table 8), the collective warehousing centre of the Gifu distribution service centre in Yanaizu-cho in the suburbs of Gifu operated according to the cooperative association type of system; consequently, since the administrative authorities were promoting measures for the structural upgrading of small- and medium-size enterprises, this particular collective warehousing centre was established on the basis of special funds provided for the realization of those measures. Warehouse enterprises advancing into the area were five in number, with truck terminals and wholesaler's complex juxtaposed beside them. The collective warehousing centre of the Hamamatsu distribution service centre was established beside the Hamamatsu interchange, in the vicinity of which,

Table 8 Character of collective warehousing centres in the Tokai and Hokuriku districts (1984)

Collective warehousing centres	Period of establishment	System of establishment <sup>1)</sup>	Number of advancing enterprises	Storage floor space (in m <sup>2</sup> )	Type of location <sup>2)</sup>	Related physical distribution facilities (○ indicates the presence and X the lack of facilities)				
						Truck terminals	Wholesaler's complex	Wholesale markets	Railway freight stations	Ports
Gifu distribution service centre	1978	②	5	16,000	◎	○	○	×	×	×
Hamamatsu distribution service centre	1971	④	8	43,600	◎	○	○	×	×	×
Nagoya freight terminal	1980	③	6	13,200	◎	○	×	×	○	×
Nagoya Port, West-4 section I	1977	②	15	50,600	△	×	×	×	×	○
"	1977	①	10	71,000	△	×	×	×	×	○
"	1975	①	13	72,300	△	×	×	×	×	○

1) ① the joint capital company system ② the cooperative association system ③ the tertiary sector system ④ the individual enterprise system

2) ◎ : inland-area types △ : port area types

Note: Nagoya Port, West-4 section I consists of the warehouse cooperative association of the Nagoya Port collective warehousing centre; Nagoya Port, West-4 section II consists of the warehouses of the Tokai collective warehousing centre; and Nagoya Port, West-4 section III consists of the Nagoya Port commodity distribution centre.  
(Source: Ministry of Transport)

truck terminals, wholesalers' complex and inland container centre<sup>30)</sup> operating under Shizuoka prefectural management were to be found. These establishments were formed according to the individual enterprise type of system by each enterprise on an independent basis, and the enterprises that moved into the area were eight in all. The Nagoya freight terminal, which had been established according to the tertiary sector type of system was adjacent to Hattat freight station; six enterprises advanced into this area. Three of them, though different from each other in the way of establishment, are located inland and the others are in the Nagoya Port area.

Classification of the twenty-four collective warehousing centres found in Japan, based on the hierarchy<sup>31)</sup> of urban functions and establishment types<sup>32)</sup> (Azumi, 1986) will lead to three categories as follows: the joint capital company-tertiary sector type in the three metropolitan regions (type A); the cooperative association type in the regional central cities and local cities (type B); and the individual enterprise type in the three metropolitan regions, the regional central cities and the local cities (type C). According to these classifications, the collective warehousing centre in Yanaizu in the suburbs of Gifu falls under type B, that of Hamamatsu under type C and the Nagoya freight terminal and that of Nagoya Port area under type A. Because of the diversified types, when warehouse enterprises move into

collective warehousing centres, how they deal with the types and their characteristics is important (Table 9). First, regarding the characteristics of type A, in the three metropolitan regions where the demand for storage facilities was large, the formation of collective warehousing centres was mostly realized by establishment of the large joint capital companies or the tertiary sector institutions under the initiative of warehouse enterprises. Of the advancing enterprises, this type was the most numerous, and moreover, had the largest storage floor spaces. As for location, they were divisible into the inland area type<sup>33)</sup> and the port area type<sup>34)</sup>. The kind of advance involved was predominantly of the new advancement type, mainly in the form of the expansion of warehouses. Therefore, the proportion of storage floor spaces in each warehouse in the collective warehousing centres to the total storage floor space, which includes the storage floor spaces of already existing other warehouses owned by each enterprise is relatively small; hence the warehouses of the enterprises in the collective warehousing centres do not measure up to functioning as strategic bases. Parent companies involved included quite a few port transport businesses as well as warehousing businesses, and the advancing enterprises were mainly headquartered in the local area<sup>35)</sup> except for a considerable number of them headquartered outside the local area<sup>36)</sup>. The business scale of the advancing

Table 9 Special characteristics of the collective warehousing centres in Japan by type (1984)

Type		A	B	C
Elements indicating the characteristics of collective warehousing centres				
Conditions of formation	Initiative held by warehouse enterprises	○		
	Initiative held by administrative bodies		○	
	Dependent on character of each collective warehousing centre			○
Advancing enterprises	numerous	○		○
	few		○	○
Storage floor spaces of collective warehousing centres	large	○		
	small		○	○
Type of location	inland	○	○	○
	port	○	○	○
Form of advance	new advances by enterprises	○		○
	Mainly new establishments and partly replacements of the old and abolished warehouses		○	
Nature of base position	strategic		○	
	non-strategic	○		○
Parent company	mainly warehouse enterprises and partly port transport enterprises	○	○	
	mainly warehouse enterprises and partly port transport and overland transport enterprises			○
Site of main office	local	○	○	○
	external	○		
Size of enterprise	large and medium	○		○
	small	○	○	○
Area of business operations	large	○		
	small		○	
	mainly small, partly large			○
Linkage with other physical distribution facilities	strong			
	weak	○	○	○

Note: The symbol ○ indicates the category to which each type belongs.  
 (Sources: Tokai District Maritime Transport Bureau, Ministry of Transport and direct enquiries by the author)

enterprises included large-, medium- and small-size enterprises, and the differences in scale were considerable; however, in terms of the area of business operations, a considerable number of them covered the large-size area type or the medium-size area type<sup>37</sup>). Various physical distribution facilities were located within the same warehousing complex, but the link between them and the warehouses was weak.

Where type B was concerned, in the regional central cities and local cities which had a great number of small-scale enterprises, the collectivization of warehouses was promoted under the measures for the structural upgrading of small- and medium-size enterprises instigated by the administrative authorities. The number of advancing enterprises was relatively small, and moreover, the warehouse storage floor space of the collective warehousing centres was also small. The locations involved included both the inland area and port area types. The new advance type was conspicuous; there were also a considerable number of cases in which old warehouses were abolished and replaced by new warehouses in the collective warehousing centres. The advance to the collective warehousing centres replacing the old and abolished warehouses was one of the purposes of the structural upgrading project. That is say, the structural upgrading project, while at the same time promoting the collectivization of warehouses, also aimed at doing away with the old



warehouses at previous other sites. Consequently, a considerable number of the warehouses in the collective warehousing centres came to function in the capacity of strategic bases for storage activities. The parent companies generally centred on the warehousing business, but some were involved in the port transport business. The majority was headquartered in the local area, and many of the advancing enterprises were notably small in the scale of operation. The area of operations of the advancing enterprises was mainly of the small-size area type, and the linkage with other physical distribution facilities was, as was the case with type A, weak.

Finally, concerning type C, there were some differences of character among the advancing enterprises operating under the individual enterprise system. Because of this, the conditions pertaining to the formation of collective warehousing centres evinced a considerable diversity, and also the number of advancing enterprises varied according to the collective warehousing centres involved; the storage floor spaces of the centres were relatively small. As in the case of types A and B, the patterns of location included both the inland area and the port area types. Advances were, in great part, new, and unlike the case of type B, most of the warehouses of each company within the collective warehousing centres did not meet the requirements of a strategic base for storage. Among the parent companies, there were quite a few warehousing

businesses, and overland and port transport businesses also existed. They were mainly headquartered in the local area. The management scale of advancing enterprises showed considerable diversions, and in terms of the area of operation, a relatively large number of the small-size area types were found although a smaller number of large-size area types were also to be found. As in the cases of types A and B, the linkages with other physical distribution facilities within the centres were weak.

Summing up the above, it will be seen that from the first half of the 1970s, cases of warehouse enterprises attempting to secure land sites of their own became rare and considerable changes took place in the means used for the securing of land for warehouse sites. Along with the increasing difficulties regarding the securing of land sites, there were also changes in the conditions involving the land, and the use of rented warehouses and of collective warehousing centres came to be emphasized as part of the conditions of the advance of warehouses into new regions. It should also be noted that where transport and land for building sites were concerned, unlike the situation with regard to the securing of consigners, differences in conditions according to the type of warehouse enterprise involved were almost non-existent.

## III-2 Conditions for the Advance of Warehouses into Port Areas

Where the advance of warehouses into port areas was concerned, as with inland warehouses, the basic condition was the securing of client consigners. In addition, as noted in connection with the collective warehousing centres dealt with in the previous section, there were other conditions of importance, as well as a large number that in general, affected the locating of warehouses at ports. Moreover there were certain hindering conditions differing from those found in the cases of inland warehouse enterprises, with regard to the securing of client consigners; in order to cope with these, special conditions for advance peculiar to the situation at ports were required. This section will consider inherent conditions hindering the advance of the port warehouse. For the purpose of clarifying these conditions, the warehousing business-inland area types and overland transport business-inland area types of enterprises which advanced into port areas, while at the same time continuing to own large numbers of warehouses in the inland areas will be examined.

## (1) The Characteristics of the Physical Distribution of Commodities at Ports and the Commodity Flow Routes

Ports are in the nature of transit areas for land and seagoing freight, and normally, where foreign trade is

concerned, a great deal of loading and unloading of huge quantities of cargo takes place. A considerable difference between the units of transport pertaining to sea and to land traffic systems, and administrative procedures pertaining to import/export freight at times gave rise to a stagnant situation (*tairyugensho*) whereby freight stagnated in port for a period of time. Hence, a port had to contain a number of operations including cargo handling, transportation, customs clearance, storage and so on, calling for a large variety of port workers.

To look into the basic flow of imported cargo at ports (Fig. 12), when a ship docks, first the stevedores unload the cargo onto the wharf, where it is picked up by longshoremen and removed to the bonded shed (*uwaya*)<sup>38</sup>). In the case of offshore delivery, stevedores unload the cargo onto barges, which transport the cargo to shore, and the bonded shed. The cargo in the shed is sorted into two, one part being destined for storage in warehouses; the other is to be delivered directly to consigners. When the bonded shed is also a warehouse, as happens sometimes, the cargo to be stored remains where it is, reducing part of the secondary transport process.

Since imported commodities are brought ashore as bonded goods, they have to be kept in the bonded area until they have undergone the process that transforms them into domestic freight. Normally, this process takes place in the bonded

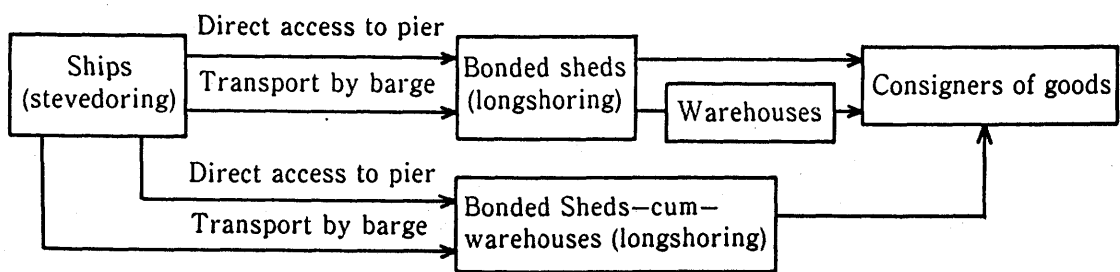


Fig. 12 Routes of imported cargo in harbour areas (1983)

(Source: Direct enquiries by the author)

shed, calling for customs clearance procedures. The sheds are all designated as bonded sheds and so they constitute dividing points for the freight, with regards to which legal regulations differ considerably, according to whether the freight is foreign or domestic. Generally, port transport enterprises differ depending on whether they handle stevedoring, longshoring or barge transportation, and moreover, in between are subcontractor enterprises, hence the ensuing transactions involving these different groups make for an extremely complicated setup.

In this way, harbour freight goes through a process involving stevedoring, barge transportation, longshoring, handling and customs clearance in the bonded shed and storage in warehouses. The storage functions of warehouses are determined by the above freight flow, and conditions for advances are very different from those of the inland warehouses. That is, in the case of ports, there is an interlocking of the variety of transactions taking place between the different types of enterprises involved, the customs processes and the public nature of port facilities; the commodity flow at ports is strictly governed by legal regulations, and by business practice.

## (2) Legal Regulations and Business Practice

Regulations under the law applied at ports are the Harbour Transport Business Law and the Customs Law. The former regulates cargo handling and transportation within the port, and in order for harbour transport enterprises to pursue these activities, it was necessary for them to obtain a license from the Ministry of Transport. The main activities of the harbour transport business are divided into general harbour transport (*motouke* or prime contractors), stevedoring, barge transport and longshoring businesses. Each of these activities has its own individual license, and the license varies from enterprise to enterprise. Some, with a license for the general harbour transport business as *motouke* or prime contractors were authorized to deal directly with shipping companies and consigners, assuming a position of leadership among the harbour transport enterprises.

The thirty-one harbour transport enterprises in Nagoya Port holding licenses for the general harbour transport business will be taken up for discussion (Table 10). The larger part of these enterprises were established before World War II or in the period between 1945 and 1960, hence many of them had been in the business for a long time; most of their main offices were locally situated in Nagoya. Of the parent companies involved, twenty-two were in the harbour transport

Table 10 Relationship between port transport enterprises and warehousing businesses at Nagoya Port (1983)

Port transport enterprise number	Period of establishment <sup>1)</sup>	Site of main office	Parent company <sup>2)</sup>	Licensing by the Tokai District Maritime Transport Bureau (○ indicates possession and X indicates non-possession of a license)	Storage floor space in Nagoya Port warehouses (in m <sup>2</sup> )
1	C	Nagoya	b	○	※
2	B	〃	〃	○	2,900
3	C	〃	〃	○	3,000
4	A	〃	〃	○	11,800
5	A	Gifu	a	○	8,800
6	C	Tokai	〃	○	23,300
7	B	Nagoya	b	○	90,700
8	A	Kobe	〃	×	—
9	A	〃	〃	×	—
10	B	Nagoya	〃	×	—
11	B	〃	〃	×	—
12	A	Tokyo	〃	○	3,000
13	C	Osaka	〃	×	—
14	B	Nagoya	〃	○	34,800
15	A	〃	c	○	6,400
16	B	〃	〃	×	—
17	B	〃	b	×	—
18	A	Himeji	〃	○	5,800
19	A	Nagoya	〃	○	12,000
20	A	Tokyo	c	○	21,600
21	B	Nagoya	b	○	2,300
22	A	〃	a	○	40,300
23	A	〃	b	○	7,300
24	A	〃	〃	○	2,900
25	B	〃	〃	○	3,800
26	A	Tokyo	a	○	45,300
27	A	Kobe	b	○	16,000
28	A	Tokyo	a	○	33,800
29	A	Nagoya	b	○	3,200
30	A	Kobe	a	○	47,200
31	A	Nagoya	b	○	※

1) A: prior to World War II B: 1945–1960 C: 1961 and after.

2) a: warehousing businesses b: port transport businesses c: overland transport businesses

※ indicates ponds for timber storage exclusively

(Source: Direct enquiries by the author)



business comprising 71 percent of the total, and six were in the warehousing business. Of the harbour transport enterprises holding licenses for general harbour transport businesses, a considerable number, twenty-four, doubled as warehousing businesses, for which they also held licenses; numerous enterprises, in fact carried on warehousing businesses in addition to their regular trade. Moreover, many of the warehouses involved were large in scale, having storage floor spaces averaging as much as 20,000m<sup>2</sup>. In other words, harbour transport business-port area type enterprises holding down the position of prime contractors were also active in the warehousing business, thus combining the work of transportation and storage. Naturally, therefore, these prime contractors were in competition, in terms of the market with the warehousing business-inland area and warehousing business-port area types of enterprises.

The bonded areas within harbours were designated under the Customs Law with regard to the physical distribution of goods, and the bonded sheds were required to be licensed. The greater part of export or import cargo had to be committed temporarily to the bonded shed, upon arrival at the port. The above mentioned Harbour Transport Business Law or the Customs Law pertains to port transport enterprises, and when warehouse enterprises move into port areas they are required to obtain a license relevant to their activities in accordance with these

laws.

During the latter half of the 1970s, a large number of warehouses advanced into the West-4 section<sup>39)</sup> of Nagoya Port. In this connection, the situation pertaining to the licensing of warehouse enterprises will be considered (Table 11). The main offices of most of the warehouse enterprises in question were located in the inland cities of Aichi and Gifu prefectures, and the parent companies were mainly in the warehousing business and some in the overland transport business. The distribution of already existing warehouses, apart from the warehouses that advanced into the West-4 section, was concentrated in inland areas, and the parent companies were chiefly warehousing and overland transport businesses; hence they were weak in the commercial activities at the port with only five of them possessing licenses for port transport businesses. Of these five warehouse enterprises, three were of the warehousing business-inland area type and two were of the overland transport business-inland area type<sup>40)</sup>. However, fifteen companies possessed licenses pertaining to the bonded shed. Thus, where the possession of licenses was concerned, the dissimilarities among the various enterprises were considerable.

Study of five warehousing business-inland area type enterprises in the West-4 section will clarify the situation

Table 11 Character of the warehouse enterprises advancing into the West-4 section, Nagoya Port (1983)

Warehouse enterprise number	Site of main office	Parent company <sup>1)</sup>	Storage floor space in the West-4 section (in m <sup>2</sup> )	Possession or lack of licenses for the harbour transport businesses at Nagoya Port (○ indicates possession and X indicates non-possession of a license)	Possession or lack of licenses for the bonded sheds regarding the warehouses in the West-4 section (○ indicates possession and X indicates non-possession of a license)
1	Yokkaichi	a	7,600	○	○
2	Ichinomiya	◇	7,600	×	○
3	Tokyo	◇	15,100	×	○
4	Shimizu	d	6,000	×	○
5	Tokyo	c	6,000	×	×
6	◇	d	5,800	○	○
7	Nagoya	a	9,800	○	○
8	Gifu	◇	4,000	○	○
9	Osaka	e	4,000	×	○
10	Komaki	◇	6,000	×	○
11	Nagoya	a	4,200	×	×
12	◇	d	2,700	○	○
13	Oguchi-cho, Aichi pref.	c	3,200	×	×
14	Ichinomiya	d	4,400	×	○
15	Yatomi-cho, Aichi pref.	a	1,800	×	×
16	Yanaizu-cho, Gifu pref.	◇	2,700	×	○
17	Yokkaichi	◇	3,500	×	○
18	Kasugai	◇	1,800	×	×
19	Nagoya	◇	1,800	×	○
20	◇	d	1,800	×	×
21	Ichinomiya	◇	3,500	×	×
22	Nagoya	◇	2,700	×	×
23	◇	a	3,100	×	×
24	◇	◇	3,500	×	○

1) a: warehousing businesses b: port transport businesses c: manufacturing businesses d: overland transport businesses e: trading companies  
(Source: Direct enquiries by the author)

regarding the disparities among warehouses caused by the possession or non-possession of a license (Table 12). First, two licensed companies use their own storage facilities, that is, they were directly contracted to the consigners on the basis of their licenses. Either the points of origin or destination of the freight involved was located overseas, and all the consigners concerned used Nagoya Port. In contrast, the other three companies did not possess licenses and resorted to a good deal of "restorage," apart from using their own storage facilities, meaning that their business depended a good deal on the subcontracting of goods from licensed harbour transport businesses--port area type enterprises, without making direct contracts with consigners. Furthermore, where the consigners were concerned, in some cases, both the points of origin and destination of freight were domestic and involved overland transport, so that Nagoya Port facilities were not used. It is thus clear that while warehouse enterprises might belong to the same category, the possession of a license made a great deal of difference in the circumstances attending on their storage activities. According to the responses to direct enquiries conducted among the enterprises apropos of the above, the scale of the warehouse enterprises only barely affected the storage situation.

Next how the possession of a license brings about

Table 12 Comparison of storage operations by warehouse enterprises with or without licenses in the West-4 section, Nagoya Port (1983)

Possession or lack of licenses	Symbols for warehouse enterprises	Consigner number	Form of storage <sup>1)</sup>	Freight consigned for storage	Points of origin	Points of destination	The utilization or non-utilization of Nagoya Port for freight storage ( ) indicates utilization in %	
Licensed warehouse enterprises	A	1	a	tobacco	overseas	Chubu district	○ (100)	
		2	〃	rice	Hokkaido/Tohoku districts	overseas	○ (100)	
		3	〃	aluminium ingots	overseas	Tokai district	○ (100)	
		4	〃	lactose	〃	〃	○ (100)	
		5	〃	pulp	〃	〃	○ (100)	
	B	6	a	tyre/tubes	Mie/Aichi/Shizuoka prefs.	overseas	○ ( 60)	
		7	〃	transport machinery and tools	Aichi/Shizuoka prefs.	〃	○ (100)	
		8	〃	textiles	overseas	Tokai district	○ (100)	
		9	〃	〃	〃	〃	○ (100)	
		10	〃	electrical goods	Aichi pref.	overseas	○ (100)	
Warehouse enterprises without licenses	C	11	a	rice	Hokkaido/Tohoku districts	overseas	○ (100)	
		12	b	lumber (semi-manufactured goods)	overseas	Aichi pref.	○ (100)	
		13	〃	rattan blinds	〃	〃	○ (100)	
		14	〃	tatami mats	〃	〃	○ (100)	
		15	〃	desks	Mie pref.	Chubu district	×	
		16	〃	chemical goods	〃	Tokai district	×	
	D	17	b	lumber (semi-manufactured goods)	Nagoya	Nagoya	×	
		18	a	cotton cloth	overseas	Hamamatsu/Kyoto/Wakayama	○ ( 90)	
		19	b	grass for livestock feed	〃	Tokai district	○ (100)	
		20	a	desks	Gifu	nationwide	×	
		E	21	a	marine products	Kyushu district	Mie pref.	×
			22	〃	rice	Hokkaido/Tohoku districts	overseas	○ (100)
			23	〃	synthetic resins	Yokkaichi	nationwide	×
			24	b	asbestos	overseas	Aichi pref.	×
			25	〃	processed foods	Aichi pref.	overseas	○ (100)

1) a: storage through the direct contract with the consigners b: sub-contracting the storage of goods to another warehouse company

Note: Consigner no. 24 utilizes Kobe Port.

(Source: Direct enquiries by the author)

conditions benefiting the advance of a warehouse into new regions will be considered. Through the means of cargo handling operations and storage, the two previously mentioned enterprises owning licenses were able to form numerous linkages with shipping companies and consigners, and gain access to the handling of the freight left in bonded sheds. As a result, these enterprises were able to observe the flow of freight, and were in an advantageous position with regard to answering the demand for storage facilities. They were able to strengthen their advantageous position even further through affiliation of enterprises (*keiretsuka*) connected with physical distribution.

Normally, the above-mentioned affiliation in port-related activities developed through physical distribution activities between shipping companies or consigners on the one hand and port transport or warehouse enterprises on the other. That is, ports, as stated previously, are composed of an aggregate of a variety of enterprises, and a division of functions between differing enterprises for a single flow of commodities, facilitates this affiliation. In order to participate in this system, the possession of a license is mandatory; once included in it, the accommodation to physical distribution activities becomes stabilized.

Transactions that take place under the system comprise one of the business practices at ports that developed out of

traditions of many years. Unlike the case of inland areas, a characteristic of port areas is that transactions involving freight are greatly influenced by business practice. For example, consigners of huge amounts of imported raw cotton and of wool designated warehouse enterprises by port, as dictated by business<sup>41</sup>). Once business practice has been established it becomes extremely difficult for new enterprises to compete with established enterprises. Transactions carried out in accordance with business practice which restricts new entries into the business, were said to be for a purpose of maintaining public nature of port activities.

In this way, in association with the customary trading practices, two licensed warehouse enterprises were ensured of the stabilized locational base of the advancing warehouses. In contrast, since the three unlicensed companies were situated outside the system, in the case of their advancing into new regions, their locational bases would have been unstable. Moreover, the instability of the three companies derived also from the vigorous activities with regard to storage on the part of the harbour transport business-port area type enterprises. Unlicensed companies competed for client consigners at whom the commercial activities of shipping companies or port transport companies were aimed; but it was virtually impossible for them to break fresh ground for themselves on their own. Direct enquiries were carried out

among related organizations<sup>42)</sup> other than the above five companies which confirmed the advantages of the possession of a license. Thus, it was clarified that regulations under the law and traditional trading practices were important conditions for the advance of port warehouses.



## CHAPTER IV

## THE LOCATIONAL PATTERNS OF WAREHOUSES

In the second and third chapters, the fact became clear that the regions advanced into by warehouse enterprises were those that were closely connected to the enterprises by way of the attributes of the latter and moreover, that differences occurred in the conditions for advance depending on the category to which the advancing warehouse belonged. If the regions advanced into had the kind of bases that made it practicable for the advancing enterprises to carry on commercial activities, those regions would become locations for warehouse concentrations. Put the other way round, warehouse concentrations sites were places that provided the bases for the establishing of warehouses. It goes without saying that regions had their own attributes, some of which were supportive of the establishment of warehouses, and some of which proved to be hindrances. The present and following chapters four and five will analyze the attributes inherent in each concentration regarding the location of warehouses, that is to say, the conditions that facilitate or hinder the location of warehouses. An analysis of these conditions will be systematically made by categorizing the location of

warehouses. Up till now, the advance of warehouse enterprises has been considered in terms of large regions, but with regard to the analysis of the conditions surrounding the locational bases, since these are of many kinds, it is necessary to examine smaller administrative units. The present chapter, therefore, will consider the types of warehouse locational patterns by municipality and districts in Nagoya.

IV-1 The Relationships among the Size of Warehouses,  
Volume of Shipments of Industrial Products and  
Population

In classification of the locational patterns of warehouses, in the beginning the relationship of the scale of the warehouses with shipments of industrial products as well as the connection with the size of the population will be considered by municipality. The volume of industrial shipments and the population size are two important indexes corresponding respectively to the sizes of the production and consumption areas, both of which constitute the locational bases of the establishment of warehouses; and if in the values denoted in the two indexes a correspondence can be found with regard to the warehouse storage floor space, it provides important lead to the categorization of the locational pattern of warehouses.

Consideration of the correlationship of the warehouse scale with the volume of industrial shipments and with the size of the population, respectively suggests that the first of these correlations is weak<sup>43)</sup> (Fig. 13) and that the second correlation is similarly so<sup>44)</sup> (this correlation is not depicted in the figure). Hence, since it would be meaningless to turn to the two previously noted indexes for classification of the location of warehouses, it next becomes necessary to observe commodities stored in the warehouses reflecting the characteristics of the regions involved. Thus, the locational pattern of warehouses will be classified from the point of view of the storage items.

#### IV-2 Regional Differences in Commodities Consigned to Warehouses

Here municipalities<sup>45)</sup> with more than 50,000m<sup>2</sup> warehouse storage floor spaces will be considered. Municipalities with less storage space generally have fewer warehouse enterprises, hence it is difficult to obtain a proper grasp of their situation. When necessary for the purpose of comparison, municipalities with small warehouse storage space are taken up. In the case of Nagoya, the area under consideration is divided into two parts<sup>46)</sup>, one is the port area composed of Minato Ward forming the central part of the

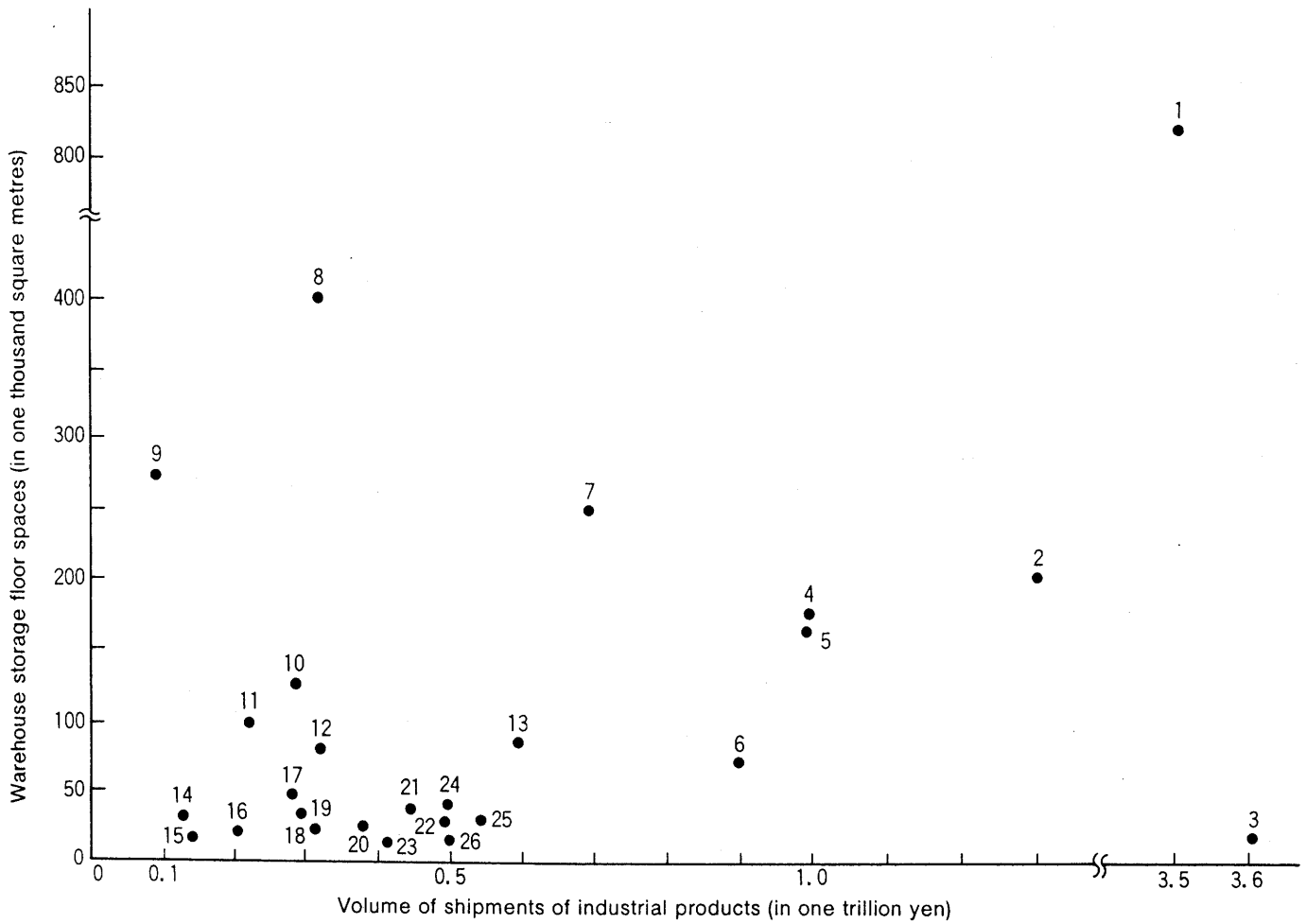


Fig. 13 Relationship between shipment volume of industrial products and warehouse storage floor space by municipality, in the Tokai and Hokuriku districts

1. Nagoya 2. Yokkaichi 3. Toyota 4. Hamamatsu 5. Fuji 6. Tokai 7. Shimizu  
 8. Komaki 9. Tobishima 10. Ichinomiya 11. Fukui 12. Kanazawa 13. Shizuoka  
 14. Fukuroi 15. Mishima 16. Yaizu 17. Obu 18. Gifu 19. Fujieda 20. Kasugai  
 21. Numazu 22. Toyama 23. Iwata 24. Toyohashi 25. Suzuka 26. Takaoka

Note: The above figure applies only to those municipalities having warehouse storage floor spaces totalling more than 20,000m<sup>2</sup>. Of the municipalities in the category of *cho* (literally 'town') and *son* (literally 'village'), only Tobishima is taken into consideration.

The figures pertaining to the shipment volume of industrial products are for 1979, and the figures for the warehouse storage floor spaces are for 1983.

(Sources: Tokai District Maritime Transport Bureau, Ministry of Transport and the Nagoya Regional Bureau of International Trade and Industry)

port area, and the other is the urban area composed of the three urban wards of Nakamura, Nakagawa and Atsuta, where warehouses are concentrated. To list items stored in warehouses, by municipality and by district within Nagoya City (Table 13), steel, barley, beans, minor grains, tobacco and fodder and fertilizers were predominant, comprising 70 percent of the total commodities, all of which consisted of seagoing freight in the case of the port area within Nagoya City. As for the items stored in the area within Nagoya City, foodstuffs, electrical machinery, synthetic resins, tobacco, paper and so on, predominated, particularly foodstuffs which comprised 30 percent of the total commodities. In Komaki, electrical and other machinery, yarn, and synthetic resins were predominant with electrical machinery being particularly so. In Ichinomiya, textile products comprised a large 70 percent, and electrical machinery comprised 13 percent of the total items stored. In Tobishima, the percentage of the storage of steel was notably high, and the comparatively large number of other commodities handled included livestock products, rice, tobacco, synthetic resins, paper, and pulp. Steel was 100 percent in Tokai, which held a monopoly on this commodity and was thus in direct contrast to the warehouses of the urban area within Nagoya City where the large variety of items were handled. At Obu, electrical machinery, synthetic

Table 13 Percentages pertaining to stored items in warehouses by municipality and by area within Nagoya City, in the Tokai and Hokuriku districts (1983)

Storage items <sup>1)</sup>	Municipalities/districts within Nagoya											Tokai				Hokuriku				Unit: %
	Port area within Nagoya City <sup>2)</sup>	Urban area within Nagoya City <sup>3)</sup>	Komaki <sup>4)</sup>	Ichinomiya	Tobishima	Tokai	Obu	Yokkaichi	Shimizu	Hamamatsu	Fuji	Shizuoka	Fukui	Kanazawa						
Rice	2	3		8	6			3	3	4		10	6	6						
Barley/beans/minor grains	14							10	16											
Livestock products	6	8		2	8															
Tobacco	13	8			6			3	3	3										
Other agricultural goods	7							7												
Non-metallic minerals	33				37	100			2											
Steel	3	8			4						5									
Non-ferrous metals																				
Metal goods	3			3	3				2	9	19			2						
Electrical machinery		11		13					2	3	14			5						
Other machinery		4							7	12	7									
Ceramics																				
Chemical fertilizers									2											
Synthetic resins	6	9			8			10	2											
Other chemical industrial goods		3						45												
Paper/pulp	2	8			6			10	4	5										
Yarn		2																		
Textiles		5		38																
Textile products		4		18																
Canned goods/bottled goods		4		9																
Sugar		4																		
Beverages		12																		
Other food industry items	1	3																		
Other daily necessities		6		2	5			2	6											
Rubber goods		2		2	3															
Animal & vegetable fodder/fertilizer	9				2															
Miscellaneous goods	1	8			6			4	17	32				4						
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100						

Note: Percentages are calculated according to weight. Blank spaces indicate zero percent or an extremely low percentage. Hence the sum totals for the municipalities and districts involved do not always come to 100 percent.

1) indicates items listed according to the classification systems devised by the Tokai District Maritime Transport Bureau.

2) indicates figures for 1978

3) indicates figures for 1978

4) indicates figures for 1978

(Sources: The Tokai District Maritime Transport Bureau, Ministry of Transport and direct enquiries by the author)

resins, other food industry items and tobacco were predominant, with electrical machinery and synthetic resins occupying a particularly high percentage.

In Yokkaichi, synthetic resins, chemical fertilizers, and other chemical industrial goods were predominant, with barley beans, minor grains and other agricultural products also being handled. In Shimizu, the warehouses were characterized by the emphasis on food with canned and bottled goods being predominant, besides which miscellaneous goods (mainly cans), barley, beans, minor grains, beverages and other food industry items were also handled. In Hamamatsu, textile products occupied a notable 40 percent of the total goods, followed by electrical machinery and other daily necessities (mainly musical instruments). In Fuji, paper and pulp occupied 50 percent of the total commodities handled; this percentage in comparison with the other goods was so high, showing a high rate of specialization in particular commodity.

In Shizuoka, metal products, paper and pulp, electrical machinery and other daily necessities were predominant, but unlike the situation in Fuji and Hamamatsu, specialization was observed in any item. In Fukui, textile products formed 80 percent of the total commodities; there were almost no other commodities, and so Fukui was a typical example of single term storage area concentrating on textile products.

Textile products occupied 50 percent of the total commodities in Kanazawa and thus had some similarities with the case of Fukui, but there were also a good deal of rice and other food industry items, and electrical machinery. Characteristics of the goods stored in municipal warehouses and warehouses in the districts of Nagoya are classified, but there were supposedly also commodities, which may be closely related to the main products of the municipalities concerned. Here we shall indicate examples of remarkable specialization in certain industries for some of the above municipalities in a list of percentages of shipments of classified industrial products (Table 14). First, in Ichinomiya, of the volume of industrial shipments the textile industry occupied approximately 60 percent and in Fukui as high as approximately 70 percent; for both cities the percentage of the textile industry was extremely high. In Hamamatsu, textile industry occupied a comparatively high 10 percent. In Yokkaichi, the percentage occupied by the chemical industry was almost 50 percent, which was extremely high in comparison to other industries. In Shimizu, the food industry is predominant, occupying about 25 percent. The paper manufacturing industry was noticeably concentrated in Fuji, with pulp and paper occupying about 40 percent. As for Tokai, the steel industry predominated, taking up a large 85 percent.



Table 14 Percentages pertaining to the volume of shipments of industrial products by municipality and type of industry in the Tokai and Hokuriku districts (1979)

Unit: %

Types of industries	City						
	Ichinomiya	Tokai	Yokkaichi	Shimizu	Hamamatsu	Fuji	Fukui
Foodstuffs	4		6	26	4	4	4
Textile industries	56		5		11		68
Clothing/textile products	5						
Lumber/wooden products				10	4		4
Furniture/other house equipment					3		
Pulp/processed paper products				4	2	38	2
Publishing and printing industries							3
Chemical industries			51	10		11	3
Oil and coal products							
Rubber products							
Leather/leatherware							
Ceramics/earthenware & stoneware goods			3				
Steel industry		85		3	3	3	
Non-ferrous metals				2	3		
Metalware	2			9	5	2	2
General machinery	5		5	11	6	4	7
Electrical machinery	20		3	6	4	14	
Machinery & tools for transport				7	30	19	
Precision machinery and tools							
Other manufactured goods							2
Total	100	100	100	100	100	100	100

Note: The blank spaces in the above columns indicate zero percent or figures under 2 percent. Hence the percentage totals for the cities do not actually equal exactly 100 percent.

(Source: Industrial statistics of the Nagoya Regional Bureau of International Trade and Industry)

As pointed out above, the main storage items in warehouses correspond to the types of industrial products found in the municipalities where the warehouses were located, thus indicating the connection between the storage items and specialized industrial products of the municipalities<sup>47</sup>). However, in the warehouses, a large number of stored items other than the industrial products of the municipalities concerned also existed, indicating the complexity of the locational patterns of warehouses, which must answer the various demands for storage space. In order to deal with this question, it is necessary to examine the points of origin and destination for stored items by municipality and district in Nagoya.

#### IV-3 The Points of Origin and Destination of Commodities Stored in Warehouses

In order to examine the points of origin and destination of stored items by municipalities and districts in Nagoya, direct enquiries were carried out among or questionnaires submitted to the parties concerned<sup>48</sup>). As a result of these investigations, it was decided to take into consideration the two most important commodities for each office of warehouse enterprise found in the above-mentioned municipalities and districts in Nagoya, according to the quantity stored. Moreover, for those commodities, the points

of origin and destination together with the types of enterprises (factories, wholesalers, retailers and so on) at the distribution level at those two points (Table 15) were also considered. These considerations should prove useful in the comprehension of the stages involved in the processing of the stored items (raw materials, semi-finished and finished products) in line with the type of business involved. The analytical criteria obtained from the above considerations should prove useful in discovering the characteristics of the regions where the commodities in question were stored.

The regions where the points of origin and destination of goods were located will be classified into five categories; where goods moved 1) from local to local areas, 2) from local to remote or nationwide areas, 3) from remote or nationwide areas to local areas, 4) from overseas to local areas and 5) elsewhere. In this case, the local area (*jimoto*) was not only the prefecture where the warehouses in question were located and the neighboring prefectures, but also included the "block" regions where those prefectures belonged. Areas other than these broader block regions are defined as remote areas. The inclusion of the block regions in the local areas certainly resulted in over-large areas, but from the point of view of the responses to our direct enquiries and questionnaires, it was found too difficult to

Table 15 Points of origin and destination, and the locational pattern of warehouses by municipality and by area within Nagoya City, and by type of items stored, in the Tokai and Hokuriku districts (1983)

Municipalities/ districts within Nagoya City	Storage items <sup>1)</sup>	Points of origin (types of enterprises at points of origin) <sup>2)</sup>	Points of destination (types of enterprises at points of destination) <sup>2)</sup>	Locational pattern of warehouses <sup>3)</sup>
Port area within Nagoya City	tobacco (2)	overseas (c)	Tokai/Hokuriku districts (a)	B
	raw cotton (2)	〃	Tokai district (a)	〃
	fodder (2)	〃	Aichi pref. (a)	〃
	fodder	〃	Tokai district (a)	〃
	fish meal	〃	Aichi pref. (a)	〃
	barley	〃	Tokai district (a)	〃
	foodstuffs	〃	Aichi pref. (a)	〃
Urban area within Nagoya City	rice (2)	Hokkaido/Tohoku districts (f)	Aichi pref. (b)	C
	gas appliances	Sakai (a)	Tokai/Hokuriku districts (b)	〃
	foodstuffs	nationwide (a)	Aichi pref. (b)	〃
	〃	Nagoya (a)	Tokai district (b)	A · C
	textile products	overseas (c)	nationwide (b)	C
	〃	Aichi/Shizuoka prefs. (a)	Nagoya (b)	〃
	electric appliances	Kanto/Kansai districts (a)	Tokai district (b)	〃
	〃	Aichi pref. (a)	nationwide (b)	A
	〃	Osaka pref. (a)	Nagoya (b)	C
	sugar	Kanto district (a)	Aichi pref. (b)	〃
	〃	nationwide (a)	Nagoya (b)	〃
	paper	Tokyo pref. (a)	Tokai/Hokuriku districts (b)	〃
	〃	Osaka pref. (a)	Nagoya (b)	〃
	film	Kanto district (a)	Tokai district (b)	〃
	pharmaceutical drugs	Fukushima pref. (a)	〃	〃
	beverages	Nagoya (a)	Nagoya (b)	A · C
	building materials	Chiba (a)	Tokai district (b)	C
	synthetic resin	Oita (a)	Aichi pref. (a)	A
tobacco	nationwide (f)	Nagoya (a)	〃	
household machin- ery and tools	Tochigi pref. (a)	Aichi pref. (b)	C	
canned goods	Hokkaido/Tohoku districts (a)	Nagoya (b)	〃	
Komaki	motorcycles	Suzuka/Hamamatsu (a)	Tokai/Hokuriku districts (d)	C
	agricultural machinery	nationwide (a)	〃	〃
	textiles	Kansai district/Aichi pref. (a)	Aichi pref. (a)	A
	〃	Tokai district (a)	nationwide (a)	〃
	textile products	Hamamatsu (a)	Tokai district (b)	C
	cans	nationwide (a)	Tokai district (a)	A
	beds	Hamamatsu (a)	Tokai/Hokuriku districts (b)	C
	electric appliances	Kanagawa pref. (a)	Tokai district (b)	〃

(Continued)

Municipalities/ districts within Nagoya City	Storage items <sup>1)</sup>	Points of origin (types of enterprises at points of origin) <sup>2)</sup>	Points of destination (types of enterprises at points of destination) <sup>2)</sup>	Locational pattern of warehouses <sup>3)</sup>
Komaki	carpets	Gifu pref. (a)	nationwide (b)	A
	paper	Aichi pref. (a)	nationwide (a)	〃
	bicycles	〃	nationwide (b)	〃
	foodstuffs	nationwide (a)	Tokai district (b)	C
	electrical products	Aichi pref. (a)	nationwide (b)	A
	〃	Tokyo pref. (a)	Tokai district (b)	C
	synthetic resins	Kanagawa pref. (a)	Aichi pref. (a)	A
	dairy products	Gunma pref. (a)	Tokai district (b)	C
	rice	Hokkaido/Tohoku districts (f)	Aichi pref. (b)	〃
tyres	nationwide (a)	Tokai/Hokuriku districts (b)	〃	
Ichinomiya	yarn (2)	Aichi pref. (a)	Aichi pref. (a)	A
	yarn	Tokai district (a)	〃	〃
	〃	〃	Tokai district (a)	〃
	〃	Aichi/Yamaguchi prefs. (a)	Aichi pref. (a)	〃
	textiles	Tokai district (a)	nationwide (a)	〃
	〃	Aichi pref. (a)	〃	〃
	〃	〃	Tokyo/Osaka (b)	〃
	electric appliances	〃	nationwide (b)	〃
rice	Hokkaido/Aomori prefs. (f)	Aichi pref. (b)	C	
Tobishima- mura	dressing tables	Aichi pref. (a)	nationwide (b)	B
	synthetic resins	Yamaguchi pref. (a)	Tokai district (a)	〃
	〃	Chiba/Oita prefs. (a)	〃	〃
	chemical industrial goods	Chugoku district (a)	〃	〃
	paper	Aichi pref. (a)	overseas (c)	〃
	tyres	Tokai district (a)	〃	〃
	transport machinery & tools	Aichi/Shizuoka prefs. (a)	〃	〃
	tobacco	overseas (c)	Tokai/Hokuriku districts (a)	〃
	aluminium ingots	〃	Tokai district (a)	〃
	marine products	Kyushu district (b)	Mie pref. (a)	〃
	rice (2)	Hokkaido/Tohoku districts (f)	overseas (c)	〃
	powdered milk	overseas (c)	Gifu pref. (a)	〃
	synthetic rubber	〃	Tokai district (a)	〃
	steel	Hyogo pref. (a)	Aichi pref. (a)	〃
〃	Wakayama/Ibaragi prefs. (a)	〃	〃	
lumber	overseas (c)	〃	〃	
Obu	electrical machinery	nationwide (a)	Tokai district (b)	C
	synthetic resins	Osaka/Oita prefs. (a)	Tokai district (a)	A
	tobacco	nationwide (f)	Nagoya (a)	〃
	liquors	Kobe (a)	Tokai district (b)	C
	cans	Shimizu (a)	Nagoya(a)	A
	canned goods	Shizuoka pref. (a)	Tokai district (b)	C

(Continued)

Municipalities/ districts within Nagoya City	Storage items <sup>1)</sup>	Points of origin (types of enterprises at points of origin) <sup>2)</sup>	Points of destination (types of enterprises at points of destination) <sup>2)</sup>	Locational pattern of warehouses <sup>3)</sup>
Obu	electrical machinery	Osaka pref. (a)	Tokai district (b)	C
	synthetic resins	Chiba pref. (a)	Tokai district (a)	A
Tokai	steel	nationwide (a)	Aichi pref. (a)	B
	〃	Kanagawa/Hiroshima prefs. (a)	Tokai district (a)	〃
Yokkaichi	cosmetic soaps/paints	Yokkaichi (a)	nationwide (a)	A
	synthetic resins (2)	〃	〃	〃
	maize (3)	overseas (c)	Tokai district (a)	B
	wheat (2)	〃	Mie pref. (a)	〃
	raw cotton	〃	Tokai district (a)	〃
	synthetic rubber	Yokkaichi (a)	Yokkaichi (a)	A
Shimizu	cans (3)	Shizuoka pref. (a)	Shizuoka pref. (a)	A
	cans	Shimizu (a)	Tokai district (a)	〃
	〃	〃	Shizuoka pref. (a)	〃
	medicines	Shizuoka (a)	Kanto district (f)	〃
	canned goods	〃	nationwide (b)	〃
	〃	〃	nationwide (b)/overseas (c)	A · B
	〃	〃	overseas (c)	B
	〃	〃	Shizuoka pref. (b)	A · C
	glass	Kanto district (a)	Shizuoka pref. (a)	A
	canned beverages	Shizuoka pref. (a)	Tokyo pref. (b)	〃
	cooking oil	〃	Shizuoka pref. (a)	〃
	cornstarch (2)	〃	Kanto district (a)	〃
	motorcycles (2)	〃	overseas (c)	B
	sundry cereals	overseas (c)	Shizuoka pref. (a)	〃
	edible industrial products	〃	Yamanashi pref. (a)	〃
	noodles	Shiga pref. (a)	Shizuoka pref. (b)	C
raw sugar	overseas (c)	Shizuoka pref. (a)	B	
refined sugar	Shizuoka pref. (a)	Tokai/Hokuriku districts (b)	A	
Hamamatsu	textiles	Shizuoka pref. (a)	Tokyo pref. (b)	A
	〃	〃	nationwide (a)	〃
	textile products	〃	nationwide (b)	〃
	〃	nationwide (e)	Shizuoka pref. (d)	C
	〃	nationwide (b)	〃	〃
	chemical indus- trial goods	Chiba (a)	Shizuoka pref. (a)	A
	rolled copper	Kanto district (a)	〃	〃
	bedding	Kanto/Kansai districts (e)	Hamamatsu (d)	C
	cotton cloth (2)	Shizuoka pref. (a)	Shizuoka pref. (a)	A
	cotton cloth	〃	Kanto/Tohoku districts (a)	〃
	rice	Tohoku district (f)	Hamamatsu (d)	C
synthetic resin	Aichi pref. (a)	Shizuoka pref. (a)	A	

Municipalities/ districts within Nagoya City	Storage items <sup>1)</sup>	Points of origin (types of enterprises at points of origin) <sup>2)</sup>	Points of destination (types of enterprises at points of destination) <sup>2)</sup>	Locational pattern of warehouses <sup>3)</sup>
Hamamatsu	machinery	Shizuoka pref. (a)	Shizuoka pref. (a)	A
	〃	〃	nationwide (e)	〃
	kitchenware	Kanagawa pref. (a)	Shizuoka pref. (d)	C
	pianos (2)	Hamamatsu (a)	nationwide (b)/(d)	A
	musical instruments (2)	〃	Shimizu (c)	B
	musical instruments	Shizuoka pref. (a)	nationwide (b)	A
	electrical products (2)	Hamamatsu (a)	〃	〃
	rolling stock parts (2)	〃	Kanto district (a)	〃
	miscellaneous goods	Shizuoka pref. (a)	nationwide (e)	〃
	electrical machinery	〃	〃	〃
	〃	〃	nationwide (b)	〃
	steel	〃	nationwide (e)	〃
	fertilizer	Tokai district (a)	Shizuoka pref. (d)	C
	agricultural chemicals	Toyama pref. (a)	Shizuoka pref. (f)	〃
engines	Shizuoka pref. (a)	Kanto district (a)	A	
Fuji	paper (5)	Shizuoka pref. (a)	Kanto district (a)	A
	paper (2)	〃	Kanto/Tokai districts (a)	〃
	〃	〃	Kanto/Kansai districts (a)	〃
	paper/pulp	〃	Kansai district (b)	〃
	〃	〃	Kanto district (b)	〃
	pulp	overseas (c)	Shizuoka pref. (a)	〃
	〃	Miyazaki pref. (a)	〃	〃
	foodstuffs	Shizuoka pref. (a)	Kansai district (b)	〃
	〃	〃	Kanto district (a)	〃
	flax	overseas (c)	Shizuoka pref. (a)	〃
	electrical products	Shizuoka pref. (a)	nationwide (b)	〃
	steel	nationwide (a)	Shizuoka pref. (a)	〃
metal products	Fukuoka pref. (a)	〃	〃	
Shizuoka	rice (2)	Tohoku district (f)	Shizuoka pref. (b)	C
	paper	Aichi pref. (a)	〃	〃
	canned goods	Kanto district (a)	〃	〃
	cans	〃	Shizuoka pref. (a)	A
	edible industrial products	Shizuoka (a)	Shizuoka pref. (d)	A · C
	building materials	Kanto/Kansai districts (a)	Shizuoka pref. (b)	C
	sundry foods	Kanto district (a)	〃	〃
	electric appliances	Shizuoka (a)	nationwide (d)	A
	electrical products	Kansai district (a)	Shizuoka pref. (d)	C
	window sashes	Shizuoka (a)	nationwide (b)	A
coils	nationwide (a)	Shizuoka pref. (a)	〃	

(Continued)

Municipalities/ districts within Nagoya City	Storage items <sup>1)</sup>	Points of origin (types of enterprises at points of origin) <sup>2)</sup>	Points of destination (types of enterprises at points of destination) <sup>2)</sup>	Locational pattern of warehouses <sup>3)</sup>
Shizuoka	paper	Shizuoka pref. (a)	nationwide (b)	A
Fukui	yarn	Kansai district (a)	Hokuriku district (a)	A
	〃	Fukui pref. (a)	〃	〃
	textiles	Hokuriku district (a)	〃	〃
	〃	Fukui pref. (a)	Fukui pref. (b)	〃
	〃	Hokuriku district (a)	Kansai district(a)	〃
	〃	〃	Fukui pref. (a)	〃
	textile products	Fukui pref. (a)	nationwide (f)	〃
	dyes	nationwide (a)	Fukui pref. (a)	〃
rice	Hokkaido pref. (f)	Fukui pref. (b)	C	
Kanazawa	rice (3)	Hokkaido/Tohoku districts (f)	Ishikawa pref. (b)	C
	structural steel	Kita-Kyushu (a)	Ishikawa pref. (a)	A
	electric appliances	Kanto district (a)	Hokuriku district (b)	C
	〃	Kanto/Kansai districts (a)	〃	〃
	〃	Gunma pref. (a)	〃	〃
	carpets	Kansai district (a)	Hokuriku district (d)	〃
	yarn	nationwide (a)	Hokuriku district (a)	A
	〃	Ishikawa pref. (a)	〃	〃
	〃	Miyazaki pref. (a)	Ishikawa pref. (a)	〃
	textiles (2)	Ishikawa pref. (a)	〃	〃
	〃	Hokuriku district (a)	〃	〃
	tyres	nationwide (a)	Hokuriku district (b)	C
	construction machinery & tools	Kyushu district (a)	〃	〃
	electrical machinery	Kanto district (a)	Ishikawa pref. (d)	〃
foodstuffs (3)	Kansai district (a)	Hokuriku district (b)	〃	
foodstuffs	〃	Ishikawa pref. (b)	〃	
dairy products	Kanto district (a)	Hokuriku district (b)	〃	

1) Numbers in parentheses following names of commodity items indicate the number of items.

2) a: factories b: wholesalers c: port enterprises d: retailers e: trading companies f: others In cases where points of origin and destination are located overseas, the enterprises involved are not always identifiable, and so are listed under port enterprises for the sake of convenience.

3) A: warehouses in production areas B: warehouses in transit areas C: warehouses in consumption areas  
(Sources: Direct enquiries and questionnaires prepared by the author)



break them up into smaller areas. Example of large areas containing the points of origin and destination of goods were, in the case of Komaki, either Tokai district or the Tokai and Hokuriku districts.

As for municipalities and districts according to the above classification, Fukui and Ichinomiya; mainly correspond to type 1) Fuji and Hamamatsu to 2) the urban area of Nagoya, Obu, Shizuoka and Kanazawa to 3) and the port area of Nagoya and Yokkaichi to 4) Komaki, Shimizu and Tobishima to 5); in concrete terms, Komaki evinced two patterns whereby goods at points of origin and destination moved from remote or nationwide areas to local areas, or from local areas to nationwide areas. Shimizu was more complex showing three patterns in which movements occurred from local areas to local areas, from local areas to remote or overseas areas and from overseas to local areas. Tobishima showed two patterns, from local to overseas areas and from overseas or remote areas to local areas.

Furthermore, to classify the types of enterprise at points of origin and destination movements of goods occur from 1) factory to factory, 2) overseas ports to factories, or factories to overseas ports, 3) factory to factory, wholesalers and retailers and 4) factories to wholesalers. Since it was difficult to obtain information through the means of direct enquiries regarding the overseas businesses

involved, the latter have all been classified under port enterprises. Municipalities and districts within Nagoya pertaining to 1) were Tokai, Fuji, and Fukui; to 2) Nagoya port area, to 3) Komaki, Obu, Ichinomiya, and Hamamatsu; and to 4) the Nagoya urban area and Shizuoka. Otherwise, municipalities having the above movement patterns 1) and 2) were Tobishima, Yokkaichi, and Shimizu, while Kanazawa combined 1) and 4). The stored items can be divided into three according to the steps involved in their processing, that is, raw materials, semi-finished and finished products. Thus, semi-finished products correspond to movement pattern 1) raw materials and finished products to movement pattern 2) semi-finished and finished products to 3) and finished products to 4). On the basis of the above, the following section offers locational patterns of warehouses with reference to the regions covering points of origin and destination.

#### IV-4 Locational Patterns of Warehouses

Next, to classify locational patterns of warehouses in municipalities and districts in Nagoya, utilizing the previously cited three criteria consisting of storage items, the regions in which the points of origin and destination of commodities were located, and the types of enterprises found

at the points of origin and destination, the result is a reduction to three categories of warehouses, found respectively in production areas, transit areas and consumption areas. From the viewpoint of physical distribution, these three types of warehouses each possessed characteristics as outlined below (Fig. 14).

The warehouses in production areas fulfilled the demands for storage space in the production areas. They handled two types of storage, one of which involved semi-finished products and the other finished products. The location of the factories involved with the semi-finished and finished products stored at the warehouses extended over a wide area, including the municipalities where the warehouses were located, and neighboring prefectures. Points of origin and destination involved movements mainly from local to local areas, remote or nationwide areas to local areas, and local areas to remote or nationwide areas. An type of the enterprises at the two points reveals that either enterprises at both points were factories, or that only the enterprises at the point of destination were factories.

The transit area warehouses per se were limited to those warehouses having transit functions for the use of ships in port areas; where they existed in the urban areas and environs of large and medium-size cities, they formed a



part of consumption area warehouses. In the past, the warehouses near freight stations were of importance as transit area warehouses, but this function deteriorated drastically after the development in motor car traffic. Some of the warehouses near the interchanges and truck terminals in the environs of large- and medium-size cities were set up as transit area warehouses, but were not exclusively so, hence here they will be treated as either consumption area or production area warehouses. The regions of the points of origin and destination for transit area warehouses involved movements mainly from remote or overseas areas to local areas, or local areas to overseas areas. In the cases of the types of enterprises found at the points of origin and destination, the movements concerned were from overseas ports to factories, or from factories to overseas ports and so on. As for the stage of processing involving the items stored, most of them were at the raw material level, but a part of them consisted of finished goods.

The consumption area warehouses answered the demand for storage space in consumption areas and the extension of the consumption area consisted of the above-defined local area. This class of warehouse stored products for final consumption, and the movements involving the points of origin and destination were chiefly from remote or nationwide areas to local areas. The types of enterprises

found at the points of origin were factories, and at the points of destination usually wholesalers and retailers.

The classification of warehouses into three categories that is, production area, transit area and consumption area warehouses, was carried out for municipalities and districts within Nagoya City as shown in Table 15. Accordingly, Ichinomiya, Fuji, and Fukui were found to be the locations for mainly production area warehouses, the Nagoya port district, Tobishima, and Tokai were the locations of mainly transit area warehouses, and the urban area of Nagoya was the location of mainly consumption area warehouses. The warehouses were almost all characterized by their belonging to only one of the three classes and clearly evince regional characteristics pertaining to storage activities. In contrast, the warehouses of Komaki, Obu, Shizuoka, and Kanazawa were both consumption and production area types, those of Shimizu were production and transit area types, those of Hamamatsu were production and consumption area types, and those of Yokkaichi were transit and production area types. Where Nagoya was concerned, a certain number of production area warehouses could be found in the urban area, but there were no areas of concentration of this type of warehouse. Moreover, in municipalities having warehouses with a double function such as the above, the flow of commodities was considerably complex and the strategic

points of physical distribution highly diversified. Locational patterns of warehouses have now become clear through the means of an analysis of the attributes of storage in the process of physical distribution for warehouses of municipalities and districts in Nagoya. The same method involving the classification of warehouse location is applicable to other regions besides the Tokai and Hokuriku districts.

Finally, a schematic locational pattern pertaining to warehouses in Nagoya and its environs by municipality and district is shown (Fig. 15). According to this Komaki and Obu show the double character of consumption area and production area warehouses. This is due to the fact that though both cities are production areas, the areas of location of the warehouses involved also include part of an extension of the consumption area in the Nagoya urban area. Komaki and Ichinomiya are both located to the north of Nagoya and at approximately the same distance as each other from the metropolitan centre. The former has both consumption area and production area warehouses. The latter has only the production area type of warehouse and their pattern of warehouse location was somewhat different. Apart from these municipalities, Tobishima and Tokai form an integral part of the port area of Nagoya, sharing its function. From this, it may be seen that the locational

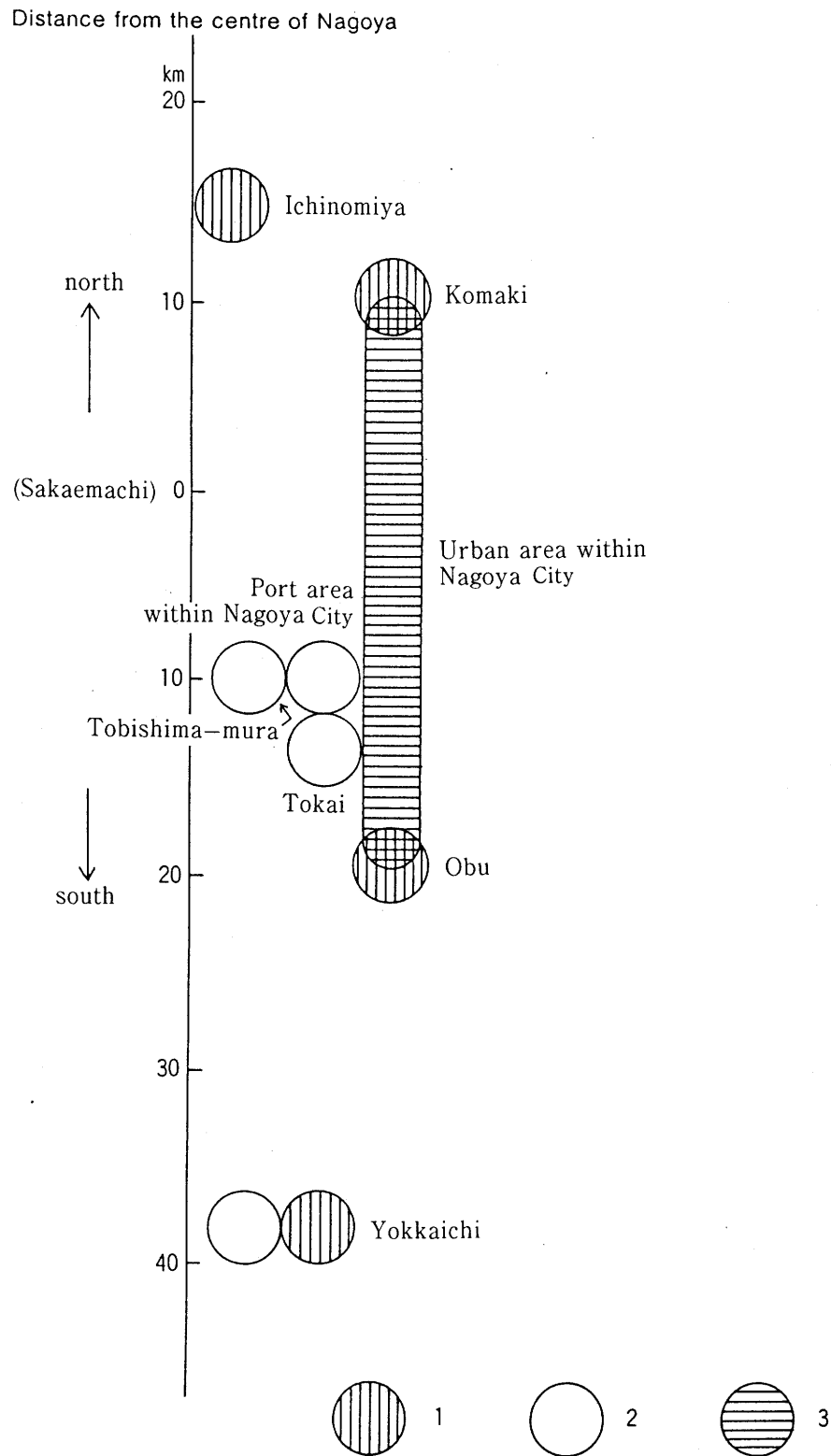


Fig. 15 Schematic location pattern of warehouses by district in Nagoya and municipality in the environs of Nagoya

1 : production area warehouses    2 : transit area warehouses  
 3 : consumption area warehouses



pattern of warehouses in Nagoya and its environs presents a considerably complicated situation from the regional point of view.

## CHAPTER V

THE LOCATIONAL BASES OF WAREHOUSES  
AND CONDITIONS HINDERING THE LOCATION OF WAREHOUSES

## V-1 The Locational Bases of Warehouses

In the previous chapter, an attempt was made to classify the location of warehouses, resulting in the emergence of the three types of production, transit and consumption areas, and analyses of the locational bases of warehouses located in the pertinent municipalities and districts of Nagoya were carried out for each of the three types. The locational bases attributable to these three types were manifold, and further, since there were mutual relationships between the locational bases of warehouses of different municipalities and districts, the adoption of a multifarious view was deemed necessary.

## (1) Production Area Warehouses

The locational bases of warehouses in the seven cities of Ichinomiya, Fukui, Shimizu, Yokkaichi, Fuji, Hamamatsu and Komaki, classified under the heading of production area warehouses will be considered in view of the commodities

stored in the warehouses.

(a) Textile Goods

Since, as noted previously, the warehouses of Ichinomiya and Fukui were located in a textile producing area, their storage items were mainly yarn and textiles. The manufacturing processes of textile production were divided into spinning, twisting, dyeing and finishing<sup>49)</sup> and so on (Azumi, 1982a), and there was a tendency to periods of stagnation between each process. The weaving process depended a good deal on small subcontractor weaving factories (*debata*), a fact which caused even further stagnation due to the accumulation of weaving thread stock. The scale of the enterprises handling the twisting and dyeing processes was small and here again, the large number of them caused the slow down of the flow of weaving thread. Generally speaking, where textile producing areas were concerned, except for the spinning sector, the processes were divided up among numerous small-scale enterprises. Because of this situation, it was difficult for spinning enterprises to decrease the stock derived from material for other processes. One characteristic of the textile producing areas was that the method of the division of labour utilized in the production process involved a considerable number of

small enterprises gathered together in the same area (Fig. 16). The regional separation of processes -- twisting, dyeing, weaving and so on -- caused the tendency towards the piling up of stock, constituting another reason for the freight stagnation occurring between the stages of production. The regional concentration of the production processes involving the division of labour caused the movements between the points of origin and destination to be accomplished within one and the same region.

Besides the division of labour pertaining to the production of textiles, the fluctuations in production due to seasonal demands are notable, so as a consequence, adjustment to a temporary fluctuation in demand took place, necessitating the storage of material. To observe the volume of monthly production of the woollen yarn and textiles of the Bisai district in Aichi Prefecture (Fig. 17), the production of the former was comparatively regular, while the production of the latter differed greatly from summer to winter, showing remarkable seasonal changes. Many of the spinning factories employed large numbers of workers and were provided with large-scale facilities; and for this reason, in order to maintain a certain level of employment and machinery operation, the number of working days per month was kept generally constant through the year as to woollen yarn production. The number of working days were

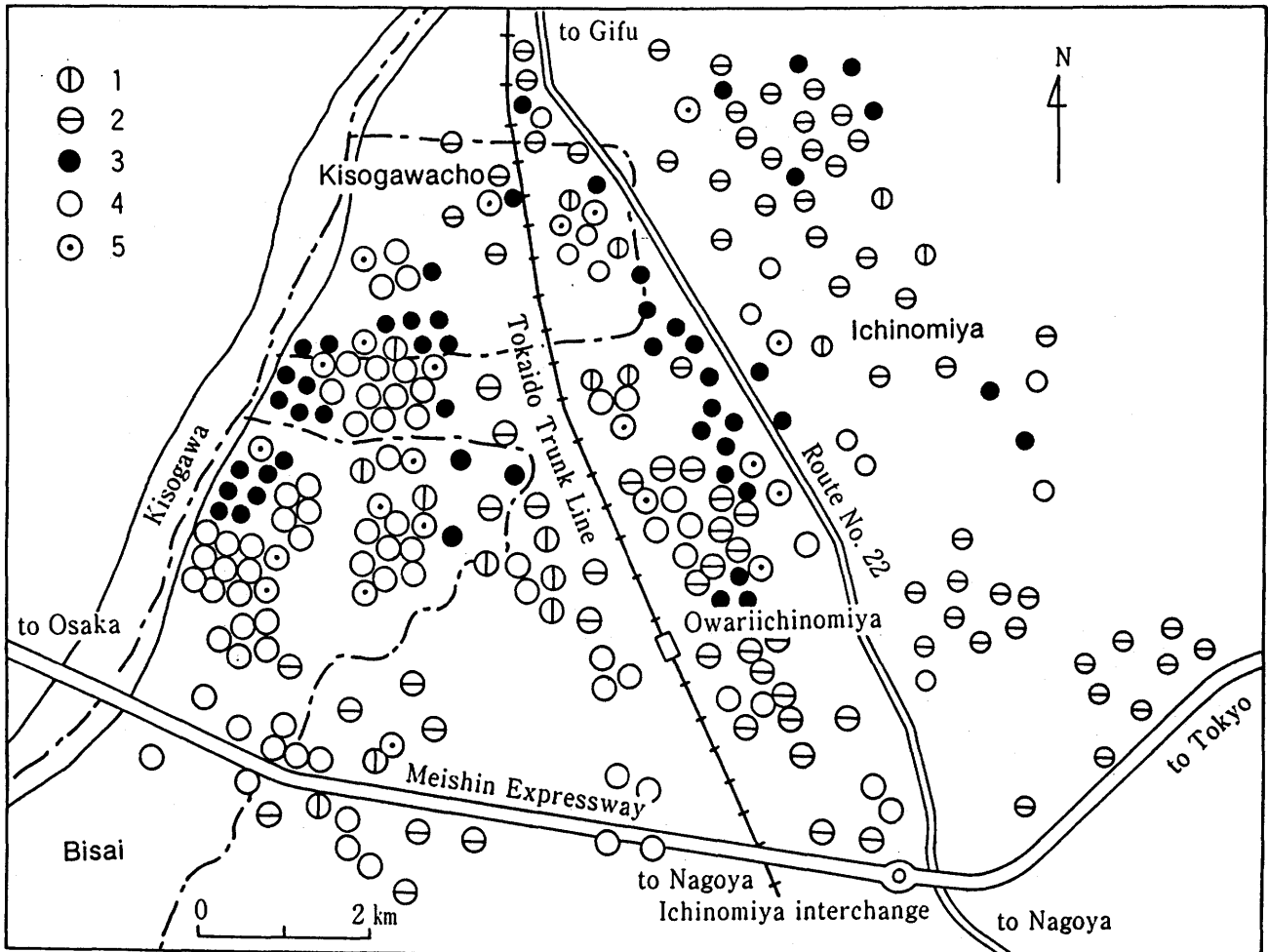


Fig. 16 Distribution of woollen textile factories by major production process in the Bisai district, Aichi prefecture (1980)

1 : wool spinning 2 : twisting 3 : dyeing 4 : *oyabata* (weaving factories with subcontractors) 5 : dyeing and finishing

Note: In the case of 2, 3, 4, only those employing more than 5, 30 & 10, respectively are shown.

(Sources: The Nagoya Branch of the Japan Wool-Spinning Association, Aichi Prefecture Twisting Industries' Union, Bisai Dyers' Cooperative, Bisai Woollen Textile Industries' Union and the Chubu Branch of the Japan Woollen Textile-Finishing Association)

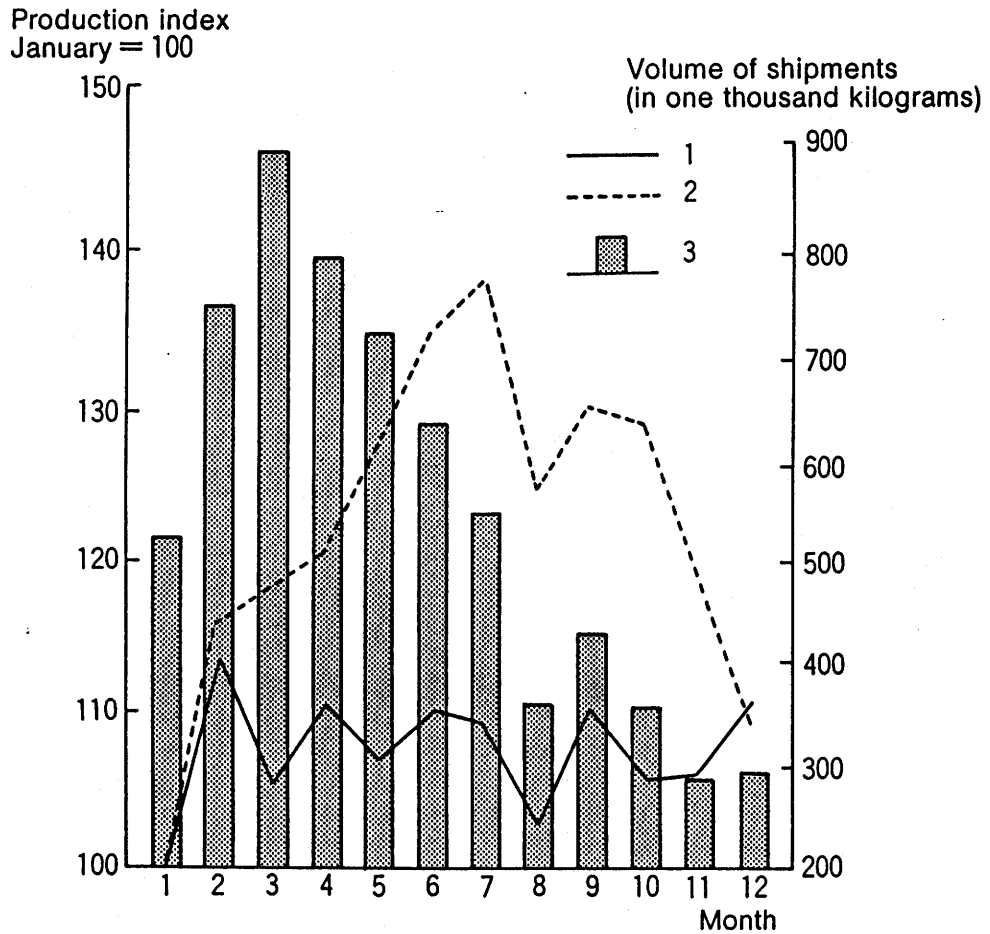


Fig. 17 Volume of monthly production of woollen yarn and woollen textiles and of monthly shipments of woollen yarn from warehouses in the Bisai district, Aichi prefecture (1980)

1: volume of woollen yarn production 2: volume of woollen textiles production 3: volume of woollen yarn shipments  
 (Sources: Tokai District Maritime Transport Bureau, Ministry of Transport and the Bisai Woollen Textile Industries' Union)

arranged in accordance with an annual production plan based on the capacity of the factory and the number of orders received from trading companies.

However, weaving operations clearly reflect the seasonal nature of woollen textile production because textiles tend to be easily governed by the seasonal demand<sup>50</sup>). In the case of Bisai district, the small-enterprise nature of its weaving shops also influenced this seasonal fluctuation. The *debata* or subcontractor weaving factory, constituting the mainstay of production, with a staff of less than five people including family members, occupied approximately 80 percent of the total weaving factories. In other words, the *debata* was a cottage industry mostly depending on family labour, and they were able to cope fairly easily with the problem of imbalance in the numbers of working days per month. The volume of monthly shipments of woollen yarn from warehouses in the woollen textile producing areas also differed greatly according to season, the height of the shipment period occurring two to three months prior to the period of maximum textile production. That is to say, the seasonal nature of woollen textile production clearly stimulated the adjustment to supply and demand on the part of the Bisai warehouses, and influenced the timing of their shipments.

Besides the above-noted division of labour and seasonal

influences, another aspect of the woollen textile producing area was that its warehouses were subject to the demand for storage space for huge quantities of woollen yarn. There were three reasons for this as follows: first, woollen yarn belonged to the category of expensive commodities, and storage fees were high<sup>51</sup>), hence warehouses relished consignments of this commodity. The second reason was that trading companies serving in in-between roles in transactions pertaining to woollen yarn rarely owned warehouses, so very often they specified the production area warehouses as the site of delivery. These latter warehouses, while standing in as storage functions of the trading companies also easily took over the shipping of materials pertaining to twisting and dyeing to the place of their next stage of processing. The third reason was that the market price of woollen yarn, in difference to other thread for weaving, was subject to considerable fluctuations<sup>52</sup>). Because of this, a good deal of speculative dealings took place, and warehouses at the woollen textile production areas were used for the storage of woollen yarn targeted for speculation. In this instance, woollen yarn for speculative buying and selling could easily be utilized as production material. In this way, where woollen textile-producing areas were concerned, the favourable commodity value of woollen yarn itself was felt to be considerably influential in



strengthening the locational basis of the warehouses concerned.

Textile products were not often stored in the area of production; generally, there was a strong tendency to store them in consumption rather than production areas. However, the two cities of Ichinomiya and Fukui, as well as Hamamatsu and Kanazawa, were textile-producing areas and also stored textiles. In this instance, whatever the kind of cloth produced in these textile producing areas, they required the storage facilities that went with the situation of divided labour described above. As it was, however, the seasonality and high value of textiles as a commodity were conditions bringing about the setting up of the locational bases of warehouses in woollen textile producing areas. In this way, out of all the different industrial types, the textile producing areas contained a variety of factors encouraging the concentration of warehouses; hence the locational basis of the latter was a strong one.

(b) Canned Goods and Cans

The development of canned goods-related foodstuff factories in Shimizu was marked, with numerous production area warehouses storing canned goods and cans (Azumi, 1975a). In Shimizu, canned goods manufacture mainly consisted of the

canning of varieties of fish foods in summer, and in winter mandarin oranges, from which it will be observed that the seasonal nature of canned goods manufacturing was a strong one. Consequently, during the respective seasons for the above commodities, a large demand for storage facilities for canned goods arose, with storage taking place in the areas of production. Along with this, the demand for cans also showed fluctuations of a seasonal nature, due to which the accumulation of stock was unavoidable. Moreover, cans were used for beverages, further enhancing their susceptibility to seasonal changes in demand; in recent years, the demand for beverage cans has been particularly notable. Cans were mostly manufactured in Shimizu and Shizuoka<sup>53</sup>), and were generally stored in these cities or neighboring areas before being moved to canneries within the same area.

To look at the relationship between production and storage (Fig. 18) for canned goods and the cans to which they related in the course of the manufacturing process, the area under consideration, as previously noted, had two can manufacturing factories, a large concentration of canning factories, and their respective warehouses, where movements of tinsplate, cans, canned food and canned beverages were markedly frequent. Although the amount involved was small, the storage of cans to be shipped to cooking oils and fats factories and of canned products of the same also took

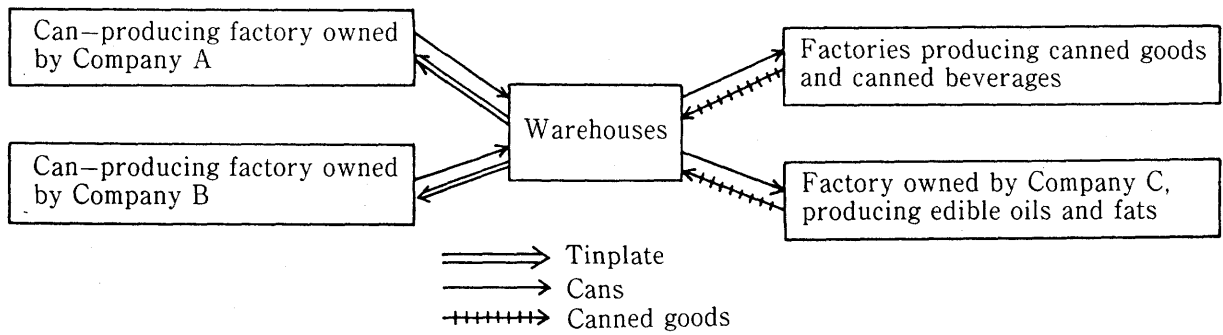


Fig. 18 Relationship between factories, respectively producing cans, canned goods and edible oils and fats, and warehouses (1987)

(Source: Direct enquiries by the author)

place. A glance at the changes in the amount of canned goods production (Fig. 19) shows 16,380,000 cartons for 1976, after which the yearly volume rose rapidly, the rate of increase becoming particularly high since 1981; in 1988, the number of cartons rose to 59,310,000 cartons, registering a 3.6-fold increase over a period of ten years. The reason for this rapid increase was the sudden growth in the consumption of canned beverages among others, in contrast to the gradual increase in canned goods for domestic consumption and the decrease in canned goods for export. The rapid increase of canned beverages strengthened to an even greater degree the demand for enlarged storage facilities. Along with the diversification of beverages, and the proliferation of automatic vending machines, the demand for canned beverages continues to grow at a rapid rate with young people at the core of the demand. With regard to this point, among the items consigned to five warehouse enterprises<sup>54)</sup> by major consigners, canned goods, canned beverages and cans predominate (Table 16), indicating the large contribution of canned goods production to the increase of the demand for storage floor space in local warehouse enterprises.

A glance at the characters of the consigners of canned goods and beverages and the consigners of can (Table 16) to the five warehouse enterprises referred to above indicates that three of the companies comprising the former had their

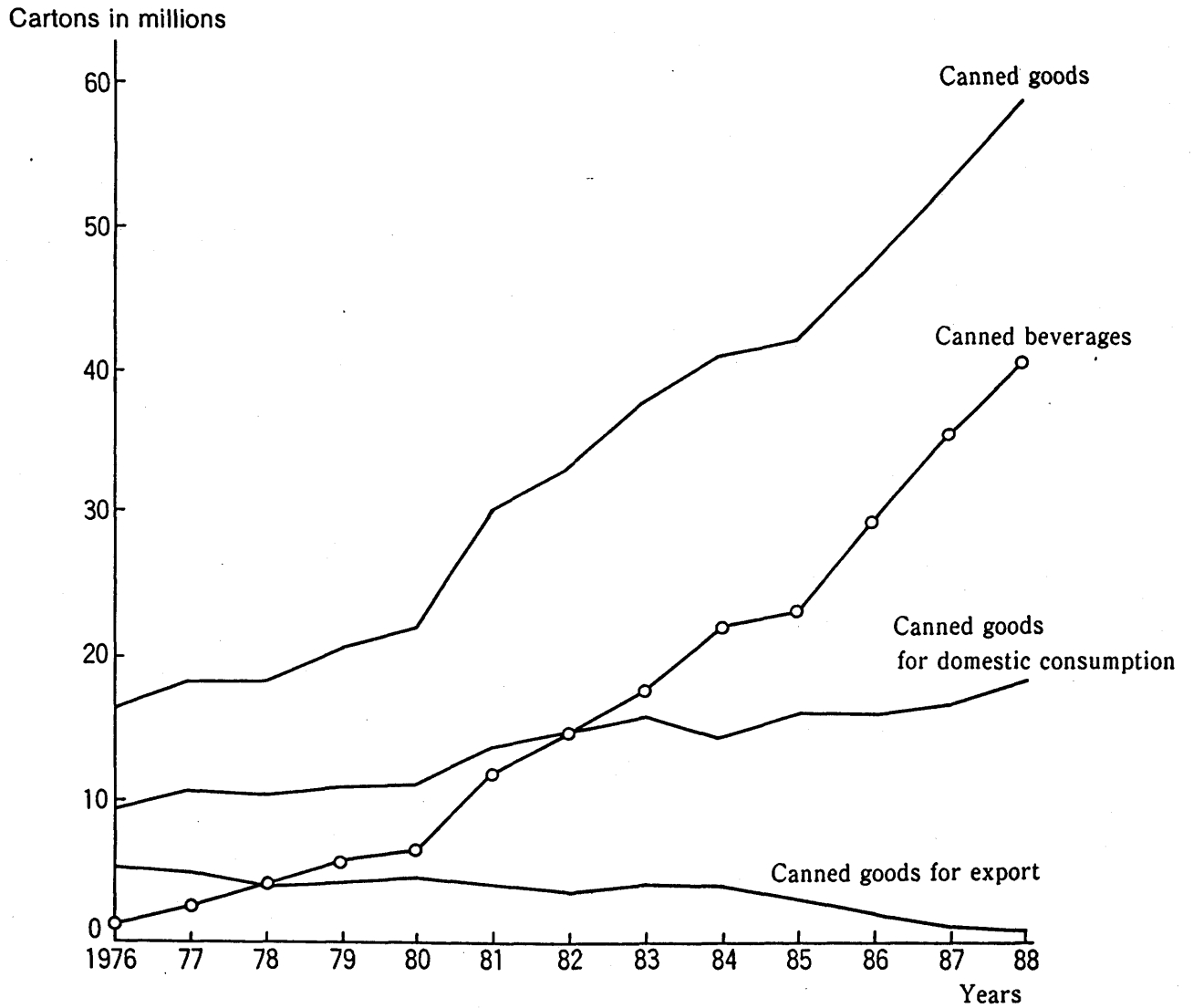


Fig. 19 Changes in production of canned goods in Shizuoka prefecture  
 (Source: Shizuoka Canned Goods Association)

Table 16 Important consigners by major warehouse enterprise in Shimizu (1989)

Warehouse enterprise number	Important consigner number	Site of main office	Type of enterprise <sup>1)</sup>	Storage items	Points of origin (types of enterprises at points of origin) <sup>2)</sup>	Points of destination (types of enterprises at points of destination) <sup>2)</sup>
1	1~4	Tokyo/Shimizu	A	barley/other sundry cereals	overseas (d)	Shizuoka/Yamanashi/Nagano prefs. (a)
	5	Tokyo	"	minor grains	"	Shimizu (a)
	6	"	"	maize	"	"
	7	"	B	rice	Tohoku district (e)	Central part of Shizuoka pref. (b)
	8	"	A	air conditioners/refrigerators	Shizuoka (a)	nationwide (b)
	9	"	"	stereophonic sets	Kakekawa (a)	overseas (d)
	10~15	Tokyo/Fuji	A · B	pulp	Canada (d)	Fuji (a)
	16	Fuji	A	paper	"	Shizuoka pref. (a)
	17	Tokyo	B	used paper	United States of America (d)	Fuji (a)
	18~20	"	"	Pasturage	"	Shizuoka pref. (e)
	21	"	A	cans	Shimizu (a)	Yaizu/Shimizu (a)
	22	"	"	"	"	"
2	1	Kobe	A	canned beverages	Shimizu (a)	nationwide (b)
	2	Kanbara	"	canned goods	Kanbara (a)	"
	3	Yui	"	"	Yui (a)	"
	4	Tokyo	"	"	Shimizu/Yaizu (a)	"
	5	"	"	cans	Shimizu (a)	Shimizu/Yaizu (a)
	6	"	"	air conditioners/washing machines	Shizuoka (a)	nationwide (b)/overseas (d)
	7	"	D	pet food	overseas (d)	nationwide (b)

(Continued)

Warehouse enterprise number	Important consigner number	Site of main office	Type of enterprise <sup>1)</sup>	Storage items	Points of origin (types of enterprises at points of origin) <sup>2)</sup>	Points of destination (types of enterprises at points of destination) <sup>2)</sup>
3	1	Osaka	A	canned beverages	Shimizu (a)	nationwide (b)
	2	Kobe	"	"	Shimizu (a)/United States of America (d)	"
	3	Tokyo	"	air conditioners	Shimizu (a)	nationwide (b)/overseas (d)
	4	"	"	cans	"	Shimizu/Yaizu (a)
	5	"	"	"	"	"
	6	"	C	rice	Tohoku district (e)	Central part of Shizuoka pref. (b) (c)
4	1	Tokyo	A	canned goods	Shimizu/Yaizu/Hachinohe/Hiroshima (a)	Kanto/Tokai districts/Niigata pref. (b)
	1	"	"	"	United States of America/Thailand (d)	"
	2	"	"	paper	Shikoku district (a)	Shizuoka/Yamanashi prefs. (a) (e)
	3	"	"	tin plate	Kudamatsu (a)	Shimizu (a)
	4	"	"	cans	Shimizu (a)	Kanto district/Shizuoka/Aichi prefs. (a)
	5	"	"	cooking oils	"	Kanto district/Shizuoka/Aichi prefs. (b)
5	6	"	B	cans	France (d)	Shizuoka pref./Hachinohe/Hiroshima (a)
	1	Tokyo	A	air conditioners	Shimizu (a)	nationwide (b)
	2	Osaka	"	canned beverages	"	"
	3	Tokyo	C	rice	Tohoku district (e)	Central part of Shizuoka pref. (b) (c)
5	4	"	A	cans	Shimizu/Tokyo/Hiroshima (a)	Shimizu/Yaizu (a)

1) A: manufacturers B: trading companies C: governmental enterprises D: wholesalers

2) a: factories b: wholesalers c: retailers d: port enterprises e: others In cases where points of origin and destination are located overseas, the enterprises involved are not always identifiable, and so are listed under port enterprises for the sake of convenience.  
(Source: Direct enquiries by the author)

main offices in the 23 wards of Tokyo, two had their main offices in Kobe and another two in Osaka, while one each had their main offices in Kanbara and Yui, respectively, and the type of business involved was that of manufacturing. With regard to the latter consigners, seven were manufactures and one was a trading company which stored imported cans, and all had their head offices in the 23 wards of Tokyo.

As indicated above, the consigners of canned goods and canned beverages very often constituted external capital, and did not utilize their own factories, but instead, in many cases subcontracted the production of canned goods under their own brands to the canneries of Shimizu of its environs. That is to say, among cannery enterprises of local capital, except for a small number<sup>55</sup>), there were no products or sales of goods under local brand names; subcontracting the work assigned to them by other companies was the general practice. In particular, the consigners of canned beverages maintained Shimizu and its environments as a strategic base of production and furthermore, retained storage functions in the same areas, from where they developed a nationwide sales network. The fact that the city of Shimizu is located in the central part of Japan, lent impetus to the above tendencies.



## (c) Chemical Goods

Since large-scale petrochemical complexes were located in Yokkaichi, numerous chemical factories are concentrated there, for which reason the storage of chemical products was predominant. However, among the raw materials or semi-finished products, some substances such as fluids, gases, dangerous goods and so on are not suited to storage; the storable freight is chiefly comprised of synthetic resins, with the addition of synthetic rubber and synthetic fertilizers (Azumi, 1980). To observe the relationships between the petrochemical complexes and warehouses (Fig. 20), the chemical factory manufactures ethylene from the naphtha supplied by the oil refining factory, and this was taken over by neighboring chemical plants which processes it into polystyrene, polyethylene, vinyl chloride, synthetic rubber and so on. The first three substances are included in synthetic resins and are stored in local warehouses. Generally, synthetic resins are produced in large quantities in equipment plants. Plastics molding plants are very often small in scale and scattered over nationwide areas; synthetic resin must be stored once at the place of production and then shipped out in divided form in answer to the demand. As for synthetic rubber, it was difficult to bring large quantities of raw material onto the storage

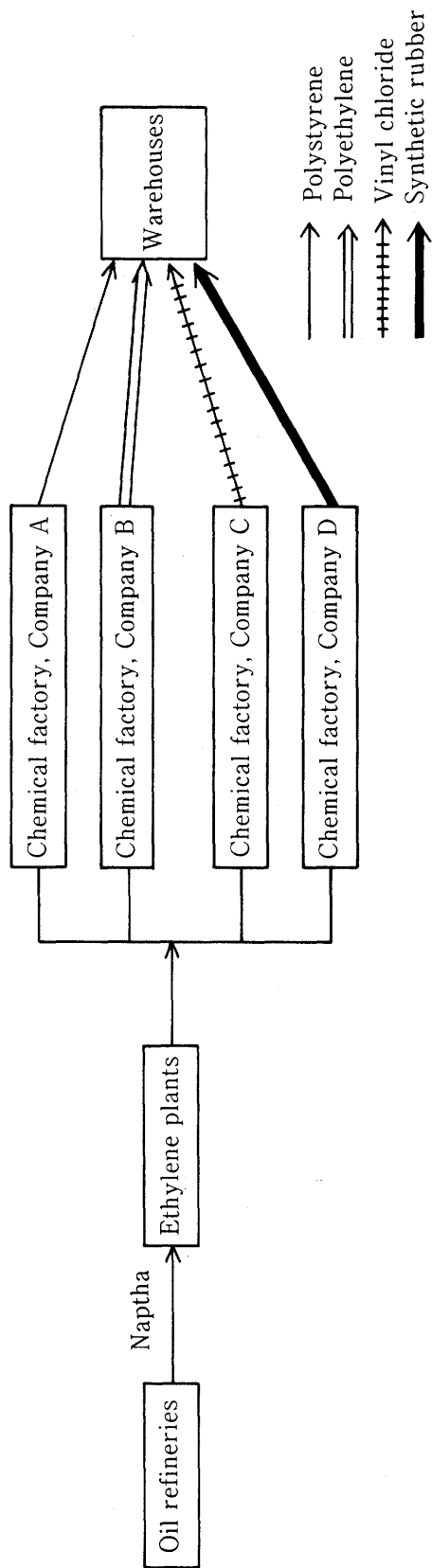


Fig. 20 Relationship between petrochemical complexes and warehouses (1989)

(Source: Direct enquiries by the author)

floor space available in the rubber processing factories, hence once again the production area served as a strategic base for storage.

To observe important consigners to four major warehouse enterprises (Table 17), among the items consigned by the former to the latter chemical products prevail. In concrete terms, warehouse enterprise No.1 had three consigners of synthetic resins; No. 2 had one consigner of synthetic resins and one of synthetic rubber; No. 4 had three consigners of synthetic resins; and No. 3 stored only dyes and paints and with the exception of one consigner, each warehouse enterprise also depended on the local chemical factory. The main offices of eight of the consigners were in the 23 wards of Tokyo, and one consigner had its main office in Osaka, and through them the Yokkaichi branch factories of the Tokyo and Osaka chemical manufacturing enterprises formed strong ties with the local warehouses. The points of destination of freight from the warehouses ranged over a nationwide area, or over the whole area of Tokai; given the above-mentioned scattered distribution of plastics molding factories, warehouses were required to break up shipments into smaller loads; in the meantime, the demand for storage continued to increase.

Table 17 Important consigners by major warehouse enterprises in Yokkaichi (1989)

Warehouse enterprise number	Important consigner number	Site of main office	Type of enterprise <sup>1)</sup>	Storage items	Points of origin (types of enterprises at points of origin) <sup>2)</sup>	Points of destination (types of enterprises at points of destination) <sup>2)</sup>
1	1	Tokyo	C	rice	Tohoku/Hokkaido districts (c)	Mie pref. (b)
	2	"	"	barley	United States of America/Canada (d)	Mie pref. (a)
	3~5	"	B	sundry grains	overseas (d)	Mie/Aichi prefs. (a)
	6	Yokkaichi	A	farm crops for oils & fats	"	Yokkaichi (a)
	7~9	Tokyo	"	synthetic resins	Yokkaichi (a)	nationwide (a)
	10~15	Tokyo/Osaka	"	cornstarch	Yokkaichi/Suzuka (a)	"
2	16~20	Yokkaichi	"	organic fertilizers	overseas (d)/Yokkaichi (a)	Yokkaichi/nationwide (a)
	1	Tokyo	A	synthetic rubber	Yokkaichi (a)	Tokai district (a)
	2	"	"	synthetic resins	Chiba/Iwakuni (a)	"
	3	"	C	wheat	overseas (d)	"
	4~10	Osaka/Tokyo	A	raw cotton	"	Chubu district (a)
	1	Tokyo	A	dyes/paints	Yokkaichi (a)	nationwide (a)
3	1	Osaka	A	titanium oxide	Yokkaichi (a)	nationwide (a)
	2	"	"	urca resin	"	overseas (d)
	3	Tokyo	"	styrene resin	"	nationwide (a)
	4	"	"	"	"	"
	5	"	"	mixed fertilizer	Yokohama (a)	Mie pref. (c)
	6	"	C	barley	overseas (d)	Mie pref. (a)

Note: See note for Table 16.  
(Source: Direct enquiries by the author)

## (d) Paper and Musical Instruments

As Fuji was an important area of production for paper/pulp, a large number of warehouses were geared to handle the storage of this commodity. Paper was mainly supplied to printing establishments, publishers, and box manufactures in the large cities; most of these companies were small-scale enterprises and there was a considerable variety in the kinds of paper ordered<sup>56</sup>); hence the direct delivery of large units of shipment to the companies entailed difficulties, and segmentation of the freight into smaller units was called for. In particular, a large paper manufacturing factory was located in Fuji, and as the amount of production was large, storage at the area of production was desirable.

Next, musical instruments, which were representative industrial products of Hamamatsu, were stored locally (Azumi, 1975a). With regard to this point, the degree of dependence of local commercial warehouses, according to percentage of storage by products, by Japan's largest musical instruments manufacturing enterprise, the Y\_\_\_\_\_ Company will be observed. During the five month period of November 1974-March 1975, the dependency degree for organs was 81 percent, for "electones" (brand name for a type of electronic organ) 87 percent, guitars 80 percent, and pianos 7 percent; in other words, apart from pianos the storage rate for musical

instruments in the local warehouses was a high 80 percent or more. There were some changes in these figures during the course of years, but in the main, they represented the normal storage situation. Where pianos were concerned, due to their special storage characteristics<sup>57)</sup>, they were generally stored in the private warehouses belonging to the manufacturers. For musical instruments, therefore, from the point of view of the distribution pattern, the area of production was the storage base, as shown by the remarkably high rate of dependence on the local warehouse except for pianos, and for the period of storage at the consumption area end merely a month or so was sufficient. Thus, musical instrument manufactures make it their business rule to rely on the local commercial warehouses for storage of their products. This is because sales of the musical instruments fluctuate greatly depending on the time of the year<sup>58)</sup> and commercial warehouses are better suited to cope with flexible storage demand.

(e) Multifarious Storage Items

The production area warehouses of Komaki, unlike the warehouses of several municipalities noted earlier, do not handle large quantities of specific freight, but are rather characterized by the variety of the freight they handle.

The Komaki warehouses had connections with an unspecified number of industries, in which fact lies their special character. Moreover, the ties between the production area warehouses of Komaki with factories in Komaki are extremely weak; the warehouses depend for their business on factories in neighbouring regions, or areas outside of Aichi Prefecture. Of special note is the fact that Komaki developed also as an inland industrial region, with the shipment volume of its industrial products rising to 300 billion yen in 1978. The question arises as to why, under these circumstances, the many production area warehouses were able to depend on so few of the factories in the municipality for consignments. In order to answer the question, the storage situation of products (Table 18) from thirty-three factories employing more than 100 workers are examined below.

To classify the factories according to the type of production, factories for order production numbered 20, and factories for market production numbered 13; that is to say, factories for order production occupied 60 percent of the total factories. Among others, five factories, Nos. 27, 28, 29, 30 and 32, are large ones, each with over 1,000 employees and the yearly production surpassing ten billion yen, but they follow the order production system. Consequently, since the proportion of the order production mainly at large-scale

Table 18 Storage situation pertaining to products of major factories in Komaki (1978)

Factory number	Products	Production system <sup>1)</sup>	Factory-owned warehouses (○ indicates the existence and × the non-existence)
1	bottle caps	A	×
2	dump trucks	〃	×
3	seat for motor cars	〃	×
4	airplane engines	〃	×
5	tiles	B	○
6	electric parts	A	×
7	bicycles	B	○
8	machinery	A	×
9	paints	B	○
10	medicine/chemicals	〃	○
11	plastic processed goods	A	○
12	〃	〃	○
13	corrugated cardboard boxes	〃	×
14	tableware for Western-style meals	B	○
15	textile products	A	×
16	moulds	〃	×
17	precision machinery	〃	×
18	machine tools	B	○
19	chairs	〃	○
20	palettes	A	×
21	confectionary	B	×
22	textile products	A	×
23	labour-saving machinery	〃	×
24	confectionary	B	×
25	lactic acid beverages	〃	×
26	machinery	A	×
27	rubber vibration insulators	〃	×
28	labour-saving machinery	〃	×
29	insulators	〃	×
30	belts	〃	×
31	machinery	B	○
32	electrical plugs	A	×
33	glass bottles	B	○

1) A: order production B: market production  
(Source: Direct enquiries by the author)



factories was comparatively large, there was less need for storage facilities. Moreover, most of the factories undertaking market production were located on the premises large enough to accommodate their own warehouse facilities. This being the case, the only factory utilizing commercial warehouses was factory No. 18. Factories Nos. 21, 24 and 25 operated on the system of market production; however, they did not own warehouses because they were making perishable confectionery or lactic acid beverages. In this way, because the share of the order production based on planning was large, and because land sites for the building of factory-owned warehouses were fairly easy to obtain, there was little need for the local commercial warehouses.

Thus, for the above reasons, the points of origin of freight for the production area warehouses of Komaki were various factories spread over a considerably extended area centering on neighbouring regions. Operating in an area as large as this, the production area warehouses of Komaki demonstrated ample collection capacity and furthermore promoted the storage of multiple commodities, indicating the further strengthening of their locational bases. In the background to this situation were to be found the previously noted advantages of easily available sites for the building of warehouses, favourable traffic conditions, the existence of rental warehouses and so on that were influential in the

establishment of the locational bases. Accordingly, where the production area warehouses of cities other than Komaki linked up to specific industries, the warehouses of Komaki were subject to various other conditions besides depending on a non-specific number of industries, and thus differed in character from the warehouses of other cities. In any case, though Komaki might not have had the good fortune in being able to depend on the establishment of a large-scale single industry, it is still necessary to take note of the production area warehouses that stored a variety of items and which were to be found in situations of considerable concentration.

Due to large-scale production, division of labour, differences in scale of enterprise, the seasonal nature of production and so on, the types of industries that manufactured textile products, canned goods, cans, chemicals, paper, and musical instruments, as delineated above, stimulated the demand for storage space in production areas, and it was clear that the locational bases of establishment of the warehouses concerned was comparatively stable.

## (2) Transit Area Warehouses

Port area within Nagoya City, classified as the site of transit area warehouses in the previous chapter, will be

mainly discussed, with some parts given over to Shimizu, Yokkaichi and Tobishima. Ports are places where ships and overland transport systems comprising different means of transport transfer cargo; the units of cargo for each of these means of transport differ widely. Moreover, ports await the arrival of ships and it is necessary to collect cargo up to a certain amount. This is a situation peculiar to ports giving rise to periods of stagnation. The stagnation is compounded especially at trading ports, where the total cargo or units of cargo is very large, or customs clearance must be gone through (Azumi, 1984b). Hence at port areas, transit area warehouses cope with the huge quantities of sea freight, and storage facilities for import and export goods are fairly prominent.

Port area within Nagoya City handled imported freight such as raw cotton, fodder, tobacco and so on, while Shimizu Port handled imported freight, including minor grains and crude sugar, and export goods such as motorcycles and canned goods; and at Yokkaichi, imported freight including grains and raw cotton were stored. Of all these commodities, raw cotton alone was unloaded at specified ports<sup>59)</sup>, where the warehouses met the heavy demands for storage facilities, hence their locational basis of establishment was a stable one.

A look at the development of port maintenance and

transit area warehouses specialized in limited, specific goods discloses that up till 1955, as port facilities were generally meagre and moreover, the volume of cargo handled small, the warehouses adopted a pattern of storage where miscellaneous goods were stored all together. However, from the first half of the 1960s, there was a marked increase in the volume of freight and in the diversification of goods consigned for storage. With regard to the new situation, in order to raise the efficiency of transport and to promote rationalization, ships specialized in the transport of specific cargo and the related construction of piers was expedited. At the same time, at each port, specialized warehouses emerged and the specialization of storage functions according to items of freight commenced to take place; thus the locating of various warehouses accommodating the character of freight became more and more in evidence, and in this way, the development of physical distribution facilities such as specialized piers and warehouses besides specialized ships contributed to the stabilization of the locational basis of transit area warehouses.

In the case of transit area warehouses, warehouse enterprises also holding licenses for the harbour transport business had the advantage, as previously pointed out, of being in a position to secure client consigners of import/export freight. Generally, with regard to the

handling of import/export freight, the harbour transport enterprises and warehouse enterprises centering around the shipping companies formed an affiliated group (*keiretsuka*); and warehouse enterprises doubling as harbour transport businesses maintained close contact with shipping companies, with the result that freight collecting activities became brisk. In this way, generally, physical distribution at ports were strongly influenced by trading policies, which restrained excessive competition, and business practice resulting from affiliation. These policies were instrumental in the stabilization of the locational bases with regard to the warehouse enterprises holding licenses for the harbour transport business. In port area within Nagoya City, licensed warehouse enterprises were in the majority, but in Tobishima, there were numerous unlicensed enterprises<sup>60</sup>). Hence while both places were located in the same Nagoya Port area, the stability of their locational bases was unequal. This fact brought about differences in the regional flow of freight for the two places and was responsible for the growth of the considerable stockpile of domestic freight in Tobishima. The above clarifies the locational bases of warehouses based on the situation of import and export freight stored in port warehouses, the development of specialized warehouses, and the possession of licenses for the harbour transport business.

Next, with regard to steel which comprised one of the most important sectors of domestic freight handled at Nagoya Port, the locational bases of the transit area warehouses will be clarified in terms of the points of origin. Almost all of the steel freight came from five major integrated steel manufacturing companies to the transit area warehouses and the points of origin were determined subject to regional differences in the kinds of steel products geographical location and the production capacity of ironworks. The steel industry was characterized by the large variety of its products<sup>61</sup>), hence it was difficult for all the types of products to be produced in one place. Industries like Company V, which owned a large number of ironworks, promoted the production allotment system with regard to important products manufactured at the ironworks (Table 19). In accordance with the system, the Nagoya ironworks was limited to the production of three main types of products: thin plates, plates and steel tubing; demands for other types of steel-related products were met by other ironworks. Other steel companies owned smaller numbers of ironworks, hence they did not utilize the regional allotment system of production to the extent that Company V did; nonetheless, if certain types of products or standards of manufacture were called for, production was given over to specific ironworks<sup>62</sup>). In this way, the diversification in its types

Table 19 Production percentages of V—Company's products by ironworks (1977)

Names of ironworks Types of products	Muroran	Kamaishi	Kimitsu	Tokyo	Nagoya	Sakai	Hirohata	Hikari	Yahata	Oita
	Rails	—	—	—	—	—	—	—	—	A
Steel sheet piles	—	C	—	—	—	E	E	—	D	—
H shapes	E	—	E	—	—	C	D	—	E	—
Shapes	E	E	E	—	—	E	E	—	D	—
Bar steel	A	E	—	—	—	—	—	—	—	—
Wire rods	D	E	D	—	—	—	—	D	—	—
Plates	—	—	D	—	E	—	D	—	E	E
Thin plates	E	—	E	—	E	E	E	—	C	—
Steel tubing	—	—	D	E	D	—	—	D	—	—

Note: Percentages are indicated as follows:  $A \geq 80\%$ ,  $60\% \leq B < 80\%$ ,  $40\% \leq C < 60\%$ ,  $20\% \leq D < 40\%$ ,  $E < 20\%$

Tokyo and Hikari ironworks do not possess blast furnaces.  
(Source: The Japan Iron and Steel Federation)

of products enlarged the area covering the points of origin. In other words, due to the regional allotment system, points of origin of the transit area warehouses were increased. This caused weight to be given to the function of freight collecting on the part of the warehouses, and at the same time, schemes were devised for the improvement of the functions such as the lining up, storing and delivery of goods, thus promoting the stabilization of the locational bases of the warehouses in question.

To look at ironworks belonging to Companies W, X, Y and Z, as well as Company V, with regard to their allocation of W, X and Y each operated one factory in East Japan and one in West Japan, and Company V had eight factories all over Japan, while Company Z established two factories in Hyogo Prefecture. These differences in the allocation of ironworks by steel enterprises caused the formation of various extended area to cover scattered points of origin. Where production capacity was concerned, the Company X ironworks of Fukuyama was notably larger in scale than the Kawasaki ironworks, and the Company Y ironworks in Kashima was notably larger in scale than the Wakayama ironworks<sup>63)</sup>; and with Company V, there were considerable differences in the production scales of its various ironworks<sup>64)</sup>. Otherwise, Company W operated ironworks in two places, but there was comparatively little difference in the production scale



between the two<sup>65</sup>). Due to the imbalances in the scales of production points of origin for steel spread ever more widely all over Japan and presented a complex situation. Moreover, the effect on the transit area warehouses was the increased diversification of their functions.

A result of the interlocking of three elements of ironworks, i.e., the kinds of products involved, the allocation and production capacity of each enterprise's works was the formation of steel distribution areas peculiar to the particular ironworks involved. With the development of such distribution areas, the territories of the transit area warehouses were no longer unevenly set among specific regions, but spread uniformly over the country. Hence the points of origin for transit area warehouses at Nagoya Port included nationwide integrated steel factories in Fukuyama, Oita, Kakogawa, Kashima, Kita-Kyusyu, Muroran and so on. A point to be noted here, however, is that set against the situation in which points of origin for transit area warehouses were located nationwide, was the influence of the geographical location of Nagoya Port, which is located in the central part of Japan. In the case of a steel enterprise with one factory each in Easter and Western Japan, the transit area warehouses of Nagoya Port came to serve as a junction of distribution for the both areas, forming the nationwide territory. The steel developing such

nationwide areas of the points of origin increased their dependence on the transit area warehouses, thus contributing to the strengthening of the locational bases of the transit area warehouses.

### (3) Consumption Area Warehouses

The warehouses in the urban area within Nagoya City classified as consumption area warehouses in the previous chapter will be mainly considered, partly with reference to Kanazawa, Shizuoka and Hamamatsu. Normally, consumption area warehouses were located in the urban areas of cities which were the centre of the demand for consumption goods. Where Nagoya was concerned, there was a marked concentration of consumption area warehouses in the urban area. That is to say, the urban area of active consumer demand, where wholesalers and retailers were concentrated, formed a strategic base for the physical distribution of goods for consumption; here could be found a traditional type of consumption area warehouse, attesting to the strength of its locational basis (Wakita, 1981). In concrete terms, the locational basis is expressed by the characteristic of the stored freight and the consigners as explained below.

Stored freight centered around foods, electrical machinery, synthetic resins, tobacco (domestic), paper and so

on, illustrating the diversity in the composition of the freight involved. Among others, foodstuffs accounted for some 30 percent of the total, reflecting the characteristics of urban storage. The food consumption units were small and the kinds of foods diverse, hence the need for storage in consumption area-type warehouses arose. As to processing stages of stored freight, finished products accounted for a large 86 percent, and the demand for storage facilities was high. The types of businesses in which the consigners were engaged were manufacturing, accounting for 58 percent, trading accounting for 14 percent, and wholesale 14 percent, while 6 percent constituted governmental bodies and 8 percent others in a variety indicating the diversity of the freight. The fact that a comparatively large share of the consigners concerned were engaged in the wholesale business was a characteristic of the consumption area warehouses.

Apart from urban area within Nagoya City, Komaki, Kanazawa, Shizuoka and Hamamatsu were four municipalities that contained concentrations of consumption area warehouses. Three of the four, that is Kanazawa, Shizuoka and Hamamatsu were each a medium-size city with a population of over 400,000, and each constituted a physical distribution core. The distribution areas for the three cities differed in size, but the physical distribution area for each of them was considerably extensive.

To observe the points of destination in regard to warehouses in urban area within Nagoya City, a part of the distribution area reached up to a section of the Hokuriku district, but otherwise, it generally matched the extent of the Tokai district. In the case of Kanazawa, its distribution area included, besides Ishikawa Prefecture, both Toyama and Fukui Prefectures, and thus covered the three prefectures of the Hokuriku district. However, the distribution areas of Shizuoka and Hamamatsu were restricted to the confines of Shizuoka Prefecture, and both cities contained large consumer populations.

The consumption area warehouses of Komaki included among their numbers some that were derived from the centrifugal expansion of the consumption area warehouses of urban area within Nagoya City, resulting in some of the urban area warehouses being allotted to Komaki. As discussed in Chapter II, after the period of rapid economic growth, due to the difficulties in securing land for warehouses, the tightening of traffic regulations and so on, changes involving the shift of warehouses to suburban areas became marked. It should be pointed out here that besides the fact that the warehouses of Komaki were establishments that had moved in from Nagoya, numerous other types of warehouses could also be observed in Komaki. They can be categorized (Fig. 21) into: I. warehouses newly located in

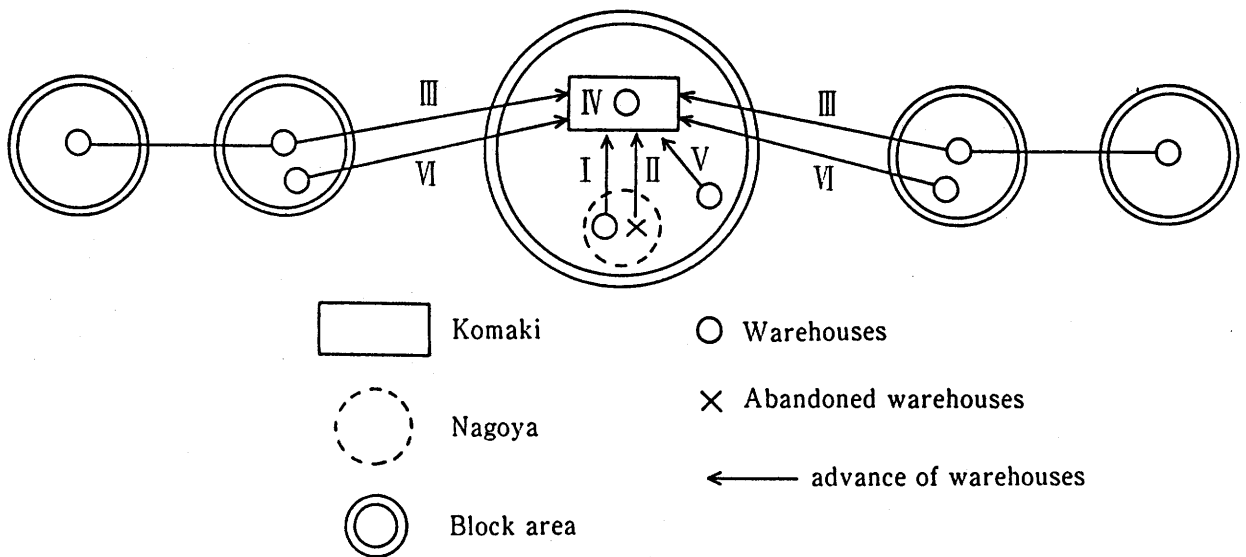


Fig. 21 Schematic establishment pattern of warehouses in Komaki

Note: I. Additional warehouses built in Komaki by enterprisers owning already existing warehouses in Nagoya; II. Warehouses built in Komaki to replace abandoned warehouses in Nagoya; III. Warehouses built in Komaki as part of nationwide network; IV. Warehouses found only in Komaki; V. Additional warehouses built in Komaki by enterprisers owning already existing warehouses in places other than Nagoya in the Tokai district; and VI. Additional warehouses built in Komaki by enterprisers owning already existing warehouses in other block areas.

Komaki in addition to those already existing in Nagoya; II. warehouses built in Komaki to replace warehouses in Nagoya; III. warehouses built in Komaki as a part of a nationwide network; IV. warehouses found only in Komaki; V. additional warehouses constructed in Komaki by enterprises owning already existing warehouses in the Tokai district excluding Nagoya; VI. additional warehouses constructed by enterprises owning already existing warehouses in other block areas; and VII. others. To divide the fifty-three Komaki warehouse enterprises according to the above establishment pattern, the result is as follows: for I. seventeen enterprises; II. four enterprises; III. five enterprises; IV. fifteen enterprises; V. four enterprises; VI. seven enterprises and VII. one enterprise, with the numbers of establishments for I. and IV. being high. Furthermore, in the case of I. as previously noted, the expansion of the warehouses within the city of Nagoya became problematic due to the limited availability of land, hence while maintaining the already existing establishments, the enterprises concerned sought to build new ones in Komaki. As for IV., most were enterprises whose parent companies were other than warehouse businesses, and after these enterprises had advanced into Komaki, they were able to establish themselves by dint of adding warehousing to their line of business. That the diverse types of warehouse establishment were able to prevail was

due to the fact that the locational bases of the consumption area warehouses in Komaki were very strong, confirming the stability of the locational bases. Besides the advantage of being located near Nagoya, Komaki was also fortunate with regard to the availability of land, favourable traffic conditions and the availability of rental warehouses, and these, set against a background of the diverse types of locational bases, brought about an increase in the number of warehouses in a short period of time.

Apropos of the above, another point for consideration is the fact that because the traffic conditions were especially advantageous to the consumption area warehouses of Komaki, many of the latter were able to establish locational bases for distribution centres. From the first half of the 1960s, while the physical distribution of freight increased on the one hand, on the other, in order to cope with the delivery of freight that was small in quantity but large in variety, and also with the matter of promptness of delivery, the role of the distribution centres became important. For the distribution centres under discussion here, the work of arranging and sorting of freight and the delivery of freight formed the mainstay of the business; the turnover in freight, both incoming and outgoing, was repaid, so that unlike the hitherto existing warehouses that practised long-term storage, the distribution centres took

on the character of sales front. Here, the share of the distribution centre is shown by percentage of storage by consigners having the function of distribution centres to the total storage volume handled by the warehouses belonging to the twenty-three warehouse enterprises in Komaki. From this viewpoint, warehouse enterprises that functioned entirely as distribution centres numbered eight, enterprises in which the share of distribution centre functions was over 80 percent numbered five, enterprises in which the share of distribution centre functions was over 50 percent numbered six, and those in which the share of distribution centre functions was less than 50 percent were four in number, thus indicating the large percentage occupied by the functions of the distribution centre. The enterprises of which the function of the distribution centre comprised a low percentage were those storing mainly electric machinery and textiles products, goods for which the demand was strongly seasonal and for which long-term storage was required. Accordingly, it can be seen that the availability or lack of the adjustment function to supply and demand was a condition that strongly influenced the establishment of distribution centres.

Along with the advance of the distribution centres in Komaki, increasing instances of the regional separation of the Nagoya-based old business transaction section and the



delivery section in a new location were observable. Due to the development of the computer system, however, disadvantages caused by regional separation were almost non-existent. The system brought about a systematic integration of the scattered locations of the main office, factories, branch business offices and distribution centres and made possible the simultaneous comprehension of the production volume, the volume of demand, the amount of stock and so on. Because of the computer system, inventory management and shipment were carried out accurately and speedily at the distribution centres advanced into Komaki, and the progress represented by data processing techniques was one reason for the stabilization of the locational bases of the consumption area warehouses in Komaki.

As a result of the importance that was attached to the proximity to the large units of the consumption area warehouses in places such as Komaki, their locations were oriented towards areas in the periphery of Nagoya, resulting in their locating within a radius of about 20 kilometres from the city centre. This belt encircling the city represented a distance over which trucks could make two return trips a day, as calculated by consigners with a view to delivering freight from Komaki to its destinations as efficiently as possible. Municipalities besides Komaki containing consumption area warehouses within this belt

included Obu, Nishiharu-cho and Iwakura; Obu, among others, contained approximately 50,000m<sup>2</sup> of storage floor space. The locating of such consumption area warehouses developed at the same time as the advance of truck terminals into suburban areas, and hence could be considered as an aspect of urbanization. In this sense, the locational bases of consumption area warehouses in Komaki differed from that of Kanazawa, Shizuoka and Hamamatsu.

#### V-2 Conditions Hindering the Location of Warehouses

Some considerations on the regional bases sustaining the establishment of warehouses were presented in the previous section but there were also regional conditions that proved to be hindrances. In this section, by defining the hindering conditions, the conditions in general attending on the location of warehouses should become clearer. Thus considerations will be made of the reasons that caused difficulties in the way of setting up warehouses, even though in the regions concerned there was a demand for storage space, or the situation was not without possibilities for the setting up of warehouses. As with the locational bases of warehouses, the hindering conditions need to be observed from many angles.

## (1) Production Area Warehouses

In a preceding section the fact was made clear that the locational bases of production area warehouses differed according to the type of industry involved. Hence with textiles products, canned goods, paper and so on, the need for storage facilities was strong; in contrast, warehouses in production areas of automobiles, which constituted a core industry in Aichi Prefecture, were remarkably few in number, as was the case in the ceramic and porcelain producing areas found extensively in Aichi and Gifu Prefectures. There have been no other cases in which businesses of so large a scale developing over such extensive areas presented difficulties where the location of warehouses was concerned.

## (a) Automobile Production Areas

The warehouse storage floor spaces in Toyota were less than 30,000m<sup>2</sup>, which was extremely small-scale in comparison with the volume of industrial shipment. The scarcity of storage facilities was in line with the rationalization policies adopted by the Toyota Motor Corporation with regard to production prior to the first oil crisis of the 1970s, to curb the accumulation of stock (Azumi, 1982b). Particularly to be noted is that after the oil crisis, Toyota Motor

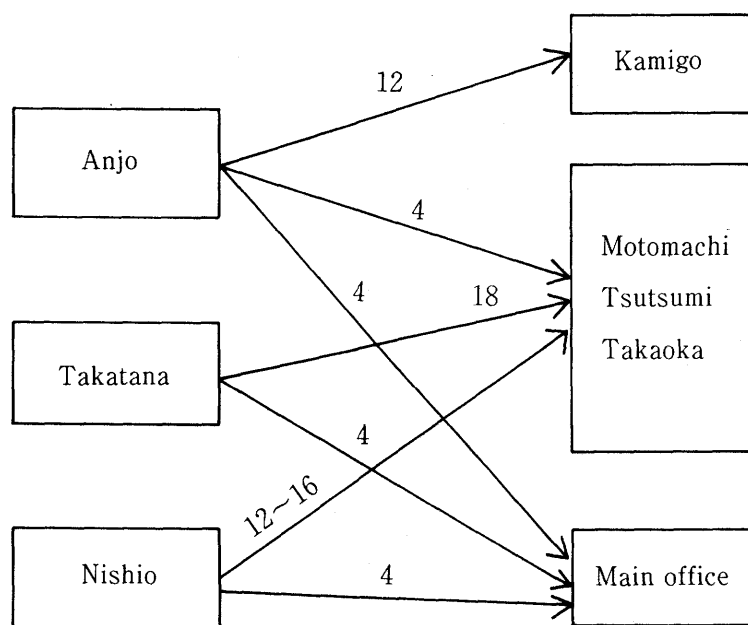
switched to the so-called "Toyota production system," directing car parts manufacturers with which it was connected to keep stock of car parts down to the minimum by manufacturing many varieties of car parts in small amounts and in a short period of time for steady delivery. Consequently, the need did not arise for storage facilities in production areas for new car parts for assembly, hence the difficulty of establishing or sustaining warehouses in the areas involved.

With regard to the above, the first point was that in the automobile production area of Toyota, the work process at plants involved divided labour, with one sector manufacturing parts, and the other engaged in assembly, leading to remarkable regional concentration. Especially of note was that Toyota Motors adopted the policy whereby assembly work for 75 percent of the total car production was concentrated in the municipality of Toyota and its environments. Moreover, 70-80 percent of the costs of car parts was spent by the Toyota group on parts purveyed within the confines of Aichi Prefecture. One result of this was that the time used for the transportation of parts from the parts manufacturing plants to the assembly plant was drastically shortened, hence the location was a favourable one where car manufacturing as a comprehensive assembly industry was concerned. The proximity factor played an

important role in enabling the parts factories to contain the accumulation of stock and yet continue to supply Toyota Motor often and regularly (Fig. 22). Especially along with increase in the volume of production and the diversification of automobile types, this proximity factor became even more influential in the containment of the accumulation of stock.

The second point for consideration is that a characteristic of the automobile production area is the pyramid form of its production structure, i.e., the assembly plants at the peak of the pyramid are in a position to centripetally collect the parts manufactured by many related plants. The assembly plants that thus formed the core of the production areas displaying the pyramid structure, made possible the containment of parts factory stockpiling. The textile industry, on the other hand, showed an inverted pyramid form (Fig. 23). Here, spinning enterprises involved numerous small enterprises dealing with the processes of twisting, dyeing and weaving and so on, apart from spinning and spreading outwards from the spinning sector as their starting point. Hence the directing of inventory management was difficult, resulting in the accumulation of stock, as previously noted.

The maintenance of a considerable amount of stock was necessary for spare parts in order to meet the demands of an indefinite number of buyers, from the marketing point of



K—Company factories

Toyota Motor Corporation factories

Fig. 22 Number of deliveries per day from K—Company to the Toyota Motor Corporation (1981)

Note: Numbers indicate the number of deliveries. Of the factories attached to the Toyota Motor Corporation, only the Kamigo factory manufactures car parts.

(Source: Direct enquiries by the author)

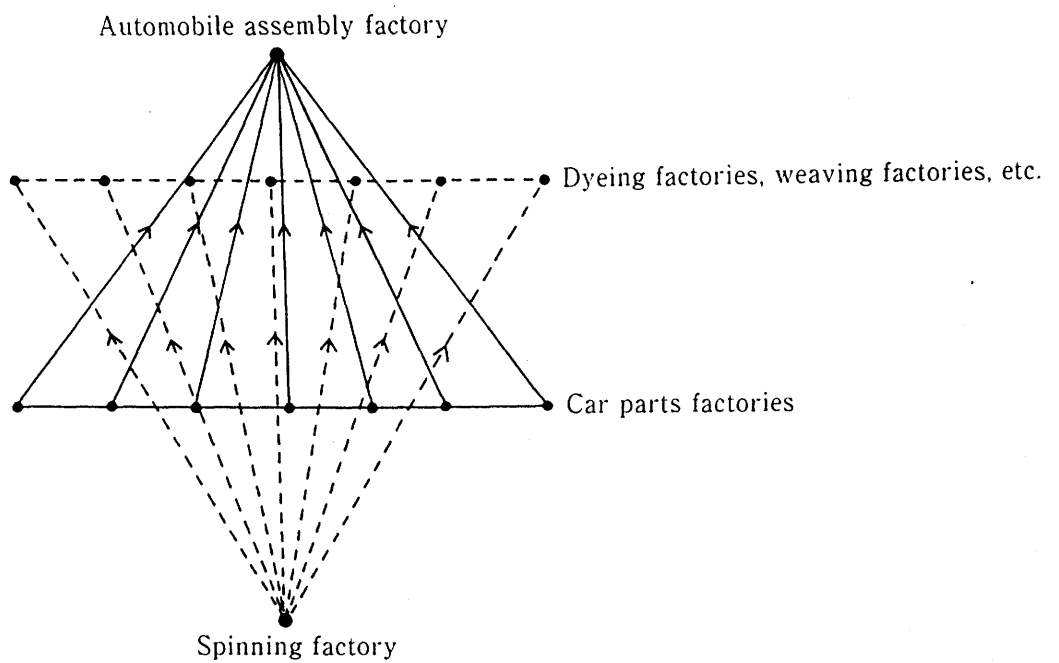


Fig. 23 Schematic comparison between production processes in the motor car and textile industries

Note: Solid lines indicate the production process of automobile industries. Dotted lines indicate that of textile industries. Arrows indicate the direction of the process flow.

view. As long as automobiles were in use, spare parts warehouses were compelled to keep on hand supplies of a diversity of spare parts at all times. It was deemed necessary for the latter type of warehouse to store for certain periods of time, spare parts for old makes, that is, it maintained an accumulated stock. Besides this particular aspect of spare parts, starting from the time of the oil crisis, Toyota Motor further strengthened its efforts towards the diversification of car types, and developed a policy of segmentalizing its products. For example, in the case of passenger cars, variations in the chassis or engine emerged<sup>66)</sup> and moreover, they were divided into a number of classes<sup>67)</sup>. The promotion of segmentation brought about an increase in the number of spare parts<sup>68)</sup>, matching the increase in the production of automobiles, and the need for storage space increased. Besides this, along with the rapidly growing competition with regard to sales, accuracy and speed in the supplying of parts was always essential.

As it was, the types of spare parts were numerous and because of the technical aspects of the business, professional inventory management became necessary, and most of the parts were stored in private warehouses belonging to Toyota Motor. A great deal of the warehouses were concentrated in the suburban areas to the north of Nagoya. The reason for the concentration of the warehouses in the



suburbs to the north of Nagoya lay in the development process of the private warehouses by the former Toyota Motor Sales Corporation (Fig. 24). At the beginning of the 1950s, a warehouse of this company was established on the premises of the spinning factory belonging to the Toyota group in Fukuzumi in Nakagawa Ward, Nagoya; following on this, the warehouse was established in Sakou in Nishi Ward, site of the former spinning factory taken over by Toyota Motor Sales, but these were abolished in 1961. Instead, in the same year, in Haruhi-mura in the suburban area to the north of Nagoya, an area that was actually an extension of Nishi Ward, a new establishment was set up, which later expanded into Komaki, Inazawa and Oguchi-cho in the environs of Nagoya. Centering around the same area, commercial warehouses were also temporarily rented<sup>69</sup>). The centrifugal expansion of warehouses from the Nagoya City proper towards its suburban area grew out of the difficulties involved in the securing of land. Basically, the nature of spare parts involved location at consumption areas; however, the Kamigo warehouses in Toyota were exceptions, being located in production areas.

The establishment process of the warehouses of the Toyota Motor Sales corporation could be said to be, basically, of the market-oriented location type, but in the early days, the site of the spinning factories belonging to



the Toyota group, was mainly utilized for warehouses. There was also the case of the Toyoda Boshoku Factory at Oguchi-cho, which underwent a total transformation<sup>70)</sup> into a warehouse, but otherwise, most of the warehouses under consideration were located in the area favoured with traffic conditions and the availability of rental warehouses. The distribution of the warehouses were characterized by the fact that most of them were in the neighbourhood of Nagoya, that is to say, concentrated in the adjacent areas to the north of Nagoya with easy access to the Meishin, Tomei, and Chuo Expressways. The warehouses for the storage of spare parts belonging to other manufactures of parts were mostly located in the adjacent area to the north of Nagoya centering around Komaki, and thus were in the same area where the Toyota Motor Sales Corporation's warehouse was located. Among others, there were five spare parts warehouse companies handling tyres which constitute important car parts; of these five companies, four were concentrated in Komaki and neighbouring municipalities. Komaki was a junction for several expressways and therefore extremely convenient from the point of view of express road transport. Accordingly, most of the warehouses in the area were in a favourable position to deliver or collect spare parts all over Japan. For example, of the total volume of shipments from the Toyota Motor Sales Corporation warehouses to their

distribution areas in 1980, the Kanto district received 30 percent, the Chubu district 23 percent, the Kansai District 17 percent, the Kyusyu district 10 percent, the Tohoku district 7 percent, and so on; a considerable amount of shipments were to remote areas, a fact which clearly confirms the above situation. In fact, the Nagoya northern adjacent area formed a spare parts warehouse belt (Fig. 25). As a result, spare parts were rarely stored in the areas of motor car production. Apropos of this, the warehouse enterprises in Toyota numbered just two, of which only one handled automobile parts or related goods.

(b) Ceramic and Porcelain Production Areas

In Seto there were no commercial warehouses, and the scale of warehouses in Tajimi was less than 10,000m<sup>2</sup>. Generally, ceramic and porcelain goods are cheap and because of their weight in comparison with their low added value, it was difficult for the consigners to meet the costs of storage in commercial warehouses. Besides, since storage facilities for these goods can be of the simple kind, the private warehouses juxtaposed to the production area wholesalers sufficed (Azumi, 1975b). The storage capacity of the production area warehouses was small in scale, the storage floor space being on the average about 200-350m<sup>2</sup> per



warehouse. Ceramics and porcelain have very little seasonality and a great part of the orders were for small lots, so the demand for storage space was small. Normally, the stock held in warehouses equalled the volume of 1-2 months' worth of sales, and the prospective purchases from the manufacturers consisted of only a part of the stock. Hence the storage system required by wares of this sort seldom involved a separate establishment, a simpler building often consisting of a private house-cum-workplace type being more likely to be utilized.

However, from around 1965, the amount of ceramic and porcelain goods being handled increased<sup>71)</sup>, and for many of the wholesalers located in the centre of the urban area, the expansion of the storage floor capacity was not possible, hence some of them decided to relocate in the neighbouring area. At this point, a look at the relocation movements, commencing in 1965, of twenty-seven production area wholesalers on Tohoncho Street in Seto (Fig. 26), reveals that six had moved away, and that of those six, two had moved to the semi-industrial estate<sup>72)</sup> of Seto, and that the others had moved to the environs of the urban area. On the other hand, there were two special cases where after a wholesaler had moved away, the next-door wholesaler bought up the vacated establishment and thus enlarged his own place of business. In this way, in any case, in order to achieve the

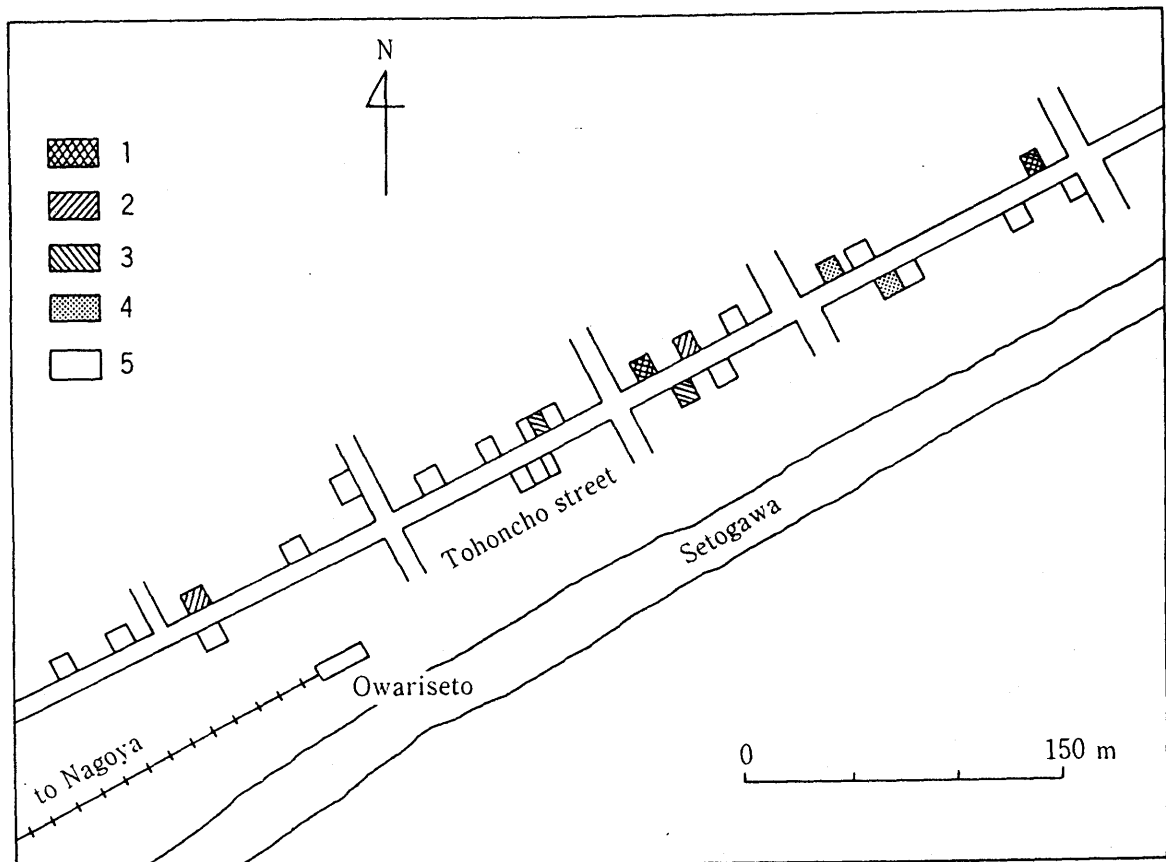


Fig. 26 Locational changes in production area wholesalers of ceramics and porcelain in Tohoncho street, Seto (1974)

- 1: closed down
  - 2: moved out
  - 3: moved out with business premises purchased by new wholesalers
  - 4: relocation to semi-industrial estates planned
  - 5: unchanged
- (Source: Direct enquiries by the author)

expansion of storage floor space, the production area wholesaler utilized his private warehouse space so that there was no dependence on the commercial warehouse. Moreover, behind this ability to handle storage by means of the private warehouse, was the fact that the stored commodities, while being ceramic and porcelain wares, were almost all tableware for Japanese cuisine; the quantity of novelty goods, such as ornaments and toys, tableware for Western cuisine, electric porcelain and other types of chinaware, was small. One reason for this was that the novelty goods and tableware for Western cuisine were export goods which were sent directly to ports by the manufacturers; and the larger share of the production of electric porcelain belonged to major manufacturers which shipped the goods directly to the consumption area wholesalers. Accordingly, out of freight linked directly to production areas, private warehouses mainly limited themselves to the storage of tableware for Japanese cuisine for the domestic market. The style of packing was suited to storage in commercial warehouses, but due to the above-mentioned limitations peculiar to the products, the establishment of commercial warehouses in ceramic and porcelain production areas was problematical. In other words, the added value pertaining to industrial products was an important condition with regard to the location of the



commercial warehouse.

## (2) Transit Area Warehouses

The establishment of transit area warehouses at ports, was greatly influenced by the types of export and import cargo passing through the ports. At Yokkaichi, for example, the storage of grains, raw cotton and so on took place, but crude oil, which from the viewpoint of quantity is the largest imported item, depended on the private oil storage tank. Normally, the establishment of transit area warehouses was successful in the case of ports where cargo in the form of raw cotton or miscellaneous goods predominated. Regarding this point, compared to Yokkaichi, port area within Nagoya City handled a large quantity of raw cotton and miscellaneous goods and the location of its warehouses was more stable. At Toyohashi Port since the first half of the 1970s, nine enterprises having a core comprised of local warehouse enterprises advanced into the area near the piers, but only four of them handled marine freight exclusively. The reason for this was that the quantity of freight handled by the port was small, miscellaneous goods being particularly meagre, and this factor rendered the location of the transit area warehouses unstable. Hekinan Port resembled Toyohashi Port in character, but since there were

no local warehouse enterprises there, the number of enterprises advancing into it was even less than in Toyohashi<sup>73</sup>).

Besides the conditions regarding quantity of export and import freight, the physical distribution area of the transit area warehouses of port area within Nagoya City, extended to Aichi Prefecture or the whole of the Tokai district. As a result, where the transit area warehouses of Yokkaichi, Toyohashi or Hekinan Ports were concerned, freight-collecting activities were extremely difficult. For example, in the case of raw cotton, the transit area warehouses of Yokkaichi Port had a considerable amount of freight forwarded from Nagoya Port. With regard to the point of origin of raw cotton handled by N\_\_\_\_\_ Warehouse Company at Yokkaichi, of the total of 190,000 tons of raw cotton freight, 48 percent consisted of freight coming from Yokkaichi Port and about 50 percent consisted of cotton freight forwarded from Nagoya Port. Moreover, regarding forwarding methods for freight, 66 percent of the means of transport constituted trucks, and 34 percent slips, indicating the high percentage of land transport.

In order to demonstrate the difference in freight collecting capacity of the transit area warehouses of Nagoya and Yokkaichi, a comparison will be made of the percentages of the unloading ports for container freight consumed in the

Tokai district, for two different periods, in line with the Nagoya customs investigations (the Survey of Export and Import Container Flow). In 1978, the share of Nagoya Port was 34 percent, Kobe Port 26 percent, Tokyo Port 13 percent, Yokkaichi Port 12 percent, Yokohama Port 7 percent and Shimizu Port 3 percent. In 1986, the share of Nagoya Port was 48 percent, Kobe Port 23 percent, Yokohama Port 12 percent, Shimizu Port 9 percent, Tokyo Port 7 percent, and Yokkaichi Port 2 percent. In both cases, it is observable that the percentages for Nagoya Port were the highest, and that the rate of increase for this port in the second period was remarkable. In contrast, in both periods, the percentages for Yokkaichi were small, with the figures for the second period being a decrease from the first. These changes in percentages indicated the increase in freight collecting capacity for the transit area warehouses of Nagoya Port, and the decrease in the freight collecting capacity of Yokkaichi Port.

In the case of Shimizu Port, the influence of Tokyo and Yokohama Ports was strong. To compare the container freight cleared through customs at Shimizu Port in 1978 and 1985 by port of loading and unloading based on the Nagoya customs investigation (refers to *Survey of Export and Import Container Flow*). Shimizu Port handled 32 percent of loading activities and 50 percent of unloading; for Tokyo Port the

share for the same activities was 43 percent and 21 percent, and for Yokohama Port 25 percent and 27 percent. Actually, the large percentages for Tokyo and Yokohama should rather have pertained to Shimizu; as it was, they indicated the dependence of the latter on the ports of Tokyo and Yokohama. However, by 1985, the loading rate at Shimizu Port was 49 percent and the unloading rate was 55 percent; these changes showed an increase over the figures for 1978, indicating the lessening of the influence of the other ports. While Shimizu Port continued to receive the influence of the physical distribution involving the ports of Tokyo and Yokohama, the distance existing between them and Shimizu, and moreover, the distance between Shimizu and Nagoya Port, were reasons for the increased autonomy of and ensuing rise in the percentages of loading and unloading at Shimizu. Consequently, the locational bases of transit area warehouses of Shimizu, in conjunction with the improvement in rates pertaining to the handling of consumption freight mentioned above, attained considerable stability, unlike the situation at Yokkaichi. The transit area warehouses of Tobishima and Tokai took on the partial role of warehouses in the Nagoya Port district. Hence they differed in character from the transit area warehouses of the ports of Toyohashi, Hekinan and Yokkaichi, which were in competition with Nagoya Port.

Finally, the location of the transit area warehouses along the canal in Nagoya was greatly influenced by the amount of operation of the barges. Up until the mid-1960s, the location of the transit area warehouses along the canal was comparatively stable, but later on, the deterioration of barge functions due to the improvement of pier facilities brought about new influences on the locational bases of the existing transit area warehouses. With regard to this aspect, changes in freight storage depending on barge transport will now be considered regarding thirty-four transit area warehouses<sup>74)</sup> located along the Nakagawa Canal in Nagoya which occupied 70 percent of the total canal freight at Nagoya Port (Fig. 27). According to the figure, while there were differences in the degree of dependence on barge transport by ten warehouses established along the canal up till 1954, at all the warehouses there was some coming and going of barge freight. During the 1955-64 period of nineteen warehouses, fourteen stored barge freight to the tune of five percent of the total goods handled, making up a considerable number having connections with barge transport. However, if barge freight handled by warehouses Nos. 1, 2, 3, 15 and 17 at five sites during this period were compared to the percentage of barge freight handled during the period up till 1954, a decline becomes evident. Of warehouses established since 1955, warehouses

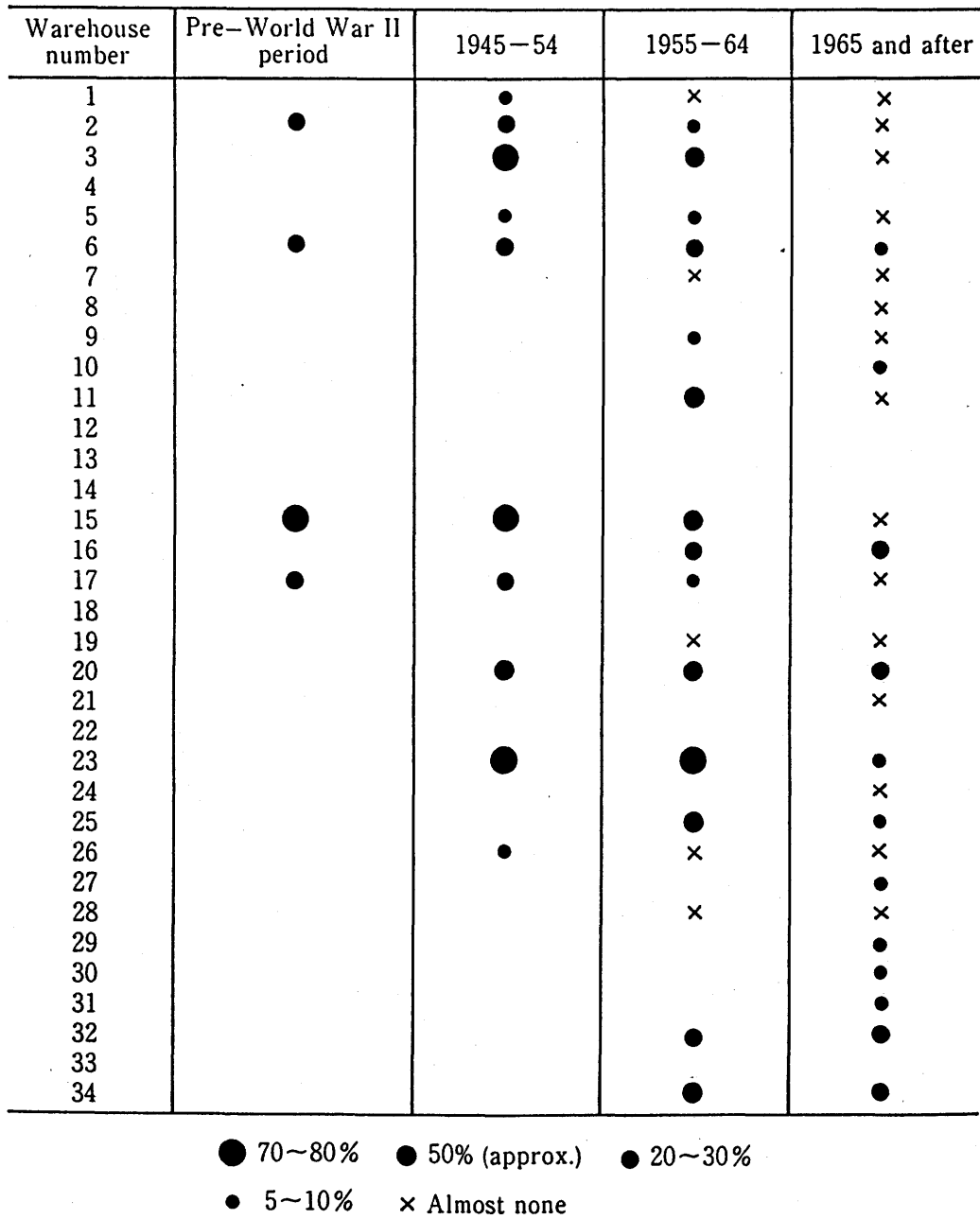


Fig. 27 Changes in the degree of reliance on barges by warehouses along the Nakagawa Canal, Nagoya

(Source: Questionnaire prepared by the author)

Nos. 7, 19 and 28 from the beginning had almost no connection with barge freight.

When it came to 1965 and afterward, of twenty-seven warehouses along the canal, fifteen had come to have no connection to barge freight, and for other warehouses, the percentage of barge freight in the total freight was less than 30 percent. Warehouses that from the beginning had nothing to do with barge freight numbered seven and of them, Nos. 4 and 13 were truck transport enterprises as well as warehouses; most of the others were established after 1965. From the above, it will be seen that through the reliance of warehouses on barge transport of freight differed from one warehouse to another, this particular means of transport generally registered a decline ground the first half of 1960s. By 1975, of ocean freight, cargo-handling by barges on the Nakagawa Canal was no more than 1 percent, or a mere 30,000 tons. The changes in revenue by business department in the case of I\_\_\_\_\_ Company, a major harbour transport enterprise (Fig. 28) shows share of barge transportation fees declined since around 1965. In contrast, the percentage of income derived from truck transportation was on the rise. From this when it comes to canal-side warehouses whose dependence on barge transport lowered their hitherto locational bases as transit area warehouses were clearly and considerably weakened. Thus, the location of transit

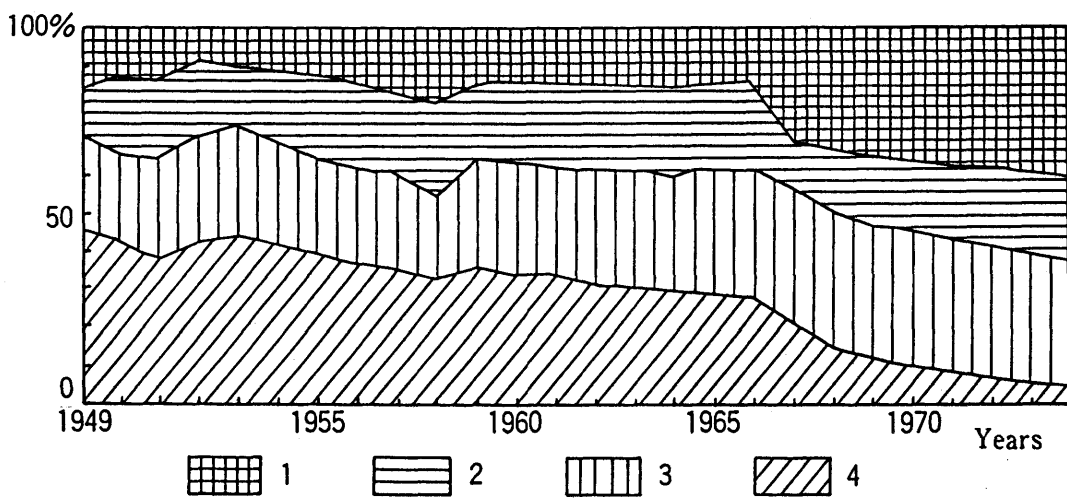


Fig. 28 Changes in revenue composition by business department of I—Company

1 : others (mainly truck transport fees and warehouse storage fees)  
 2 : longshoring fees 3 : stevedoring fees 4 : barge transport fees  
 (Source: Direct enquiries by the author)



area warehouses was governed by the kind and volume of the freight they handled, by the physical distribution area of Nagoya Port and by the decline of canal functions.

### (3) Consumption Area Warehouses

As previously noted, the most advantageous places for the location of consumption area warehouses are the urban areas of cities having large-scale populations, where wholesalers and retailers are concentrated. The warehouses of urban area within Nagoya City were typical examples, with the distribution areas of most of them extended o the whole of the Tokai district. This being so, the city of Gifu was included in the Nagoya distribution area, which hence made things difficult for the location of consumption area warehouses in Gifu. Though Gifu was a medium-size city with a population of some 400,000, its storage capacity was less than 30,000m<sup>2</sup>. A glance at the three kinds of consumer freight pertaining to Gifu comprising beer, confectionery and electric appliances (Table 20), shows that all were consigned to the consumption area warehouses of eight Nagoya or its environs (Azumi, 1979). The latter locations were strategic storage points for a distribution area including not simply the city of Gifu but Gifu Prefecture as well. In concrete terms, in the case of beer, three companies utilized

Table 20 Strategic storage points and delivery areas pertaining to beer, confectionary and electrical appliances in Aichi, Mie and Gifu prefectures (1979)

Type of enterprise	Enterprise number	Site of warehouses (storage floor space in m <sup>2</sup> )	Delivery area (prefectures)							
			Aichi	Mie	Gifu	Fukui	Ishikawa	Toyama	Shizuoka	Nagano
Beer	1	Nagoya (10,000)	○	○	○	○	○	○	△	○
	2	Nagoya (11,000)	○	○	○				△	
	3	Shinkawa (25,000)	○	○	○				△	△
Confectionary	4	Ichinomiya (3,300)	○	○	○					
	5	Nagoya (2,300)	○	○	○	○	○	○		
	6	Nagoya (2,000)	○	○	○					
	7	Komaki (3,300)	○	○	○					
	8	Komaki (2,100)	○		○					
Electric appliances	9	Komaki (15,000)	○	○	○				△	
	10	Obu (8,600)	○	○	○				△	
	11	Nishiharu (6,600)	○	○	○				○	
	12	Ichinomiya (4,900)	○	○	○				○	
	13	Komaki (8,000)	○	○	○	○	○	○	○	○

Note: ○ indicates prefectures entirely covered.  
 △ indicates prefectures partially covered.  
 (Source: Direct enquiries by the author)

over 10,000m<sup>2</sup> of warehouse storage space in the Nagoya factories. with the distribution area encompassing the three prefectures of the Tokai district, including Gifu Prefecture. Deliveries were carried out directly from the factory warehouses; the system did not include the location of secondary or supplementary warehouses in Gifu Prefecture. The situation was much the same for confectionery and electric appliances, which as in the case of beer, were produced at factories and distributed from warehouses in Nagoya or nearby Komaki; the capacity of the latter warehouses was from 2,000-15,000m<sup>2</sup> and they formed strategic collection points from which the goods were delivered to Gifu, since Gifu was part of the distribution area.

Due to the development of automobile traffic, the distance between Nagoya and other points was considerably reduced and there was a tendency to expansion on the part of the areas drawn into the distribution area having Nagoya as its centre. The main cities included in this area, besides Gifu, were Toyohashi, Okazaki, Yokkaichi and so on, and they were all located within a distance of about fifty kilometres from the centre of Nagoya, and had populations of over 250,000. Warehouse storage floor space in Okazaki amounted to no more than 10,000m<sup>2</sup>, and in Toyohashi less than 50,000m<sup>2</sup>, which were low in comparison with the size of the population of each city. As for the very small-scale warehouses in

Gifu and Toyohashi, those of the former city mostly had the functions of production area types of warehouses, and those of the latter mostly had the functions of production and transit area types of warehouses. The storage items in the Gifu warehouses consisted mainly of textiles and tobacco, and in Toyohashi of livestock products (including dried cocoons)<sup>75</sup>). The city of Tsu was the seat of the prefectural government, but partly since its population was small, its warehouse storage floor space was even smaller than that of Gifu. Tsu was also part of the distribution area of Nagoya, indicating that any efforts to form a strategic base of physical distribution would not be very effective though it is a central place of a prefectural capital level. Hamamatsu had its own area of distribution, but this was at the same time also part of the distribution area of Shizuoka, and furthermore, of that of Nagoya.

In contrast, warehouses in Kanazawa or Shizuoka were able to maintain relative independence from the distribution areas of Nagoya or Komaki and managed to secure their own areas of distribution. In particular, with the warehouses of Kanazawa located more than 150 kilometres from the centre of Nagoya, and with the city of Kanazawa itself playing a part of sub-regional central city as the core of the three prefectures of the Hokuriku district, Kanazawa warehouses share Nagoya's distribution activities in regard to Fukui

and Toyama. Consequently, while it was true that the warehouses of Fukui were basically production area establishments, they did not show evidence of consumption area functions other than with regard to rice. Of three prefectural capitals of the Hokuriku district, Toyama had the least warehouse storage floor space, which was occupied mostly by chemical goods and steel<sup>76</sup>); it would appear that this state of affairs made it difficult for consumption area warehouses to establish themselves there. With regard to the warehouses of Shizuoka, the distribution area was limited to the confines of the prefecture, but it covers an extensive area stretching eastwards and westwards within those confines. However, at times, Hamamatsu and its environs were excluded from this distribution area. In this way, the warehouses of the four cities of Nagoya, Kanazawa, Shizuoka and Hamamatsu each possessed their own independent distribution areas, which at the same time overlapped to form stratified distribution areas in conformation with the hierarchy of urban functions. The distribution areas having this overlapping pattern are shown in Fig. 29.

In recent years, due to the improvement of the expressways, as noted previously, the distribution areas of Nagoya warehouses have notably shown tendencies towards expansion. Along with this, as part of the rationalization of physical distribution system, the strategic nodal points

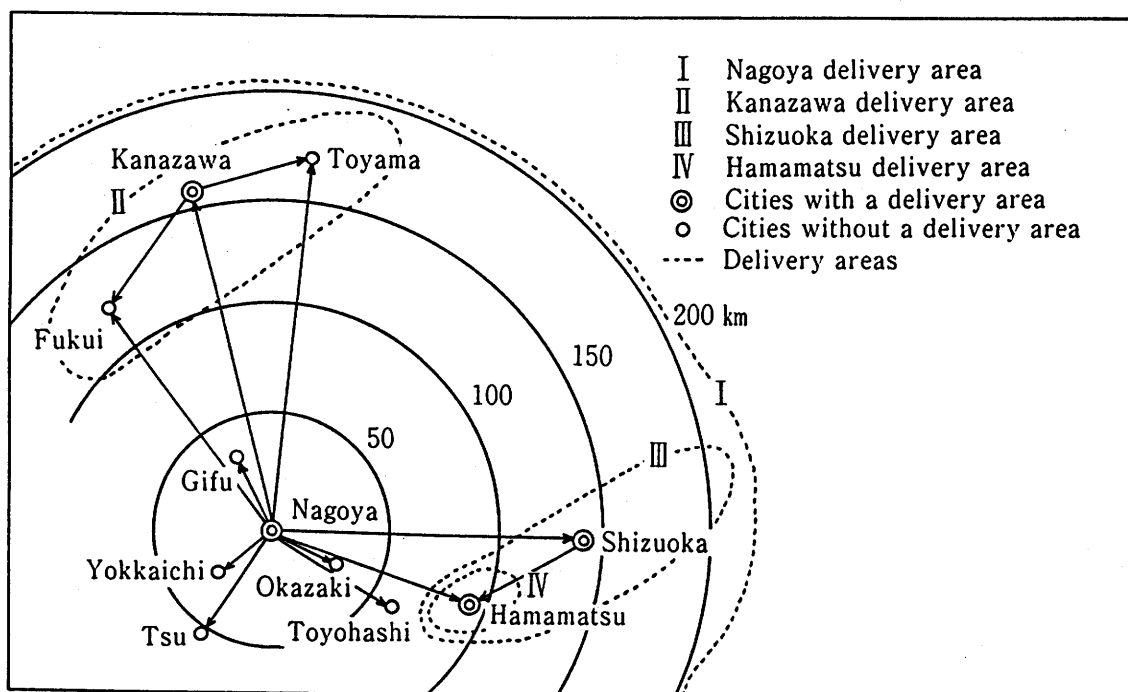


Fig. 29 Overlapping situation of delivery areas pertaining to consumption area warehouses in the Tokai and Hokuriku districts (1983)

Note: Arrows indicate points of destination.

(Sources: Direct enquiries and questionnaires prepared by the author)

of physical distribution are promoted to concentrate in national level large cities. Consequently, the locational bases of consumption area warehouses, even those of the scale of the warehouses of Kanazawa or Shizuoka, supposedly commenced a process of gradual weakening. In fact, some among the previously mentioned important enterprises manufacturing beer, electric appliances and confectionery, began expanding the distribution area of the strategic storage base of Nagoya first to the three Hokuriku Prefectures, and furthermore into Nagano Prefecture. However, along with the above tendencies, the location of consumption area warehouses would suffer notable changes due to the interaction of opposing factors, emphasis on marketing strategies and the rationalization of the physical distribution system depending on the scale of the cities.

In connection with the above, where the consumption area warehouses of Kanazawa were concerned, it should be noted that changes were taking place in the physical distribution routes. An observation of the consumption area warehouses through important consigners (Fig. 30) in this connection reveals four patterns of changes in the physical distribution routes, as follows:

I. In 1980, Company A carried out distribution activities in Fukui Prefecture, utilizing warehouses in the city of Fukui; but in 1990, the warehouses in Fukui were

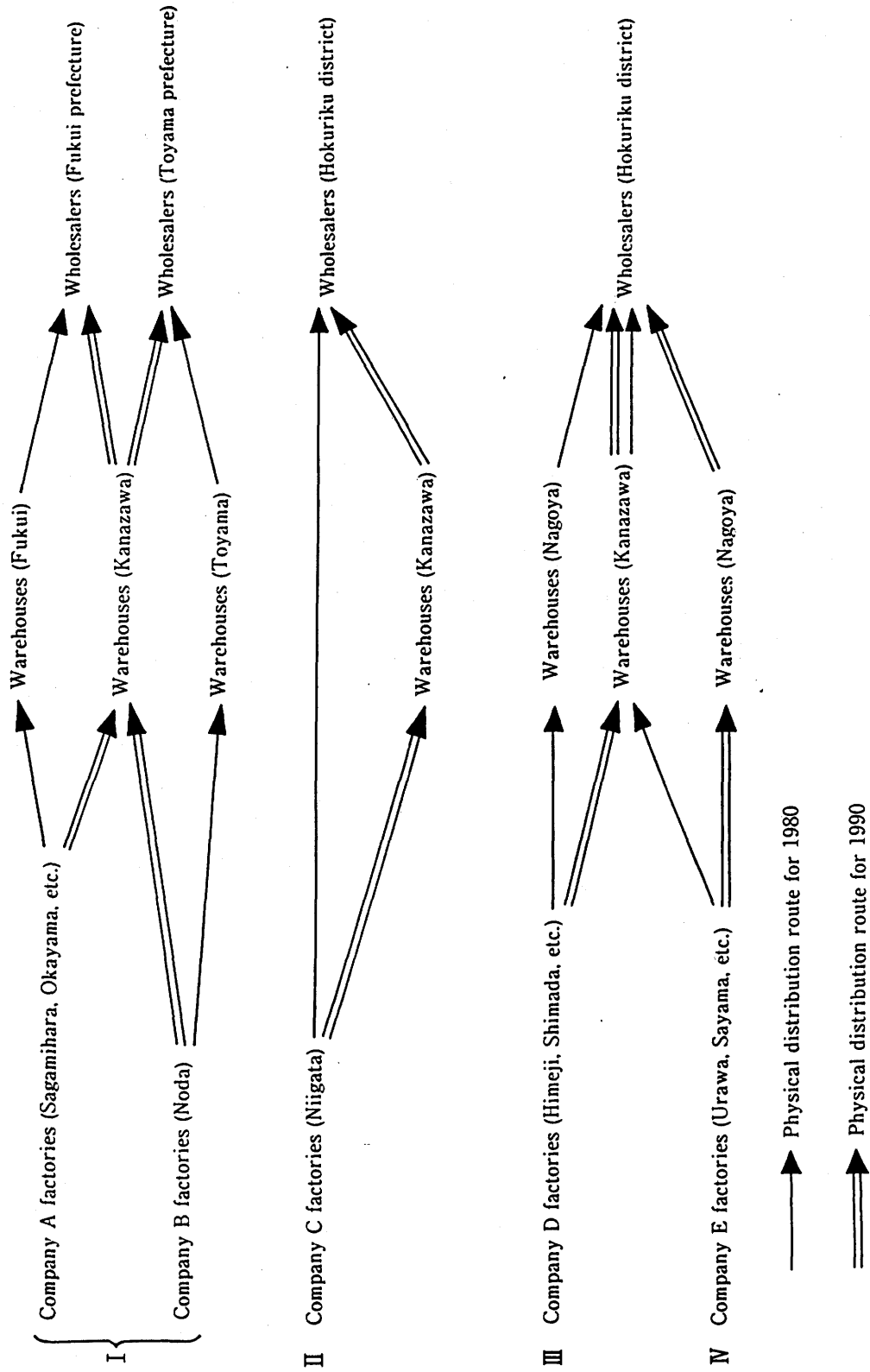


Fig. 30 Changes in physical distribution routes as seen by the viewpoint of major consigners to consumption area warehouses in Kanazawa (1990)

Note: ( ) indicate districts, prefectures or cities where factories, warehouses or wholesalers are located. (Source: Direct enquiries by the author)



abolished and warehouses in Kanazawa came to be used instead, with distribution for Fukui being carried out from the Kanazawa warehouses. A similar situation occurred in Toyama Prefecture, involving Company B, which earlier had depended on Toyama city warehouses, but which in 1990, integrated the Toyama warehouses with the warehouses of Kanazawa, after which Toyama Prefecture was included in the distribution area of the Kanazawa warehouses.

II. In 1980, Company C was sending freight directly from the Niigata factory to wholesalers in the Hokuriku district; but with the increase in volume of physical distribution and the diversification of goods, a system was devised whereby the freight was first deposited temporarily in Kanazawa warehouses, where inventory management including arranging and sorting will be carried out to make delivery to the wholesalers in the Hokuriku district.

III. In the past, Company D had been accustomed to sending goods from factories at Himeji and Shimada, to warehouses in Nagoya where they were sorted out and one part forwarded to wholesalers in the Hokuriku district. However in 1990, out of the freight sent to the Nagoya warehouses, the company adopted a new system switching only those goods destined for the Hokuriku district to Kanazawa warehouses; and from the subsequent new strategic distribution base in Kanazawa, the company proceeded to forward freight to

wholesalers in the Hokuriku district. The purpose of these manoeuvres was to expedite the distribution of freight.

IV. Company E showed a physical distribution pattern that was quite the opposite of that of Company D; in 1980, Company E had freight sent from factories in Urawa and Sayama to the warehouses of Kanazawa, from which strategic distribution base, the freight was then forwarded to the wholesalers of the Hokuriku district; but in 1990, the Kanazawa warehouses were abolished, and merged and integrated with Nagoya warehouses.

In this way, in recent years, due to the reorganizing on the part of the consigners in the choice of warehouse, the locational bases of the consumption area warehouses of Kanazawa were either stabilized or weakened, maintaining a flexible state. This situation resulted from changes in the consigners' marketing scale and so on in the Hokuriku district. It was also the main reason for the determining on the part of the consigners as to whether a warehouse should or should not be set up. That is to say, each consigner decided on his need for warehouse storage space in the Kanazawa, taking into consideration the scale of sales volumes, the increases of decreases in sales, the list of sales articles the allocation of factories, or the movements of other enterprises in the same field of business in Fukui, Ishikawa, Toyama Prefectures or the total Hokuriku district.

Consequently, a comparison of the locating of consumption area warehouses with that of production area warehouses clearly points up the fact that the tendency of the former to concentrate in a small number of fixed cities was predominant. This was greatly influenced by the relationships pertaining to the distance from cities serving as the nucleus of physical distribution, and was connected to the development of motor car traffic. In other words, the situation of the scale of population and centrality were important factors regulating the location of consumption area warehouses. Moreover, depending on the city scale, the locational bases of consumption area warehouses evinced a flexible aspect in line with the physical distribution strategies of consigners, which is also an important point to bear in mind.

### V-3 Scheme of the Locational Bases of Warehouses and Conditions Hindering the Location of Warehouses

A consolidation of the various aspects discussed in this chapter regarding the locational bases of warehouses and conditions hindering the location of warehouses brings us to Table 21. According to this table, the location of production area warehouses was related to various types of industrial goods such as textiles, canned goods, cans,

Table 21 The locational bases of production area, transit area and consumption area warehouses in the Tokai and Hokuriku districts, and conditions hindering their locating

	Production area warehouses	Transit area warehouses	Consumption area warehouses
Locational bases of warehouses	<p>Division of labour in work processes (textiles) [Ichinomiya/Fukui/Hamamatsu/Kanazawa]</p> <p>Seasonal nature of demand (textiles/ canned goods/ cans/musical instruments) [Ichinomiya/Shimizu/Hamamatsu]</p> <p>Mass production (paper/ chemicals/ canned goods/ cans) [Fuji/Yokkaichi/Shimizu]</p> <p>Seasonal nature of production (canned goods/ cans) [Shimizu]</p> <p>Building lots/ traffic conditions/ rental warehouses (many unspecified industries) [Komaki]</p>	<p>Huge quantity of harbour freight [port area within Nagoya City] [Yokkaichi/Shimizu/Tobishima]</p> <p>Harbour freight suited to storage [port area within Nagoya City] [Yokkaichi/Shimizu/Tobishima]</p> <p>Steel arriving from nation-wide areas [port area within Nagoya City] [Tobishima/Tokai]</p>	<p>Cities forming physical distribution cores [urban area within Nagoya City] [Kanazawa/Shizuoka/Hamamatsu]</p> <p>Building lots/ traffic conditions/ rental warehouses [Komaki]</p> <p>Increase of delivery centres [Komaki/Obu]</p>
Conditions hindering the locating of warehouses	<p>Promotion of stock reduction by final assembly enterprises (motor cars) [Toyota]</p> <p>Low added value of products (ceramics) [Tajimi]</p>	<p>Harbour freight unsuited to storage [Yokkaichi]</p> <p>Locational connection with ports forming physical distribution cores [Yokkaichi/Hekinan/Toyohashi]</p> <p>Decline of barge transport [port area within Nagoya City (along the Nakagawa Canal)].</p>	<p>Locational connection with cities forming physical distribution cores [Gifu/Yokkaichi/Okazaki/Toyohashi/Tsu/Fukui/Toyama]</p> <p>Maintenance/improvement of the traffic network [Gifu/Yokkaichi/Okazaki/Toyohashi/Tsu]</p>

Note: ( ) indicate the type of industry; and [ ] indicate the municipalities or areas in Nagoya City where the pertinent warehouses are located.

musical instruments, paper, chemical products and so on, and the bases of location differed according to the types of goods involved. That is, the textiles stored in production area warehouses were distinguished by the division of labour taking place in the process of production and by the seasonality of demand, and again where canned goods and cans were concerned the demand and production were seasonal in nature, and the goods required to be mass produced; the demand for musical instruments was seasonal and where paper and chemical products were concerned, mass production was required. And all these factors formed the locational bases. There were only two types of industries, automobile production and the ceramics and porcelain industry where the locational bases of the production area warehouses concerned were subject to conditions hindering their location. In the case of cars, the conditions consisted of the policy promoted by the final assembly enterprises of not allowing car parts stock to accumulate; in the case of ceramics and porcelain, the hindering was mainly caused by the inability on the part of the consigners to pay the high commercial warehouse storage fees, due to the low added value of the goods. The locational bases of transit area warehouses were conditioned by the quantitative scale of handled freight and its feasibility for storage. Moreover, where the locational bases of transit and consumption area warehouses were

concerned, they were greatly influenced by the location of ports and cities forming physical distribution cores and by the distance from those ports and cities.

For further clarification of the above locational bases, a scheme depicting the distribution of warehouses by municipality and district in Nagoya as shown in Fig. 31 has been worked out in terms of the locational bases of warehouses and the conditions hindering the establishment of warehouses. According to the scheme, the locational bases of the transit and consumption area warehouses are largely influenced by circular structure centering on Nagoya transport area and consumption area warehouses which comprise the physical distribution core, and are clearly influenced by the distances between their places of location and Nagoya. A typical example of the above is the situation in which appear differences between the transit and consumption area warehouses in the two "block" areas of Mikawa-Mie and Shizuoka. Here, with similar warehouse functions of Tobishima and Komaki in the peripheral areas added, transit and consumption area warehouses of Nagoya strengthened their influence over the extended area. With regard to production area warehouses, there was no dependency on distance as in the case of transit and consumption area warehouses, and the warehouses themselves were scattered over a wide area. This can clearly be

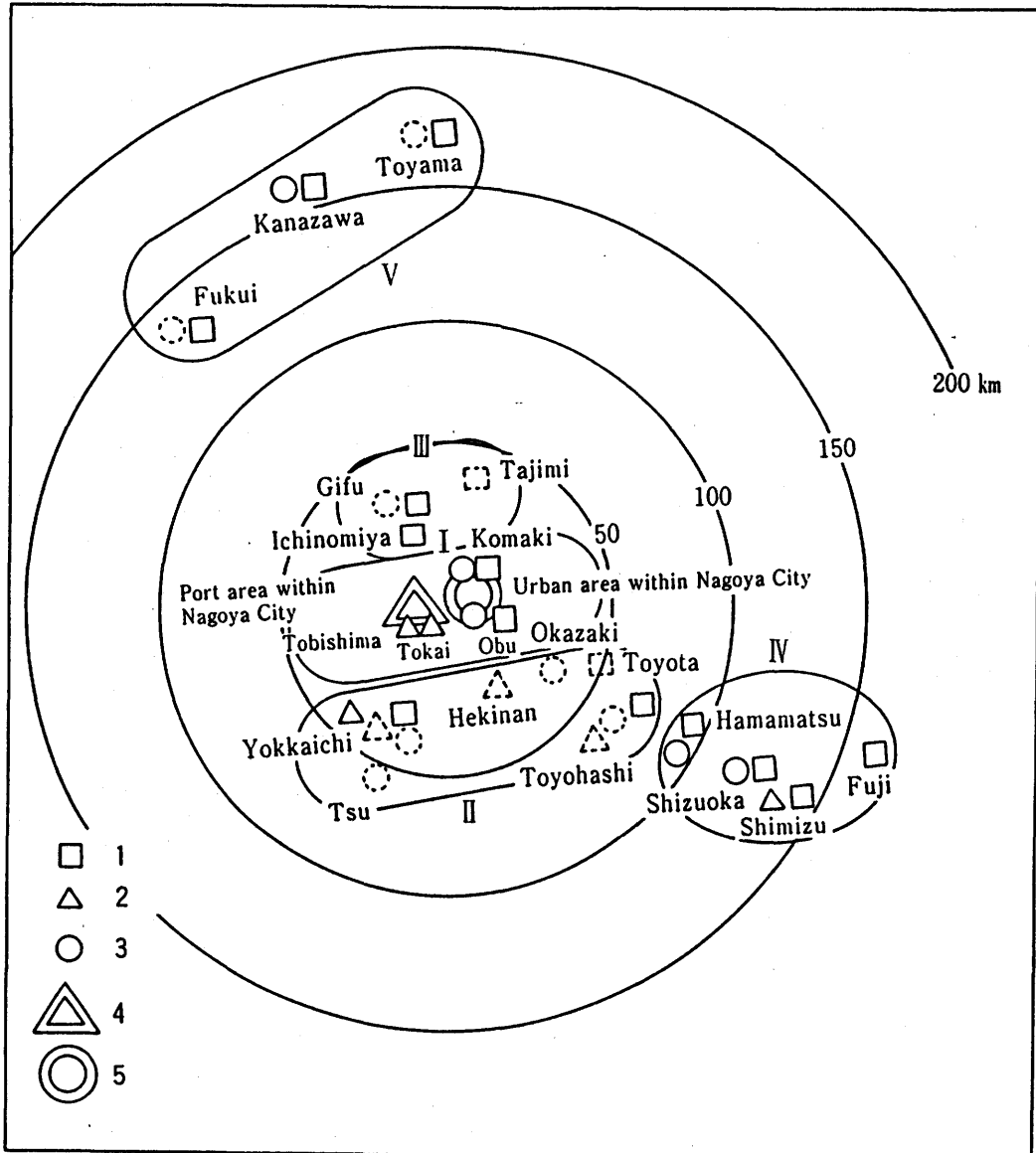


Fig. 31 Schematic distribution of warehouses in terms of locational bases and conditions hindering their location by municipality in the Tokai and Hokuriku districts and by district in Nagoya

1: production area warehouses 2: transit area warehouses  
 3: consumption area warehouses 4: transit area warehouses forming the physical distribution core 5: consumption area warehouses forming the physical distribution core  
 I: Nagoya block area II: Mikawa/Mie block area III: Ichinomiya/Gifu block area IV: Shizuoka block area V: Hokuriku block area

Note: Solid lines indicate warehouses with a firm locational basis. Dotted lines indicate warehouses with conditions hindering their location.

observed in the cases of Ichinomiya, Gifu and the Hokuriku block. Accordingly, the location of production area warehouses was larger in number than consumption area warehouses, and moreover, the conditions hindering their establishment were relatively few. Many production area warehouses can establish themselves on various industries developed in each area. As a result of the above, the distribution of warehouses seen from the viewpoint of the locational bases of warehouses and the conditions hindering the location of warehouses, clearly showed that production area warehouses were extremely different from transit or consumption area warehouses, but that transit and consumption area warehouses were relatively similar to one another.



## CHAPTER VI

## CONCLUSION

The purpose of this study was the analysis of the advancement of warehouse enterprises and of the locational bases of commercial warehouses in the Tokai and Hokuriku districts. On the basis of the differences in the development processes between warehouses in port areas and inland areas or between those in port cities and inland cities, this study tried to categorize warehouse enterprises and locational bases of warehouses, especially focusing on their relationships with the regions in which they were located. In other words, for the purposes of classification, the parent companies of warehouse enterprises, regions into which warehouses advanced, the kinds of items stored in warehouses and the points of origin and destination freight were taken into consideration. On the basis of the above classification, the conditions of warehouse enterprises advance into new areas, the locational bases of warehouses and conditions hindering the establishment of warehouses were considered. These analyses lead to the following conclusions:

(1) Warehouses are concentrated to a remarkable degree in Nagoya and its environs and distributed in a rather

scattered fashion in other medium-size cities. Historically speaking, warehouses established before World War II in Nagoya were concentrated in the four wards of Minato, Naka, Nakagawa and Nakamura and those in the environs of Nagoya were located only in Ichinomiya, textile production area, with Nagoya warehouses showing stronger trend of port warehouse functions. Even after World War II, these prewar concentrations were maintained up to around 1960. It was only with the onset of the period of rapid economic growth, the improvements in port facilities, changing means of transportation, and increasing urban congestion, that almost all the warehouses in Naka Ward were transferred or abolished, thus strengthening the tendency on the part of warehouses towards suburban expansion and the diversification of warehouse functions in Nagoya. Consequently, two warehouse concentration areas, namely the port area and the inland area became clear, these two concentration areas being subdivided into four, namely the Nagoya Port, the Nagoya urban, Ichinomiya and Komaki areas, each of which had different warehouse functions.

As for a medium-size city, in Yokkaichi, a port city, warehouses were already centered in harbour areas in the prewar period, and attempts were made to carry this trend over into the postwar period with new establishments. However, due to the development of automobile traffic, the

locating of warehouses in inland areas was also encouraged. The same situation was observable at Shimizu, where the locating of warehouses in the harbour area had been notable in both the prewar and postwar periods, with expansion into inland areas taking place around 1970. On the other hand, in the cases of inland cities, Hamamatsu, for example, experienced the development of warehouses in the vicinity of railway stations in both the prewar and postwar periods; after around 1970, with the development of automobile traffic, as well as a shortage of land for warehouse sites and urban renewal in the area surrounding the railroad station, most warehouses in the areas surrounding railway stations were compelled to move elsewhere, thus encouraging new location in distribution centres in the vicinity of the interchanges and along the trunk roads. Shizuoka, Fukui and Kanazawa experienced the same development process of warehouse location as Hamamatsu. In this way, therefore, common characteristics of the development of warehouses are observable in four medium-size inland cities. Thus, what should be noted in the development process of warehouses is that warehouse location is divided into two groups of port areas and inland areas or port cities and inland cities, with each experiencing development different in character.

(2) The regions into which warehouse enterprises advanced differed according to the attributes of the warehouse enterprises. Generally speaking, the larger is the storage capacity of the warehouse enterprises, the larger gets the area advanced into. Regarding the site of the head office, enterprises headquartered in the Nagoya metropolitan region cover smaller area than those headquartered in Tokyo or Osaka metropolitan region. Also the earlier is the period of establishment, the larger gets the area of advancement.

For warehouse enterprises, the parent companies of which were engaged in the warehousing business, their strategic points of operation were centered in both inland and port areas, while in cases in which the parent company was engaged in manufacturing or overland transportation, the warehouse enterprises were mainly located inland; and in the cases the parent companies are port transport enterprises, warehouse locations were limited to port areas. Based on the characteristics of the parent companies of warehouse enterprises and their advance target of either a port or inland area, four pertinent categories of warehouse enterprises are obtained: 1) warehousing business-inland area type, 2) warehousing business-port area type, 3) harbour transport business-port area type, and 4) manufacturing business or overland transport business-inland area type.

(3) With regard to the conditions for advancement of warehouse enterprises, an important problem for inland area warehouses was the securing of client consigners. How they went about it depended on what type of enterprise they were. Most warehousing business-inland area type enterprises depended mainly on existing consigners for their patronage in the regions advanced into. For the warehouses of the manufacturing business-inland area type, the crucial condition for advancement was that the regions advanced into constituted the production areas and strategic sales bases of specific consigners. In the cases of warehouses of the overland transport business inland area type, line haul truck enterprises advanced along the operational route, securing a firm hold on client consigners who required the combined services of transport and storage out of indefinite number of consigners. In the cases of chartered truck enterprises, the crucial condition for advancement was the penetration into areas where specific consigners needed to have their freight transported to meet the demand to secure steady clients.

Besides the gaining of consigners, two other important conditions were the traffic situation and land for the building of warehouses. Regarding traffic conditions, through the development of automobile transport, environs of

the expressway interchanges and the area along the truck roads became advantageous. Where land was concerned, it was desirable that extremely large lots could be purchased at lower prices. However, excessive price hikes made the buying of land more and more difficult, and dependence on the rental warehouses owned by farmers or collective warehousing centres became more frequent. As to rental warehouses, in the cases of warehouse enterprises which advanced into the suburbs after the first half of the 1960s, a remarkably large proportion of them utilized the farmers' rental warehouses, without buying the land and this constituted an important condition for the advancement of warehouse enterprises into the suburbs. As for the collective warehousing centres, their establishment patterns are divided into these categories as follows: the joint capital company-tertiary sector type in the three metropolitan regions (type A); the cooperative association type in the regional central cities and local cities (type B); and the individual enterprise type in the three metropolitan regions, the regional central cities and the local cities (type C). The collective warehousing centre in Yanaizu-cho in the suburbs of Gifu falls under type B, that in Hamamatsu under type C, and then Nagoya freight terminal under type A. In this way, there are several types of collective warehousing centres, and where the advances of warehouse

enterprises are concerned the type of warehousing centre chosen is extremely important.

The proper conditions for the port area warehouse enterprises entail the possession of licenses for various port activities established under the law; these activities include the harbour transport business or the operation of the bonded shed, and so on. Generally, in the cases of port area operations, affiliation (*keiretsuka*) through physical distribution channels is developed between shipping companies or consigners, and harbour transport warehouse enterprises. Furthermore, the customary trading practices involved in transactions within the affiliated group remain strong. Thus, licensed warehouse enterprises often maintain close relationships with shipping companies and consigners through cargo handling operations and storage activities, and they are able to handle the cargo in the bonded shed. Consequently, they are in a position to directly grasp the flow of freight and to secure the business of meeting the demand for storage, thus stabilizing physical distribution activities. On the other hand, the activities of unlicensed enterprises generally tend to be extremely unstable.

(4) In order to classify the locational pattern of warehouses three elements of items in storage, points of origin and destination, and the types of enterprises found

at the points of origin and destination are considered from the viewpoint of physical distribution. As a result, warehouses could be divided into three types of production area, transit area and consumption area warehouses. To classify them by municipality and district of Nagoya, the warehouses in Ichinomiya, Fuji and Fukui were mainly of the producing area type, the warehouses in the port area within Nagoya City, Tobishima and Tokai were mainly of the transit area type, and those in the urban area within Nagoya City were mainly of the consumption area type. Warehouses in both Yokkaichi and Shimizu had dual characters being of both production and transit area types.

(5) Regarding the locational bases of warehouses by type, the warehouses of the textile production areas of Ichinomiya and Fukui depended on the division of labour in the production process and the seasonal nature of the demand for finished products, warehouses in the producing areas of Fuji (paper) and Yokkaichi (chemical products) depended on mass production and the small-scale users of semi-finished products, and the warehouses of Shimizu (canned goods and cans) depended on the seasonality of the operating period and mass production, because all these led to the accumulation of semi-finished and finished products.

Regarding warehouses in transit areas, occurrences of



temporary accumulation of import and export cargo at the port area and the availability of import and export cargo for storage at each port can be pointed out. In the cases of the Nagoya Port transit area warehouses for steel products, where shipments come from various ironworks all over Japan, resulting in wide range of inventory sorting and delivery functions are strongly called for, stabilizing their locational base.

Where warehouses in consumption areas were concerned, the consumption demands of urban inhabitants of cities with intensified centrality had to be met. Urban area within Nagoya City, which with their accumulations of wholesalers and retailers, constituted the urban areas of high consumption demand, maintain traditional consumption area warehouses, indicating strong locational bases for warehouses. Consumption area warehouses of this kind were found, besides in Nagoya, also in Komaki, Kanazawa, Shizuoka and Hamamatsu. Excluding Komaki, the other three cities were medium-size cities having populations of more than 400,000, constituting cores of physical distribution. The warehouses of Komaki function as an extension of consumption area warehouses in urban area within Nagoya City resulting from their centrifugal expansion, and share a part of urban area warehouses.

(6) Stock reduction system promoted by the final assembly enterprise and the low added value of ceramic and porcelain products can be cited as conditions hindering the establishment of warehouses (*soko seyaku joken*) in the case of production area warehouses. Concerning the former it was noted that there existed very few commercial warehouses in Toyota, the centre of automobile production. This is because of Toyota Motor's "Toyota production system" which eliminated almost all the demand for storage of car parts for automobile production in the production area. Naturally, storage facilities for spare parts was necessary but the latter were in great part stored in private warehouses of the Toyota Motor Sales Corporation. Furthermore, the latter company originally had private warehouses in Nishi Ward, Nagoya, and later expanded into the northern suburbs in the extended area of Nishi Ward. The location of the later warehouses owed partly to the advantageous situation of the northern suburbs centering on Komaki, a strategic point in the expressway network, which accommodated the need for the delivery and collection of spare parts to and from all parts of Japan. Concerning products' low added value, a typical example was the ceramic and porcelain production area of Seto, where no commercial warehouses were found. This was due to the fact that the added value of ceramic and porcelain products was low in proportion to their weight,

resulting in low capacity in paying commercial warehouse storage fees. Generally, ceramic and porcelain products of Seto were stored in private warehouses of production area wholesalers, since in any case, storage facilities of structures were sufficient.

Transit area warehouses were strongly influenced by the kinds of import and export freight. Crude oil, for example, is not appropriate for storage at commercial warehouses, hence this makes for a weak locational basis. Also, when the cargo handled at a harbour was small in quantity, this also constituted a great hindering condition. In the case of harbours located within the physical distribution area of another large core port, collection capacity of transit area warehouses in those harbours was weak. This was illustrated by the case of Yokkaichi harbour where the locational bases of transit area warehouses were weakened by the extension of the physical distribution area of Nagoya Port. Warehouses along the canal connected to Nagoya Port rapidly lost their locational bases as transit area warehouses due to the improvement of Nagoya Port, which enabled the latter to decrease its dependence on barges in the handling of freight.

The location of warehouses in consumption areas is largely influenced by the distance from large cities constituting the core of physical distribution and also by

the improvement of the road network. Functionally weak warehouses in the consumption areas of Gifu, Toyohashi, Okazaki and Yokkaichi, despite the fairly large population scale of these cities, resulted from their inclusion in the physical distribution area of Nagoya. In contrast, located at a considerable distance away from Nagoya, consumption area warehouses of Kanazawa and Shizuoka formed their own delivery areas, testifying their functions. Though included in the Shizuoka delivery area, Hamamatsu partially formed its own delivery area. Also to be noted was the recent development of the expressway network resulting in the extension of the Nagoya delivery area and affecting the locational bases of the warehouses in the consumption areas of Kanazawa and Shizuoka. Actually, the consumption area warehouses of Kanazawa underwent diversified changes in their physical distribution channels taking various forms. Cases of new warehouses established in Kanazawa separate from those existing in Nagoya, and of Kanazawa warehouses abolished and their functions integrated with those of Nagoya warehouses can be cited as major examples. The situation was a fluid one, but it was clear that the four cities of Nagoya, Kanazawa, Shizuoka and Hamamatsu formed their own distribution areas, which moreover tended to overlap, in accordance with the hierarchy of the urban function of each of these cities. Consequently, it can be

concluded that the location of warehouses in consumption areas, in comparison with those in producing areas, tended to be centralized in a small number of cities.

## NOTES

- 1) We define areas other than port areas as inland areas.
- 2) A port area means piers and areas surrounding piers where freight is loaded or unloaded and kept. Also included are the areas along canals leading into port areas, if those canal-side areas also deal with harbour freight.
- 3) Here we define commercial warehouses as those which collect payment for the handling of goods entrusted to them by consigners, under the license of Ministry of Transport.
- 4) Here we define private warehouses as those which store freight belonging to the owner of the warehouse.
- 5) The classification was devised in accordance with the structure and equipment of warehouses under Article 3 of the Regulations of the Ministry of Transport Relative to the Warehousing Law.
- 6) Cold storage warehouses are defined as those which mainly store goods at a temperature of below minus 10° centigrade.
- 7) Class 1 is the standard-type warehouse, which mainly stores miscellaneous freight occupying more than half the warehouse space. Of the class 2 type, there are only a few, consisting of old structures. The third class comprises warehouses for steel.
- 8) Warehouses located in built-up areas, which dealt mainly with domestic freight by means of inland transport.

- 9) The distribution centre whose construction started in 1973 consists of a base for the storage and distribution of seagoing cargo. The centre showed a concentrated allocation of a general warehouse complex (*futsu soko danchi*), container freight stations, a cold-storage warehouse complex and truck terminals, with some parts under construction.
- 10) Land formation (*tochi zosei*) was carried out by the Industrial Bureau of the Aichi prefectural government and lots were sold to private enterprises in and after 1965. The total acreage involved was 640,000m<sup>2</sup> and thirty-four truck transport companies, of which twenty-three operated chartered truck businesses, located there.
- 11) Local prefecture refers to the prefecture where the cities under discussion belong.
- 12) Warehouse enterprises having their headquarters in the Nagoya metropolitan regions refer to those based in Aichi, Gifu, Mie and Shizuoka Prefectures.
- 13) Warehouse enterprises headquartered in the Tokyo metropolitan region refers to those based in Ibaraki, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa and Yamanashi Prefectures. Warehouse enterprises headquartered in the Osaka metropolitan region refer to those based in Shiga, Kyoto, Osaka, Hyogo, Wakayama and Nara Prefectures.

- 14) There were seventy-seven warehouse enterprises which had storage floor spaces of 30,000m<sup>2</sup> or more. We made a study of sixty-nine enterprises, (of fifty-two enterprises to which we sent questionnaires, we received forty replies or 77 percent), and conducted direct enquiries among the other twenty-nine enterprises.
- 15) We divide the areas of advance of warehouse enterprises into nine districts: Hokkaido, Tohoku (Aomori, Akita, Iwate, Miyagi, Yamagata and Fukushima Prefectures), Kanto (Ibaraki, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa and Yamanashi Prefectures), Hoku-Shin-etsu (Fukui, Ishikawa, Toyama, Niigata and Nagano Prefectures), Tokai (Aichi, Gifu, Mie and Shizuoka Prefectures), Kinki (Shiga, Kyoto, Osaka, Hyogo, Wakayama and Nara Prefectures), Chugoku (Okayama, Hiroshima, Tottori, Shimane and Yamaguchi Prefectures), Shikoku and Kyushu.
- 16) On the basis of the above-mentioned classification into nine districts, we define the enterprises which advanced into four or more districts as the large-size area type. Enterprises which advanced into two or three districts are medium-size area types, and the small-size area types refer to those enterprises which advance into only one district.
- 17) The time of the establishment of warehouses is divided into prewar and postwar periods, and the latter is sub-



divided into the years prior to the era of rapid economic growth, the years of rapid economic growth and the years after the era of rapid economic growth, that is, the prewar years, the postwar years in 1945-1960, and the years after 1960.

- 18) The port transport business consists of cargo handling and the activities of enterprises dealing with cargo handling and transportation in port areas.
- 19) Trading companies and tertiary sector institutions can also constitute parent companies, but they are few in number, hence it is difficult to classify them into inland area or port area types.
- 20) This matter will be discussed in more detail in Section 2 of Chapter III.
- 21) Only three companies belong to category 3).
- 22) The port of Yokkaichi was opened in 1899.
- 23) The chartered truck transport enterprise is that which engages in transportation using trucks chartered by specific consigners.
- 24) Rental warehouses numbered thirty-eight in 1973. More than half of them were established in the first half of the 1970s.
- 25) While the average storage floor space of the Farmers' Collective Rental Warehouses was 5,400m<sup>2</sup> in 1973, that of rental warehouses of individual ownership was no more than

1,500m<sup>2</sup>.

- 26) The limited company referred to in Note 27) paid an average of 600,000yen annually for one tan (0.245 acres) to the landowners. If the latter depended on the cultivation of cereals (rice, barley or wheat), the approximate income was from 60,000-70,000yen per tan.
- 27) The limited company for management of rental warehouses was comprised of the farmers who provided farmland for the building of warehouses; each of them invested the same sum of money, amounting to one million or two million yen. Generally, the more numerous the investors, the larger becomes the storage capacity of the warehouses. The company was responsible for arranging rental contracts with warehouse and transport companies, the repair of the warehouses, revision of rents and so on.
- 28) The accumulated amount of credit extended to the collective rental warehouse business from the Komaki Agricultural Cooperative between 1969 and March 1972 was around two billion, which occupied more than 30 percent of the savings deposits held by the Cooperative.
- 29) Collective warehousing centres are warehouse estates the land for which was developed by the administrative authorities. A large number of warehouse enterprises advanced into these estates, where they were arranged according to plan. The plan called for the warehouses to

- be arranged regularly in rows, and generally, one warehouse space was shared by several enterprises with a large space secured for a truck yard and cargo handling.
- 30) The container centre had a supplementary function with regard to Shimizu Port, having as it did customs procedure facilities.
- 31) Regarding the urban hierarchy, we here divide it into three, consisting of the three metropolitan regions, regional central cities and the local cities. The Tokyo metropolitan region is comprised of Kanagawa, Chiba, Saitama and Tokyo Prefectures; the Osaka metropolitan region is comprised of Osaka and Hyogo Prefectures, and the Nagoya metropolitan region consists of Aichi Prefecture.
- 32) The types of establishment were divided into the following four: the joint capital company type, the cooperative association type, the tertiary sector type and the individual enterprise type.
- 33) We define the inland areas as the areas other than port areas, and all the warehouse enterprises located inland as inland area types.
- 34) Warehouse enterprises located at piers and in their environs and areas, where harbour freight stays for loading or unloading, are defined as port area types.

- 35) A prefecture where the collective warehousing centre in question is located is defined as a local area. In the case of the Tokyo metropolitan regions, the local area includes Tokyo, Kanagawa, Chiba and Saitama Prefectures. The local area in the Osaka metropolitan region refers to Osaka and Hyogo Prefectures and that in the Nagoya metropolitan region refers to Aichi Prefecture.
- 36) Areas outside the prefecture where the collective warehousing centre in question is located is referred as outside or external.
- 37) See Note 16).
- 38) The *uwaya* or bonded shed is a facility specific to harbour areas for cargo handling and differs from warehouses which have the purpose of storage.
- 39) The West-4 section of Nagoya Port is a large piece of reclaimed land located in the western part of Nagoya Port.
- 40) One of these companies had a storage floor space of less than 30,000m<sup>2</sup>, hence was not included among the enterprises considered in Chapter II. However, the classification of enterprises was based on the same criteria as given in Chapter II. Later on, some enterprises which had storage floor spaces of less than 30,000m<sup>2</sup> are to come under discussion.
- 41) The number of warehouse enterprises designated for the storage of raw cotton is five at Nagoya Port, five at

Osaka Port, two at Kobe Port, two at Yokkaichi Port, one at Yokohama Port and one at Shimizu Port.

- 42) Five other organizations are the Tokai Warehouse Association, the Tokai Port Transport Association, the Tokai Collective Warehousing Centre, the Nagoya Port Commodity Distribution Centre and the Nagoya Port Authority.
- 43) The coefficient is 0.527, indicating a relatively low correlation.
- 44) If we exclude the case of Nagoya, the resulting coefficient is -0.054, indicating a very low correlation.
- 45) Local government. Since there are no *cho* (town) relevant to the subject, the municipalities here comprise only *shi* (city) and *son* (village).
- 46) The storage floor space of Minato Ward is 480,000m<sup>2</sup> and occupied 57 percent of storage floor space of Nagoya, and the three wards of Nakamura, Nakagawa and Atsuta have 260,000m<sup>2</sup> of storage floor space corresponding to 32 percent of total Nagoya. The storage floor space of the four wards hence occupy more than 90 percent of the total storage floor space in Nagoya.
- 47) The exceptions are the warehouses of Tokai where, because of the existence of private warehouses belonging to Nagoya works, the Nippon Steel Corporation, warehouse enterprises have no close relationship with the local steel industry

and instead have the character of transit area warehouses for iron industries having factories in other areas.

- 48) The number of warehouse enterprises in the municipalities and districts of Nagoya, to which direct enquiries were addressed, and which had over 50,000m<sup>2</sup> of storage floor space in Aichi and Mie Prefectures were as follows: five enterprises in the area within Nagoya City (five business offices), fourteen enterprises in urban area within Nagoya City (fourteen business offices), nine enterprises in Komaki (nine business offices), six in Ichinomiya (six business offices), ten in Tobishima (ten business offices), and five in Yokkaichi (five business offices). In selecting the enterprises in each municipality or district, preference was given to enterprises having large storage capacity.

In Shizuoka, Fukui and Ishikawa Prefectures, survey by questionnaire was carried out in municipalities having storage floor spaces of 50,000m<sup>2</sup> and more as follows: At Shimizu, questionnaires were distributed to twenty-six companies and fourteen companies (54 percent) sent in answers, but the answers of two companies were incomplete, so we used only twelve enterprises (twelve business offices). At Hamamatsu, of twenty-five questionnaires sent out, answers were received from sixteen companies (64 percent), but two were incomplete so we were

able to analyze fourteen enterprises (seventeen business offices).

Questionnaires were distributed to thirty-one companies in Fuji and eighteen (58 percent) answers received of which five were incomplete, hence we analyzed thirteen companies (thirteen business offices). At Shizuoka, among ten companies, six companies (60 percent) (seven business offices) answered. At Fukui, among thirteen companies, four (31 percent) (six business offices) answered. At Kanazawa, among twenty-two enterprises, twelve (55 percent) (thirteen business offices) answered. Enquiries in the questionnaire consisted of the following: 1) A request for the names of two top commodities according to the quantity of storage for each business office together with the points of origin and destination. 2) A request regarding the points of origin and destination, and the specifying of names of pertinent prefectures, districts such as Kanto, Kinki, or places nationwide or overseas. 3) A request regarding the type of enterprise at points of origin and destination, choosing from among factories, trading companies, wholesalers, retailers, port enterprises and others.

49) Besides dyeing, the final stages in the process of textile production included the undertaking of cleaning, pressing repairing and so on.

- 50) For instance, about 90 percent of the volume (m<sup>2</sup>) of 100 percent wool products consisted of clothes for autumn and winter.
- 51) Storage fees in 1981 varied according to the quantity and turnover rate, but generally, textile products cost the most, with metal, foodstuffs and chemical products at the intermediate level, and agriculture and fishery products, paper, pulp and ceramic products at the lowest. Among textile products, woollen yarn fees were from 7,000-8,000yen per month for 3.3m<sup>2</sup>, and 3,000-4,000yen for synthetic fibre.
- 52) In 1981, the fluctuation of storage fees for woollen yarn during one month was in the order of ten to twenty percent, a fluctuation much greater than that for cotton thread.
- 53) Shizuoka and Shimizu had one large can-manufacturing factory each.
- 54) We have here selected five large-scale warehouse enterprises established many years ago and having a long history of activities.
- 55) Only three local enterprises have a proper brand and a nationwide distribution network.
- 56) Paper is divided into *Yoshi* ("Western-style" paper) and *itagami* (paperboard); the former consists of printing paper, toilet paper, wrapping paper and newspaper sheets and so on, and the latter consists of cardboard, white



- paperboard and so on.
- 57) The storage of pianos was difficult for the warehouse enterprise to deal with because it necessitated the regulation of humidity; and pianos could not be piled one on top of another to save floor space.
- 58) Production of the musical instruments for the domestic market occupied 80 percent of the total production; showing remarkably high dependence on the domestic market. Thus, the monthly fluctuation in sales was great; for instance, for the Nagoya branch of K\_\_\_\_\_ Company, putting the average number of sales in January in 1971-1973 at one hundred, the December sales, the highest value, were two hundred ninety in case of the monthly sales of pianos.
- 59) Unloading ports for raw cotton were limited to six ports, that is, Nagoya, Osaka, Kobe, Yokkaichi, Yokohama and Shimizu.
- 60) Among twenty-four warehouse enterprises that advanced into Tobishima, nineteen had no licenses for the harbour transport business. However, they were only those that had advanced into the Tokai collective warehousing centre and the collective warehousing centre of the Nagoya Port Collective Warehousing Centre Cooperative Association.
- 61) Steel is classified into around 1,500 kinds, according to the variety, dimension and standard.
- 62) For instance, Company W produced shapes, bar steel and

wire rods at the Mizushima works, and plates at the Chiba works, and Company X bar steel at Kawasaki works, steel sheet piles at Fukuyama works and Company Y and shapes at the Kashima works.

- 63) The production of crude steel in 1979 at Company X, was 16 million tons at Fukuyama and 4.5 million tons at Kawasaki; and in the case of Company Y at Kashima 15 million tons and at Wakayama 8 million tons.
- 64) Crude steel production at Company V was divided among its steelworks as follows: at Muroran, 2.59 million tons; at Kamaishi, 0.97 million tons; at Kimitsu, 6.35 million tons; at Nagoya, 3.9 million tons, at Sakai, 3.09 million tons, at Hirohata, 2.82 million tons, Yahata 5.86 million tons and at Oita 5.85 million tons.
- 65) Crude steel production at Company W in 1978 was 5.4 million tons at Chiba and 6.8 million at Mizushima.
- 66) For instance, the types of the Toyota Corolla body increased from two to four during the 1971-1981 period and the types of engines increased from two to three in the same period.
- 67) The grades of the Toyota Corolla increased from four to ten between years 1971 and 1981.
- 68) The number of spare parts in stock increased to two hundred eighty-seven in 1981 with the 1970 figures as one hundred in the case of Toyota Motor Sales Corporation.

- 69) The commercial warehouse floor space rented by Toyota Motor Sales Corporation in 1981 is estimated to be about 30,000m<sup>2</sup>.
- 70) In 1978, the Oguchi Factory of Toyoda Boshoku Corporation was converted into a warehouse.
- 71) Production of Japanese style ceramics and porcelain tableware were 150,000 tons, 250,000 tons, and 300,000 tons in 1965, 1970 and 1973 respectively, showing an increase each period.
- 72) This semi-industrial estate was developed by the Seto municipal authorities government in 1973 for industrial and commercial use.
- 73) Two warehouse enterprises advanced into the area of Hekinan Port.
- 74) There were forty-six warehouses along the Nakagawa Canal, so 73 percent of the total warehouses answered our enquiries. Here, warehouses in the Nakagawa Canal area means those that face the canal.
- 75) With the cocoon market located in Toyohashi, the storage of dry cocoons was large in quantity.
- 76) Among the storage items in Toyama in 1983, the most important were chemical products (26 percent) followed by steel (22 percent).

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