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Anglo-Dutch trade flows 1955-75; their effects on, and
consequences for, Dutch port development and planning

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on

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In the last few decades Dutch port planning has increasingly become dominated by the spectacular growth of the main port in the Dutch national seaport range, Rotterdam. The success of this port has resulted in it becoming a model for seaport development not only in the Netherlands, but also world-wide. There have even been recent suggestions by port planners in the Netherlands that development of other seaports in the national range should cease, as all future trade could be adequately accommodated by the main port.

Anglo-Dutch trade flows passing through the Dutch seaports over the twenty years during which the main growth in total trade took place are examined in depth, with particular emphasis on their effects on Dutch seaport development. To retain proper perspective, and at the same time provide a comprehensive outline, this is continually set against total trade flows passing through Dutch seaports over the same period. The position at the start of this period is outlined in the first chapter. Movements in total trade are examined in detail over the twenty year period in the next chapter. Chapter three deals with the changes in Anglo-Dutch trade during this time, while the following two chapters deal mainly with the relationship between the movements in trade and Dutch port development over the period. Finally current Dutch port planning is examined in the light of the movements in trade flows.

The main conclusions reached are that the smaller Dutch ports are of crucial and increasing importance to Anglo-Dutch trade, yet planners appear to be unaware of this. Should the development of the smaller ports cease, it would have disastrous effects on Anglo-Dutch trade. Comprehensive studies of trade flows with individual forelands can provide important indicators for seaport planning.

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INTRODUCTION

1 Foreword

Before any kind of research is undertaken it is necessary to define the fundamental reasoning behind such research and therefore to state something about the motivation, aims and methodology adopted in pursuing a particular line of inquiry.

2 Motivation

Between the 1950s and the early 1970s there was a spectacular growth in world seaborne trade, and most seaports underwent considerable development and expansion. A great deal of interest was generated amongst researchers in this phenomenon, resulting in a large volume of literature on port economics and port development.

Within the present decade, as world recession has deepened, over-capacity in world shipping and at ports has become more evident, and interest amongst researchers has considerably abated. Many of the plans drawn up in the 1960s for port expansion have been either postponed or abandoned altogether.

Although the pressures on port planners have decreased, the need to step back and evaluate the present situation in the light of developments over the last few decades is now even greater. The recession has meant stringent economies being imposed in most areas, so that it is essential that any available funds are directed effectively. There has scarcely been a time when an evaluation of trends in shipping and trade flows through ports was more urgent, in order to achieve a more efficient approach to port investments and a wiser management of existing resources.

The Netherlands, with the world's largest seaport, takes a leading

role in seaport planning and development. The development of Rotterdam has come to form a model for seaport development world-wide. It follows, therefore, that national seaport policy in that country is of crucial importance to the planning of port development world-wide.

3 Aims

Initial approaches to this study were made with the above observations in mind. Even a brief study of Dutch seaports in the literature, however, reveals a hiatus. There is an abundance of studies on the port of Rotterdam, but other ports (with the occasional exception of Amsterdam) in the Dutch port range are largely ignored. Little is known about their interaction with the main port and each other. The importance of the national port hierarchy has been overshadowed by development of the main port. This situation persisted despite, as Hoekveld¹ points out, a wealth of information on all aspects of trade and transport in the Netherlands published by the statistical office (Centraal Bureau voor de Statistiek) readily available to transport geographers. So developments at Rotterdam dominated Dutch port planning in the post-war period, with trends in trade and industrial development coming under close scrutiny. The forces at work amongst the other elements of the port range were considered to be of little consequence.

I decided, therefore, to pursue a line of inquiry into the development of the whole Dutch port range over the period 1955 to 1975. These years mark the end of the aftermath of the second world war when many ports needed rebuilding, followed by the rapid growth period of the 1960s, up to the recession in trade following the oil crisis of the 1970s.

In addition to providing a general survey of the development of Dutch

ports over the period, it was considered that a line of enquiry needed to be adopted which would enable some of the critical factors affecting Dutch port development to be isolated, so that useful indicators for port planning in the future could be provided.

There have been many studies of ports concentrating on industrial development and on the organization of port hinterlands, but very little work has been done on trade flows with the foreland. As Grote-wald points out,² the geography of international trade flows is virtually a virgin field of inquiry, with the basic facts being the size of trade flows, commodity composition, and direction of trade. Trade flows passing through a port are of critical importance to that port: not only do they reflect the port's status in a hierarchy, but these flows are the resultant of changing forces in both hinterland and foreland. It is vital that ports are sensitive to changes in these trade flows.

These aspects of ports have been relegated mainly to a secondary place in research. The external relations of seaports including foreland connections and volume and direction of trade, as pointed out by Britton,³ have not been given the same attention as hinterlands. One of the most common reasons given for this is the complexity of the external relations of seaports, as opposed to hinterlands. However, the term hinterland is a vague one (Sargent)⁴ and any one port may have a great number of hinterlands depending on the criteria adopted. More recent attempts by Schut⁵ and others have done little to clarify a confusing number of definitions of a port's hinterland.

In contrast, there is nothing vague about a port's maritime connections. The problem here, however, is one of scale. A port's overseas connections, especially for the larger ports, are likely to be numerous and on a global scale. In many cases, as Bird⁶ points out, the correct form of

of statistics to enable proper analysis of a port's trade is difficult to obtain. Nevertheless, the first steps towards port studies based on foreland flows have been made by Britton,⁷ Rimmer⁸ and others,⁹ which have laid the foundation for an evaluation of such flows (see Chapter 2). However, the problem of large amounts of statistical material needed for such evaluations remains, along with the identification of the numerous origins and destinations. Rarely are both given in port statistics. For the Netherlands, although Dutch trade flow statistics are very comprehensive, only the countries of destination, not the actual ports, are given by the Centraal Bureau voor de Statistiek.

Against this background, it was decided to attempt a slightly different approach to a foreland trade flow study with regard to the Dutch port range based on the statistical material available. This study looks at the changes in the volume of trade with one particular foreland passing through each port in the range over a period of time, to see whether it is possible to relate this to port development and evaluate a port's sensitivity to the needs of this trade flow.

The volume of cargo tonnage was chosen rather than any other criteria as this provides the most reliable measure of the status of seaports, as pointed out by Rimmer.¹⁰

Traditionally, the United Kingdom has formed an important trading partner for the Netherlands. Little attention has been focussed in recent times on Anglo-Dutch trade as the flow of oil from the Middle-East dominated post-war trade flows through the larger Dutch ports. Nevertheless, Britain's overseas trade was becoming increasingly orientated towards European markets over the period leading up to entry to the Common Market, and the Dutch ports formed a key position in this trade by virtue of their location and links with the European hinterland. Clearly, this formed an

important area for analysis, and it was hoped that from this the major trends in trade flows through Dutch ports could be identified and related to port developments. To avoid losing the overall perspective, Anglo-Dutch trade is compared with total trade at an early stage. Finally, should it prove possible to identify major trends in trade flows through such an in-depth study of Anglo-Dutch trade passing through the Dutch ports over a period of time, and to compare this to the degree of response by each port in terms of port development over the same period, any findings from the study would be applied to current Dutch seaport planning policies in order to provide some indication for future planning measures.

4 Methods of research.

As a starting point for the research, the basic material was collected from statistical material provided by the Centraal Bureau voor de Statistiek (C.B.S.). Although general statistics on all movements of goods between the Netherlands and the United Kingdom are available,¹¹ most of these movements are seaborne and the C.B.S. publish comprehensive monthly statistical information on the volume of trade flows and nature of commodities passing through all the Dutch ports,¹² under the headings of individual seaports and countries of origin/destination. The groupings used in this study are based on these divisions. Statistical material for each port is further recorded for total trade between the United Kingdom and a particular port, and the total of the commodities involved, since transit trade outwards included export from entrepôt warehouses inwards in the same month. The figures involved in this were generally slight, especially for the smaller ports which did not always have this

facility. Once all the relevant statistical material had been collected it was aggregated and processed to produce comparative material over the whole port range, for total trade flows and for trade with the United Kingdom.

Material was then collected on port development over the period in question, and interviews arranged with most of the port authorities in the Netherlands to obtain some impression of the degree to which port authorities and planners were aware of the needs of, and changes taking place in, trade flows, and in particular Anglo-Dutch trade. The general attitude towards port development was also considered important, as was that of regular users of the port, especially liner services involved in short-sea trade with the United Kingdom. Finally, all this was placed in the context of overall national Dutch seaport planning policies and objectives.

NOTES

Introduction

- 1 J.B. Hoekveld, 'Over onze beide grote havens', Geografisch Tijdschrift, 18 (1965), p.1.
- 2 A. Grotewald, 'Some aspects of the geography of international trade', Economic Geography, 37 (1961), pp. 309-319.
- 3 J.N.H. Britton, 'The external relations of seaports: some new considerations', Tijdschrift voor Economische en Sociale Geografie, 56 (1965), pp. 109-112.
- 4 A.J. Sargent, Seaports and Hinterlands (London, 1938), p.15.
- 5 T. Schut, 'Enige aspecten van achterland afbakening, in het bijzonder met betrekking tot zeehavens' (unpublished dissertation, University of Rotterdam, 1973)
- 6 J. Bird, Seaports and Seaport Terminals (London, 1971), p. 140.
- 7 J.N.H. Britton, 'The external relations of seaports'.
- 8 P.J. Rimmer, 'Recent changes in the status of seaports in the New Zealand coastal trade', Economic Geography, 43 (1967), pp.231-243.
- 9 See for instance J.M. Desbarats, 'A geographical analysis of the Clyde's forelands', Tijdschrift voor Economische en Sociale Geografie, 62 (1971), pp. 249-263.
- 10 P.J. Rimmer, 'The problems of comparing and classifying seaports', The Professional Geographer, 18 (1966), pp. 83-91.
- 11 Centraal Bureau voor de Statistiek, Maandstatistiek van Verkeer en Vervoer ('s-Gravenhage).
- 12 Centraal Bureau voor de statistiek, Maandstatistiek van de zeevaart en van het havenverkeer ('s-Gravenhage).

CHAPTER 1

ANGLO-DUTCH TRADE FLOWS IN 1955

1. Introduction

Since the Second World War, the increasing importance of the transport sector, and in particular the role played by ports in national economies, has become an essential economic issue, especially in industrial Western Europe. This region, which Kuiler¹ describes as the 'Mountain Triangle', is one of the three main industrial areas of the world, alongside the eastern seaboard of the U.S.A. and Japan, and as such is the origin and destination of a large part of the world's trade. Home production of raw materials is on a limited scale, but there is a high level of industrial output; consequently the dominant feature of trade flows here is one of large scale inward movement of raw materials, together with an outward flow of semi-finished and finished products. Not only is there an exchange of products between this area and the rest of the world, but also within the area there is considerable traffic between industrial centres. These goods travel by various transport modes according to the geographical nature of the intervening area, the distance to be travelled, the economic costs involved, the nature of goods to be carried etc. Generally, sea and inland waterway transport modes are used for heavier, bulk low-value products, and rail, road and air for lighter, higher-value products.

It is within the general outline discussed above that we must consider the trade flows between the Netherlands and the United Kingdom; i.e. as

part of the intra-European trade flows taking place within the larger external flows to and from Europe from the rest of the world. We would expect a considerable redistribution element in this trade; however, it must be borne in mind that exchanges between industrial centres also occur.

As in the case of other Western European countries, the United Kingdom faced a growing discrepancy in post-war trade between inward and outward flows, with the former becoming increasingly dominant.² Western Europe in general, even before the Second World War, was experiencing a gradual decrease in the importance of home-produced raw materials and a growing reliance on cheaper imported raw materials to feed its growing manufacturing industries. This was true not only of external flows, but also for intra-European flows, with the decline in export of bulk products (home-produced) between European centres and increasing imports of manufactured goods between the main manufacturing centres of Germany, France and the United Kingdom. The most marked decline was suffered by European coal, and iron ore, with the former gradually being replaced by alternative fuels and the latter being faced with increasing competition from cheaper foreign ores. Both coal and iron encountered competition from cheaper, higher quality raw materials from outside Europe. Even before the Second World War these general trends were apparent, and together with the rapid increase in overall world trade (550 million tons in 1950, 2,280 million tons in 1969)³ this forms the background against which any post-war study of Anglo-Dutch trade flows must be placed.

1.1. The European setting

Before moving on to the situation in 1955, it is useful to take a

brief look at the European setting of Anglo-Dutch trade flows.

Kuiler points out that, in the context of European international transport, U.K. transport with the 'old six' takes a relatively small share. However, in the context of transport by sea the United Kingdom accounts for over 50% of intra-community trade, and this is of obvious importance to European ports. In addition the share of total United Kingdom trade in the post-war period taken up by E.E.C. trade has increased relatively rapidly (see table below):

<u>Year</u>	<u>Sterling area</u>	<u>E.F.T.A.</u>	<u>E.E.C.</u>	<u>N.America</u>	<u>rest of the world</u>
1953/66 imports	-15.6	+2.9	+5.9	+4.3	+4.9
1953/66 exports	-13.0	+2.7	+8.2	+2.6	+1.2

Table 1. Percentage increase/decrease in the share of United Kingdom trade by areas 1953-1966. (Source: calculated from figures contained in E.F.T.A. Trade, Report on Overseas Trade (London 1967) p. 138).

The growth in United Kingdom exports and imports in the post-war period has been most rapid in relation to trade with the E.E.C. The European markets have become vital for Britain's prospects and the post-Second-World-War era shows increasing European orientation for Britain's trade.⁴ For the Netherlands, trade relations with the United Kingdom have long been important. In 1955, with a total overseas (seaborne) trade flow of 82.5 million tons, trade to the United Kingdom amounted to 10.9 million tons, or 13%, of Dutch total trade flows.

This was partly a result of weakened trade between the United Kingdom and West Germany in the immediate post-war period, which resulted in a heavy decline, especially in exports, of trade between the two industrial centres (see Larkins 1949),⁵ and an increased export from the United Kingdom to other European centres.

1.2. Anglo-Dutch trade in the pre-war era.

Prior to the Second World War, the commodity composition of exports to the United Kingdom from the Netherlands consisted mainly of agricultural produce, which was strongly connected to local ports, whereas the transit trade (in the pre-war era 65% of Dutch port traffic, and three-quarters of Rotterdam's total trade, the largest port in the Dutch port range) was dominated by bulk products and industrial exports, strengthening the position of the larger ports in the range which could provide the necessary facilities.⁶ In 1937 the main products exported to the United Kingdom via the Netherlands were mineral products, coal and ores, iron and steel products, glass, paper, chemical products and machines (much of this originating in the Ruhr area for which the Rhine and Rotterdam provided a cheap trade outlet). In the opposite direction bulk products such as coal, iron and steel (basic pig iron and ingots) and china clay predominated. Thus the trade relationship between the British and German centres was such that the United Kingdom sent mainly specific bulk raw materials and semi-finished products, while the German centre sent mainly semi-finished and finished products, although bulk products were sent, especially via the Netherlands, due to the Rhine waterway being the most economic route for this type of product.

This trade relationship was little different to the situation previous

to the First World War. The Netherlands, although a country late to industrialize, was gradually beginning to export to the United Kingdom products other than agricultural produce and German transit products during the inter-war period and this process was continued and accelerated after the Second World War, notably in the fields of light engineering and electrical goods. The growth in exports was particularly fast in this sector as these products were competitive in the British markets, partly due to the fact that Dutch industry, being established much later than that of the United Kingdom, was able to benefit from newer technology and machinery. Dutch industry was, however, hampered by the lack of home produced raw materials, and the delay in industrialization was in part a result of this shortage. Production of coal from South Limburg, begun in the early 1900s, met only 60% of total Netherlands requirements in 1938, whereas the first discovery of natural gas in the Netherlands was not made until 1959. Oil, which has played such a large part in the European economies in the post-war period, was of little importance at this time; there was one main refinery, Royal Dutch/Shell, at Rotterdam.

In the inter-war period trade flows from the Netherlands to the United Kingdom still showed a heavy dependence on agriculture, despite these trends towards industrialization. The agricultural industry was hit heavily by the depression years, which was an additional factor in the changing structure of trade flows from the Netherlands home market to the United Kingdom. The other main element was the German transit trade via the Netherlands, which was becoming more export orientated, especially of semi-finished and finished products sent to the United Kingdom. In addition, as pointed out by Larkins,⁷ there was a pre-war re-export via Dutch ports to the United Kingdom of Indonesian products,

mainly primary 'colonial' products, although this fell away with the independence of that colony in 1949. This trade, being traditionally concentrated in Amsterdam, still took place mainly via this port in 1955, although Rotterdam was also becoming an important centre. The United Kingdom, emerging from the First World War with the loss of markets to newer, more dynamic industrial centres, and the consequent decline in heavy industries such as the textile industry, had a competitive disadvantage which in Germany, increasing its exports of manufactured items, was not slow to exploit.

As early as 1911 Sneller writes of a 'struggle' between the two industrial centres,⁸ which Kuiler describes as a 'fight for power.'⁹ The similarity in the economic orientation of these two industrial centres within the Mountain Triangle and resulting competition led to a weak trade relationship between them, and this had an important effect on trade from Dutch ports to the United Kingdom. The preponderance in bulk products, especially coal, in the export from the United Kingdom to the Netherlands and Germany favoured the larger ports situated on the Rhine, such as Rotterdam. This trend towards concentration in fewer Dutch ports in Anglo-Dutch trade from early on was reinforced by the importance of the German transit trade, although the smaller ports continued to survive as specialist exporters of home produced goods, especially agricultural produce.

1.3. Anglo-Dutch trade in the post-war era.

After the Second World War an important structural change began to take place in Anglo-Dutch trade due mainly to changes in the Dutch economy already evident before the war but greatly stimulated after it. The main industries in the Netherlands prior to the Second World War

were the Dienst der Staatsmijnen (or D.S.M., Dutch State Mines), established in 1902, a large iron and steel works at IJmuiden (Hoogovens) since 1918, the Koninklijke Nederlandse Zout Industrie (Royal Netherlands Salt Industry) set up in the same year after the discovery of salt deposits in the Twente area, the Algemene Kunstzijde Unie involved in textiles and chemicals, Philips electronics, and the Anglo-Dutch concern Unilever (1929). In 1943 the discovery of oil deposits at Coevorden and Schoonebeek led to the establishment of the Nederlandse Aardolie Maatschappij (Netherlands Crude Oil Company), alongside Royal Dutch/Shell, which had long been engaged in this area originally exploiting oil deposits in the Netherlands Indies.

These industries set the scene for post-war concentration on industrial development (De Vries, 1978),¹⁰ with the consequent decline in agricultural and increase in industrial exports, which was of obvious importance to trade flows to the United Kingdom. This trend was strengthened by developments in the hinterland. Although transit trade was becoming relatively less important for the trade of Dutch ports in the post-war period, there was a continued growth in German exports to the United Kingdom, and the disruption caused in this trade during the Second World War was more than compensated for by the rapid growth of this trade in the 1950s and 60s. The growth in demand for products from centres such as Germany and Japan led to a series of Balance of Payment crises in Britain in the 1960s. At the same time Britain's exports to Germany and the Netherlands, heavily dependent on bulk products, especially coal, fell dramatically in the post-war period as a result of a shift towards cheaper imports of coal from the United States and Poland initially, and the movement from coal to oil as the prime world energy source in the longer term.

So far we have seen that Anglo-Dutch trade was very dependent on events in the hinterland, the changing character of the home markets, and general world trade and events. With regard to the foreland (in this case Britain), we have already noted that demand for imports in the United Kingdom was rising more rapidly than for home-produced items in the post-war period. In addition, Britain's industrial output rose at a slower rate than her European trading partners. Some of her main exports, such as machinery and transport equipment, faced severe competition from Germany, where the productivity rate was higher and newer machinery (partly a result of the war's devastation leading to replacement of old stock) resulted in more efficient production. So British imports showed a growing dependency on European products, whereas her exports to Europe faced a relative decline. This situation was further aggravated by the growing demand for crude oil throughout Europe, since Britain's relatively shallow east coast ports were unsuitable for the large tankers used for this trade. The former Indonesian transit trade of colonial products to the United Kingdom via the Netherlands was replaced by bulk imports of oil and grain, redistributed mainly through the port of Rotterdam. This also increased the volume of imports into Britain from Europe. Dutch industrialization, in addition, was concentrated especially on light engineering, petro-chemicals, and electronics; these were all industries for which growth in world demand was most rapid, especially in the developed areas such as Western Europe. British industry, however, was still heavily dependent on traditional declining industries (shipbuilding, coal mining etc) and on the metal sectors (iron and steel, non-electrical machinery) for which world demand grew much less rapidly.

2. Anglo-Dutch trade flows in 1955

2.1. Background.

From the above we can identify the following elements in trade flows from Dutch ports to the United Kingdom in 1955:

- a) An increased flow of industrial products from the home market in the Netherlands and from the German hinterland to the United Kingdom.
- b) A decrease in the flow of agricultural products from the Netherlands to the United Kingdom in terms of their share of total exports.
- c) A decrease in the share of German transit trade via the Dutch ports and an increase in the share of the home market.
- d) An increased transshipment of bulk products from non-European sources to the United Kingdom via the Netherlands.
- e) A decrease in imports from the United Kingdom, especially of coal, but also of manufactured items in response to competition.
- f) A general overall weakening of trade relations, especially on the import side, between the two industrial centres of Germany and the United Kingdom, and consequent effect on trade flows via the Netherlands.

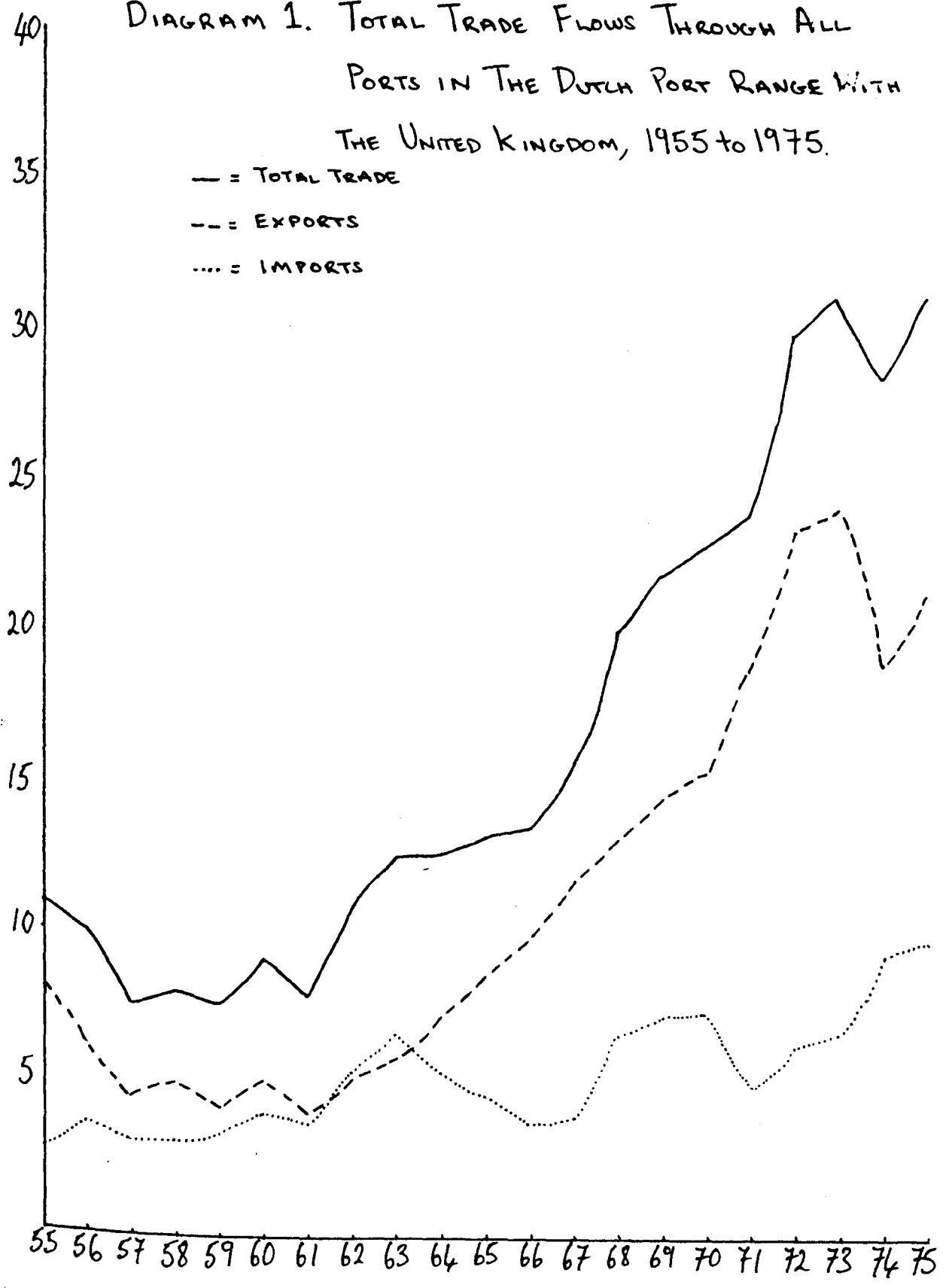
Although in the 1950s the share of total intra-European trade held by the United Kingdom was declining,¹² Europe was becoming more important for the United Kingdom as a trading partner. In 1953 13.1% of exports, and 10.3% of imports were with European Economic Community trading partners. In 1959 the figures were 14% of imports and 14% of exports. Trade to the sterling area, Britain's main trading partner, declined, as did trade with E.F.T.A.¹³ Therefore, although it may be said that Britain's relationship with the E.E.C. was strengthened in the post-war period with regard to trade flows, Britain's importance for the E.E.C. as a trading partner declined. This trend is also

reflected in Dutch trade statistics (see diagram 1) showing that imports into the Netherlands from the United Kingdom in the post-war period have been relatively stable. This suggests that the above trends cancel each other out in total effect. These figures, however, hide an internal factor; namely that there has been a shift in orientation of the Anglo-Dutch trade, from mainly transit to and from Germany, to a flow directed more towards the home market. In addition the expansion in world trade in general, especially of crude oil, left its mark on the trade flows to and from the United Kingdom, with trans-shipment of bulk products via Dutch ports. Many other changes have affected the trade flows between the Netherlands and the United Kingdom as well, not the least of which was the Benelux Customs Union in the early 1950s and the move towards a more general European customs union in the formation of the E.E.C. in 1958. However, the expansion in trade resulting from these moves, although indirectly stimulating Anglo-Dutch trade by the enlarged markets for Dutch industry and the consequent expansion, affected mainly trade between the partners concerned. The expansion of trade in the Netherlands was mainly with the hinterland of Europe rather than foreland countries such as the United Kingdom. So whatever the trade figures may suggest at an initial examination, in reality trade flows to the United Kingdom were far from stable and constant shifts were taking place due to these and other factors. A closer examination of these changes and their causes are made later in this work.

It is essentially with this background in mind, therefore, that we must approach any deeper study of Anglo-Dutch trade flows in 1955. It is also useful to compare total flows via Dutch ports with flows to the United Kingdom, giving an indication of whether Anglo-Dutch trade

DIAGRAM 1. TOTAL TRADE FLOWS THROUGH ALL PORTS IN THE DUTCH PORT RANGE WITH THE UNITED KINGDOM, 1955 to 1975.

— = TOTAL TRADE
- - - = EXPORTS
... = IMPORTS



was typical of Dutch trade in general in 1955 or whether it deviated strongly from the overall pattern.

2.2. Trade via Dutch Ports to the Netherlands in 1955.

The total goods trade via the Dutch port range in 1955 amounted to 82.5 million tons (including bunkering materials and ships' supplies). 56.4 million tons (68%) was imported, and 23.6 million tons exported (32%). This was an increase over the previous years total of 20 million tons. If we examine the growth in trade via all Dutch ports since 1938 the following growth pattern emerges.

<u>Year</u>	<u>Total</u>	<u>Imports</u>	<u>Exports</u>
1938	100	100	100
1946	20.9	26.9	10.8
1947	33.6	42.6	18.5
1948	44.1	48.3	36.9
1949	55.1	56.1	52.8
1950	73.9	72.2	76.9
1951	91.2	103.3	70.8
1952	97.3	111.8	72.8
1953	98.6	108.6	82.0
1954	115.8	124.8	100.0
1955	152.0	170.4	121.0

Table 2. The growth of trade via Dutch ports 1938-55 (base year 1938 = 100). Source: calculated from figures in the Centraal Bureau voor Statistiek, Maandstatistiek voor de in-, uit- en doorvoer, The Hague).

From table 2 it may be seen that it was not until the year 1953/54 that

Dutch trade flows via the seaports recovered their pre-war levels, although imports had already reached this level by 1951. Imports have grown faster than exports mainly as a result of the need to replace stocks and war damaged material. The transit trade did not recover its pre-war level until 1955. A major element in this recovery was the large increase in sea/sea transit via Dutch ports, mainly the redistribution of coal from the United States which was cheaper than British or German coal. The importance of the United States in the transit trade was a legacy of immediate post-war aid for Europe (Marshall aid) for which the port of Rotterdam was an important distribution point. It is interesting to note that this re-export via Rotterdam also involved a not inconsiderable export to the United Kingdom, coal arriving from the United States in ships of 7-8,000 tons and being re-exported to Britain in ships of 1-2,000 tons. As early as 1955, therefore the port of Rotterdam was functioning as a bulk re-distribution point for much of Europe. Other ports in the Dutch port range were less affected by this development due to more restricted access, and the flow to Rotterdam was replaced by oil from the Middle East and other sources as the demand for coal declined during the 1950s.

Recovery of pre-war levels of trade was fully completed for most Dutch ports in 1955, and this year serves as a convenient starting point for the study of Anglo-Dutch trade flows.

Although trade exceeded its pre-war level for the first time in that year there were considerable structural differences, with decreased dependence on German and British transit trade and increased reliance on trade with other countries such as the United States. Growth in trade was especially rapid at Rotterdam as the bulk trades were experiencing

the fastest growth, concentrated here. Oil (crude) imports was the outstanding example, taking up 14% of total Rotterdam trade in 1938, and 56% in 1955.

2.3. Anglo-Dutch commodity flows in 1955.

With regard to trade flows between the Netherlands and the United Kingdom in 1955, the following pattern emerges. In 1955 with a total seaborne goods flow to and from the United Kingdom of 10.9 million tons, 2.8 million tons (25%) was imports and 8.1 million tons exports (75%). Exports were thus three times the size of imports, which is in contrast to overall Dutch trade where imports were more than twice the size of exports. It would seem from this therefore that Anglo-Dutch trade was not typical of total Dutch trade. To take a closer look at this statement it is necessary first to examine the commodities involved in the trade flows.

2.4. Classification of commodity flows.

For this purpose the author has used the 'Nomenclature Uniforme de Marchandises pour les Statistiques de Transport, Revisé' (N.S.T.R.), at present adopted by the Centraal Bureau voor de Statistiek (C.B.S., Central Statistical Office) which collects all statistics in the Netherlands including those on transport and trade. The N.S.T.R. is the system of commodity classification used, with a few modifications, by the Benelux countries. Commodities are divided up into ten headings, or groups, and throughout the rest of this work these groupings will largely be adhered to when discussing commodity flows. However, the groupings do tend to disguise the importance of individual products, so that where

necessary certain important commodities will be examined in more detail. It is also necessary to note that there is a slight variation in the total weight of all goods to and from the United Kingdom recorded by commodity and that for total trade from the Netherlands to the United Kingdom. This is due to the exclusion of bunkering materials in some cases and to statistical collecting procedures used by the C.B.S. The 1955 commodity groupings were made according to the current national commodity classifying system (Goederen naamlijst B) and have been adapted by the author as far as possible to the N.S.T.R. classification ((adopted by the Netherlands in 1966), in order to facilitate comparison with other years. This adaptation was made using the 'Goederen naamlijst N.S.T.R. en sleutel op de C.S.T.E. goederencode en de voorheen gebruikte naamlijst B' published by the C.B.S.¹⁵

The N.S.T.R. has ten commodity groups which are as follows:

- 0 - Agricultural products and live animals. This group includes live animals, cereals, potatoes, fresh fruit and vegetables, natural and synthetic textile materials and waste, wood and cork, sugarbeet, and other crude animal and vegetable products.
- 1 - Foodstuffs and animal fodder. Including sugar, beverages, various foodstuffs such as colonial produce and prepared foodstuffs, preparations of meat and fish, other non-perishable foodstuffs, animal fodder, oils and fats.
- 2 - Solid fuels (coal, lignite, peat, coke).
- 3 - Crude oil and related products (crude petroleum, petroleum products, gas, other (non-fuel) petroleum derivatives).
- 4 - Ore and metal residues, including iron ore, non-ferrous metal and scrap and blast furnace slag and ashes.

- 5 - Products of the metal industry (pig-iron and steel, ferrous alloys, semi-manufactured goods of iron and steel, bars, rods, wire rod, railway stock, construction material, plates, steel strips and sheets, tubes, pipes and unworked iron and steel castings, other non-ferrous metals).
- 6 - Crude and manufactured minerals and building materials. Sand, gravel, salt, iron pyrites, sulphur, stone, earth and similar materials, cement, lime, gypsum and other fabricated building materials are included under this heading.
- 7 - Fertilizers (both natural and chemical fertilizers).
- 8 - Chemical products. This includes chemical based products, aluminium oxide and hydroxide, chemicals from coal, cellulose and paper waste, paints, explosives, perfumes, medical products etc.
- 9 - Machinery, transport equipment, various manufactured articles, and special transactions of other finished articles (electrical and non-electrical machinery, agricultural tractors, metal ware, glass leather, clothing, and other manufactures). This also includes bunkering material and ships provisions.

2.5 Analysis of Anglo-Dutch commodity trade 1955.

If we examine table 3 (below), we can see that bulk products were an important element in the Anglo-Dutch trade, with commodity group 2 (solid fuels, mainly coal) predominating. If we refer to table 4 (overleaf) the predominance of export in group 2 is the highest out of all the groups.

<u>commodity group</u>	<u>% share of total trade</u>
0	4.3
1	6.5
2	50.2
3	21.4
4	0.9
5	3.4
6	2.9
7	0.08
8	2.2
9	8.1

Table 3. Percentage share of commodity groups 0-9 (N.S.T.R.) in trade flows between the Netherlands and the United Kingdom in 1955.

<u>Commodity group (N.S.T.R.)</u>	<u>Import</u>	<u>Export</u>
0	1	3.5
1	1	4.5
2	1	4.8
3	1	1.9
4	1	1.3
5	1	1.5
6	1	0.3
7	Nil	100
8	1	1.4
9	1	3.2

Table 4. Ratios of imports to exports for commodity groups 0-9 (N.S.T.R.) in total trade flows between the Netherlands and the United Kingdom in 1955 (calculated from C.B.S. statistics on commodity trades, Maandstatistiek van de zeevaart en van het havenverkeer, Jan.- Dec. 1955). C.B.S.

We have already discussed the importance of Rotterdam in 1955 as a redistribution point for coal from the United States, and this is reflected in the dominance of this element in Anglo-Dutch trade. The United Kingdom, traditionally an exporting nation for coal, did not resume exports of this commodity to the Netherlands until 1948, and because of competition from other coal exporting nations these never regained their pre-war level. This was all part of the shift in United Kingdom exports towards engineering products and away from coal and textiles.¹⁶ The exhaustion of more easily workable seams necessitating the exploitation of deeper, more costly, seams, eroded the competitive position of British coal. In addition, the demand from power stations, the largest users of coal, was for cheaper, low-quality coal, and this could be obtained from the United States and Poland. This accounted for the re-exports of coal from the Netherlands to the United Kingdom in 1955.

The second major commodity in 1955 in Anglo-Dutch trade was group 3 (crude oil and oil products), a feature of the growing importance of oil in the post-war world economy. If we take a closer look at the commodities involved, then heavy fuel oil and kerosene are the major elements, hence showing the importance of the new refineries at Rotterdam for this trade. Unlike coal, which was exported unworked, crude oil was imported into the Netherlands, reworked, and then distributed. Crude oil itself, in fact, was not a trade item between the Netherlands and the United Kingdom in 1955. Looking at the import-export ratio for group 3 on table 4, imports and exports of this group almost balance, so that there is a not inconsiderable return flow of refined oil products to the Netherlands from the United Kingdom. The same products, heavy fuel

oils and kerosene dominate this return flow. This suggests that the comparative advantage of both countries in this group is almost equal.

It is these two groups, therefore, which account for the lion's share of commodity flows between the two countries concerned in 1955 (71% of all trade was coal and oil products). Of the less important commodities, group 9 is the largest (machinery, transport equipment and manufactured articles). This is of interest as this was Britain's fastest growing export group in 1955. Nevertheless, when we consider the import/export ratio, exports to the United Kingdom were $3\frac{1}{2}$ times greater than imports. This was a direct result of the recovery of the German industrial hinterland and post-war industrial growth in the Netherlands, and the increased tendency of British consumers to buy finished products from manufacturing centres outside the United Kingdom in the post-war era. For this group we can therefore speak of friction between manufacturing centres.

The main item in group 9 was machinery and transport equipment, and for this category the United Kingdom had a comparative advantage, as imports into the Netherlands were twice the size of exports. For most of the other products in group 9 (of which there was a large variety, mainly low-bulk/high-value products) exports to the United Kingdom predominated. It must also be borne in mind, when considering group 9, that bunker materials and ship's provisions, with regard to British ships, were registered as export to the United Kingdom, and this was not an inconsiderable item in terms of weight. The apparent friction between the manufacturing centres in this product must therefore not be over-emphasised.

Of the remaining commodity groups, foods and animal feedstuffs (group 1) and agricultural produce and live animals (group 0) were the two largest. As we can see from table 4, export dominates in both categories, especially

for group 1. Much of group 1 consisted of 'colonial' produce and processed home-produced agricultural products, which reflects the former importance of the Netherlands as a 'staple market' for the rest of Europe with regard to colonial goods (centred in the port of Amsterdam), and for the redistribution of these goods to the United Kingdom in the pre-war period. With the independence of Indonesia this element declined in the post-war era, and processed home-produced products became more important. In the 1950s there was a recession in the agricultural sector of the Netherlands as a result of structural changes in the economy in favour of industrialization. Much of Dutch agriculture at the time was geared to turning cheap imported raw materials into stock farming products which were then exported; hence the dominance of group 1 over group 0, and its stronger export orientation. The export of meat and meat produce was an important item. This was traditionally one of the main trade commodities between the Netherlands and the United Kingdom. Agricultural exports from the Netherlands had suffered a decline in the post-war period, partly as a result of attempts by the United Kingdom to protect their own agriculture. This decline was also relative to the increase in trade of other items rather than absolute; with rising national incomes the demand for agricultural produce tends to remain stable (demand is relatively inelastic). Another important commodity in Anglo-Dutch trade with regard to group 1 was raw sugar, which was exported to the United Kingdom (redistributed from colonial origins), and fruit and animal feedstuffs were also of note. Dairy products, although traditionally an important trade item between the Netherlands and the United Kingdom, was of little note in 1955. On the import side refined sugar was the main item in group 1.

For group 0 the dominance of exports was not so marked. Potatoes formed one of the main exports from the Netherlands to the United Kingdom in 1955, fresh vegetables were also of note. These exports were largely home produced. Wheat, rice and fresh fruit were the remaining trade items re-exported to the United Kingdom. On the import side few products stand out, barley and rubber being the only items worth mentioning. Agricultural produce, unlike other commodity groups, contained virtually no element of German transit trade, and was therefore an exchange taking place almost exclusively between the Netherlands and the United Kingdom, whether home produced or redistributed from the colonies. It is important to bear in mind that this sector had formed one of the main exchanges between the Netherlands and the United Kingdom in the past; in 1955 its importance was declining, and we could therefore assume a weakening in trade relationships for this group between the Netherlands and the United Kingdom.

The remaining commodity groups (groups 5, 6, 8, 4 and 7, in descending order of importance) together formed just under 10% of Anglo-Dutch trade in 1955. The ratio of imports to exports here was much lower than the groups already considered. Group 7, forming only a minor element, showed an absence of imports, while group 6 showed an inverted ratio, with imports greater than exports (the only commodity-group where this is the case). The most important item in group 5, (products of the metal industry), was rolled products of iron and steel; exports only slightly exceeded imports. Pig-iron was also an important export, although some import did take place. The export of semi-manufactured metals (blooms, billets, slabs and coils) also deserves mention. On the import side rolled products formed the major group, but tubes, pipes and fittings were also imported

into the Netherlands. Most of the trade in this group was confined to exchanges between the Netherlands and United Kingdom, rather than with Germany; the German trade with the United Kingdom in this group took place mainly via German ports, with suppliers taking advantage of the 'seehafenausnahmetarif' offered by the German railways. The exchange of products between the Netherlands and the United Kingdom tended to be mainly of semi-manufactured metal products, with the Netherlands exporting mainly basic metal products to the United Kingdom, and importing manufactured metals.

Group 6 (crude and manufactured minerals and building materials) showed a preponderance in imports of building materials in 1955, though some sand was exported to the United Kingdom. The increase in building and the replacement of buildings damaged in the war largely account for this dominance of imports, but new projects such as the Botlek area of Rotterdam and damage from the 1953 floods in Zeeland were also factors contributing to the import demand.

It is surprising, when considering group 8, that this commodity-group plays such a minor part in trade flows to and from the United Kingdom. Larkins¹⁸ points out that the chemical industry in the inter-war period was amongst the fastest growing Dutch industries, and this growth was accelerated in the post-war period. Chemical based products as well as starches and glucose were the main trade items within this group in 1955. We can speak of a friction in this trade between the Netherlands (and also Germany) and the United Kingdom resulting in poorly developed trade flows. All three countries were involved in building up their chemical industries, in order to provide sufficient for their home demand without necessitating imports.

Finally, within group 4 there was a small export from the Netherlands of ferruginous earth, found mainly in the northern provinces, but quantities were small and almost worked out in 1955. There was also some import and export (about equal amounts) of scrap.

2.6. Conclusion

To conclude this section, we refer back to the statement on p.10 and must qualify it. Although the total trade figures suggest that Anglo-Dutch trade does not seem typical of total Dutch trade, when examining the commodities involved we can identify many of the changing structural elements within total trade. With the exception of the large import of bulk raw materials such as coal and oil to the Netherlands from outside sources, the Anglo-Dutch trade pattern was fairly typical of total Dutch trade flows; above all due to friction between the United Kingdom and Germany as similar industrial centres, Anglo-Dutch trade shows a large proportion of trade exchanges between the Netherlands and the United Kingdom in 1955, which in turn reflect the changing structure of the Dutch economy. Anglo-Dutch trade in 1955 was dominated by exports, in which the leading commodities were coal, mainly redistributed from the United States, and heavy fuel oil and benzine, and these two commodity-groups also dominated total trade from the Netherlands. Britain sent mainly machinery and transport equipment, and other semi-finished and finished products to the Netherlands, although return flows of these products also took place, reflecting the increasing industrialization of the Netherlands and the recovery of Germany, with an industrial production orientated towards products similar to those manufactured in the United Kingdom.

3. Dutch seaport development in 1955

Fifteen seaports were recorded by the C.B.S. in 1955 for statistical purposes, classified into the following groups: (1) the New Waterway ports (comprising Rotterdam, Schiedam, Vlaardingen, Maassluis, Hoek van Holland, Dordrecht and Zwijndrecht), (2) the North Sea canal ports (Amsterdam, Zaandam, IJmuiden), (3) the northern ports (Delfzijl, Groningen, Harlingen) and (4) the Schelde ports (Vlissingen, Terneuzen and Axel).

3.1. Physical survey

In general, Dutch ports are favoured with a low tidal range, especially at the mouth of the main rivers (Maas, Waal). This varies between 15½ feet at Vlissingen, about 10½ feet at Delfzijl and around 6½ feet at Rotterdam. This means that many of the Dutch ports can have tidal basins, dispensing with the need for the costly construction of lock gates. The main locks in the Netherlands are those that give access to the main shipping canals: at Terneuzen (Gent Canal), at IJmuiden (North Sea Canal), and at Delfzijl (Eems Canal). Rotterdam, situated 18 miles inland, has one of the lowest tidal ranges in the Netherlands, and with its favourable position at the mouth of the Rhine has developed into the most important port in the Dutch range; in 1955 the total trade of Rotterdam was 8½ times as large as its nearest rival, Amsterdam.¹⁹ Before taking a closer look at trade flows via this port it would be useful to look at the position of the port with regard to infrastructure provision in 1955.

3.2. The New Waterway ports in 1955

3.2.1. Rotterdam

The history of Rotterdam's growth has been adequately covered in the literature,²⁰ and only the post-war period will be reviewed here.

Rotterdam was badly damaged during the war, and the port infrastructure was systematically wrecked. By 1949, however, reconstruction was almost completed, and by 1954 seaborne traffic tonnage via Rotterdam exceeded the 1938 figure for the first time. The Rotterdam municipal authority had long recognized the importance of expansion and extension of the port to maintain port-traffic totals, and as early as 1929 work on the first petroleum harbour at Pernis had been undertaken, foreshadowing the rapid growth in the oil traffic through the port, a growth which increased in momentum after the Second World War, leading to the construction of a second petroleum harbour at Pernis where Rotterdam's second oil refinery, Chevron, was located in 1950. Shell also expanded its activities here and by 1955 almost the whole of the Pernis area had been occupied by various industries. Port authorities were anxious to expand industrialization at the port, and thereby to decrease the transit element in the port's trade flows. Consequently a number of proposals existed for the further extension of the port beyond Pernis and one of these, the Botlek plan, was adopted in 1947 and work begun in 1954 to include the construction of a third petroleum harbour able to accommodate ships of up to 80,000 d.w.t. In 1955 this harbour was only partly completed. In this year the demand for land by industries was very high, with many industries joining the 'drift to the coast', Rotterdam featuring as an attractive location. From 1955, therefore, the port authorities began a selection procedure based on an industry's needs for location on a deep-water site.

In 1955 Rotterdam could accept ships up to a maximum size of 45,000 d.w.t. (38 feet draft). The largest basin at this time was the Waalhaven, which functioned as a bulk-handling point for coal, ores and timber.

Other basins, such as the Maas and Rijn Havens, were also involved in bulk transshipment of products such as grain and paper, with some general cargo handling. The older basins such as the Entrepot-haven and the Spoorweghaven were mainly concerned with general cargo. The largest basin in Rotterdam for general cargo in 1955 was the Merwehaven, and the Eemshaven which was completed during the Second World War was also used for this purpose.

In 1955 Rotterdam had one of the best communication networks in the Netherlands. Waterway transport was especially well developed, with the largest barges of the time able to use the Rhine artery for transport between Germany and Rotterdam. Rail traffic has always played a minor role in Rotterdam compared with other European ports such as Antwerp, and although most of the northern part of the port had access to the rail network, traffic to and from the port by rail was relatively underdeveloped. Road transport was of greater importance to the port, but the effects of congestion were already being felt.

Of the industries present in the port in 1955, there were a large number of food industries, e.g. flour, margarine and chocolate, largely for export. Engineering, mainly marine based, was linked to the nine main shipbuilding yards in the port. At Pernis a superphosphate works with related chemical plant formed the basis of the chemical industry. The two main refineries, Shell and Chevron, were also located in this area. In addition, the port provided storage facilities for a variety of bulk products, including oil storage tanks. Breweries, glass and metal works and gasworks were also present in Rotterdam in 1955. At a time of rapid industrialization in the Netherlands, Rotterdam formed one of the main industrial growth centres, so that the industrial



composition at Rotterdam was then in a state of flux. Rotterdam's facilities in 1955, as in the pre-war situation, were still largely geared towards bulk cargo-handling rather than general cargo, although new facilities for the general cargo trades were being provided. Industries there concentrated on the reworking of bulk imports (food processing, fertilizers etc.). The importance of the oil and chemical sectors, which was to dominate the post-war scene in Rotterdam, was already beginning to be felt in 1955. Shipbuilding and engineering on the other hand, faced contraction from increased competition from Japan and elsewhere.

3.2.2. Schiedam and Vlaardingen

The fortunes of the ports of Schiedam and of Vlaardingen have long been closely connected to those of Rotterdam, although the ports are operated by separate authorities. Port functions therefore tend to be complementary rather than in competition with those of Rotterdam. Schiedam was primarily concerned with shipbuilding and repair in 1955, with one of its four harbour-basins privately owned by a ship repair firm, Wilton. Of the municipal basins the Voorhaven handled some general cargo destined for Schiedam, mainly coaster traffic, at the Oude Spuihaven there was a Unilever oil storage depot, and at the Wilhelminahaven, where the New Waterway Shipbuilding Company operated, there was some general cargo-handling by lighters since there were no quay walls.

Vlaardingen had two main harbour-basins in 1955, the Vulcaanhaven, which was privately owned, and the Koningin Wilhelminahaven, which was owned by the municipality. Bulk dry cargo was handled in the Vulcaan-

haven, and general cargo in the Koningin Wilhelminahaven. Edible oils were also stored at the latter basin. A large fertilizer plant with a privately owned jetty was situated on the west side of Vlaardingen; other industries here were a soap works (Unilever) and oil storage facilities.

3.2.3. Maassluis

Further down the New Waterway, Maassluis, also on the north bank, had one tidal basin in 1955, with a depth of 15 feet. At the rear of this basin locks gave access to a canal to Delft. In this small fishing port, there was a small glass factory, the Witol oil refinery (producing light oils for transformers etc.), a rope making works, a small engineering firm and a shipbuilding yard.

3.2.4. Hoek van Holland

The last of the ports directly on the New Waterway, Hoek van Holland, was primarily a passenger port in 1955 with very little cargo handling. Unlike the other New Waterway ports, Hoek van Holland was part of the municipality of Rotterdam, and has been ever since its creation around 1890. Rail connections were excellent and electrified at an early date due to its importance as a passenger ferry terminal. The railway quay was the main berth with handling facilities, and there were in addition various small jetties where some general cargo-handling took place.

3.2.5. Dordrecht and Zwijndrecht

Dordrecht and Zwijndrecht, although separate for statistical purposes, form to all intents and purposes one port, with Zwijndrecht on the north

bank and Dordrecht on the south bank of the Oude Maas river facing each other. Although not strictly on the New Waterway itself, the shortest route to the sea for these two ports (out of several alternatives through the Oosterschelde, Haringvliet or Brouwershaven Gat) was along the Oude Maas and New Waterway, a distance of 26 miles.

Dordrecht has a long history as a port, and has played a key role in Dutch history; it was formerly the second most important port after Amsterdam. In 1955 the maximum size of ships able to enter the port was 8/10,000 d.w.t. The principal basin, sited along the Mallegat, a side arm of the river Oude Maas, was the Zeehaven, specializing in timber-handling although some general cargo was handled here. There were also a large number of smaller basins (Spoorweg, Kalk, Nieuwe, Wolwevers, Riedijks, Bom and Merwede). The majority of these were concerned with barges and small coasters rather than sea-borne trade due to limited depths. The port was owned and exploited by the municipal authority. At Zwijndrecht trade was carried out on quayage alongside the Oude Maas river. Transit trade was an important element for both ports, and the tonnage of goods carried by inland waterways exceeded the trade in sea-ships. Small quantities of a large variety of goods were handled, but raw materials and semi-finished goods predominated.

Dordrecht was traditionally the home of a variety of industries, including in 1955, engineering works, shipbuilding, electrical machinery, glass-works and several chemical plants, one of which was situated at the Zeehaven. At Zwijndrecht there was a large oil-mill owned by Unilever.

Only the Merwede, Spoorweg and Zeehavens were served by rail in 1955, Dordrecht being situated on a main line from the German border via Nijmegen to Rotterdam. Waterway connections were excellent and similar to those of Rotterdam, and Dordrecht lay on the main road from Rotterdam to Antwerp, giving road traffic a north-south orientation, although a

westward connection was under construction.

3.3. The North Sea Canal ports in 1955

Moving on to the second group of ports, the North Sea Canal ports of Amsterdam, Zaandam and IJmuiden, Amsterdam was the largest in the group and the second most important port in the Dutch port range in 1955.

3.3.1. Amsterdam

Like Rotterdam, Amsterdam had also suffered considerable damage to her port equipment and infrastructure during the Second World War, and the period 1945-50 was essentially one of reconstruction. In 1948 work was begun on the extension of the port with an enlargement of the newest basin in the western part of the port, the Westhaven, and the cutting of a new basin, the Sonthaven. In 1949 the Houtveemhaven (now the Mercuriushaven) was constructed, and in 1951 work was begun on the Jan van Riebeeckhaven. As in Rotterdam this post-war extension of the port was aimed at attracting industries to the port. Although Amsterdam was traditionally a centre for port industries, these were mainly of the older type such as food-processing, which were slow-growing or stagnant. Amsterdam, traditionally the centre of colonial trade, lost an important part of this when Indonesia became independent. Bulk goods imported at Amsterdam were destined mainly for the home market, as a result of the limited scope for through traffic to the German hinterland through the Merwede Canal, so that Amsterdam could not compete with Rotterdam in serving German industry.²¹

In 1933, however, an important project had been begun to improve the Merwede Canal and to dig a new canal from Utrecht to Tiel, to form the

Amsterdam-Rhine Canal, able to take the largest European barges. This project was completed in 1952, and gave a noticeable boost to the through transport of bulk products at the port. So during the 1950s Amsterdam was changing from a trade structure dominated by general cargo and specializing in colonial imports to one in which bulk trades with through traffic to the hinterland were predominant, but by 1955 these two elements were more or less in balance. In 1950 general cargo still exceeded bulk.²²

Of the industries present at the port in 1955, engineering was an important contributor, with several large firms specializing in marine engineering, a Ford assembly plant, and electrical machinery production. Other activities were provided mainly by food-processing industries, a sulphuric acid plant, a superphosphate works, a linseed oil mill and a pharmaceutical company. The oil industry was, by comparison with Rotterdam, poorly developed, with a (mainly refined) oil storage depot belonging to Royal Dutch/Shell. The clothing and printing industries were also important. Amsterdam's port industries in 1955 reflected a port structure formerly geared to general cargo handling, whereas Rotterdam's was orientated rather towards bulk handling.

Rail connections were provided to most of the harbour basins, but problems of congestion through the bottleneck of the Central Station resulted in long delays. Nevertheless rail traffic at the port was more important than at Rotterdam because of the limitations of the westward waterways prior to the completion of the Amsterdam-Rhine Canal. Road access to Amsterdam was hampered by an inadequate north-south connection across the North Sea Canal.

3.3.2. Zaandam

Zaandam was the smallest of the North Sea Canal ports. Access was, as at Amsterdam, through the North Sea Canal locks at IJmuiden. Zaandam had two main basins in 1955, the Oude Zeehaven, and the Nieuwe Zeehaven. The Oude Zeehaven, built in 1885, had access to the North Sea Canal through 'side canal G', but problems of limited depth and difficulty of access had led to the construction of the Nieuwe Zeehaven with direct access to the canal in 1911. The port's main activity was the storage and handling of wood, for which Zaandam was traditionally the main centre in the Netherlands. Since the Second World War there had been a marked decline in the timber trade through the port, as a result of limited depths, and imports of Scandinavian timber through the northern ports, and in 1955 the Nieuwe Zeehaven was almost unused, and much of the terrain was sold off. The decline in the timber trade was not the only reason for this, as the Nieuwe Zeehaven had been unfortunately sited at the time of construction, unprotected from rough water whipped up by westerly winds.

The maximum size of ships entering the port of Zaandam in 1955 was 10,000 tons. Most of the trade of the port was connected with local industries, especially saw-milling and woodworking, the major industries of Zaandam, and other industries such as oil-seed crushing, vegetable oil refining, and cocoa manufacture, with some engineering. Most of the cargoes were inward moving. Road, rail and waterway connections were linked with those of Amsterdam and therefore shared the same conditions.

3.3.3. IJmuiden

IJmuiden, one of the most recent of the Dutch ports, was completed at the entrance of the North Sea Canal in 1876. In 1955 two dominating

elements in the port's structure could be identified: the fishing industry (IJmuiden was then one of the largest fishing ports in Europe) and heavy industry based on the Royal Dutch Iron and Steelworks. From its earliest years, and especially since the opening of blast furnaces and steelworks in the 1920s, the trade of this port had been almost entirely concerned with the movement of bulk products for its industries.

On the southern bank of the North Sea Canal entrance there were two basins concerned with the fishing industry, the Haringhaven and the Vissershaven, both tidal and accessible to ships up to 1,200 d.w.t. Only the Vissershaven had quayage, and here were the only warehouses in the port. The fish canneries, fish meal factories, refrigerating plants and a soap works operating at IJmuiden in 1955 were all connected with the fishing industry. On the north bank of the North Sea Canal the Hoogovenhaven directed most of its activities to the requirements of the blast furnaces of the K.N.H.S. (Koninklijke Nederlandsche Hoogovens en Staalfabrieken), and its iron-ore and coal-handling facilities were owned and exploited by the company.

In the inner harbour behind the main lock gates most of the basins were completed prior to the Second World War, and were hence of relatively recent construction in 1955. All these basins were situated on the north bank of the canal. The Staalhaven was served primarily by barges and small coasters, in a trade related to the steelworks located there. The Westelijke Rijksbinnenhaven was also served mainly by barge traffic, quayage being owned and exploited by the cement and ammonia works situated there. The Oostelijke Binnenhaven serves a foundry and power station. In addition, the largest paper mill in the Netherlands (Van Gelder) had its own wharfage along the side of the North Sea Canal at IJmuiden, where it

had earlier moved from Zaandam.

Most of the other industries at IJmuiden in 1955 were connected or related to the activities of K.N.S.M. The ammonia plant, for instance, processed coal gas, a by-product of the coking plant. There was also a nitrogenous fertilizer plant, using coke-oven gas as a source of hydrogen. Most of the heavy industries here were established soon after the location of the iron and steel works in the late 1920s and early 1930s. The paper mill, however, had been operating here from 1895.

In 1955 some of the largest vessels of the time could reach IJmuiden, through moorings in the outer harbour (30,000 d.w.t.). The Hoogovenhaven and the fishing basins were served by railway track, with both rail and road connections to the port via Haarlem and Amsterdam.

3.4. The northern ports

3.4.1. Groningen

Of the northern ports, Groningen was the smallest, with its sea connection at Delfzijl via the Eems Canal (a distance of 15 miles). In 1955 loading and discharging took place alongside the Eems Canal at the Oosterhaven. Only small ships could unload here, up to a maximum of 800 d.w.t. Sea-ships calling at the port served mainly the industries there, timber (the furniture industry), pharmaceutical products, superphosphates and chemicals. Groningen was also a centre for the predominantly agricultural north eastern region of the Netherlands and as such agricultural products were the main exports. It was therefore a local rather than national port. In 1954 work was begun on deepening and improving the Eems Canal, to enable larger ships to enter the port, and a start was made on the excavation of several new basins at Groningen.

3.4.2. Delfzijl

Delfzijl also served a predominantly agricultural hinterland, shared with the port of Groningen, but it was not limited by canal access, and its Scandinavian trade also provided a national rather than a local connection.

The depth of the channels in the Eems estuary allowed ships up to 10,000 d.w.t. to enter the port, although these could only be accommodated in the outer tidal part of the port, on the western side near the entrance (the Handelshaven), with only a limited capacity for vessels. On the eastern side of the outer harbour (formerly the Balkenhaven, used for the transshipment of wood from sea-ships into barges) the pier was being lengthened in an easterly direction in 1955, to enclose the new sluices and entrance to the Eemshaven Canal under construction. The extension in an easterly direction was also a result of the salt finds around Winschoten in the early 1950s, and the interest shown by the salt industry in setting up a processing factory (soda) at Delfzijl. Since there was no terrain available for this type of industry, which needed access to open water for imports and exports, an extension was vital if the industry was to be located here.

In the inner port behind the (old) locks of the Eems Canal the Houthaven and Het Dok were mainly barge basins. Most of the facilities for sea-ships were situated at the Handelshaven in the outer port, with warehouses, rail connections and installation for handling general cargo and wood. Of the industries present in the port in 1955, two shipbuilding yards and associated engineering works, and several saw mills deserve mention. Trade was orientated especially toward the middle distant hinterland of the port, with connections with the paper industry in the Veluwe area of the Netherlands and the agricultural northern and eastern

provinces. The communications network of the port, waterway, rail and road, were centred on the town of Groningen.

3.4.3. Harlingen

Harlingen, in the province of Friesland, has a structure often compared with that of Delfzijl.²³ Harlingen, however, is a port whose fortunes were on the decline in 1955, whereas those of Delfzijl were on the increase. The trade structures of the ports had formerly been similar in that the same type of imports and exports were handled at the two ports. Harlingen had been a fishing centre of some note in the previous century, but only a remnant of this was left in 1955. Only small vessels up to 1,500 tons could enter the port in 1955, and the possibilities of deepening the access to the port between the islands of Vlieland and Terschelling were limited. The port had an outer section consisting of the tidal basins of the Nieuwe Voorhaven (only recently completed in 1955 with improvements to the Harinxma Canal), the Nieuwe and Oude Willemshaven (called Het Dok), and the Buitenhaven. The inner port behind the sluice gates of the Harinxma Canal consisted of the Noorder and Zuider Havens, used only by barges and small fishing vessels. Most of the cargo for the port was discharged at the Nieuwe and Oude Willemshavens, where the various liner services serving the port were based. At the port itself there were no industries. In the town, port-related activities included saw-milling and fish-preserving, and a gas works using imported coal. The agricultural hinterland of Friesland and the brick-making industry of the interior made use of the port. Harlingen was essentially a port serving the immediate rather than the national hinterland in 1955, although due to its regular trading connections in the pre-war era, it also had a national function.

3.5 The Schelde ports

The final group of ports in this survey of the Dutch ports and their structure in 1955 are the Schelde ports, Terneuzen and Vlissingen.

3.5.1. Terneuzen

Terneuzen, on the south bank, is unusual in that it has an isolated position with regard to the rest of the Netherlands, being close to the Belgian border which separates the area of Zeeuws Vlaanderen from the Netherlands to the east. Road traffic wishing to avoid crossing the Belgian frontier must make use of a ferry across the River Schelde when travelling between this area and the rest of the Netherlands, whereas rail connections to the port of Terneuzen are linked to the Belgian network. The main transport artery for Terneuzen is the Ghent-Terneuzen Canal, so that the hinterland of this port is Northern Belgium. In 1955 Terneuzen was accessible to ships up to 20,000 d.w.t. in the western tidal outer harbour, which also leads to the main canal lock of the Ghent-Terneuzen Canal (the West Lock). There was also an eastern outer port leading to the Middle and Eastern Locks. In the inner harbour along the side of the canal the main basins in 1955 were the Noorder and the Zuider Kanaalhavens, equipped for handling mainly bulk cargoes. Further south along the Ghent-Terneuzen canal at Sluiskil, near the Belgian border, there were a number of industries including a coke oven and a fertilizer (ammonia) plant handling bulk cargoes for their own use with quayage privately owned. At Sas van Gent there was a flour mill, a sugar-processing plant and a glass factory. The presence of these industries gave Terneuzen's trade a large bulk-importing element, with exports of re-worked bulk products. At Terneuzen itself there was an electricity station (coal fired) and a small gasworks as well as several shipbuilding yards. Most

of the transit trade of the port was destined for Ghent. Terneuzen therefore fulfilled a role as a local port serving its industries rather than as a national port, but it also had an international function in serving as an entry port for Ghent and Northern Belgium.

3.5.2. Vlissingen

Vlissingen, on the northern bank of the river Schelde, was able in 1955 to admit some of the largest vessels of the time due to deep water at the entrance of the Schelde. The main basin was the Buitenhaven, with a deep water quay on the western side. An important function of the port was the bunkering of sea-ships, accounting for the bulk of the trade figures of the port, the Steenkool-Handels Vereniging having opened a coal bunkering station here in 1927, and an oil bunkering station in 1934 on the eastern side of the Buitenhaven. General cargo was handled at the deep water quay of the Buitenhaven, which was owned and operated by the N.V. Haven van Vlissingen (a consortium of users and the local council). Vlissingen served the mainly agricultural hinterland of the province of Zeeland, and agricultural products formed the main exports in 1955. Vlissingen had also sustained extensive damage in the Second World War, and trade had suffered a decline since the pre-war era due to the demise of the S.M.Z. (Stoomboot Maatschappij Zeeland) liner services. The first and second Binnenhavens and Het Dok formed the inner harbour, accessible through lock gates and used by small sea-going vessels and barges. The Eerste Binnenhaven was used mainly by naval vessels, whereas the Tweede Binnenhaven handled some general cargo. In the west, Het Dok was the site of one of the largest shipbuilding concerns in the Netherlands, the Koninklijke Maatschappij De Schelde. Shipbuilding and related engineering were the main industries at the

port in 1955. Plans were already underway for the possible development of the Sloe area, a piece of land to the east of Vlissingen, which was flooded during the floods of 1953, to meet the 'De Schelde' company's needs for exports, which could not be met in the old port. Vlissingen had excellent rail connections with the rest of the Netherlands, and road connections were also adequate. Waterway connections through the Walcheren Canal to the rest of Zeeland were of limited importance.

4.0. Trade flows through the Dutch port range in 1955

Before taking a closer look at the trade of each port in the Dutch port range in 1955, it is useful to point out certain important facts from the above appraisal of port facilities in that year. Firstly, many of the ports were engaged in, or about to engage in, important expansion projects. In the post-war period existing port facilities at many ports were inadequate to meet the new demands from increased trade, trade which was changing its orientation towards increasing imports of bulk raw materials. The increasing size of sea-ships also meant a demand for new facilities, although the main growth in ship size was still to come, especially after the closing of the Suez Canal (1956-7), bringing the demand for large tankers travelling long distances around the Cape. Ports and shipping are two inseparable commodities. The awareness of one to the need of the other is crucial, especially in the less flexible unit, the port, which must adapt its facilities to the needs of the sea-ship in order to maintain its competitive position. It seems that most of the Dutch ports, especially Rotterdam with its ambitious plans for the Botlek area, soon to be supplemented by the even more ambitious Europoort project, showed this essential state of awareness of the changing needs in 1955. However, these were not the only factors to be considered in assessing the many projects for port expansion in the mid-

1950s in the Netherlands; the industrial expansion of the country, proceeding at a rapid pace, was often centred on the seaports, so that expansion was a result not only of external pressures, but also of internal forces necessitating the construction of new facilities and the adaptation of existing ones. Where these pressures were less, as at Harlingen, this expansion was less likely to occur.

4.1. The total trade structure and commodity composition of the Dutch ports in 1955

In order to assess the importance of flows to and from the United Kingdom for each port individually, it is first useful to examine the total flows and commodities involved, and then move on to an appraisal of the position of the United Kingdom trade within these total flows.

Table 5 (below) shows the import/export relationship for each port in the Dutch port range in 1955.

Port	Import	Export	import dominates
Rotterdam	68	32	+
Schiedam	5	95	
Vlaardingen	85	15	+
Maassluis	13	87	
Hoek van Holland	8	92	
Dordrecht	95	5	+
Zwijndrecht	31	69	
Amsterdam	62	38	+
IJmuiden	83	17	+
Zaandam	94	6	+
Delfzijl	43	57	
Groningen	68	32	+
Harlingen	20	80	
Terneuzen (and Axel)	58	42	+
Vlissingen	47	53	
Average	52	48	+

Table 5. The trade of the Dutch ports in 1955; percentage share of imports and exports.

In view of what was earlier stated on import dominance in Dutch trade, it seems surprising that only eight out of the fifteen Dutch ports show an import dominated trade structure, although these include the largest ports and hence the bulk of trade flows. Those where export dominated most were small regional ports, with the exception of Vlissingen which had a specialist activity (bunkering) and Delfzijl; both these ports show a fairly evenly balanced trade. In two ports there was very little export, Zaandam and Dordrecht, whose imports were dominated by wood and wood products.

Table 6 (below) shows the percentage distribution of trade over the fifteen Dutch ports in 1955.

Port	% of total trade of range	imports	exports
Rotterdam	80.6	80.5	80.9
Schiedam	0.1	0.01	0.4
Vlaardingen	3.2	4.0	1.5
Maassluis	0.07	0.01	0.2
Hoek van Holland	0.1	0.01	0.3
Dordrecht	1.5	2.07	0.2
Zwijndrecht	0.05	0.02	0.1
Amsterdam	9.4	8.5	11.5
IJmuiden	2.4	2.9	1.3
Zaandam	0.3	0.4	0.06
Delfzijl	0.4	0.2	0.6
Groningen	0.06	0.06	0.06
Harlingen	0.2	0.05	0.06
Terneuzen and Axel	0.6	0.5	0.9
Vlissingen	0.8	0.6	1.4

Table 6. Percentage share of total (sea-borne) cargo of the Dutch ports in the range in 1955.

The most striking feature of the range is the overwhelming dominance of Rotterdam in the total cargo figures, and as many as nine small ports with a share of trade in 1955 of under 1%. This pattern of high concentration of cargo in few ports emerges, with Rotterdam as the dominant element in the Dutch port system in 1955. Amsterdam was the second port in terms of weight of cargo handled, followed by Vlaardingen, IJmuiden and Dordrecht. Together these five ports accounted for no less than 97% of all Dutch sea-borne trade in 1955.

Taking a closer look at the commodities involved in the ports' trade, it would also be useful to determine the main forelands involved in this trade in order to build up a picture of each port's trading connections in the year 1955.

4.1.1 Trade flows and commodity structure of the North Sea Canal ports in 1955.

4.1.1.1. Amsterdam

At Amsterdam, where imports exceeded exports, the main import was coal, imported from the United States and Britain, and the transit by sea of American coal was an important element in its trade in 1955. Oil products formed the second most important import, coming from Venezuela, the Netherlands Antilles, and the United States. Ores were third on the list, imported mainly from Sweden, Canada, Spain and Indonesia. Wood imports were from Scandinavian countries and Africa. Other imports of note were grains, mainly from Canada and the United States, oil-seeds from African countries, and phosphates from the U.S.S.R. and N. Africa. Finished goods such as iron and steel products and chemicals played only a minor role in the total import of Amsterdam.

4.1.1.3 IJmuiden

Imports also predominated at this port, consisting mainly of ores, especially iron ore from Spain, Algeria and Liberia. Coal, used for the blast furnaces, was also a major import, with the United States as the main supplier. Wood-pulp for the paper industry was imported from Scandinavia. The only exports of note were iron and steel products, mainly semi-finished, exported to the United Kingdom and Scandinavia. There was virtually no transit trade at this port, so that in 1955 IJmuiden was, like Zaandam, essentially providing local industries at the port.

4.1.2. Trade flows and commodity structure of the New Waterway ports

4.1.2.1. Rotterdam

Of the New Waterway ports, Rotterdam's commodity structure in 1955 was dominated by the import of crude oil from Venezuela and the Middle East, followed by coal and coke from the United States and by oil products imported from the Netherlands Antilles, the United Kingdom, and a large number of other countries. Ores were also important, most of which were destined for transit to West Germany from Scandinavia and other countries. There was also a considerable import of grains, especially maize from the United States and Argentina, wheat from the United States and Canada, and oats from the United States. The least important import to Rotterdam was fertilizers (group 7); this, however, was the third largest export from Rotterdam, after oil products and the transit of coal. Oil products, the main export, were produced largely in the local refineries and belong therefore to direct export rather than transit trade. Exports of oil products were twice the size of imports, and the United Kingdom and Scandinavia were the main destinations. The re-export of crude oil by sea and the export of iron ore played a very minor role in the export

structure of Rotterdam. Coal was re-exported by sea to the United Kingdom and Italy. Other important exports were raw minerals (stone, salt, etc.) to Scandinavia and other destinations, and animal and vegetable oils and fats to the United Kingdom, West Germany and elsewhere. It will be appreciated that the above is only a brief description of Rotterdam's trade, since a large variety of other commodities were also involved in trade flows. In all the principal commodity groups, the volume of goods handled in Rotterdam exceeded the totals of other ports in the Dutch port range, although, unlike Amsterdam, there was a very large transit trade especially in bulk commodities which dominated the trade structure. Coal and iron ore were some of the principal commodities involved in transit in 1955 to West Germany. It is interesting to note that in 1955 crude oil was listed as a major commodity only for Rotterdam, and not for the other Dutch ports; this indicates an early monopoly in this commodity due to the oil refineries situated at Rotterdam. Of Rotterdam's trading partners in 1955, the United States, Scandinavia and the United Kingdom were among the most important.

4.1.2.2. Schiedam

The figures for Schiedam show the predominance of exports in its trade pattern of 1955. The main export was bunker materials and ship's provisions, with a small export of transport equipment. Imports were mainly of transport material, and refined oil products (from Panama) used for bunker material.

4.1.2.3. Vlaardingen

There was a predominance of imports at this port, of which ores were the major commodity, mainly destined for through transport to West Germany.

These ores came from Canada, Scandinavia and northern Africa (mainly iron ore). Raw phosphate was also a major import, destined for the local fertilizer factory. Oil products were imported from the United Kingdom, West Germany and the U.S.S.R. and from the Netherlands Antilles, oils and fats (vegetable and animal) from the United States, along with coal and coke, mainly for through transport. The main export was of fertilizers from local industry, products going to a variety of destinations. Oils and fats were exported to the U.S.S.R., the United Kingdom and West Germany, and raw mineral products to the Netherlands Antilles. So Vlaardingen's trade in 1955 was dominated by bulk dry cargoes, mainly ores and fertilizers. There was a large element of through transport of bulk products to the German hinterland, a function of the specialized handling facilities available in the port and Vlaardingen's favoured position along the New Waterway with easy access to the Rhine. Other trade at the port was associated with the activities of local industries. Very little general cargo was handled here.

4.1.2.4. Maassluis

Maassluis, one of the smallest ports along the New Waterway, was mainly an exporting outlet in 1955. Agricultural products formed the major category, with fresh vegetables and potatoes exported to the United Kingdom. The trade of Maassluis was mainly locally directed to the immediate agricultural hinterland of the 'Westland' area of the Netherlands.

4.1.2.5. Hoek van Holland

Exports also dominated the trade of Hoek van Holland, serving the same agricultural hinterland as Maassluis, with vegetables and fruit exported

to the United Kingdom, some of which was a re-export from Rotterdam by rail to the Hoek for rapid transport to the United Kingdom. Bunkering materials for ships formed the rest of the imports. A small number of machines were imported from the United Kingdom.

4.1.2.6. Dordrecht

Further inland at Dordrecht imports predominated. There was a considerable import of iron ore (mainly for through transit by barge to Germany) from Scandinavia, Spain and northern Africa. Wood was imported from the U.S.S.R. for use in local industries, and oil products also came mainly from the U.S.S.R., and the United Kingdom.

A variety of lesser commodities were imported. There was virtually no direct export by sea-ship from Dordrecht in 1955, but some transit of raw mineral products outwards took place, mainly of salt to Scandinavia.

4.1.2.7. Zwijndrecht

Zwijndrecht was an export oriented port in 1955, shipping animal feedstuffs to West Germany and Scandinavia; oils and fats (products of local industry) were also exported to West Germany. Wood from Scandinavia formed the main import, together with oils and fats from the United Kingdom to serve the Unilever plant.

4.1.3. The northern ports

4.1.3.1. Groningen

Groningen was the only port in this group to show a predominance of imports, which were twice the size of its exports. The main import commodity was wood and wood products, coming from Scandinavia and the U.S.S.R. The only other import of note was oats from the United Kingdom and Sweden.

Exports consisted largely of locally produced starch (from potatoes) which went to the United Kingdom, and grain exported to Scandinavia. Groningen's trade in 1955 had declined by 50% since the pre-war years, and the trade structure had also altered, being dominated by exports in the pre-war era. Most of the trade of the port was destined for industries in Groningen and the immediate hinterland.

4.1.3.2. Delfzijl.

At Delfzijl some transit trade took place by sea, mainly of fertilizers. Trade was fairly evenly balanced here in 1955, with exports slightly exceeding imports. The main commodities exported were raw minerals (largely salt) to Scandinavia, and paper and cardboard to the United Kingdom. Potatoes and starch were also exported to the United Kingdom, along with a small amount of ferruginous earth. The main imports were of Scandinavian wood, and of coal from the United Kingdom and the United States. Imports of fertilizers came from Chile.

4.1.3.3. Harlingen

Exports also exceeded imports at this port, the main export being paper and cardboard to the United Kingdom, with agricultural products (dairy produce, meat and potatoes) going to the same destination forming the bulk of the remaining export. Imports of wood from Scandinavia and a small amount of coal from the United Kingdom made up the rest of Harlingen's trade.

4.1.4. The Schelde ports

Terneuzen and Axel was import dominated, whereas Vlissingen showed a predominance of exports in its trade. The trade of both ports was, however, fairly evenly balanced.

4.1.4.1. Terneuzen

Terneuzen imported mainly dry bulk cargo products, in particular ores from Spain and Greece, and coal from the United States. A small amount of fertilizer was imported from Chile. Coke was exported to Scandinavia and artificial fertilizers to a variety of destinations. Terneuzen was therefore characterized by its bulk imports of raw materials for its heavy industries. There was also some transit to Belgium (Ghent), mainly of coal.

4.1.4.2. Vlissingen

Vlissingen's trade in 1955 was dominated by exports arising out of its dealings in bunkering materials, the greater part of which was for Scandinavian and British ships. The main imports at Vlissingen in 1955 were also connected with this bunkering trade, including oil products from the Netherlands Antilles and the Middle East, and coal.

4.1.5. Conclusion

In general, imports of coal, oil and oil products formed some of the main activities of the Dutch ports, and agricultural produce formed an important export for the smaller ports. The United States, Scandinavia and the Middle East provided some of the main trading partners for the larger ports especially, whereas the United Kingdom was an important trading partner for the smaller ports in 1955.

5.0 Trade flows from the Dutch ports to the United Kingdom in 1955.

In this final section the intention is to take a closer look at each port's share in the Anglo-Dutch trade in 1955, in relation to the total trade of the ports, and with regard to the type of commodities involved in the trade.

5.1. Comparison of total and United Kingdom trade for the Dutch ports in 1955.

Table 7 shows the total (sea-borne) trade figures of the Dutch ports in 1955 in relation to the total flow of Anglo-Dutch trade in that year.

Port	Total trade	U.K. trade	(weight in 1,000 tons)		
			U.K. trade as % total (dependency figure)	50%+	10%+
Rotterdam	66214.7	8981.3	13.6		+
Schiedam	119.2	1.3	1.1		
Vlaardingen	2639.7	94.8	3.6		
Maassluis	62.2	50.7	81.5	+	+
Hoek van Holland	97.1	52.5	54.1	+	+
Dordrecht	1232.1	70.3	0.06		
Zwijndrecht	45.0	11.3	25.1		+
Amsterdam	7760.0	1071.6	13.8		+
IJmuiden	1973.6	197.4	10.0		+
Zaandam	264.1	5.2	2.0		
Groningen	53.3	3.4	6.4		
Delfzijl	296.4	126.1	42.5		+
Harlingen	140.0	115.7	82.6	+	+
Terneuzen and Axel	537.0	73.9	13.8		+
Vlissingen	668.7	8.9	1.3		

Table 7. Trade flows in 1955 of the Dutch ports in relation to trade flows to the United Kingdom from each port, calculated from: Maandstatistiek voor de zeevaart en van het havenverkeer, January-December 1955.

Harlingen showed the highest dependency figure on trade to the United Kingdom in 1955 (82.6%). Maassluis also showed a high dependency on trade with the United Kingdom, whilst Hoek van Holland was the only other port in 1955 with over half its trade with the United Kingdom, Delfzijl having just under half. The ports where Anglo-Dutch trade was least significant were the ports of Vlissingen, Zaandam and Schiedam, with dependency figures of 1-2%.

The majority of Dutch ports, nine in all (including Amsterdam and Rotterdam), showed in 1955 a trade flow of 10% or more with the United Kingdom. In general, therefore most ports showed a relatively weak dependence on Anglo-Dutch trade in 1955, with the two largest ports of Rotterdam and Amsterdam handling the largest volume.

We have already seen that imports dominated total Dutch trade, whereas exports dominated in the trade with the United Kingdom. The following table shows the relationship of imports to exports in Anglo-Dutch trade at each of the ports.

Port	Import	Export	Import dominated
Rotterdam	20	80	
Schiedam	98	2	+
Vlaardingen	53	47	+
Maassluis	8	92	
Hoek van Holland	17	83	
Dordrecht	85	15	+
Zwijndrecht	89	11	+
Amsterdam	64	36	+
IJmuiden	22	78	
Zaandam	11	89	
Delfzijl	25	75	
Groningen	46	54	
Harlingen	11	89	
Terneuzen and Axel	82	18	+
Vlissingen	73	27	+

Table 8. Percentage of imports and exports in the trade with the United Kingdom of the Dutch ports in 1955, calculated from figures in: Maandstatistiek van de zeevaart en van het havenverkeer, Jan-Dec. 1955 (taken to nearest 1%)

Only Terneuzen, Amsterdam, Dordrecht and Vlaardingen showed an import/export relationship similar to that of their total trade structure. At Rotterdam, exports were greater than imports, the reverse of the situation in total trade. Schiedam's trade pattern with the United Kingdom also shows an import/export structure the opposite of that for total trade, although it must be borne in mind that Schiedam also had a very low dependency on trade with the United Kingdom. Vlaardingen's dependency on imports for total trade was higher than that for United Kingdom trade. The dominance of export over import flows between Maassluis and the United Kingdom is even greater than in its total trade (Table 5), which is consistent with this port's high dependency on trade with the United Kingdom. Hoek van Holland also showed a high dependency on trade with the United Kingdom, and its import/export mix resembled that of total trade of the port, with export dominating. The structure of Dordrecht's trade with the United Kingdom was also similar to that of its total trade, with imports predominating, but Zwijndrecht had a reverse structure for this trade, with imports rather than exports predominant. Amsterdam, with a low dependency figure, showed a remarkable similarity between the import/export mix in its total and its United Kingdom trade, suggesting that Amsterdam's trade with the United Kingdom in 1955 was closely related to its facilities and structure. This will be explored more fully when a closer look is taken at the commodities involved. Zaandam and IJmuiden had import/export relations with the United Kingdom that contradicted their total trade flows.

Of the northern ports, Harlingen showed a close relationship between its total structure and that of its trade with the United Kingdom. This, too, was to be expected, due to the high dependency ratio of the port on this trade. Groningen, with a low dependency figure, showed a trade flow

with the United Kingdom that ran counter to its total trade, whereas Delfzijl, where trade with the United Kingdom was important, showed exports dominating in both its total and United Kingdom trade.

Among the Schelde ports, the dominance of United Kingdom imports at Terneuzen is the more striking in view of the very slight preponderance of imports over exports in its total trade. Vlissingen, with a low dependency figure on trade with the United Kingdom, showed imports predominating in its trade with the United Kingdom in 1955, whereas in total trade exports predominated. In general then, ports with a low dependency on trade with the United Kingdom showed a trade structure running counter to that of total trade. For ports with a high dependency on trade with the United Kingdom the import/export mix tended to be similar to that of total trade. There were some exceptions to this, as at Amsterdam, where the dependency figure was fairly low and where the structure of trade with the United Kingdom was very similar to that of its trade; this suggests a stable commodity flow closely related to port activity.

5.2. Commodities involved in Anglo-Dutch trade through the ports in 1955.

To examine these statements in greater detail, and to map out the relationship of the Dutch ports with the United Kingdom in 1955, it is necessary to take a closer look at the commodities involved, for which the N.S.T.R. commodity groups are again used (see p.14). Here an attempt will be made to compare the commodities involved in the United Kingdom trade with those of total trade of the ports.

5.2.1. The New Waterway ports.

5.2.1.1. Rotterdam

Rotterdam's main imports from the United Kingdom in 1955 were, in

descending order of importance, group 3, mainly fuel oils and diesel oil, group 2 (mainly coal), group 5 (rolled products and tubes and pipes) and group 9 (machinery and transport equipment). Foodstuffs were also imported, mainly refined sugar, indicating the re-worked export of colonial products from the United Kingdom. Fertilizers, group 7, formed the only commodity totally absent from Rotterdam's imports, and the import of group 4 (ores) was very small.

If we compare this with the overall commodity import of Rotterdam (p. 43) the most important commodity in United Kingdom import was only third on the list for total imports (group 3). The import of group 2 corresponds with the total import pattern in sharing second place in importance. Ores, the third most important commodity in Rotterdam's overall import, were only of minor importance in the United Kingdom trade. Fertilizers were an unimportant element as they were also in the total trade. Imports from the United Kingdom were much more orientated towards semi-finished and finished products than total trade flows, although bulk products were still an important item, especially coal. Refined oil products (group 3) and metal products (mainly finished) and machinery (groups 5 and 9) formed the major items in these flows. Exports to the United Kingdom from Rotterdam were dominated by the same groups as imports, group 2 being the most important (coal), re-exported to the United Kingdom from the United States. Oil products (group 3) were the next most important export, mainly kerosene and fuel oil from the Rotterdam refineries. Coal exports to the United Kingdom were more than eight times the size of imports of coal from there, and exports of oil products were twice the size of imports. Groups 1 and 0, were also important in Rotterdam's export trade to the United Kingdom in 1955. Group 9 also deserves mention, although the major export in this

group was of bunker material. As in their imports, the exports of fertilizers and ores (group 7 and 4) were of very minor importance. Of Rotterdam's total exports in 1955, oil products comprised the largest export, with coal in second place. For trade to the United Kingdom this was reversed, with coal the most important export followed by oil products. Fertilizers were relatively important in Rotterdam's export, but not to the United Kingdom. However, in terms of the main commodities involved in Rotterdam's general trade with the United Kingdom in 1955, this resembled the structure of its total trade in that bulk commodities predominated, though coal was the leading commodity in the former and oil and oil products in the latter.

5.2.1.2. Schiedam.

Schiedam, of little importance for trade to the United Kingdom, showed group 9 (mainly bunker material) as the major export. Import to the port was mainly of transport equipment and machinery (also group 9) from the United Kingdom. Exports, also mainly bunker materials, predominated in the total trade of Schiedam, and imports were mainly of transport equipment. It must be borne in mind that the trade figures in table 7 exclude bunker material, whereas this is included in the commodity statistics, so that the trade links of Schiedam with the United Kingdom are underestimated.

5.2.1.3. Vlaardingen

Vlaardingen also had a weak dependence on the United Kingdom for its trade in 1955. Imports and exports to the United Kingdom were fairly evenly balanced. The main import was of group 2 (solid fuels, coal and coke). Group 3 (oil products) were also important, and the main import

from the United Kingdom was of diesel oil. Of lesser importance were group 1 (animal feedstuffs and prepared foods), mainly oils and fats, and group 6. If we compare this with total imports to Vlaardingen, ores, Vlaardingen's main import, played no role at all in import from the United Kingdom (group 4). Oil products and fertilizers (groups 3 and 7) were also important commodities in total imports, but whereas the former was important in trade from the United Kingdom, the latter played no part in this trade in 1955. Vlaardingen's imports from the United Kingdom therefore bore little resemblance to the total import patterns for the port. Group 1 was the major export to the United Kingdom, mainly oils and fats. Of lesser importance was the export (re-distribution) of group 4 (mainly iron ores) and of group 9, comprised, as at Schiedam, largely of bunker material for British ships. In total exports the main commodities were fertilizers and oil products, which were not represented in trade to the United Kingdom in 1955, and oils and fats which were. Only a small part of the port's total trade, in 1955 was with the United Kingdom, and the structure of the latter was not representative of the pattern for total trade.

5.2.1.4. Maassluis

A large percentage of Maassluis's trade was with the United Kingdom so that a close correlation between the commodities involved in the port's total trade and its United Kingdom trade is to be expected. Imports were mainly group 9, and consisted of transport materials (mainly tractors and other farm equipment), the largest import of Maassluis in 1955. Exports predominated, group 0 (agricultural produce, especially potatoes and fresh vegetables) being the major commodity involved. This was similar to the structure of total exports from the port so that, as expected,

Maassluis had a commodity structure for total trade closely resembling that of its trade with the United Kingdom, due to its high dependency on trade with that country.

5.2.1.5 Hoek van Holland.

Hoek van Holland also had a high dependency on trade with the United Kingdom, so that again total flows of commodities resembled flows to the United Kingdom. Group 9, mainly machinery, formed the main imports from the United Kingdom in 1955, with a small import of group 1 (fish). Exports to the United Kingdom, which exceeded imports, were mainly of group 9, machinery and bunker materials, and groups 0 and 1 (agricultural products, mainly vegetables and fruit).

5.2.1.6. Dordrecht.

Dordrecht imported mainly group 6 (crude minerals and building materials) from the United Kingdom, the rest of the imports consisting of group 4 (ores and metals), most of which was iron ore. Small amounts of chemicals, coal and other goods were imported. Group 4, ores, predominated in Dordrecht's total trade in 1955, mainly destined for through transport to Germany. Wood and oil were the other main imports, which did not come from the United Kingdom. The main imports from the United Kingdom were only of minor importance for total imports. Exports were mainly of groups 0 and 1 (agricultural products), with prepared meat and vegetable products being the main items for export to the United Kingdom. There was also some export of chemical products, mainly re-exported from the United States. Agricultural produce played only a very minor role in total exports, whereas ores and crude mineral products, the main exports of Dordrecht in 1955, were not part of its export to the United Kingdom. Dordrecht's

trade, with a low dependency on trade with the United Kingdom, therefore showed a total trade structure different from that of its trade structure with the United Kingdom.

5.2.1.7. Zwijndrecht.

Zwijndrecht imported wood from Scandinavia as its main import, and oils and fats (group 1), which was the main import from the United Kingdom.

Other imports from the United Kingdom were group 5, tubes and pipes for use in local engineering industries, and a small amount of oils and fats, products of the Unilever plant. Unlike Dordrecht's trade, which was mainly transit, trade at Zwijndrecht was destined mainly for local industries and this was also true of trade with the United Kingdom.

Import trade showed a structure similar to that of total trade, with the exception of wood. The main export of the port was animal feedstuffs, which were not exported to the United Kingdom. Despite a relatively high dependency figure total trade and United Kingdom trade showed diverging commodity structures.

5.2.2. The North Sea Canal ports.

The North Sea Canal ports showed a fairly low dependency on trade to and from the United Kingdom in 1955.

5.2.2.1. Amsterdam.

Amsterdam imported mainly solid fuels (group 2) from the United Kingdom, and crude minerals (group 6). Imports of groups 8 and 9 (chemicals and other finished articles), mainly basic chemical products and transport equipment and machinery were also of some note. The remainder of imports from the United Kingdom were finished and semi-finished items, such as

rolled metal products and oil products, and a variety of other items. In total trade flows, group 2 formed the major import; however, ores, the second most important total import, formed only a very minor part of trade with the United Kingdom. Raw minerals, an important import from the United Kingdom, formed only a minor element in total imports. Wood and wood products were also important in the total import of Amsterdam in 1955, but they did not figure in imports from the United Kingdom. Exports to the United Kingdom from Amsterdam were predominantly in groups 1 and 0, agricultural produce and colonial products. Meat preserves, cocoa and chocolate, spices and animal feedstuffs formed some of the main items. The other main export to the United Kingdom was in group 9, a variety of manufactured items, group 8, chemical products, and 2, coal.

In total exports from Amsterdam, agricultural products were relatively unimportant. Coal and coke, the main export items, were only of minor importance in exports to the United Kingdom. Fertilizers and raw mineral products (groups 6 and 7) likewise played a very minor role, whereas these products were important for total trade. The structure of Amsterdam's trade with the United Kingdom in 1955 bore little resemblance to total trade in terms of commodity flows, so that despite the resemblance between import/export structures mentioned earlier, Amsterdam's trade with the United Kingdom diverged from that of total trade. For total trade bulk commodities were more important, whereas for United Kingdom trade general cargo still featured more predominantly.

5.2.2.2. Zaandam.

Zaandam's trade with the United Kingdom was very small in 1955. Very little was imported, and the main export was group 8, chemical products,

mainly starches from the surrounding agricultural area. Import of wood was the main activity in the total trade of the port related to port industry. Starches, the main export to the United Kingdom, were a product of the hinterland rather than of the port environment. The structure of this port's trade with the United Kingdom was, therefore, in conformity with its low dependence rate, unlike to the trade structure.

5.2.2.3. IJmuiden.

At IJmuiden exports to the United Kingdom were also more important than imports. Group 5 was the leading export commodity group, mainly rolled products and iron and steel ingots, products of the local industry. Imports from the United Kingdom were mainly of commodity group 2 and small amounts of group 5 (coal and unworked iron and steel products). A small quantity of group 8 was also imported (a variety of chemical products). The imports of coal, destined for use in the blast furnaces, and of metal products, were connected with local industrial activity. In total trade at the port in 1955, group 5 was also the major export, whilst ores and coal were the main imports. The commodity flows of trade with the United Kingdom were different from total trade flows only with respect to ores, so that despite a fairly low dependence figure on this trade the trade patterns of total and United Kingdom trade were similar.

5.2.3. The northern ports.

The northern ports, as a group, showed a higher dependency in 1955 on trade with the United Kingdom than ports in the rest of the country.

5.2.3.1. Groningen

Groningen had the lowest dependency figure on trade with the United Kingdom. Small amounts of groups 8, 0 and 1 were imported, with potato

starches, oats and refined sugar as the main commodities. Export to the United Kingdom slightly exceeded imports, the main commodities being group 8, mainly starches. In total imports for local industries, and grains, were the main items. Exports to the United Kingdom of starch corresponded with the main total export from the port. The structure of trade with the United Kingdom was therefore not very different from the total trade of the port, apart from wood products.

5.2.3.2. Delfzijl

Delfzijl's imports from the United Kingdom in 1955 consisted mainly of commodity group 2, with a small amount of groups 8 and 1, principally coal, starches and animal feedstuffs. Exports were mainly of group 9, paper and cardboard, with some export of ferruginous earth from the hinterland and a small amount of group 8 (mainly starches). For total trade in 1955 the major import was coal, which was also the main import from the United Kingdom, and wood, which was not part of the United Kingdom trade. Raw mineral products, the main export, and fertilizers, also an important export, were not represented in trade with the United Kingdom, although cardboard and paper were. Despite a high dependency figure the structure of trade with the United Kingdom did not therefore bear a very strong resemblance to its total trade structure.

5.2.3.3. Harlingen

Harlingen had the largest percentage of its trade with the United Kingdom, and the highest percentage in the Dutch port range. Exports to the United Kingdom were nine times as large as imports. The main commodity was group 9 (paper and cardboard) and groups 1 and 0 (dairy produce, potatoes and vegetables), with a small export of group 8 (starches) and

group 4 (ferruginous earth). Group 2 (coal) accounted for 96 percent of imports from the United Kingdom. The export structure to the United Kingdom closely resembled that of total trade, but in total imports wood and wood products featured strongly. This was not the case for import from the United Kingdom. The general situation in the northern ports in 1955 was that on the export side, which predominated, trade with the United Kingdom was very important, while on the import side connections with Scandinavia were more important (wood products).

5.2.4. The Schelde ports.

The Schelde ports, Terneuzen and Vlissingen, showed a weak connection with the United Kingdom in 1955.

5.2.4.1. Terneuzen

Terneuzen imported mainly groups 2 (coal) and 6 (crude minerals) with a small amount of scrap (group 4) and these products were mainly destined for local industries. Ores, the leading import in total trade, did not figure among imports from the United Kingdom. Coal was important in total imports and this did feature in United Kingdom trade. The import of crude minerals, important for United Kingdom trade, was only a minor element in Terneuzen's total import.

Exports to the United Kingdom were much smaller than imports, groups 7 and 8 (fertilizers and chemical products) and group 0 (vegetables) being the main exports. Coke was the main export in total trade, none of which went to the United Kingdom, but fertilizers, the second most important total export, comprised the main export to the United Kingdom. Trade with the United Kingdom played a fairly minor role in the port of Terneuzen's total trade in 1955, and the commodity structure was not closely related to total commodity structure.²⁴

5.2.4.2. Vlissingen

Vlissingen imported group 2 (coal for bunkering) from the United Kingdom. Exports were almost entirely of bunker material for British ships in 1955, with a small amount of agricultural produce (potatoes and fish products). Total trade was dominated by imports of oil products for bunkering. Exports to the United Kingdom resembled total exports in the dominance of bunker materials. Trade to the United Kingdom, despite a low dependence figure, resembled in structure the total trade of the port in being mainly orientated towards the bunkering of sea-ships.

5.2.5. Summary

We can therefore see that one of the main products involved in trade flows with the United Kingdom in 1955 was coal, imported into all the Dutch ports except Zaandam, Maassluis, Schiedam, Hoek van Holland, Zwijndrecht and Groningen. It was especially important to the trade of the larger ports, with bulk handling facilities. Exports of coal to the United Kingdom in 1955 exceeded imports at the ports of Rotterdam and Amsterdam because of the redistribution of cheaper American coal. Oil products were also a fairly important export item in trade from the larger ports to the United Kingdom (Amsterdam, Rotterdam, Vlaardingen and Dordrecht), again needing specialist handling facilities not available at smaller ports. Agricultural produce was part of United Kingdom trade flows for all ports except Zaandam and Schiedam, being especially important for smaller ports. Oils and fats, starches, machinery and finished products were also important for many ports as trade items.

6.0 Conclusion

The preceding sections have explored in some detail the trade flows in 1955 between the United Kingdom and the Dutch ports, both in terms of general flows and individual flows and the main commodities involved. Manufactured products formed the main exports from the United Kingdom in 1955, whereas from the Netherlands exports of bulk raw materials were becoming increasingly important. Exchanges between the Netherlands and the United Kingdom were based on the old traditional pattern of trade between the two centres in 1955, with trade in coal, a product which was declining in importance in the post-war era, and agricultural produce, becoming less important for the Netherlands as industrial growth was rapid. Trade flows of finished and semi-finished products were poorly developed as a result of competition from the manufacturing centre of Germany, whose post-war industrial development, like that of the Netherlands, had been rapid. The trading situation between the Netherlands and the United Kingdom in 1955 was therefore a weak relationship, based on older traditional products such as coal and agricultural products, with the Netherlands exporting more than it imported. The consequences of this were especially of importance to some of the smaller ports in the Dutch port range dependent on United Kingdom trade, such as Maassluis and Harlingen. The final section in this chapter examined the ports' trade with the United Kingdom and the products involved in relation to total trade, showing that a high or low dependency on trade with the United Kingdom did not necessarily mean a close or divergent relationship with total commodity trade of the ports, in this way enabling a clearer picture of the individual trade of the ports with the United Kingdom to emerge in relation to their total trade. For most ports, trade with the United Kingdom seemed to be concentrated on one or two main products, especially

with regard to imports, whereas exports were slightly more diversified. Another interesting feature is the greater importance to the northern ports than to the southern ports of trade with the United Kingdom in 1955. Trade flows between the Netherlands and the United Kingdom in 1955 were poorly developed, and dependant on products which were declining in importance in the post-war period.

In 1955 the future of Anglo-Dutch trade flows seemed bleak. The following chapter examines the changing nature of the trade with the United Kingdom over the period 1955-75, to determine the development and changes in structure of these flows, especially with regard to the individual development of ports in the Dutch port range.

NOTES

Chapter 1

- 1 H.C. Kuiler, De Plaats van Nederland in West-Europa, met name in het E.E.G. gebied. (Kamer van Koophandel en Fabrieken voor Midden en Noord Zeeland te Middelburg, 1966).
- 2 In 1938 imports were 65.3 million tons and exports 50 million tons. By 1965 imports had increased to 157.5 million tons, but exports had decreased to 35.3 million tons (see: Digest of Port Statistics, National Ports Council, London 1970).
- 3 Digest of Port Statistics (National Ports Council, London, 1969).
- 4 A. Walsh and J. Paxton, Trade in the Common Market Countries (London, 1965), p.7.
- 5 L.B.S. Larkins, Netherlands. Overseas Economic Surveys (H.M.S.O., London, 1949).
- 6 H.C. Kuiler, 'De Stoomvaart Maatschappij Zeeland in de Golven der Maatschappelijke Ontwikkeling', in Honderdjaar Engelandvaart edited by P.W. Klein and J.R. Bruijn (Bussum, 1975), pp. 125-165.
- 7 Larkins, Netherlands (1949).
- 8 Z.W. Sneller, De Geschiedenis van de Steenkolenhandel van Rotterdam (Groningen, 1946).
- 9 H.C. Kuiler, 'De Stoomvaart Maatschappij Zeeland', p. 141.
- 10 J. de Vries, The Netherlands Economy in the Twentieth Century (Assen, 1978).
- 11 V. Anthony, Britain's Overseas Trade (London, 1971).
- 12 H.C. Kuiler, 'Vervoersstromen tussen de Continentale E.G. Landen en het Verenigd Koninkrijk', Maandstatistiek van Verkeer en Vervoer (mei 1974), p. 191.
- 13 See Digest of Port Statistics, 1969.

- 14 Maandstatistiek van de Zeevaart en van het havenverkeer (Centraal Bureau voor de Statistiek, 's-Gravenhage, December, 1955), p. 11.
- 15 Maandstatistiek van de Zeevaart en van het havenverkeer (Centraal Bureau voor de Statistiek, 's-Gravenhage, January-December, 1967), pp. 516-520.
- 16 Board of Trade Journal, 1968 (London, 1955), pp. 149-150.
- 17 Economic Intelligence Unit, Britain and Europe (London, 1957), p. 13.
- 18 L.B.S. Larkins, Netherlands (1949), p. 49.
- 19 B.J. Udink, 'Rotterdam 1960', Tijdschrift voor Economische en Sociale Geografie, 51 (1960), pp. 103-108, points out that the geographical position of the port is its main asset.
- 20 See for instance G.G. Weigend, 'Stages in the development of the ports of Rotterdam and Antwerp', Geoforum, 13 (1973), pp. 5-15.
- 21 See Amsterdam Gemeenteblad, Havennota 1969, Bijlage F (Amsterdam, 1969).
- 22 See Gemeentelijk Havenbedrijf Amsterdam, Havenstatistieken (Amsterdam 1977), p. 48.
- 23 See for instance J.G. Groenendijk and M. de Smidt, 'De havenformatie als facet van de functionele structuur (toegelicht aan een vergelijkende analyse van Delfzijl en Harlingen)', Bulletin Geografisch Instituut Utrecht, 5 (1967), pp. 77-99.
- 24 In addition, some of the trade passing through the port of Terneuzen with the United Kingdom was destined for the Belgian port of Ghent, receiving coal, coke, and oil products with some general cargo from the United Kingdom, and sending a small amount of iron products and general cargo via Terneuzen using the Ghent-Terneuzen Canal. See R. Cambier, 'De haven van Ghent', Tijdschrift voor Economische en Sociale Geografie, 43 (1952), p. 194.

CHAPTER 2

TRADE FLOWS OVER THE DUTCH PORT RANGE 1955-75

1. Introduction

In the preceding chapter developments in the seaborne trade of the Netherlands in the period up to 1955 were outlined, showing the variations experienced by the individual ports in the Dutch range, both for total trade and for trade with the United Kingdom with a detailed description of the situation existing in 1955.

The purpose of the present chapter is to examine the changes which have taken place in the trade flows to and from the Dutch port range and individual ports during the period 1955-75. As emphasized by a number of writers, seaports are dynamic phenomena both in spatial and in functional terms.¹ A variety of factors influence this dynamism, related to foreland and hinterland characteristics. As stated in the introduction to this study, we are focusing attention on the influence of foreland characteristics, in particular the effects of the alterations in trade structures and volumes to and from forelands and the effects on the individual ports in the Dutch port range, rather than hinterland characteristics and their effects on the ports. Since, however, the two areas are so closely interrelated, significant changes in the hinterland conditions that affect the foreland will obviously be taken into account, as, for instance, the abolition of trade barriers with the formation of the European Economic Community in 1959.

2. Developments in sea transport 1955-75

The twenty years from 1955 to 1975 were some of the most important years in the history of maritime transport, and the rapid innovations which occurred have led several authors to talk of a 'second transport revolution' (Kuiler 1970, Küster 1969).² Two main sub-divisions can be distinguished in this much-discussed phenomenon: the developments which took place in the bulk trades (divided into liquid and dry bulk cargo), and the developments in general cargo trades. Both these factors have made a tremendous impact on ports and port development throughout the world, especially in the more technically advanced countries such as those of Western Europe. It profoundly affected the competitive position of ports in Western Europe and elsewhere, and also influenced the relative significance of ports in national port ranges such as those in the Netherlands. A great number of factors were responsible for the rapid changes taking place in maritime transport in the late 1950s and early 1960s and the consequent demand for new terminal facilities to be provided at the ports, such as the general increase in world population and trade over the period (between 1950 and 1970 there was a fivefold increase in world trade).³ The most marked increase in tradé was in the movement of bulk products, especially oil, by sea. The desire to gain greater economies of scale by transporting these products in ever larger ships was spurred on by such developments as the Suez crisis of 1957 with the closing of the Suez Canal in late 1956, necessitating the use of the Cape route, and very large tankers. This led to the development of specialized handling facilities and techniques at the port terminals to cater for these large units. The pace was set by the oil tankers. Whereas the maximum size of tankers in the world fleet in 1955 was 50,000 d.w.t., by 1975 ships of 320,000 d.w.t. and upward were not unusual. In 1950, 20% of the world

fleet was tankers, by 1971 this figure had increased to 39% (Reuchlin 1970).⁴ The draft of these ships increased from 41 feet (50,000 d.w.t.) to over 70 feet: as a consequence the number of ports which could offer facilities to these large oil tankers declined dramatically.

Dry bulk cargo ships also underwent a dramatic change in scale over the period. General cargo carriers were initially much slower in their development, but with the rapid containerization of many trades in the 1960s an outbreak of what many call 'containeritis' occurred which transformed many of the traditional handling techniques and facilities for general cargo. This method was first developed in the United States but later spread to Europe. Other developments in general cargo handling aimed at the reduction of the turn-around time of ships in ports, such as palletization and roll-on roll-off techniques were also rapidly adopted during the 1960s. This not only led to adaptation of existing terminal facilities and the adoption of new ones, but also in turn affected ship size, with container ships of 50,000 d.w.t. in operation in 1975, a considerable increase on the original size of general cargo carriers. These developments had an important effect on port development, the main demands of the 'second transport revolution' being for deep water access and increased land space for movement and storage of cargo. Smaller ships of the conventional type found competition with the larger carriers difficult, and there was a consequent decline in their numbers. These developments were taking place at the same time as a rapid rise in the world demand for energy, especially oil, and other bulk raw materials particularly in the developed countries (between 1955 and 1959 the European demand for oil alone rose from 100 million tons to 150 million tons).⁵ A demand therefore existed for the increased movement of bulk raw materials, both liquid and dry, in large quantities from less developed

nations to the developed world especially, and very large ships were the most economic means of transportation, especially over longer distances, despite the large capital outlay needed. The return flow of finished and semi-finished products also increased during the post-war period, although this was less spectacular than the flow of raw materials.

These, then, were some of the main elements in the 'second transport revolution' during the period 1955-75, but by the end of the period increasing signs of over-capacity in the world fleet and a general world recession seemed to indicate an end to this era of expansion. Not surprisingly this had a dramatic effect on port structures and facilities, and the competitive position of ports. Especially in the developed world, the post-war period was one in which there was a general consolidation of trade flows at certain geographically and economically favoured locations, as the needs of ships became more specialized and necessitated the provision of deep water access, costly specialist terminals and large areas of land. It is with these underlying observations that we must approach any study of trade flows through ports and structural alterations which took place between 1955 and 1975. In chapter four the question of the effect of these developments on the physical structure of the Dutch ports and the adaptations which have taken place will be looked at in more detail; meanwhile an examination of trade flows will be made starting with the changes which took place in total Dutch seaborne trade during the period.

3. Developments in the Dutch economy 1955-75.

Since trade flows were ultimately affected not only by external forces of change already noted, but also by internal developments within the Netherlands, we must first outline the major developments in this area.

Despite the gradual loss of initial post-war economic advantages over other countries (such as lower labour costs) and an increasingly tight labour market during the late 1950s and early 1960s, the industrialization of the Netherlands continued at a rapid pace up to the early 1970s, in accordance with the government's post-war programme first outlined in the 'Memorandum on the Industrialization of the Netherlands' of September 1949 (Abert, 1969).⁶ Following the Suez crisis a slight recession in the economy occurred around 1957 and lasted until 1960. Again in 1967-69 there was a recession in the economy leading to the devaluation of the Dutch guilder against the German Mark. Otherwise the two decades prior to 1975 were marked by vigorous growth. The structural changes occurring in the economy, most of which were already evident in 1955 (see chapter one), continued and strengthened throughout the period, along with several new elements. The output of coal from the South Limburg coalfield, for instance, declined from 13 million tons in 1938 to 5.5 million tons in 1969, as world demand for coal decreased and competition from cheaper sources increased.⁷ At the same time internal Dutch consumption of oil increased by a factor of 4½ between 1955 and 1973, whereas coal demand had fallen to a quarter of its original size during the same period. In 1959 a new natural energy resource was discovered in the north-east of the Netherlands, natural gas, which was also of considerable importance to the Dutch economy and hastened the decline not only of the internally produced coal but also of coal imports from abroad. The large increase in the import of crude oil during the period was linked to the setting up of additional refineries in the Netherlands; at Rotterdam (Esso, Gulf and British Petroleum) and later at Amsterdam (Mobil) and at Vlissingen (Total). All were located at major port sites allowing access for large ships, although at Amsterdam and Vlissingen where large tankers could not be admitted, the refineries were

served by pipeline from the port of Rotterdam, where access for very large carriers was possible.

Pipeline technology also left its impact on the Netherlands, especially in the 1960s. The first major oil pipeline to be built was in the late 1950s to the Ruhr (Cologne) from Rotterdam to carry crude oil, and resulted in the virtual cessation of barge shipments of crude oil along the Rhine, although this was replaced by a consequent increase in the movement of oil products. In the latter half of the 1960s a pipeline was also built to Antwerp from Rotterdam for the transfer of crude oil, and this resulted in the strengthening of Rotterdam's position as premier port of the Netherlands during the period.⁸

The increase in oil refining had an important effect on the development of other sectors of the economy, especially the chemical sector, with the development of petro-chemical complexes in the proximity of the major refineries during the 1960s, especially at Rotterdam, although the non-oil based chemical sector also showed rapid growth over the same period. During the 1960s the chemical sector formed the fastest growing industry in the Netherlands in terms of industrial production (see table 9 below).

	1964	1966	1969
chemicals	122	159	259
oil refining	111	131	201
paper	112	129	160
manufacturing	110	122	152
rubber	111	125	140
stone and earth	119	126	135
metals and machinery	111	121	NA
food, drink, tobacco	106	110	NA
textiles	105	106	114
leather	107	102	102
clothing, shoes	105	100	95
coal processing	106	88	28

Table 9. Industrial production per working day: monthly averages. 1963 = 100. Source: O.E.C.D. Economic survey of the Netherlands, April 1970, p.48. (NA = not available)

The above table shows that the major growth in the chemical sector took place in the latter half of the 1960s, after which growth slackened off again. Only two manufacturing industries showed a decline in the same period, the textile industry showed a slight increase with the clothing and shoes sector declining, due mainly to increasing labour costs,⁹ whilst the coal industry saw a rapid decline in production. Metals and machinery only grew slowly due to the restructuring of the industry during the 1960s and increasing competition from elsewhere. The food and drink industry experienced slow growth. Chemicals and oil refining constituted the fastest growing elements in the industrial economy of the Netherlands during this period. In terms of relative importance for the economy and especially in employment the agricultural sector continued to decline. The Dutch economy between 1955 and 1975 was therefore characterized by growth in most industries, especially chemicals and oil, and decline in the coal and textile industries, with a relatively stable metals sector. These developments must be borne in mind in any examination of trade flow patterns during this period, as trade flows reflect the forces of demand and supply in the economy. When considering trade development at individual ports, however, we must also bear in mind the increasing role of government involvement in the economy throughout the period. In 1951 the notion of development areas was introduced in the Netherlands with the designation of the Drenthe province as such an area. By 1959 most of the North, East, and Zeeland had development area status, and this in turn had an important effect on port development and trade flows over ports in these areas, since the incentives offered attracted industries to the ports.

The Dutch economy during the period 1955-75 can be characterized as a growth economy therefore, especially during the 1960s. By the end of our

period a recession was experienced, especially following the Arab oil embargo on the Netherlands in 1973. Expansion in manufacturing industry and the service sector was responsible for sustained growth up to this time, and the part played by Dutch ports in offering favourable locations to new industries was vital.

4. Trade flows over the Dutch port range 1955-75.

In view of the preceeding, therefore, we would expect (a) an increasing concentration of trade flows spatially, especially for certain bulk commodities with specialist requirements, (b) rapid growth in the volume of trade, especially of bulk raw materials to serve the growing manufacturing industries of the Netherlands, (c) increased export of finished products and re-worked materials produced by Dutch industries.

4.1. Analysis of total trade flows 1955-75.

In 1955 total seaborne trade over the Dutch ports came to just over 82 million tons, of which 68% was import and 32% export (see Chapter 1, p. 7). Of this total, 47% of the imports and 44% of the exports were made up of transit trade. By 1975 the total seaborne trade of the Netherlands ports came to just over 313 million tons, the largest part of which (75%) was imports, and the rest (25%) exports. Transit trade had fallen to 22% of imports and 25% of exports, therefore the role of transit trade in total Dutch trade declined over the period. Otherwise, a rapid increase in trade took place, with a fourfold increase in total trade. To obtain a picture of overall development of trade over the Dutch port range we refer to table 10 below, which depicts the development of total trade and imports and exports over the period 1955-75 in terms of growth rates, taking 1955 as the base year.

Year	imports	inc/dec	exports	inc/dec	total	inc/dec
1955	100	-	100	-	100	-
1956	120	+20	94	-6	112	+12
1957	128	+8	92	-2	116	+4
1958	127	-1	94	+2	116	0
1959	119	-8	96	+2	112	-4
1960	143	+24	106	+10	132	+20
1961	155	+12	111	+5	141	+9
1962	163	+8	119	+8	150	+9
1963	184	+21	117	-2	163	+13
1964	201	+17	127	+10	178	+15
1965	213	+12	135	+8	188	+10
1966	218	+5	148	+13	196	+8
1967	231	+13	167	+19	211	+15
1968	267	+36	181	+14	240	+29
1969	303	+36	212	+31	275	+35
1970	356	+53	275	+63	331	+56
1971	366	+10	259	-16	332	+1
1972	412	+46	281	+22	374	+42
1973	466	+54	340	+59	426	+52
1974	417	-49	293	-47	377	-49
1975	416	-1	299	+6	379	+2
Average		+15.8		+9.9		+12.9

Table 10. Growth rate of seaborne trade over the Dutch port range 1955-75 (base year = 1955).

Source: calculated from Maandstatistiek voor de zeevaart en van het havenverkeer 1955-75.

The average annual growth rate for total trade over the period was 13.9%. For imports, growth was interrupted twice, during the latter part of the 1950s, and can be attributed mainly to the Suez crisis which caused a slight world recession due to its effects on oil supplies, a major import item for the Netherlands. The second decline, not until the end of the period 1973-75, was again due to disruption of oil imports. The Middle East oil embargo in 1973 hit especially hard in the initial year, but recovered fairly quickly as alternative suppliers were found. growth in imports was fastest in 1960, 1963-64 and especially 1967-73. After a setback in 1970-71, growth was again high in 1971-73. The growth in imports 1959-70 was almost entirely due to the transit of iron ore, mainly to West Germany,¹⁰ whereas the increase of 1963-64 and 1967-70 could be attributed to the increased import of crude oil with the development of Europoort providing space for new refineries, and the development of increased capacity pipelines to the Ruhr and to Antwerp and Amsterdam in the late 1960s.

The development in exports over the period is less clear. From 1955-60 exports from the Netherlands declined, not recovering their 1955 level until 1960. The decline was not in direct exports from the Netherlands, which saw only a slower growth rate over the period, but in transit outwards, especially from Rotterdam.¹¹ This was mainly as a result of decreased through transit of American coal to other destinations (sea/sea transit) which had been an important element in the first part of the 1950s. The decline of 1962-63 was only a temporary feature, which can be linked to a number of causes, among them a decrease in the transit of German coal outwards which had seen an increase in the early part of the 1960s. During the rest of the 1960s growth occurred in exports which was again brought to a halt in 1971, this time, however, the decline could

be attributed to direct export rather than to transit trade. This decline is difficult to explain,¹² but was probably due to a number of causes including increased labour costs and slower growth in export of chemicals from the Netherlands. The decline was only temporary, however, and exports soon recovered their former level. The decline of 1974-75 was due to the Arab oil embargo of 1973 which affected the (mainly direct) export of oil products from the Netherlands. As with imports, growth in exports was fastest in the latter half of the 1960s, and also in the period immediately preceding the oil embargo on the Netherlands. Although initial growth in exports in the early 1960s was sluggish compared with imports, by 1969 the growth in exports exceeded the growth rate of imports. So despite the general decline in the contribution of transit trade through the Netherlands, the success of the Dutch economy in developing a strong manufacturing character more than compensated for this.

4.2. Analysis of commodity flows 1955-75.

It is necessary to take a closer look at some of the main commodities involved in these changes of trade in order to build up a more comprehensive picture of the seaborne trade of the Netherlands during the period 1955-75. We have already seen that there were important developments in the oil and coal trades over the period. Crude oil imports increased from 15.6 million tons in 1956 to 93.7 million tons by 1970 (a sixfold increase),¹³ and formed one of the fastest growing imports into the Netherlands. This flow was almost exclusively concentrated at Rotterdam, with a small amount of crude oil import at Amsterdam (98.4% and 1.6% in 1970 respectively). In the same period oil products increased from 13.4 million tons to 33.2 million tons, imports doubling and exports trebling in size. Growth in the chemical sector was even more dramatic,

with a sixteenfold increase in trade 1956-75, both imports and exports showing rapid growth. The coal trade almost halved in size over the same period, from around 20 million tons in 1956 to just over 11 million tons in 1975, and in relative terms this decline was even greater. Decline was rapid initially in the late 1950s, stagnation occurred during the 1960s and there were some signs of recovery in the early 1970s, so that development in this trade was uneven. Ore, grain and minerals, along with other products involved in trade generally showed some growth 1955-75, although less spectacular than the increase in chemicals and oil. Iron ore imports, destined mainly for transit to West Germany, saw a fourfold increase over the period, mainly moving over Rotterdam, but at IJmuiden, where import was destined for the immediate area, a similar increase was recorded.

The variations in commodity flows to which some reference has been made, can best be assessed on a quinquennial basis.

4.2.1. 1955-60

From 1955-60 several major changes occurred. The first was the decline in import of coal from the United States, some of which was for redistribution to Scandinavia and the United Kingdom. The post-war exports of American coal to the Netherlands reached a peak in 1957, never to reach the same level again. A slight rise in the export of German coal through the Netherlands occurred in the late 1950s. From the middle of the 1950s the dominating position of coal in the commodity composition of Dutch trade gave way to oil and oil products. By 1960 these dominated trade flows. The reasons for this have already been discussed (see p.71).

At the end of the 1950s ore trade also increased dramatically, mainly due to the increased demand from the hinterland. Import of grain remained fairly stable throughout this period, as did most other commodities,

although there was a rise in the transit of metal goods and metal-ware through the Netherlands from West Germany, indicating the continued growth of the German economy, particularly in semi-finished and finished products. There was only slight growth in chemical trade.

4.2.2. 1960-1965.

From 1960 to 1965 the chemical trade more than doubled in size, and formed one of the most rapidly growing commodities in trade. Oil and oil products continued to grow almost as rapidly, with import of crude oil experiencing the fastest growth. During this time the growth in the export of oil products was unexpectedly low, a factor which is attributed to the increase in refining capacity abroad.¹⁴ Almost all other commodities increased in size over the period, including coal after the heavy decline in the preceeding half decade, due to a slight increase in the import of American coal in 1963-64, after which there was a decline once more. The grain trade underwent varying fortunes during this time, which resulted in small nett gains overall, for while in the early 1960s Rotterdam's imports of this commodity were declining, Amsterdam's were increasing, but by 1965 the position was reversed. Exports of agricultural produce saw a steady increase, as did finished products. The import of ore declined 1960-63, but from 1964-65 grew strongly once more.

4.2.3. 1965-1970.

The period 1965 to 1970 recorded some of the most rapid increases in trade in the post-war period, although some products such as grain stagnated and wood imports declined. The chemical industry again recorded the fastest growth rate in trade, with a trebling in size of imports and exports, mainly as a result of the growth in the petro-chemical industries at Rotterdam after the location of refineries there. Oil imports doubled

in size, while exports of oil showed especially rapid growth, trebling in size; the main increase being in exports from storage (redistribution) which increased to 23 times its former size 1965-70. Ore import increased during the period by around 60%. It is interesting to note that the export of ore, although relatively of much less importance, increased sixfold over the period; this was mainly re-export and showed the growing importance of the Netherlands as a centre for redistribution of imported products to the rest of Europe during the period.

There were also interesting developments in the coal trade 1965-70. Coal imports continued to decline, though seaborne exports of coal showed strong growth, partly due to increased exports of German coal through the Netherlands. As a result, whereas in 1965 exports of coal were only a sixth the size of imports, by 1970 exports and imports of coal were almost balanced, with a consequent stagnation in total coal trade through the Netherlands during the period at around 8 million tons per annum.

Export of agricultural produce showed only slow growth over the period. Export of machinery and transport equipment, which had displayed only slow growth during the early 1960s, doubled in size. This was both transit and direct export, showing continued growth in sales of Dutch finished products abroad, and continuing growth in the German industrial hinterland.

4.2.4. 1970-1975.

Finally the half-decade 1970-75 was one of fluctuating fortunes for most commodities. Initially in 1970-71 there was stagnation in the trade of several commodities, the main one being ore imports; however, this was only a temporary setback as growth was then again rapid up to 1973. From 1973 to 1975 many commodities showed a decline in their growth rate, especially oil, oil products, fertilizers and (for the first time)

chemicals. Oil and oil products recorded a growth of only 20%, the slowest growth rate for this commodity in the whole period 1955-75. Not all the blame for this can be assigned to the Arab oil embargo, which as we pointed out earlier was soon alleviated by alternative sources of supply. Increasing competition from other specialist terminals for the import of crude oil to Europe had become evident during the 1960s, with the appearance of southern terminals such as that at Marseilles-Fos, and Trieste in Italy with its pipeline to southern Germany (Trans-Alpino pipeline). Chemical products over the period 1970-75 also showed much slower growth rates, imports declining in absolute terms slightly, and exports increasing by only 4%, in contrast with the threefold increase recorded in the previous half-decade for both imports and exports of this commodity. Ore grew at a much slower rate than in the previous period, at around 7%, imports increasing but exports (redistribution) declining. Coal showed growth during the period of around 30% (making this one of the fastest growing commodities), mainly in direct imports, as a result of the oil embargo and the search for alternative fuels. Grain and agricultural produce also saw an increase of around 40% over the period, and import to the home market of grain again accounted for the major increase. Compared to the large increase in trade in raw materials and building materials in the latter part of the 1960s there was a decline in this trade in 1970-75, due to the gradual completion of major engineering projects such as Europort and the Maasvlakte area of Rotterdam. Trade in fertilizers fell by 15% over the period, with exports remaining fairly constant, home exports rising, and transit trade outwards decreasing. It is interesting to note that finished products, including machinery and transport equipment, recorded the fastest growth rate of any commodity group 1970-75, with

a 50% increase, exports being the fastest growing element.

The above is only a rough outline of the behaviour of Dutch external (seaborne) trade over the period 1955-75, and the changes taking place within this trade over the period.

5. The development of trade flows through individual ports in the range 1955-75.

Before moving on to a closer examination of trade at individual ports it is necessary to discuss one or two aspects of the development of port ranges over time, and to examine various ways of measuring the dynamism of port ranges such as the Dutch range.

5.1. Changes in the Dutch port hierarchy 1955-75: indices of concentration.

A number of authors have made studies of the changing relative significance of ports within a port range over time. Ogundana¹⁵ defines a port range (or port complex) as ports which are related by being linked to common forelands on the seaward side, or as alternative outlets to a part or all of a defined unit area. A single port cannot be treated in isolation, therefore it is best treated in comparison with other ports. He also points out that ports may be related on different levels, local, national or extra-national. Over time changes occur in the port hierarchy within a port range.

Early attempts to examine the changes in port ranges concentrated on ranking ports into a hierarchy, classifying ports according to a variety of criteria including cargo tonnage, cargo value, net registered tonnage, number of ships calling at ports, commodity characteristics or morphological features,¹⁶ or a combination of these.¹⁷ Britton¹⁸ was the first to use a more theoretical approach to the study of trade flows between the ports in a port range and individual forelands, borrowing

techniques first developed in industrial location studies. He used two indices in his study, the first was the location quotient, developed by Sargent Florence,¹⁹ which Britton used to examine the relative contribution of different forelands to the total commodity flows, enabling a standard comparison for ports to be made, and which was used by Bird in a study of British seaports.²⁰ The second index was the index of concentration, first used by Hirshman,²¹ and this has been used by a number of subsequent writers²² to examine the changing significance of ports within a port range over time. It is a useful indicator of increasing concentration or diffusion²³ of total trade of ports, but can also be used in an examination of concentration in commodities in a port range.

The index of concentration is given as:

$$I = \sqrt{P_1^2 + P_2^2 + \dots + P_N^2}$$

where I = the index of concentration

P1 = the percentage share of the first port's trade in the total trade of the range

P2 = the percentage share of the second port's trade in the total trade of the range

PN = the percentage share of the last port in the port range of total trade of the range.

The value arrived at varies between 0 and 100, the closer to zero the index, the greater the port diffusion in the range, while the closer to 100 the greater the concentration of port activity in fewer ports. Generally in developed economies the value of the index tends to be higher than in developing economies, and for the Netherlands' port range we would therefore expect a high index value indicating a high degree of concentration. Nevertheless the index does provide us with a useful tool

for measuring the changing relative status of Dutch seaports in general over the period 1955-75. Britton's use of the index was mainly concerned with examining the concentration in commodity flows of a port (in this case Melbourne) at a fixed point in time in relation to forelands, but writers on West African port ranges such as Hilling and Ogundana²⁴ have used the index to study changes over periods of time, identifying periods of port diffusion and port concentration, with stable and unstable port development in a port range.

Table 11, below, shows the indices of concentration for trade over the Dutch port range 1955-75 for the fifteen Dutch ports recorded by the C.B.S. as seaports.

Year	import	export	total
1955	81.14	81.80	81.32
1956	79.93	80.29	79.55
1957	78.02	80.35	78.58
1958	77.38	81.41	78.38
1959	77.74	80.17	78.37
1960	75.73	80.85	77.05
1961	78.94	78.31	78.75
1962	78.75	82.56	79.68
1963	77.60	80.74	78.30
1964	78.47	80.06	78.81
1965	80.29	80.16	80.25
1966	81.49	81.65	81.51
1967	82.09	82.50	82.18
1968	80.03	81.50	80.37
1969	81.33	82.35	81.57
1970	82.69	84.86	83.45
1971	84.01	82.26	82.86
1972	85.80	82.82	85.20
1973	85.67	84.87	85.61
1974	85.81	82.96	83.70
1975	85.42	82.79	84.75

Table 11. Indices of concentration for trade over the Dutch port range 1955-1975. Calculated from: Maandstatistiek voor de zeevaart en van het havenverkeer, total trade by ports Jan-Dec 1955-75.

These figures are for all commodities and concern trade with all fore-lands. Concentration was relatively high over the period, but some interesting fluctuations occurred. A decline in the index 1955-60 showed a tendency towards port diffusion in the late 1950s. A possible explanation for this decline would be the increased bulk trade of Amsterdam in this period after the opening of the Amsterdam-Rhine Canal, but it also indicates the faster growth rates in trade recorded by some of the smaller ports in the Dutch port range in this period, relative to the prime port, Rotterdam. Ports such as Delfzijl and Terneuzen recorded high rates of growth during this period. The early 1960s showed only slight fluctuations in the index, indicating a fairly stable port complex 1960-65. From the mid-1960s, however, the index showed a gradual increase, which lasted to 1973, despite the addition of a sixteenth port, Scheveningen, in 1969. The relative decrease in the percentage share of port trade over the whole range was especially marked for Amsterdam and some of the smaller ports over this period and the position of Rotterdam strengthened with the increased import of crude oil and other bulk products at this port due to facilities being provided for unloading of large carriers. The development of Europoort, deepening of the main approach channel in the latter part of the 1960s and other developments at Rotterdam all contributed towards an increase in the concentration of Dutch trade flows here at this time. In 1964, for instance, Amsterdam had approximately 10% of total Dutch port trade, by 1975 this was only 5%. In 1973-74 the index was interrupted once more as the oil crisis served to bring a temporary setback in the growing dominance of the port of Rotterdam in the range. By 1975, however, concentration was increasing once more.

For the import and export indices over the period it is interesting to note that in the early part of the period under study the concentration

of exports was greater than of imports, whereas later concentration in imports became higher than in exports. Again this can be traced to the increasing concentration of oil imports at the main port during the 1960s, whereas many of the smaller ports showed increasing diversification and increased exports during the period as the importance of transit of German exports declined relative to the growth in direct home trade, and the location of new production units at ports other than Rotterdam, following government development policies.

The above analysis of the indices of concentration is useful as it tells us something of the behaviour of the individual elements in the system relative to the total system over a period of time, and serves to highlight the interrelation between ports in a port range. Since, however, it tells us little about the internal developments within the trade of each port in the range, it is necessary to look at absolute changes in trade at each port during the 1955-75 period. An examination of the behaviour of total trade for each port during this time will be made followed by a study of the changes that have taken place in commodity composition within the trade of each port. In this way an outline of the fluctuations within the port range over time, and the changing relative function of individual elements within the range over the period 1955-75 may be made. Again, for the sake of comparability, changes will be examined over five-yearly periods.

5.2. Changes in total trade flows through each port, 1955-1975.

As in chapter one, the Dutch port range can be divided into four main groupings geographically and functionally: the New Waterway ports, the North Sea Canal ports, the Northern ports, and the Schelde ports. Since some of the physical changes occurring at these ports 1955-75 will be discussed in chapter four, the present chapter will be confined

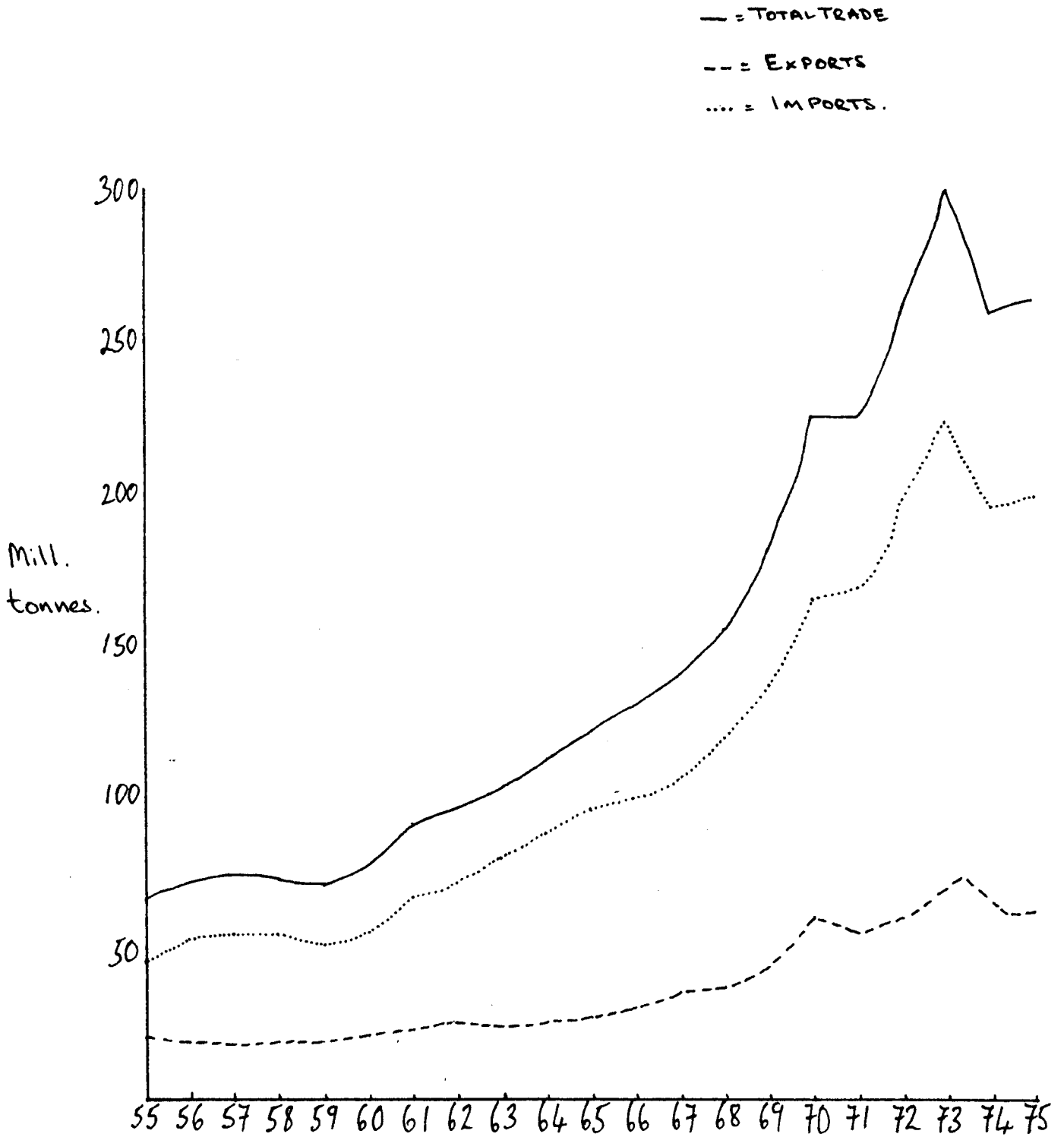
to a discussion of changes in trade flows.

5.2.1. The New Waterway ports

5.2.1.1. Rotterdam

One of the main features of the Dutch port range 1955-75, as we have seen above, was the increasing concentration of trade flows to and from the Netherlands at the port of Rotterdam. In 1955 Rotterdam's share of total Dutch seaborne trade was around 80%, falling to 76% by 1960. But at the end of the period, 1975, Rotterdam had just over 84% of total Dutch seaborne trade. Diagram 2 shows continuous growth at Rotterdam over the period 1955-75, with the exception of the late 1950s. In absolute terms Rotterdam's trade increased over the period from 66.2 million tons to 263.8 million tons, an average annual increase of 9.8 million tons. Growth in trade at Rotterdam was greatest from 1967-70 and 1971-73. Imports formed the major growth component over the period, with a fourfold increase 1955-75, and exports showed a threefold increase. In 1955 approximately two thirds of total trade was imports, whereas by 1975 this was more than three quarters of total trade. The role of transit trade in Rotterdam's trade flows declined, for whereas in 1955 almost half of both imports and exports consisted of transit trade mainly to and from the German hinterland and redistribution of American coal to other European destinations by sea, by 1975 only 34% of imports and 24% of exports were transit. The significance of Rotterdam for transit inwards to western Germany declined less than for transit outwards. This was due to a continued decrease in the port's reliance on transit outwards from the German industrial centre, whereas Germany's dependence on Rotterdam for bulk imports of raw materials for its industrial machinery was sustained. In absolute terms transit outwards increased by 200%. Compared to direct imports and exports, however,

DIAGRAM 2 TRADE FLOWS THROUGH THE PORT OF ROTTERDAM 1955 to 1975.



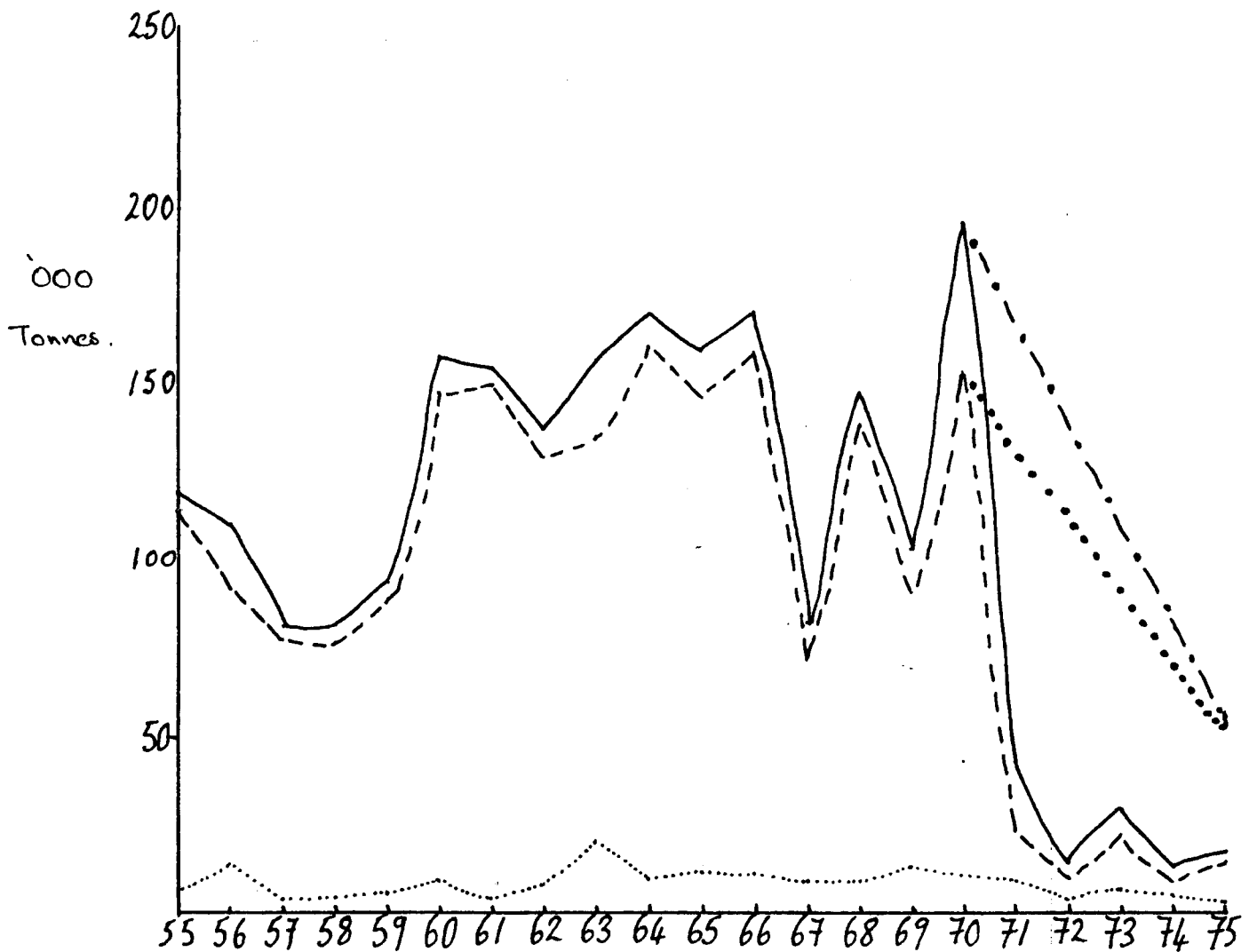
(which increased sixfold and by four and a half times respectively over the same period) this was not a large increase. The decline in trade at the end of the 1950s was due mainly to decreased transit, both inwards and outwards, against a growth in direct import and export. This was a result of Germany's developing other outlets and supply routes, particularly for oil, and promoting trade through its own ports. The growth at the end of the 1960s was due more to direct imports and exports than to transit.

5.2.1.2. Schiedam.

Schiedam's trade (see diagram 3) fluctuated throughout the period, but underwent an overall decline. In 1955 total trade was approximately 113,000 tons, by 1975 only 18,000 tons. After an initial decline throughout the later 1950s similar to that at Rotterdam, the period 1960-65 saw fairly sustained high totals, whereas 1965-70 showed fluctuations from year to year with a peak in 1970, followed by a slump in 1971. The reasons for the earlier fluctuations are associated mainly with the bunkering of sea-ships, as a later analysis of commodity composition will show. In 1955 Schiedam's trade was heavily export dominated (95% of trade). By 1975 imports formed one fifth of total trade, with exports still predominating. Imports remained, in absolute terms, fairly stable over the period, so that the wide fluctuations were caused by variations in export. Transit was relatively unimportant here; two thirds of imports in 1955 were destined for transit but only an insignificant part of export, and this situation was more or less unchanged in 1975. In terms of the total port range, however, Schiedam's role in 1955 was insignificant, with only 0.1% of total trade, and its reduction to only 0.006% in 1975 is reflected in its decline from eleventh place in the port hierarchy in 1955 to bottom place (sixteenth) in 1975.

DIAGRAM 3. TRADE FLOWS THROUGH THE PORT OF SCHIEDAM 1955 to 1975

— = TOTAL TRADE
-- = EXPORTS
... = IMPORTS



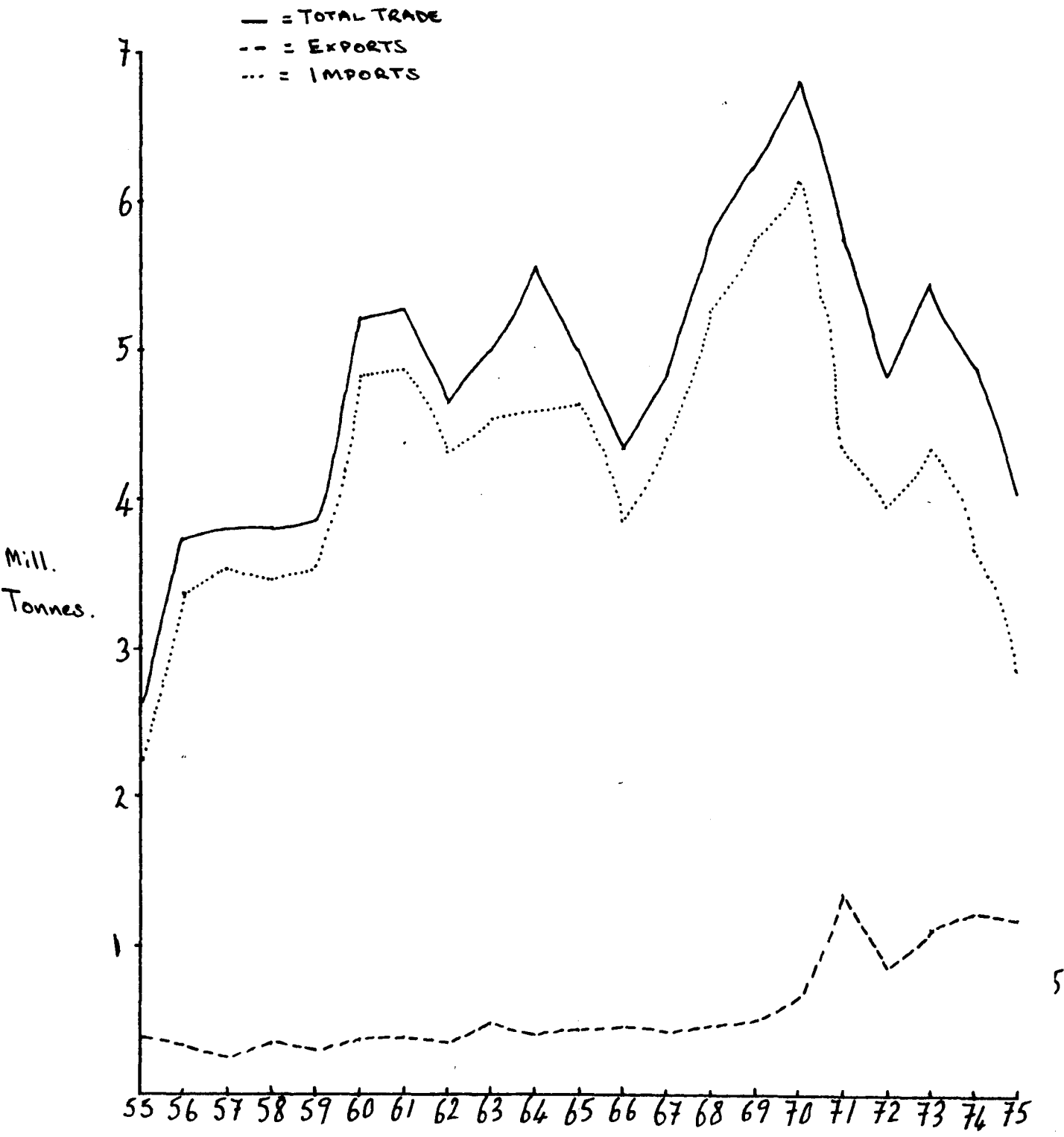
5.2.1.3. Vlaardingen.

Vlaardingen's role in the total trade of all Dutch ports also underwent a decline over the period, from 4% of all trade in 1955 to 1.3% in 1975. Initially, however, Vlaardingen's share of total trade increased to 5% in 1960, after which it declined. In 1955 Vlaardingen was the Netherlands' third major port in terms of its share of total trade, but by 1975 it had dropped to fifth place in the hierarchy. In absolute terms trade at the port increased from 2.6 million tons to 4 million tons over the period. Growth was not, however, spread evenly over the period (see diagram 4), since there was stagnation between 1956-59, a fluctuating growth 1960-66, and rapid growth in trade at the end of the 1960s, followed by a more general decline 1970-75. This port's trade structure, unlike Schiedam's was clearly dominated by imports, which claimed 85% of total trade in 1955 and 70% in 1975. The role of transit in port trade increased over the period, so that while 54% of imports and 17% of exports were in transit in 1955, the figures for this had increased by 1975 to 61% and 40% respectively. The structure of exports especially at the end of the period was less orientated towards export from the local area and more to redistribution from overseas and from the German hinterland. The most rapid growth element was in exports, especially transit outwards, with a threefold increase 1955-75. Imports saw only a slight rise over the period however, the major growth in imports occurring during the late 1960s (1966-70), after which there was a decline. Exports grew 1969-75 by a factor of two and a half, though before this growth had been sluggish.

5.2.1.4. Maassluis.

Maassluis had a minor place in the Dutch port hierarchy in 1955, with only 0.07% of total trade in this year. In 1975, although its percentage

DIAGRAM 4. TRADE FLOWS THROUGH THE PORT
OF VLAARDINGEN 1955 to 1975.



share of total Dutch trade had fallen to 0.04%, Maassluis had moved up from thirteenth to twelfth place in the Dutch port hierarchy. In absolute terms trade at the port increased 1955-75 from 54 to 126 thousand tons. Exports dominated the port trade structure during this period, claiming 87% of trade in 1955 and 70% in 1975. Growth in trade (see diagram 5) was fairly steady at this port, with a slight increase 1957-60 and 1963-66, and only slight yearly fluctuations 1966-71. The most rapid growth occurred between 1971 and 1974, and this was mainly due to increased exports. Nevertheless, over the whole period imports showed the fastest growth. Imports increased 1955-75 to over five times their former level, whilst exports only increased by one and a half times. Transit trade at the port in 1955 accounted for 16% of imports and 28% of exports, in 1975 this was 18% and 16%, so that exports from the local area showed the fastest growth, and overall transit became less important to the port's trade.

5.2.1.5. Hoek van Holland.

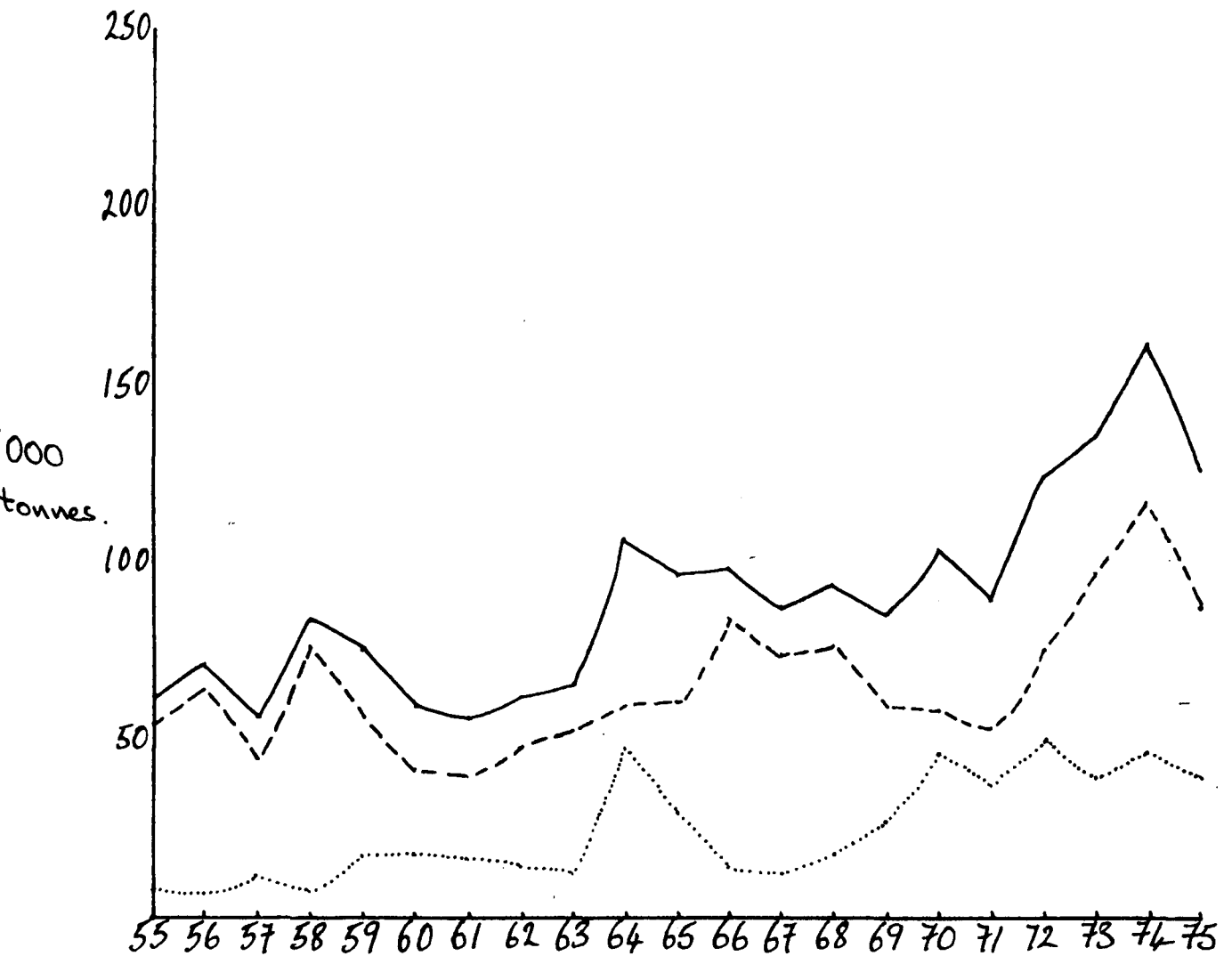
Hoek van Holland was twelfth in the port hierarchy in 1955, with 0.12% of total Dutch trade. In 1975 this figure had increased to 0.3%, bringing Hoek van Holland to ninth place. However, too much emphasis must not be placed on this, since an examination of diagram 6 shows that there were two abnormally high trade peaks in the years 1968 and 1975 (see p.117). Taking 1974 as more representative of the port's trade growth, we find that in this year Hoek van Holland only had 0.03% of total Dutch trade, giving it the same position in the Dutch port hierarchy as in 1955. Apart from the anomalous two peaks, trade at this port shows a remarkably stable pattern from 1955-69, with even a slight decline over the period, though from 1969 a general upward trend is evident. In absolute terms trade grew between 1955 and 1974 from 83,000 tons to 107,000 tons.

DIAGRAM 5. TRADE FLOWS THROUGH THE PORT
OF MAASSLUIS 1955 to 1975

— = TOTAL TRADE

--- = EXPORTS

.... = IMPORTS



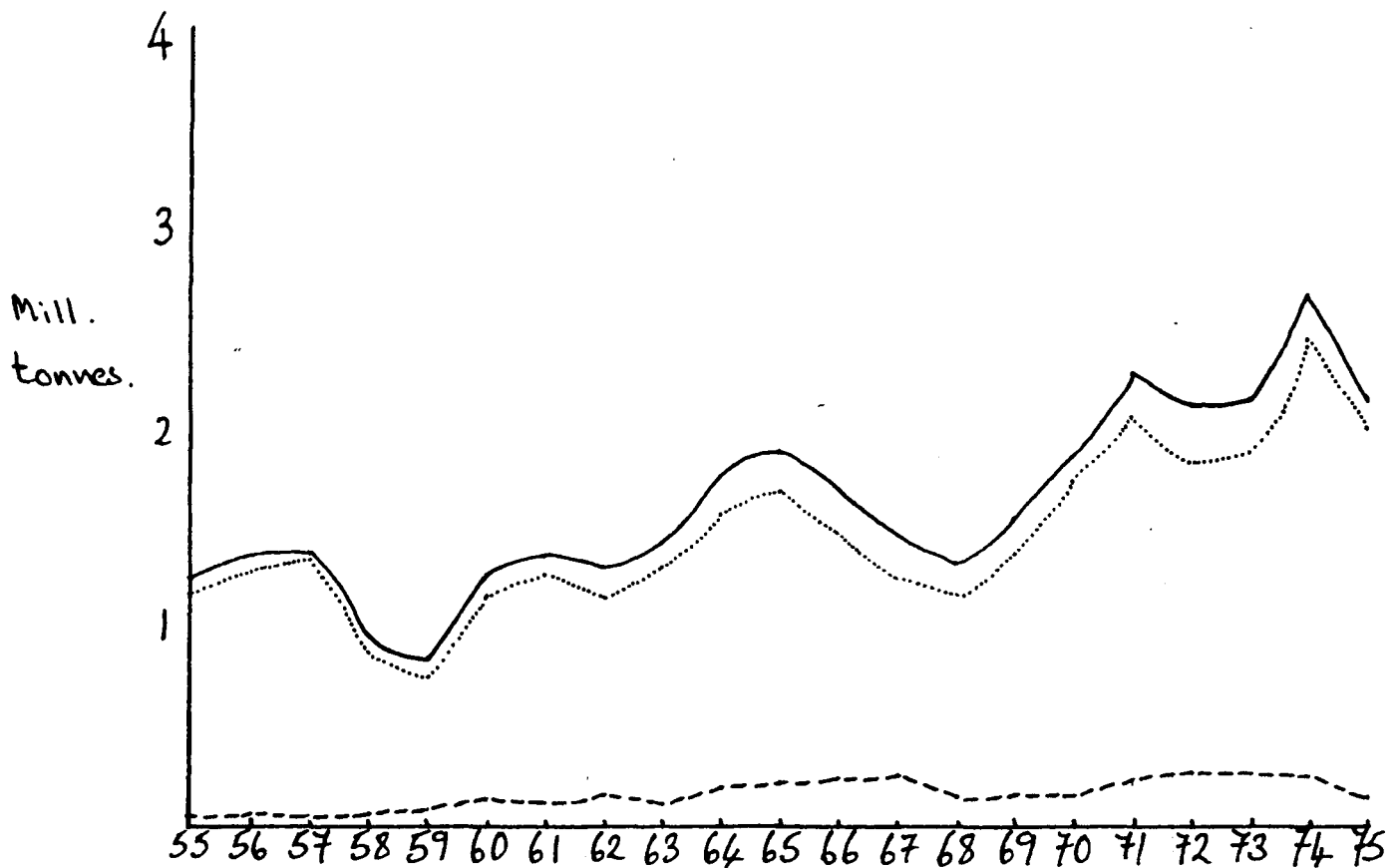
In 1955, 92% of all trade was import, in 1974 the figure was 75%. Imports showed growth, indeed the two trade peaks were due to vast increases in import, while exports showed a general decline. The role of transit trade at the port increased from 24% of imports and 12% of exports in 1955, to 70% and 40% in 1974. So the growth in trade over the period was due mainly to increased transit inwards.

5.2.1.6. Dordrecht.

This port showed considerable fluctuations in its trade flows 1955-1975, but by 1975 it showed an absolute increase from 1.2 million tons in 1955 to 2.1 million tons by the end of the period, with a decline between 1955 and 1959 due to the recession. From 1959 to 1965 seaborne trade through the port more than doubled, but there was a further decline from 1965 to 1968. From 1968 to 1974 trade again doubled, with a slight interruption in growth between 1971 and 1973. Throughout the period Dordrecht's trade favoured imports, which accounted for over 90% of total trade. There was a decline in the role of transit trade 1955-75. Whereas in 1955 transit trade was overwhelmingly dominant, with 96% of imports and 77% of exports, by 1975 the share of transit in the port's trade had fallen to 65% of imports and 33% of exports. This is an indication that the trade of the port became more orientated towards local industrial activity and less towards through trade during the period. Exports grew proportionately faster than imports, more than doubling over the period; growth was especially rapid in direct export from the port, and this is again an indication of increasing local orientation in the port's trade pattern. Relative to other ports in the Dutch port range, Dordrecht held fifth place in the hierarchy in 1955, with 1.5% of the total trade over the range, but by 1975 Dordrecht's position had slipped to seventh place, with 0.7% of total trade.

DIAGRAM 7 TRADE FLOWS THROUGH THE PORT
OF DORDRECHT 1955 to 1975.

— = TOTAL TRADE
-- = EXPORTS
... = IMPORTS



5.2.1.7. Zwijndrecht.

Zwijndrecht was the smallest Dutch seaport in the range in 1955, but although its share of total trade declined from 0.05% in that year to 0.02% in 1975, it was then no longer the smallest Dutch seaport. In absolute terms Zwijndrecht's trade increased from 45,000 tons in 1955 to 79,000 tons in 1975. Throughout the period exports dominated the port's structure, with around 60% of total trade. Transit trade was not important in 1955, but this increased in importance over the period (for imports from 0.1% to 4%, and for exports from 5% to 13%). Total trade at the port fluctuated, especially in the late 1960s and early 1970s. During the late 1950s growth was slow, and it was most rapid during the 1970s. Zwijndrecht's trade was little affected by the recession at the end of the 1950s or in the early 1970s; as at IJmuiden this reflects the dependence of the port on local trade.

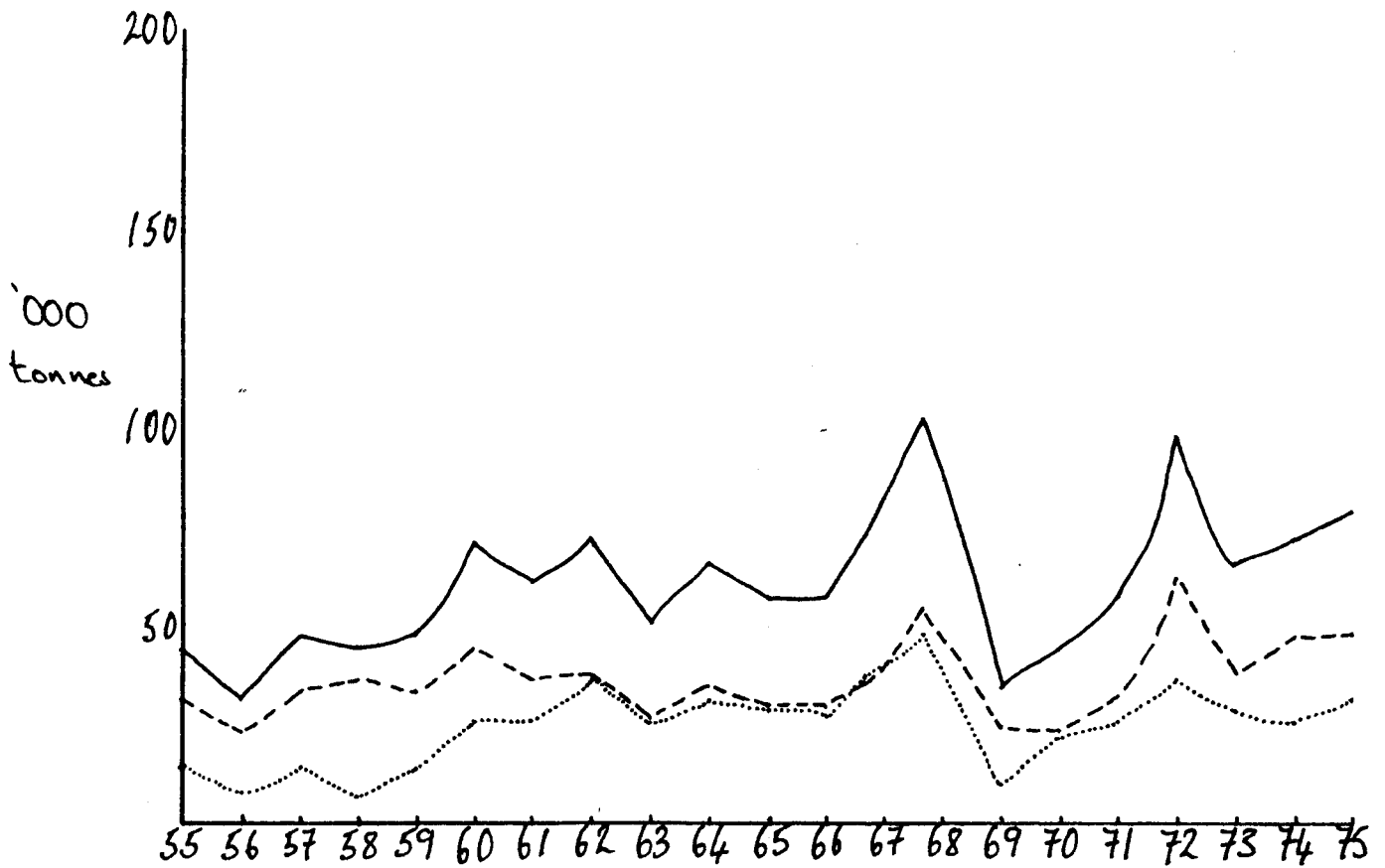
5.2.2. The North Sea Canal ports.

5.2.2.1. Amsterdam.

Amsterdam's percentage share of trade over the Dutch port range fell from 9% in 1955 to 5% in 1975. Initially, however, during the late 1950s and early 1960s, Amsterdam's share of trade rose to 11%, but declined rapidly after 1968. The growth pattern of Amsterdam's trade (from 7.8 million tons in 1955 to 17.4 million tons in 1975) resembled that of Rotterdam, with the exception of the mid-1960s when Amsterdam's trade fluctuated. The year 1959 marked a recession in Amsterdam's trade, after a period of fairly rapid growth following the opening of the Amsterdam-Rhine Canal and subsequent growth in bulk commodities passing through the port. In the early 1960s there was a rapid recovery, and by the end of the 1960s and early 1970s Amsterdam was recording some of the fastest

DIAGRAM 8. TRADE FLOWS THROUGH THE PORT
OF ZWIJNDRECHT 1955 to 1975

— = TOTAL TRADE
-- = EXPORTS
... = IMPORTS



post-war growth in its trade. The recession in the mid-1970s affected Amsterdam earlier than most other ports. Throughout the period there had been little change in the import/export balance, in which imports claimed 62% of trade in 1955 and 69% in 1975. The port's reliance on transit trade had increased slightly by 1975 from a 32% share of exports and 36% of imports in 1955 to 35% of exports and 47% of imports in 1975.

5.2.2.2. IJmuiden.

The trade of the port of IJmuiden saw a steady and rapid increase over the period 1955-75, with growth slightly faster in the 1960s than in the 1950s. It is interesting to note that the general recession experienced by most ports at the end of the 1950s did not affect this port, and even the recession of 1973 only resulted in a slight decline in trade. The main explanation for this, the port's reliance on locally generated trade, is further discussed in section 5.4.2.3. Some of the fastest growth rates for any port in the Netherlands were recorded here. In absolute terms trade grew from 1.9 million tons to 11.9 million tons over the period. Transit trade was almost non-existent in 1955 (2% of exports and 0.2% of imports) and had increased only slightly by 1975 (to 4.6% of exports and 0.7% of imports). Imports dominated the port trade structure throughout the period, representing 83% of total trade in 1955, and 85% in 1975, but exports also showed a growth. In 1955, with 2.4% of total trade, IJmuiden was the Netherlands' fourth largest port after Rotterdam, Amsterdam, and Vlaardingen; by 1975, with 3.8% of total trade over the range, it had moved up to third place.

5.2.2.3. Zaandam

Zaandam had a trade structure mainly dependent on locally generated

DIAGRAM 9. TRADE FLOWS THROUGH THE PORT
OF AMSTERDAM 1955 to 1975

— = TOTAL TRADE
-- = EXPORTS
... = IMPORTS

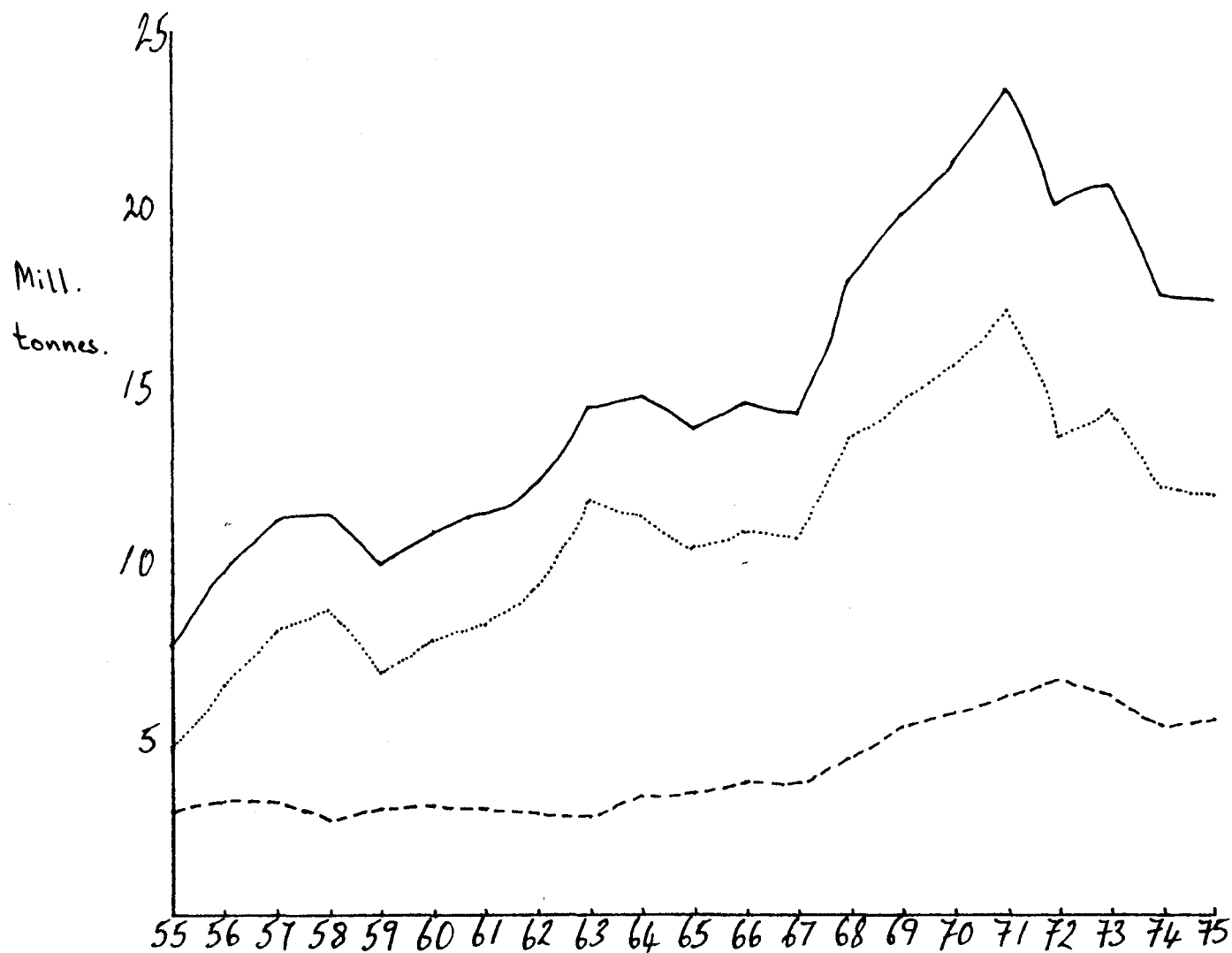
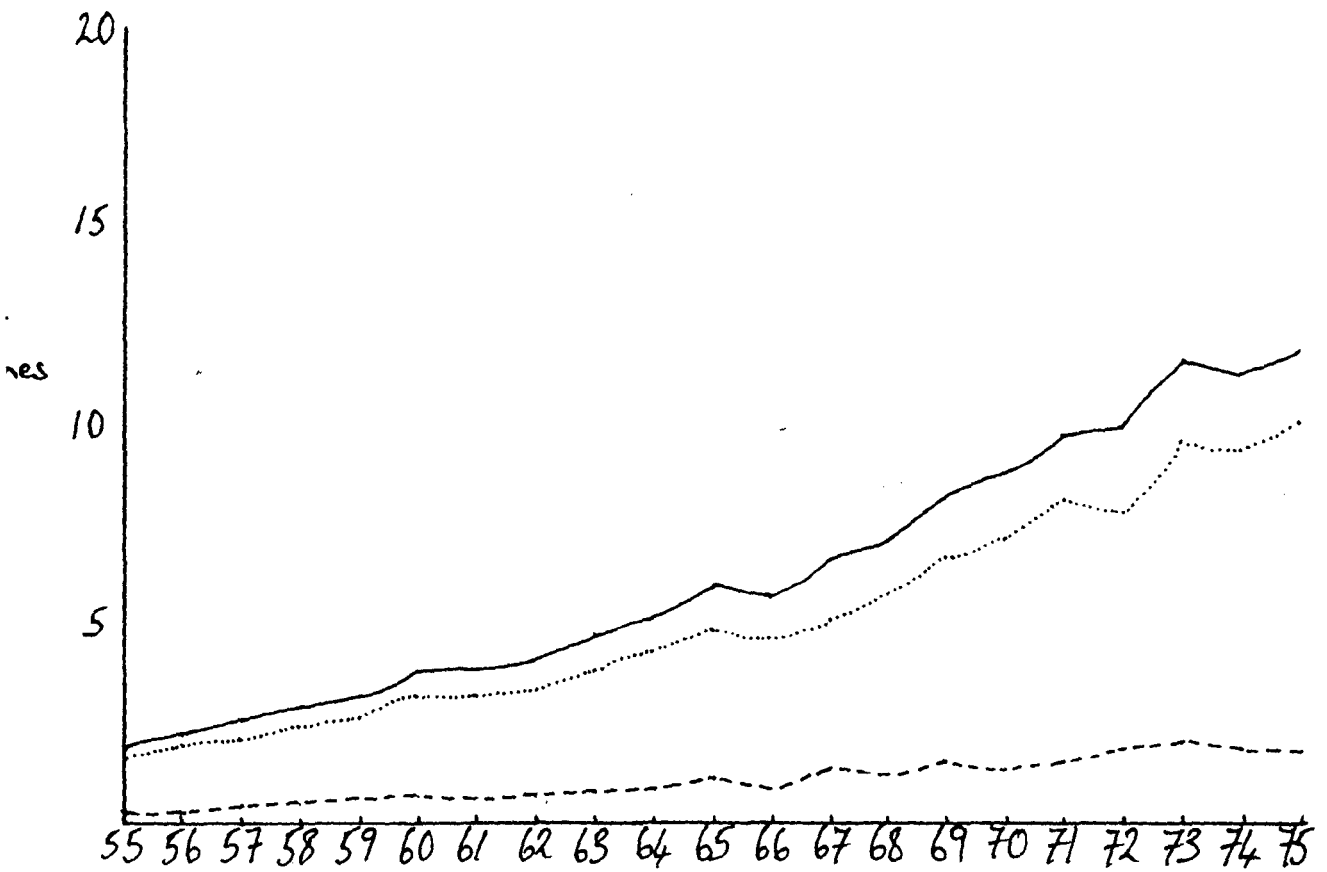


DIAGRAM 10. TRADE FLOWS THROUGH THE PORT OF IJMUIDEN 1955 to 1975

— = TOTAL TRADE
-- = EXPORTS
... = IMPORTS



trade flows, and was dominated by imports over the period 1955-75. In 1955 imports accounted for 94% of all trade through the port. By 1975 this dominance was marginally less, with 82% of trade. Transit trade increased slightly at the port, with 10% of exports and 1% of imports in 1955, the transit outwards had fallen away completely by 1975, but transit inwards had increased to 14% of all imports. If we examine the development of total trade at this port (diagram 10), we can see that in general the period up to 1967 was one of decline. The late 1960s and early 1970s record an increase in trade, although by 1975 there had only been slight overall increase on the 1955 figure. Because of this initial decline and slow growth Zaandam's position in the total port range fell from ninth in 1955 to eleventh in 1975 (with 0.3% of total trade falling to 0.09%).

5.2.3. The northern ports.

5.2.3.1. Delfzijl

Delfzijl showed steady growth in trade in the early 1960s, after an initial decline at the end of the 1950s. From 1967 onwards growth in trade accelerated, with the period 1972-74 witnessing a particularly high growth rate. There was a sevenfold increase in trade 1955-75, making Delfzijl one of the fastest growing ports in the Netherlands in the post-war period. Its share of total trade over the range increased from 0.4% to 0.7% in 1955-75, but its position in the port hierarchy (eighth) remained unchanged. In 1955 Delfzijl's trade was fairly evenly balanced, with exports slightly exceeding imports of 57% of total trade. By 1975 trade was less evenly balanced at the port, with exports accounting for 69% of total trade. Exports were thus the fastest growing element in the port's trade, with an increase to eight times their former level over the period, imports growing more slowly to five times their former

DIAGRAM 11. TRADE FLOWS THROUGH THE PORT OF ZAANDAM 1955 to 1975.

— = TOTAL TRADE
-- = EXPORTS
..... = IMPORTS

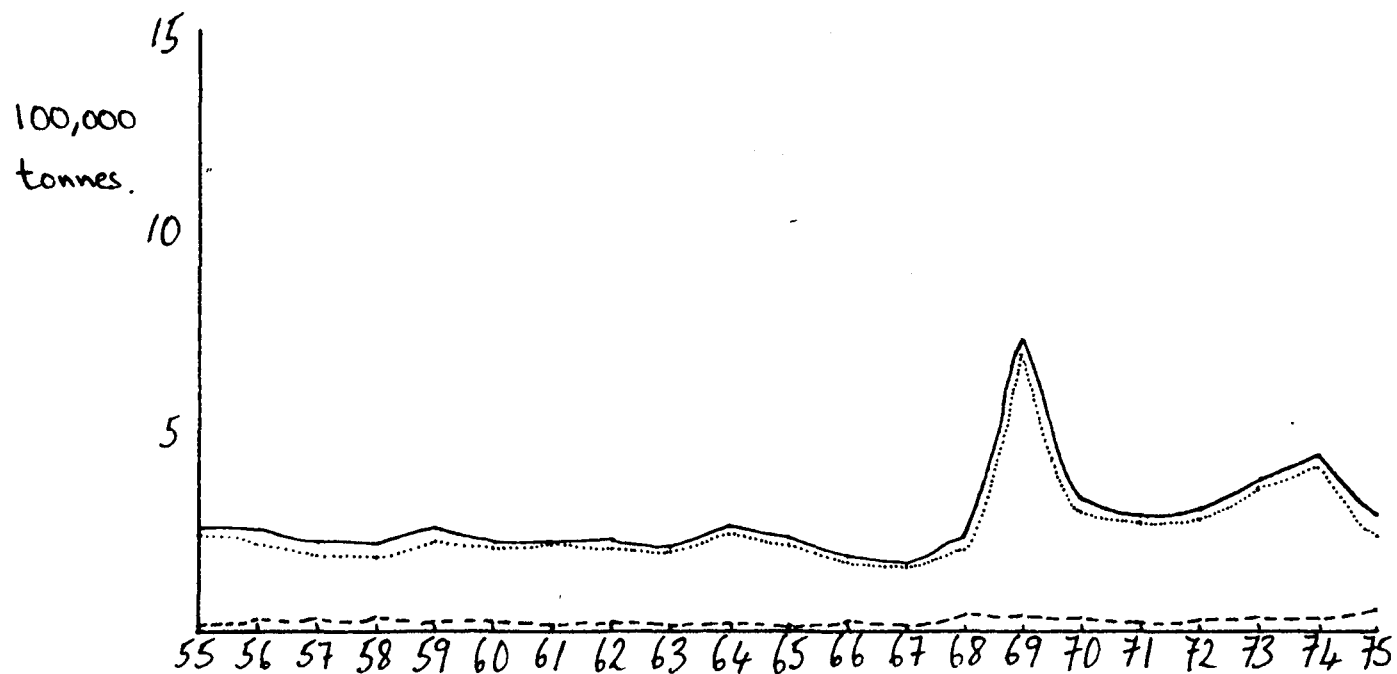
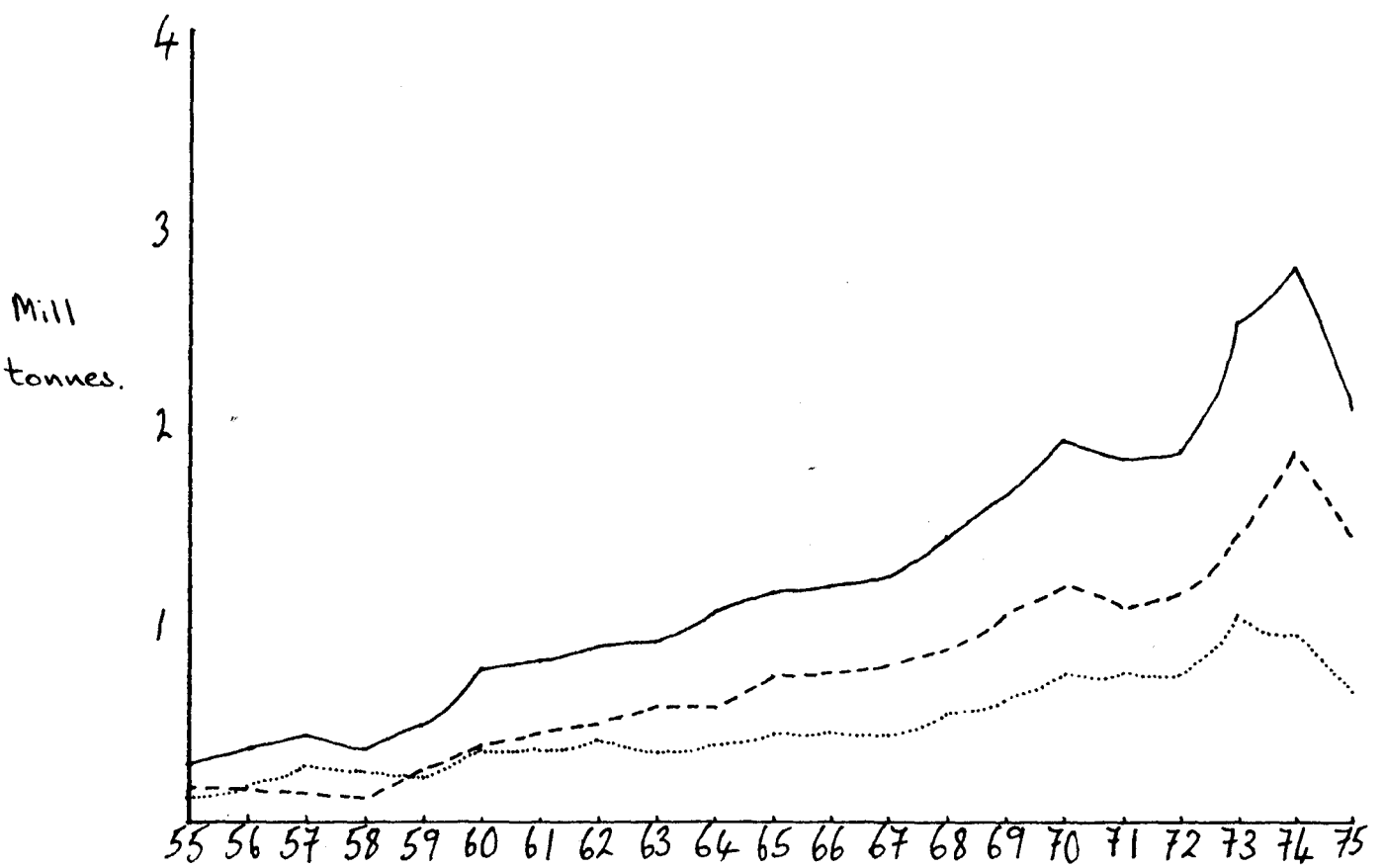


DIAGRAM 12. TRADE FLOWS THROUGH THE PORT OF DELFZIJL 1955 to 1975

— = TOTAL TRADE
-- = EXPORTS
... = IMPORTS



level. Transit trade was not significant for the port. In 1955 10% of imports and 6% of exports were in transit, in 1975 the figure for imports had risen to 15%, but for exports fallen to 2%.

5.2.3.2. Groningen

This was the smallest port in the range after Zwijndrecht in 1955, with 0.06% of total trade. In 1975 Groningen was still the Netherlands' second smallest seaport, with Schiedam now in last place. In absolute terms the port's trade grew slightly from 53,000 tons in 1955 to 77,000 tons in 1975, but trade fluctuated during the period. From 1955-64 Groningen experienced growth, with the exception of 1958, then from 1964-69 there were fluctuations, after which a fairly consistent decline set in. By the end of the period, however, trade showed some signs of recovery. There was a shift in the pattern of trade over the period, since imports which claimed 68% of total trade in 1955 had been overtaken by exports by 1975, which then had 60% of all seaborne trade. Transit trade was insignificant to the port, with only 2% of both imports and exports in 1955, and the figure was little changed by the end of the period.

5.2.3.3. Harlingen

Harlingen was the only other Dutch port besides Schiedam to show an absolute decline in trade between 1955-75 from 140,000 tons to 108,000 tons. In the late 1950s and early 1960s trade at the port increased, reaching a peak in 1964, after which a decline set in. There was also a shift in the balance of trade. In 1955 Harlingen was a strongly export-orientated port, exports taking 80% of total trade. In 1975 trade was more equally balanced with imports slightly exceeding exports. The decline in trade at Harlingen was mainly due to a fall in exports, over the period

DIAGRAM 13. TRADE FLOWS THROUGH THE PORT OF GRONINGEN 1955 to 1975

— = TOTAL TRADE
-- = EXPORTS
... = IMPORTS

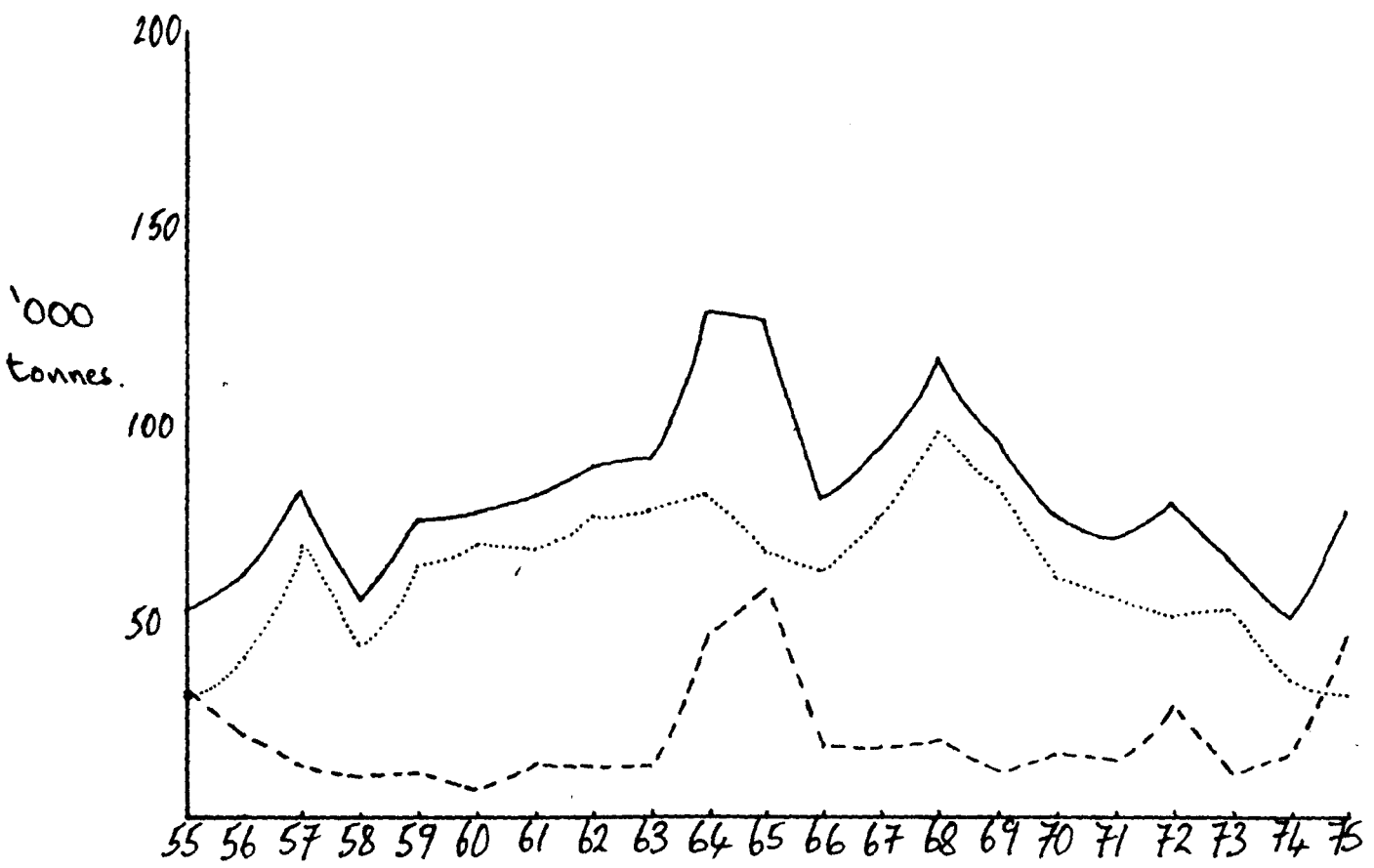
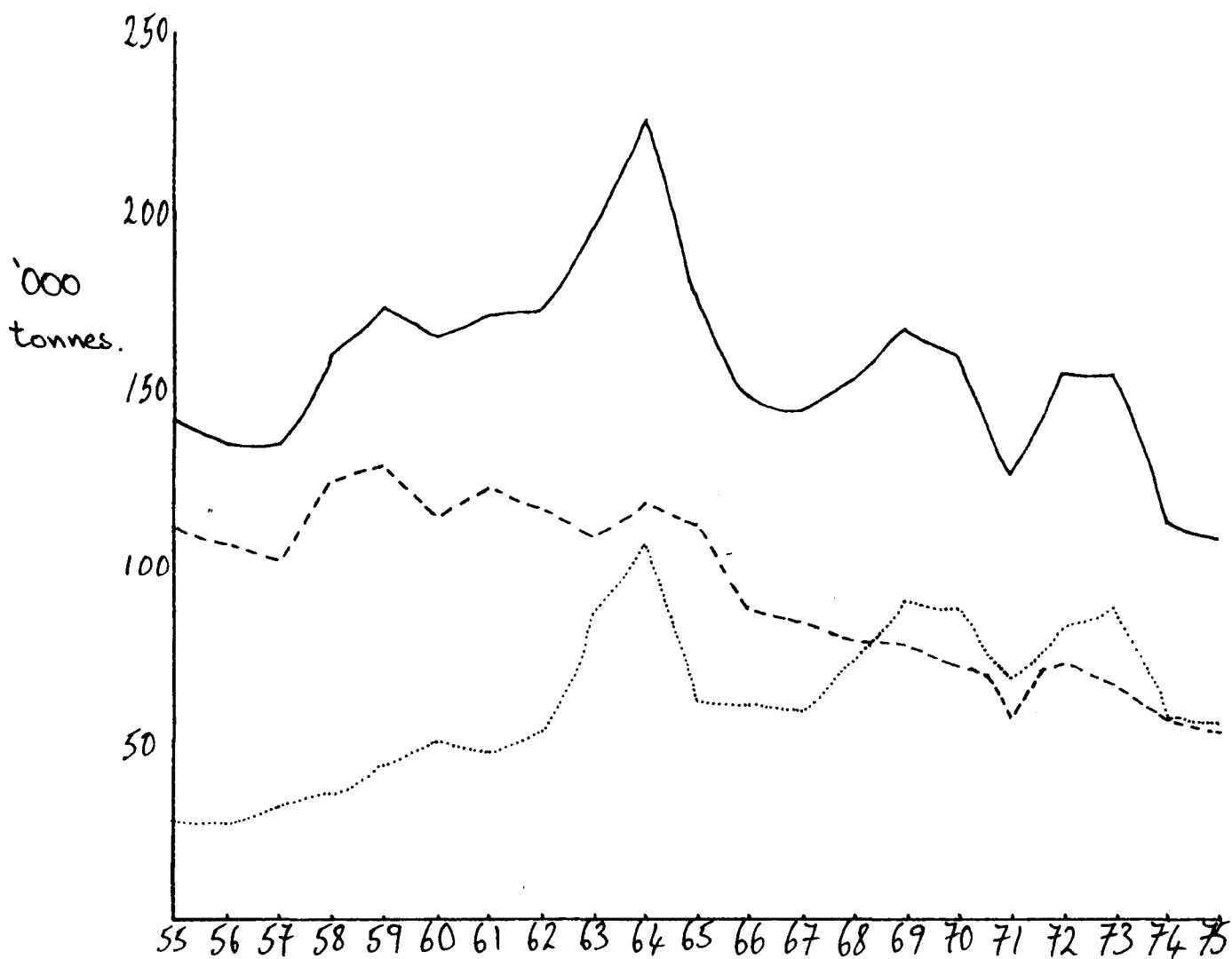


DIAGRAM 14 TRADE FLOWS THROUGH THE PORT OF HARLINGEN 1955 to 1975

— = TOTAL TRADE
-- = EXPORTS
... = IMPORTS



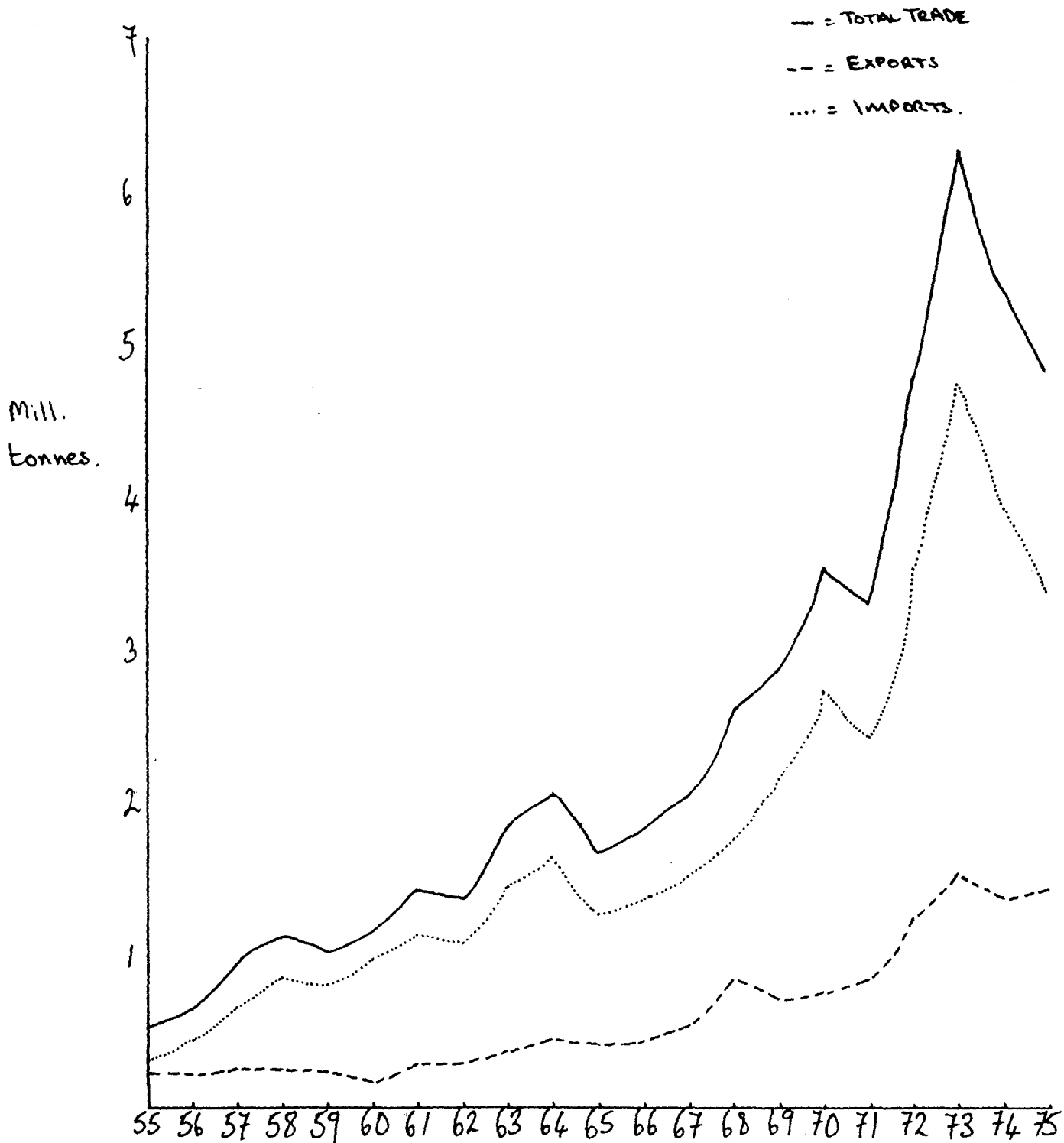
exports halved in size. Imports into the port almost doubled. Transit trade was insignificant, with 1% of imports and under 1% of exports in 1955, although there was a slight increase over the period to 5% of imports and 4% of exports. Harlingen's share of the total trade of the Dutch port range declined from 0.2% in 1955, when it was in tenth position, to 0.03% in 1975, when it took thirteenth place in the hierarchy.

5.2.4. The Schelde ports.

5.2.4.1. Terneuzen

In absolute terms Terneuzen's seaborne trade increased from 537,000 tons to 4.8 million tons, almost a ninefold increase over the period, making it the Netherlands' fastest growing port. Growth was fairly steady from 1955 to 1964, but from 1965 to 1973 there was rapid growth, culminating in 1973 when trade was eleven times its 1955 level. From 1973 to 1975 a decline set in. Imports, which formed 58% of total trade in 1955 were the fastest growing element, increasing their share of trade to 70%, with an elevenfold increase; exports showed a sixfold increase over the same period. Transit trade declined relatively over the period 1955-75, with 47% of imports and 18% of exports in 1955, and 27% and 11% respectively in 1975. This is an important indicator showing that the port became less dependent on the Belgian hinterland, as the transit traffic was mainly to and from the port of Ghent through the Ghent-Terneuzen Canal. Terneuzen's relative share of trade over the Dutch port range also increased, from 0.6% of all trade to 1.5%. In 1955 Terneuzen was the Netherlands' seventh port in terms of volume of seaborne trade, and in 1975 the port was fourth, after Rotterdam, Amsterdam and IJmuiden.

DIAGRAM 15 TRADE FLOWS THROUGH THE PORT OF TERNEUZEN 1955 to 1975



5.2.4.2. Vlissingen

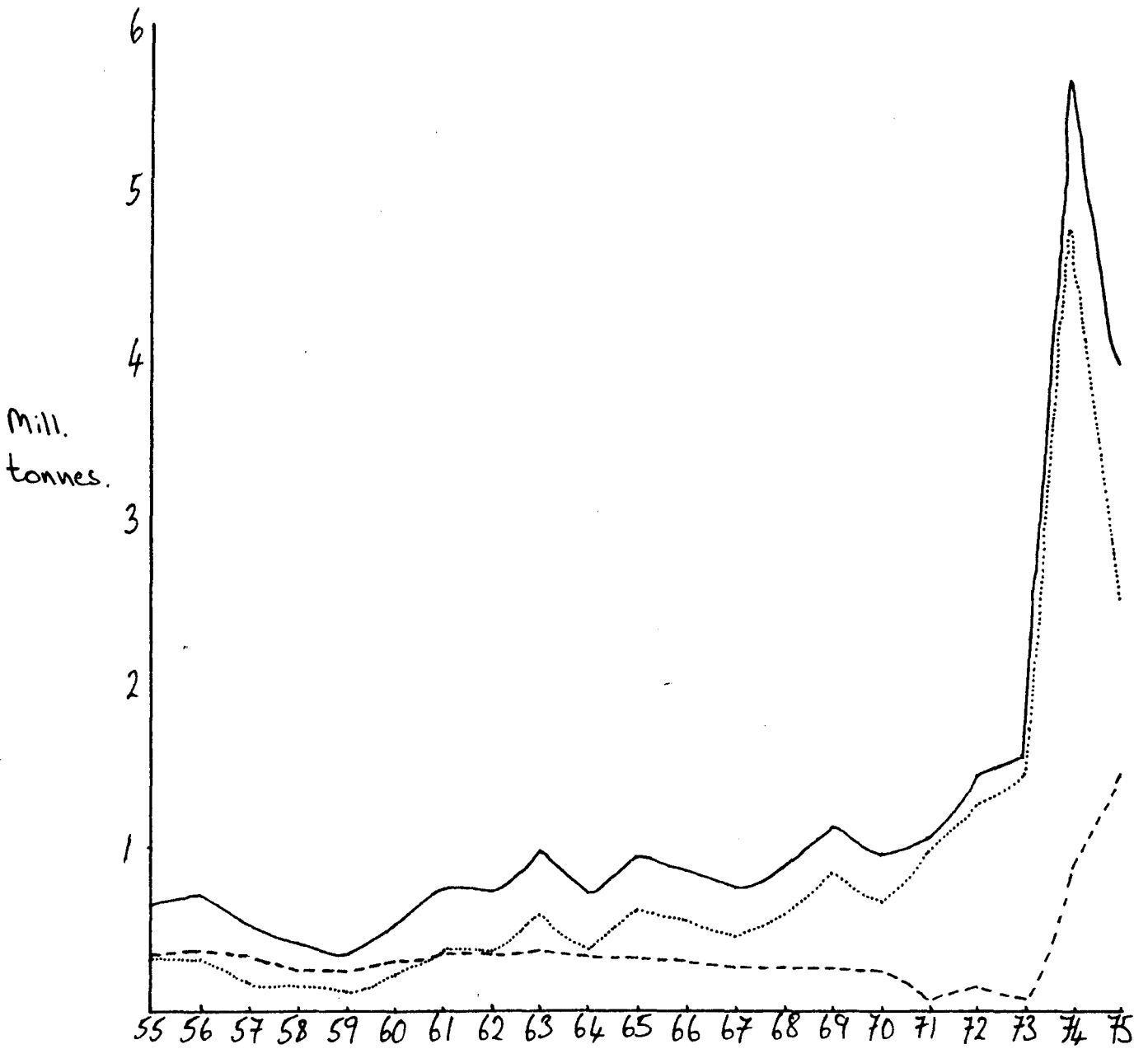
The growth in trade at this port, although not as spectacular as at Terneuzen, was also rapid between 1955 and 1975, with a sixfold increase. Vlissingen's relative position in the hierarchy remained constant, with the port in sixth place, although the percentage share of total trade increased between 1955 and 1975 from 0.8% to 1.3%. An absolute increase in trade was recorded, from 669,000 tons in 1955 to 4 million tons in 1975. If we examine the behaviour of total trade (diagram 16), it can be seen that this growth only took place in the 1970s; in the 1960s there was only slow growth in the port's trade, and the recession of the late 1950s hit the port harder than other ports. A change also took place in the composition of trade at the port over the period, with exports predominating up to 1961. In 1955 exports had 53% of trade through the port, whereas in 1975 imports predominated, with 63% of total trade. Transit trade through the port grew relatively more important during the period, unlike Terneuzen; 6% of imports and 11% of exports were in transit.

5.2.5. Conclusion

To sum up, most of the larger ports in the Dutch port range over the period 1955-75 had seen faster growth in imports than in exports. This was true of Rotterdam, Amsterdam, IJmuiden, Terneuzen and Vlissingen, the only exception being Vlaardingen. Rotterdam, Terneuzen and Dordrecht experienced a decline in transit trade, whereas transit through Vlaardingen, IJmuiden, Amsterdam and Vlissingen, along with several smaller Dutch ports such as Hoek van Holland, Zaandam and Zwijndrecht, increased. Transit trade remained generally important for the New Waterway ports and least important for the northern ports, which were adversely affected by limited access to the hinterland and by the increasing size of sea-ships

DIAGRAM 16 TRADE FLOWS THROUGH THE PORT
OF VLISSINGEN 1955 to 1975

— = TOTAL
— = TRADE
-- = EXPORTS
... = IMPORTS



during this period. The relative increase in transit in the trade of the North Sea Canal ports was less than might be expected after the improvement in access to the hinterland in the 1950s. Several smaller ports in the range increased their export activities, including Zaandam, Zwijndrecht, Delfzijl and Groningen. Imports showed an upward trend in the trade of Harlingen, Schiedam, Maassluis and Hoek van Holland, two of which were the only ports to show an absolute decline in trade over the period. It may be concluded that, in general, imports became more important for the larger ports over the period, while exports became more important for several smaller ports in the range, although the New Waterway ports other than Rotterdam tended to show a more equally balanced trade structure. The Schelde ports showed an increasing imbalance in trade, but the imbalance in structure of trade at the North Sea Canal ports remained, and the northern ports showed fluctuations in the trade, but with increasing imbalance at the largest port, Delfzijl. Growth in trade over the ports 1955-75 is summarized in table 12 (below). Growth was greatest during the period at the ports of Terneuzen, Delfzijl, IJmuiden and Vlissingen, and least at Groningen, Vlaardingen and Zaandam.

	<u>1975</u>	<u>average annual increase</u>
Amsterdam	224	6.2
Rotterdam	398	14.9
IJmuiden	606	25.3
Zaandam	112	0.6
Schiedam	15	-4.25
Vlaardingen	154	2.7
Maassluis	203	5.15
Hoek van Holland	See Note 27	-
Dordrecht	174	3.7
Zwijndrecht	175	3.75
Delfzijl	709	30.45
Groningen	145	2.25
Harlingen	77	-1.15
Terneuzen	899	39.95
Vlissingen	592	24.6

Table 12. Growth of total trade over Dutch ports 1955-75. (1955 = 100, base yr)

5.3. Analysis of hypothetical trade flows and the Dutch port hierarchy 1955-75.

The changes that have been noted in the ranking order of the ports can usefully be compared with the hypothetical pattern of port growth that would have resulted had ports equally shared the national average for all ports over the period. This technique, used first in the study of ports by Rimmer,²⁵ has been borrowed from studies of comparative change in manufacturing industry.²⁶ The measure is a useful one for examining growth throughout a port range, and has been largely ignored by other authors concerned with the development of port trade. The hypothetical tonnage is calculated as follows:

$$HP = XP \frac{Y_{nz}}{X_{nz}}$$

where HP = hypothetical tonnage,

XP = tonnage of individual ports in the range in the initial year,

Xnz = total tonnage of all ports in the range in the initial year,

Ynz = total tonnage of all ports in the range in the terminal year.

Comparative loss or gain in trade of any individual port could then be measured by the formula

$$YP - HP$$

where HP = hypothetical tonnage, and YP = tonnage of an individual port in the terminal year.

The result of these calculations for the ports in the Dutch port range and their development in trade between 1955 and 1975 are found in table 13 below.

	actual tonnage (000 tons)			
	<u>1955</u>	<u>1975</u>	<u>HP</u>	<u>YP-HP</u>
Amsterdam	7760	17425	29488	-12063
Rotterdam	66215	263836	251617	+12219
IJmuiden	1974	11974	7501	+4473
Zaandam	264	295	1003	-708
Schiedam	119	18	452	-434
Vlaardingen	2640	4069	10032	-5963
Maassluis	62	126	236	-110
Hoek v. Holland	97	(1974) 107	369	-262
Dordrecht	1232	2151	4682	-2531
Zwijndrecht	45	79	171	-92
Delfzijl	296	2099	1125	+974
Groningen	53	77	201	-124
Harlingen	140	108	532	-424
Terneuzen	537	4830	2041	+2789
Vlissingen	669	3961	2542	+1419
Total.	82103	312467		

Table 13. Comparative change in trade over the Dutch ports 1955-75.

(Figures to the nearest '000 tons).

From the above table it may be seen that the largest comparative gain 1955-75 was made by the port of Rotterdam, followed by IJmuiden, Terneuzen and Vlissingen, with Delfzijl showing the smallest comparative gain over the period. All other ports in the Dutch port range underwent a comparative loss, yet again an indicator of the increased importance of Rotterdam in the port range over the period. The hypothetical tonnage

and comparative gain or loss is a useful measure in the examination of changes in trade throughout a port range over a period of time. It gives a relative measure which enables a comparison of hypothetical growth, based on the average growth over the whole range of Dutch ports over the period 1955-75, with actual growth at each port, showing a decline or growth in the position of the port in relation to the development of the rest of the range. However, it must be borne in mind that it is based on a comparison of average growth rates, so that smaller ports with less spectacular growth than large elements (such as Rotterdam) appear in an unfavourable light.

One final aspect of the changes within the port range during the period 1955-75 must be mentioned: the addition by the C.B.S. of a sixteenth port to their list of Dutch seaports in 1969: Scheveningen, which was formerly only important as a fishing port, and in terms of volume of trade too small to be included in the figures. Although, due to lack of available trade statistics, it is not possible to include available trade figures here with those covering the whole period 1955-75, the figures for 1969-75 show a growth in trade in the port. Tonnage almost trebled from 169,000 in 1969 to 504,000 in 1975. In 1969 exports formed 60% of total trade; this had fallen to 49% in 1975. The importance of transit through the port increased, from 9% of export and 31% of imports to 19% exports and 60% imports. The increase in trade at the port was partly a result therefore of growth in transit inwards, indicating a growth in the importance of the port as a redistribution centre for imports from overseas. Scheveningen was in tenth position in the Dutch port hierarchy in 1975.

5.4. Commodity analysis of trade flows through individual ports
1955-75.

The variations which occur in the status of a port in a port range are usually associated with changes in the hinterlands, and changes occurring in the volume and composition of commodities exchanged with forelands.²⁸ In the following section attention will focus on the latter, the exchange of commodities with forelands, in order to seek an explanation for the changes which have occurred in the total port trade structures outlined in the previous section. The reasons for this are twofold: (a) changes taking place in the hinterland are often difficult to quantify in terms of their effects on port trade; (b) the variations taking place in the commodity composition of a port reflect the changes in the nature of, and the demand from, the hinterland.

One major difficulty in studying the changes in commodity composition of a port's trade over a period of time is the large quantity of information available, especially for the larger ports in the range. For this reason only the major commodities involved in the port's trade will be considered, and will be scrutinized over periods of five years rather than on a yearly basis, although where exceptional fluctuations have occurred, such as at Hoek van Holland, some attempt will be made to provide an explanation in terms of commodities involved.

In this five-yearly commodity analysis 1955-75, the ten commodity classifications of the N.S.T.R. will be adhered to (see chapter one, p. 10-11), but since the statistics have had to be adapted for the years 1955-65 (Goederen naamlijst B was used by the C.B.S. up to 1966), some under-representation may occur in the initial years of the period under examination. As with total trade, we will study the commodity shifts within each port individually. For the sake of convenience in

in studying commodity flows we have taken 1956 as the starting year rather than 1955. The reason for this is that this was the first year in which the C.B.S. published a separate list²⁹ of the movement of the main commodity groups through the Dutch seaports. The comparisons made between the five-yearly periods originate from table B2,³⁰ table 2a and 2b,³¹ table 2,³² and table 3,³³ where necessary adapting the information to enable comparisons to be made by grouping commodities under the 'headings' used in the N.S.T.R. method. As a result of the different methods used, some of the earlier figures for commodity flows may not add up to 100%. One other factor must also be borne in mind; commodity flows and totals of trade flows 1955-65 include bunkering and ships provisions, but the figures for 1970-75 do not include bunkering materials, so that this also influenced trade totals, especially at ports where this was an important element in trade flows.

5.4.1. The New Waterway ports.

5.4.1.1. Rotterdam

5.4.1.1.1. 1956-60

Rotterdam showed a number of interesting changes in its commodity composition 1956-60. There was a slight decline in the relative share of group 0 (agricultural produce) in the port's trade, from 11% to 10%, although in absolute terms trade in this group increased, mainly imports of grain. Group 1 (foodstuffs etc) became more important in trade, increasing its relative share from 2.5% to 4.7% of total port trade. This was especially due to increased imports of animal feedstuffs and oil seeds. Group 2 (solid fuels) showed a great decline over the period, from 22% of total trade in 1956 to 6.4% in 1960. If we look more closely at the figures the main decline was due to decreased transit inwards, signifying reduced demand for this product from the German hinterland.

There was also a decline in the seaward redistribution of coal. Whereas imports of solid fuels had been three times the size of exports in 1956, a structural change had taken place by 1960, so that exports exceeded imports in that year, although in absolute terms exports had also suffered a decline over the period. Part of the reason for this rapid decline in the coal trade was the replacement of this fuel by oil, a general world trend in the 1950s despite set-backs such as the Suez crisis. This enabled West Germany to meet its home demand for coal by home output, rather than by imports. Group 3, oil and oil products, increased their share of Rotterdam's trade over the period by 6%, from 40% to 46% of total port trade. Most of this growth was due to the direct import of crude oil, and also of direct export from Rotterdam refineries of oil products. There was a slight decline in the transit of oil products. Group 4, ores, saw an increase in the relative share of port trade from 13% to 15% over the period, most of the increase being accounted for by transit inwards, due to an increase in the demand for iron ore from the Ruhr area of Germany. Group 5 remained fairly stable in its relative share of trade at the port, with 2.4% of trade in 1956 and 2.5% in 1960. Again transit was the dominant element in the group, with growth in both inward and outward movements. Groups 6, 7, 8 and 9 constituted fairly minor elements in the trade of the port. Group 6, crude minerals, rose from 1.1% to 1.4% (1956-60), group 7, fertilizers, from 2.5% to 3.7%, and group 8, chemical products, from 0.8% to 1.6% of trade (making it the smallest group in the port's trade). Figures for group 9 were not available for 1956-60, but it also constituted a minor item, and there was a decrease in export of bunker materials from the port. In 1960, therefore, oil, ore and agricultural produce (mainly grain) were the main items

of trade at the port. In 1956 this had been oil, coal, ore and agricultural produce. The main change in commodity composition of the port over this period was therefore the decline in the coal trade.

5.4.1.1.2. 1960-65

From 1960-65 the relative share of commodity groups 1 (other food-stuffs), 4 (ores, 6 (crude minerals) and group 8 (chemical products) increased. In this period, growth was most rapid in group 6, with increases in both direct imports and direct exports, due partly to the movements of sand and gravel in connection with engineering works at the port. In absolute terms all commodities at the port underwent growth, but the relative share of oil decreased from 46% to 43.2%, which is surprising in view of the increased home demand from new refineries and rising demand in the hinterland. Germany's consumption of oil increased from 21.7% of total energy demand in 1960 to 46.8% in 1967-68).³⁴ Transit continued to play a minor role in this group. In 1962 the volume of oil traffic at the port had risen to exceed the volume of dry bulk cargo for the first time. Group 0, agricultural produce, showed a small decline in its relative share of trade in 1960-65, but an absolute increase especially in transit outwards of grain from Rotterdam as a redistribution centre for the rest of Europe occurred. Commodity group 2 also showed an absolute increase, but relatively declined even further to 5.5% of port trade in 1965. Both the German and Dutch coalfields were finding it increasingly difficult to compete against lower-priced imports at this time. There was a slight decrease in the percentage share of group 5, metal manufactures, from 2.5% to 2.2%, though there was an absolute increase, most of which was attributable to direct exports from the home market. Group 7, fertilizers, remained fairly stable over the period with regard to its share of total trade.

The main growth in relative terms in the period 1960-65 was in the ore trade, most of which was transit inwards destined for West Germany.

5.4.1.1.3. 1965-70

From 1965-70 the relative share of ore in the port's trade underwent a decline, yet in absolute terms the outward transit trading in this group showed the most rapid growth. The dominant trend of this period was, however, the increased dependence of the port on the oil trade; whereas the share of oil had increased only slightly in 1956-65, in 1965-70 oil's share of trade increased from 43.2% to 62.7% of all port trade. There was a decline in all other commodity groups' share of total trade during the period, with the exception of group 8, chemicals, whose percentage share increased from 3% to 4.2%. The decline in percentage share was especially marked for group 0, agricultural produce, which halved in absolute terms over the period. The main reasons for this were decreased imports of wood and grain at the port, but there was also a decline in the export of agricultural produce. There was also a sharp decline in the fertilizer trade (group 7), relatively and absolutely, with exports (mainly transit) declining faster than imports. The volume of coal trade again decreased with imports declining but exports rising, and its share of port trade declined from 5.5% to 2.7%, reduced to a minor element in trade by 1970.

5.4.1.1.4. 1970-75

From 1970-75 there was little change in this situation. Agricultural produce saw a growth in relative importance once more, from 3.9% to 5.2% of total trade, due mainly to a recovery in the grain trade through Rotterdam. Group 1 also increased its share slightly, as did group 9, finished products (the latter due mainly to the growth of transit out-

wards, also from West Germany). The relative share of oil and oil products, ore, coal and metal manufactures remained at much the same level, while group 6 and 7 declined both in relative and in absolute terms, both groups suffering from a decline in direct import. There was also an absolute and relative decline in the share of group 8 in port trade for the first time, due to a decrease in through transit, but also in direct trade, signifying reduced growth in this industry in the first half of the 1970s.

5.4.1.1.5. Summary

The main trends in the trade of commodity groups and their relative share of total trade 1956-75 are summarized in table 14 overleaf. Over the whole period the main trend has been the increasing concentration of port trade on one commodity, namely oil and oil products, in which direct trade was the dominant element, and it is mainly because of this that the port showed reduced dependence on transit trade. The dwindling of the coal trade, especially marked during the earlier part of the period, was also an important feature. The share of ore in port trade, which remained heavily dependent on transit inwards to the West German hinterland, remained fairly constant. Chemical products (group 8) saw a steady growth in trade up to 1970. Most other groups continued to show a fairly strong reliance on transit to and from the German hinterland throughout the period, such as group 5. Transit outwards from Rotterdam, often emphasised as an important aspect of its trade development as the port was increasingly functioning as a redistribution centre for raw materials for the rest of Europe, played a relatively minor role in most groups (except coal and metal products), and achieved a relatively slow growth during the period. The balance between import and export changed over the period for commodity groups 2, 5, 7 and 8. For groups 2 and 5 (whose relative share of port trade declined during 1956-75)

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exports were increasingly dominant, while for groups 7 and 8 imports became the dominant feature. The development of group 9 was interesting. Although figures are not available for the early part of the period, as this group was only a very minor element in port trade, the early 1960s saw growth in the movement of general cargo through Rotterdam.³⁵ Despite the arrival of the first container ship at the port in the mid-1960s and the development of unitization the share of group 9 declined during 1956-75, but this was largely a result of the exclusion from statistical information of bunker materials as an element from 1965 onwards. Nevertheless, the relative decline during 1965-70 (excluding bunker materials) is surprising in view of the rapid developments in general cargo transport, although it should be borne in mind that any absolute increase is offset by the huge increases in the oil trade at this time. From 1970 to 1975 there was a revival of the growth in the relative share of group 9, causing a structural change by 1975, when exports exceeded imports, whereas in 1965 the reverse was true. Transit outwards was the main growth element in 1970-75, and the redistribution of containers from the United States and other deep sea origins to near sea areas was undoubtedly a significant factor.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	11	10	9.7	3.9	5.2
1	2.5	4.7	6.8	5.2	6.1
2	22	6.4	5.5	2.7	2.7
3	40	46	43.2	62.7	62.7
4	13	15	16.2	12.6	12.8
5	2.4	2.5	2.2	1.7	1.6
6	1.1	1.4	4.2	3.2	1.7
7	2.5	3.7	3.6	1.9	1.6
8	0.8	1.6	3.0	4.5	3.6
9	(4.7)*	(3.0)*	2.0(5.6)*	1.5	2.0

*= bunker materials included

Table 14. Rotterdam: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75. Source: Maandstatistiek van de zeevaart en van het havenverkeer, 1956-60, 54, 70 and 75, tables B2, 2a & b, 2 and 3.

5.4.1.2. Schiedam

The commodity composition of the port of Schiedam showed a much simpler pattern. Bunker materials dominated the structure of the port during the period 1956-70, but for 1975 figures for bunker materials were not included in total trade by the C.B.S. for seaports, so that this is the main explanation for the sharp decline in trade at the port of Schiedam during 1970-75 (see diagram 3), although the role of bunker materials in the trade of the port did decline relatively (from 82% to 61% in the period 1956-70). Trade at the port excluding bunker materials underwent a slight absolute decline over the period 1956-75, from 19,600 tons to 18,000 tons. The main item was group 9, especially transport equipment and machinery. From 1956-60 the share of this group in port trade increased from 11.7% to 20.5%. While imports predominated in 1956, exports were the main element in 1960. There was very little transit involved, so that the main increase was in direct exports. Throughout the period 1956-75 group 9 remained the second most important element in trade after the export of bunker materials, with the exception of 1970, when there was a large import of group 6 (raw minerals, mainly sand). This commodity did not feature in other years, however, and was mainly due to the increased import of this material for engineering projects along the New Waterway and building developments in and around Rotterdam. Other commodity groups that were not present in some years, must also be regarded as impermanent features. Oil products, mainly import associated with the provision of bunker materials, featured in the port's trade in all years except 1970, showing a growth in 1956-65. Group 0 was registered as a trade item in 1960 and 1970, but here two different commodities were involved, since wood imports formed the main item in group 0 in 1960, and grain imports in 1970. Group 5 was of minor

importance to the port over the period and showed a decline. Exports of chemical products (group 8) accompanied the peak of the growth period of the chemical industry in the Netherlands, most of the trade being transit outwards. Group 7 also only made a brief appearance in the trade of the port in 1965, both direct import and transit outwards, suggesting redistribution of this product. Schiedam therefore saw increasing diversification of trade during the 1960s, but by 1975 there was again a concentration on few commodities, as in 1956.

Group (N.S.T.R.)	1956	1960	1965	1970	1975*
0	-	1.3	-	0.5	-
1	-	-	0.6	1.2	p
3	2.3	0.5	4.5	-	p
5	-	0.8	0.06	0.3	-
6	-	-	-	18.5	-
7	-	-	3.4	-	-
8	-	-	3.6	1.4	-
9	11.7	20.5	11.1	16.1	p
Bunker	82.3	73.0	76.0	61.2	na

Table 15. Schiedam: percentage share of commodity groups N.S.T.R. in the port's trade 1956-75.

Source: see p. 108.

*Percentage shares for this year have not been included as a relative comparison is not possible due to the exclusion of bunker materials. The letter p denotes that a commodity was present in this year.

5.4.1.3 Vlaardingen

This port also showed considerable variation in its commodity composition 1956-75. In 1956 group 4 was the largest item in port trade, with 62.5% of all trade in that year. Most of this was transit inwards, destined mainly for West Germany, with virtually no export of this commodity. Oil products (group 3) formed the next largest group, with

just over 11% of trade, and group 7, with 10%. About a third of the oil products were destined for through transit, whereas group 7, in which imports dominated, was mainly direct import. Group 1, mainly the import of oil seeds, had almost 8% of trade and group 2 only 3.1%, showing that, in contrast to Rotterdam, the import of coal was not important, and half of the coal was in transit inwards. Groups 6 and 8 had only a minor share in trade; in the former group imports and exports were almost balance, while imports predominated in the latter, with little transit trade in either group. By 1960 the position of group 4 (ore) had been strengthened to 63.6% of the total, due to a steady increase in transit inwards. Group 1 now formed the second most important trade item, with a notable rise in direct imports. The share of group 7 decreased slightly, although in absolute terms growth occurred in imports especially of raw phosphate, the main commodity in this group. The relative share of group 3 and its absolute volume also declined. There was a rise in the share of group 2 in the port's trade over the period, and in absolute terms its trade (imports) doubled, a rather surprising feature in view of the decline in this product at nearby Rotterdam during this period. Most of this was destined for local use for the transit trade inwards had almost ceased. The increased demand can be attributed to a growing demand from local industries. Group 5, of little significance in 1956, had 1.4% of trade in 1960, due to an increase in transit inwards through the port. The share of groups 6 and 8 had declined between 1956 and 1960, both in relative and absolute terms. Bunker materials featured for the first time in port trade in 1960, but in contrast to Schiedam this was a very minor element in trade.

From 1960-65 these developments were strengthened, with the continued

dominance of group 4. Group 1 also showed an increase in its relative share of the port's trade, and group 7 recovered its 1956 level. There was a marked decline in group 2, to the point where direct imports of coal had almost ceased. Imports of group 3 increased, mainly for transit inwards. The position of group 5 declined from 1.4% to 0.9% of trade over the period, whereas the smaller groups 6 and 8 saw a slight increase. Groups 0 and 9 featured for the first time in statistics in 1965, but constituted very minor items in total trade here. Bunker materials increased their share of total trade to 2.7%.

Over the periods 1965 to 1970, and 1970 to 1975, a major structural change took place in Vlaardingen's trade structure. Ore imports fell to 41.1% of port trade in 1970 and only 13.5% of trade in 1975, so that by 1975 ore had fallen from first place in trade to fourth place, caused by a massive decline in transit inwards. At the same time there was continued growth in group 1, so that by 1975 this group took the largest share of trade. Group 2 also showed growth over the period 1965-75, and increased its share of total trade from 0.3% in 1965 to 22% in 1975, making it the second most important item in that year, the first time in the period 1956-75 that coal had been a major item in port trade. Whereas in previous years coal had been imported mainly for local industries, it was a new demand for transit inwards that caused the growth in this period, though transit outwards also increased. Group 7 also showed continued growth, increasing in absolute terms, especially 1965-70, after which there was a decline, especially in exports, suggesting that the fertilizer plant at the port was heavily hit by the recession in the early 1970s. Group 3 saw a fairly continuous decline in imports (mainly transit) so that the share of this commodity fell in 1965-75 from 9% to just under 3%. During the same period group 6 saw a growth in trade, with most of the increase at

the end of the 1960s, declining again between 1970-75. As at Schiedam the main increase was in the import of sand, connected with the extension of the port of Rotterdam, so that much of the material was transit inwards.

Table 16 below summarizes these developments in trade. In general we can say that the decline in total trade at Vlaardingen in the 1970s was due to the decline in ore trade at the port (see diagram 4), and although the commodity structure of the port remained fairly stable from 1956 to 1965, a major structural change took place in trade during 1965-75.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	-	-	0.1	0.4	0.3
1	7.7	10.9	11.6	18.5	27.5
2	3.1	4.6	0.3	8.9	22.0
3	11.3	7.9	9.0	4.3	2.8
4	62.5	63.6	63.6	41.1	13.5
5	-	1.4	0.9	1.6	8.7
6	0.9	0.4	0.9	8.2	7.1
7	10.3	9.3	10.1	14.1	15.8
8	0.4	0.2	0.6	1.7	1.7
9	-	(1.0)*	0.1(2.7)*	0.3(0.9)*	0.2

Table 16. Vlaardingen: percentage share of commodity groups N.S.T.R. in the port's trade 1956-75. Source: see p. 108.

*Bunker materials included.

5.4.1.4. Maassluis

Here the trade structure in 1956 was dominated by exports, especially of group 0, which had 85% of all port trade in that year. Group 9 was the second item in trade, consisting mainly of transport equipment, in which imports and exports were fairly evenly balanced. The only other item recorded in port trade was group 1, processed agricultural produce. In 1960 the dominance of group 0 (exports of mainly vegetables) was

slightly less, with group 1 disappearing altogether and group 9 gaining relatively, due mainly to increased import. There was some import of group 6 in this year, but it was only very small. From 1960-65 the share of group 0 in trade continued to fall, whereas group 1, largely exports, formed the second most important item. There was a small export of group 3 from the port in 1965. Group 9, which had declined to a relatively unimportant part of the port's trade in 1965, had risen again to second place by 1970. The share of group 0 in port trade had fallen even further by 1965, and continued to do so, in absolute as well as relative terms. An interesting development over the period 1965-70 was an increase in the number of commodity groups shown in the trade of the port. Transit trade, unimportant in the port's activities in 1956, claimed most of the commodities other than those of groups 1 and 0 in 1970, and about half of group 9. Groups 2, 4, 5 and 8 featured in port trade for the first time in this year. Group 6 increased to figure once more in port trade in 1970, being mainly increased import of sand and gravel as at other New Waterway ports.

By 1975, as at Vlaardingen, a fundamental change appeared to have taken place in the trade of Maassluis. Group 1 was now the main item in port trade, with (direct) exports dominant. The main growth was in the export of frozen and prepared foods with a decline in the export of fresh foodstuffs. This is in line with the increasing demand generally experienced in the developed economies for prepared products in this field. The major element in port trade therefore continued to be agricultural produce, although the emphasis in this commodity group changed. Group 9, with a smaller share of trade than in 1965, remained the second item in the port's trade in 1975. Group 5 now claimed third place, with an increase mainly in direct export. Group 8 continued to increase its relative share of port trade whereas imports of groups 2

and 3 declined once more so that these had a minor share in trade in 1975. Group 6 showed a relatively stable pattern between 1970 and 1975. A small import of group 7 formed a new element in port structure. Clearly the trade of Maassluis showed a marked diversification in the late 1960s and early 1970s, which accounts for the increase in trade at this port, although agricultural produce still dominated the port's structure in 1975 as in 1955. Transit trade also became more important over the period, showing that the port was no longer as heavily dependent on the immediate hinterland at the end of the period.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	85	71	59.3	39	8.7
1	1.4	-	30.5	17.5	47.6
2	-	-	-	6.1	0.8
3	-	-	3.0	2.7	0.8
4	-	-	-	0.5	1.6
5	-	-	-	2.5	11.9
6	-	0.3	-	3.6	3.2
7	-	-	-	-	0.8
8	-	-	-	6.1	7.9
9	4.6	14.2	0.7	21.0	16.7

Table 17. Maassluis: percentage share of commodity groups N.S.T.R. in the port's trade 1956-75. Source: see p. 108.

5.4.1.5. Hoek van Holland

This was a minor port in 1956, dominated by the bunkering of sea-ships as the major trade item (45%), followed by agricultural produce with 18.9% of trade, mainly consisting of exports of fresh fruit and vegetables. Group 9, mainly exports of transport equipment, was also represented.

In 1960 a similar situation existed, although bunker materials were relatively less important, while group 0 had grown in importance (mainly through increased export), as had group 9, due to increased outward transit of machinery. By 1965 the share of bunker materials had fallen even further, and group 9 (other than bunker materials) now dominated port trade, with growth in both import and export of machinery and transport equipment (mainly direct rather than transit). Group 0 has once again increased its relative share of the port's trade, and group 1 also showed an increase after a decline 1956-60. Of minor importance were groups 4, 5 and 8. From 1965-70, although there was an absolute decline in total trade, agricultural produce (group 0) had shown an absolute and relative growth and now had 52% of port trade (excluding bunker materials, which had continued to decline in size). Group 9 was now the second item in port trade, imports of this group predominating for the first time. Groups 4 and 5 were no longer present in this year, but group 8 increased its relative share. The large total of 1968 (see diagram 6) was due almost exclusively to a large import of sand (group 6) to the port. The large total of 1975 was also due to this phenomenon (the import of group 6), caused by attempts to improve the beach area of Hoek van Holland in order to provide recreational facilities using materials from the development of the Maasvlakte. The main item in port trade in 1974, however, was group 9, with almost half of the port's trade, exports predominating. Group 0 remained an important item, with exports of fresh fruit and vegetables as the major element. Trade in group 1 rose once more, and there was a small transit of groups 5 and 6 in this year. Group 8 continued to increase its relative share of trade. By the end of the period, therefore, Hoek van Holland had a trade structure similar to that of 1956, with the exception of bunker materials. It was still

clearly dominated by agricultural produce, although the share of group 9 had also increased greatly to form the main items in 1974. The decline in port trade 1956-70 was mainly due to the decreased importance of bunkering at the port whereas machinery and fresh fruit and vegetables remained an important element, and most other commodities saw an absolute increase in trade.

Group (N.S.T.R.)	1956	1960	1965	1970	1974 [‡]
0	18.9	23.8	26	52	31.7
1	6.8	5.0	11	8.6	10.3
4	-	-	2.7	-	-
5	-	-	2.7	-	1.9
6	-	-	-	-	0.9
8	-	-	1.4	3.8	6.5
9	5.5(45)*	8.4(35)*	27(24.8)*	32.3	48.5

Table 18. Hoek van Holland: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75. Source: see p. 108.

*bunker materials included

‡see p. 90.

5.4.1.6. Dordrecht

Dordrecht and Zwijndrecht, due to their close proximity, are often considered as a single entity, but, as shown earlier, the trade structures of the ports are quite distinct. Dordrecht, with most of its trade in transit in 1956, had a seaborne trade flow heavily dominated by the transit inwards of group 4 (74.5% of all trade at the port). At the end of the period this group accounted for only 29.3% of all trade, so that a major structural change had meanwhile taken place. Other commodity groups were of relatively minor importance

in 1956, being mainly transit inwards of groups 6, 3, 7 and 0. Groups 2 and 5 were the smallest items. From 1956 to 1960 the dominance of group 4 in trade declined, both in relative and absolute terms, with transit of iron ore to the hinterland decreasing. This was in contrast to other New Waterway ports such as Rotterdam and Vlaardingen, where the import (transit) inwards of this product grew over the same period. This shows a relative shift in the trading pattern of this product in favour of these ports and to the disadvantage of Dordrecht. This can be attributed mainly to the limited depths at the latter port, together with the increase in the size of ore carriers and the provision of modern bulk-handling facilities at Rotterdam and Vlaardingen. Imports of group 3 increased over the period, making it the second item in port trade, with 11.7% of the total. Imports of group 2 also increased during the period, despite a decline in this commodity at larger ports. Groups 5 and 6 increased their share slightly, and group 0 declined in importance. Group 8, insignificant in port trade in 1956, constituted the third item in 1960.

From 1960-65 the decline in the relative importance of group 4 continued, although there was a slight absolute increase. Group 8, with 22% of port trade, was one of the fastest growing elements during this time, taking second place, due to direct imports. Group 3 declined once more, but group 2 (solid fuels) maintained a fairly constant share of port trade, increasing in absolute terms. Group 7 (fertilizers) recovered once more after the decline 1956-60, and group 6 (transit inwards of crude minerals) also increased its share. Group 0 continued to decline in importance, although there was an absolute increase mainly of direct import.

From 1965-70 the dramatic decline relatively and absolutely of group 4 reduced it to second place in 1970. Group 6 now constituted the major

item in trade, which was consistent with developments at other New Waterway ports. The importance of group 8 declined for the first time. Group 3 also showed a decline mainly in imports. Most other groups increased their share of trade, including group 2, the steady growth of which throughout the sixties was connected mainly to local demand (direct imports). In 1975 the situation at the port remained similar, with group 6 the major item, although its share had declined, and group 8 increasing its share once more. Group 0 continued to decline, as did group 3. Group 2 also declined during this period, again in contrast with ports such as Vlaardingen and Rotterdam.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	4.6	3.9	3.4	5.9	2.4
1	-	-	0.2	1.4	1.8
2	1.3	6.2	6.5	8.0	2.8
3	5.8	11.7	9.0	4.5	2.5
4	74.5	54.3	37.7	13.4	29.3
5	0.1	0.5	0.3	0.5	1.6
6	6.0	7.4	12.7	46.8	36.3
7	4.9	-	5.7	5.3	6.7
8	-	10.8	22.1	12.5	19.4
9	-	-	3.8	0.9	1.8

Table 19. Dordrecht: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75.

Source: see p. 108.

5.4.1.7. Zwijndrecht

Zwijndrecht's seaborne trade in 1956 was dominated by the export of group 1 (animal feedstuffs, and oils and fats), most of which were produced in local industries, accounting for 78% of port trade. The only other commodity of note in 1956 was group 0, mainly import, but throughout the whole period 1956-75 the port's trade structure became more diversified. In 1960 the dominance of group 1 had fallen slightly and group 0 had also declined, but group 9 (mainly the import of finished metalware) had become of some note. By 1965 the share of group 1 in total trade of the port had fallen further, but group 0 had risen, due to the increased import of wood. Import of group 9 had almost ceased, although there was still a residual export. Group 5 made its first significant contribution to the port's trade in this year.

In 1970 the fall in the share of group 1 in trade had continued, due mainly to the reduced export of animal feedstuffs, and it was the fall in this trade that caused a 'slump' in overall trade figures at the port in 1968-72 (see diagram 8). On the other hand the import of oil seeds had risen steadily since 1956 and in this year exceeded the export of animal feedstuffs for the first time. The share of group 0 declined 1965-70, mainly due to the decreased imports of wood, although there was a rise in the import of grain at the port. As at Dordrecht, group 6 was of some importance in 1970. Groups 9 and 5 grew in relative share of trade 1965-70, and group 8 featured for the first time. At the end of the period group 1 still dominated port trade, despite the diversification that had taken place with groups 5 and 8 now also important elements in trade. Otherwise the basic trade pattern at the end of the period 1956-75 remained unchanged, with trade dominated

by groups 1 and 0, and orientated towards serving local industries rather than transit.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	15.5	7.5	45.4	17.7	16.4
1	78.2	71.1	47.0	45.8	50.6
5	-	-	5.0	8.4	10.1
6	-	-	-	4.8	3.8
8	-	-	-	1.4	12.7
9	-	13.6	1.2	17.3	6.3

Table 20. Zwijndrecht: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75.

Source: see p. 108.

5.4.2. The North Sea Canal ports.

5.4.2.1. Amsterdam

In 1956, group 2 was the leading commodity at Amsterdam, with 28% of all trade. Unlike Rotterdam, with its outward and inward transit of solid fuels, most of the trade here consisted of direct import for the home market. Group 4, with 10.7% of all trade at the port, was the second item, with transit predominant. Groups 0 and 3, mainly direct imports were in third and fourth place with 8.9% and 7% of trade. The remaining commodity groups all had less than 5% of trade, with groups 5, 8 and 9 forming the smallest elements.

By 1960 trade showed a more even spread over the commodity groups. Group 2, although still important, had seen an absolute and relative decline to just over 13% of total trade. As at Rotterdam the decreased import of U.S. coal was mainly responsible, although here linked more

to the decline in home demand rather than in demand from the German hinterland. Group 4 now constituted the main item in trade, with 21.6%. Most of the increase was due to transit inwards, a result of increased demand from Germany and improved access to the hinterland through the Amsterdam-Rhine Canal. Between 1956 and 1960 the relative share of groups 3 and 0 increased to around 10%, mainly direct import. The smaller groups remained with under 5% of total trade, but there was an absolute growth in all groups except group 1. In 1965 the growth in grain imports, mostly for transit, resulted in the dominance of group 0 in that year, with over 24% of trade. Group 4 increased in absolute terms 1960-65, but its relative share in port trade fell. Group 2 continued to decline. Group 1 increased its share, as did groups 3, 9 and 8, but the remaining commodities declined in importance.

Over the next five-year period, 1965-70, all the smaller groups (5 - 9) saw a decline in their relative share of trade, and there was a continued decline in the share of group 2. Group 4 had increased its dominance of the port's trade to 31.7% of all trade, with group 3 still in second place having increased its share to 22.1%. Group 0 saw an absolute growth, especially in imports, but its relative position in the port's trade declined. By 1975, however, group 4 no longer held first place in trade, and in absolute terms there had been a decline, especially in transit inwards. This was in contrast to Rotterdam where transit trade in ore increased over the same period. Group 3, which had seen continued growth throughout the period, now formed the most important element, with 24% of total trade. The coal trade (group 2) increased its share of total trade for the first time during the period 1956-75, but in absolute terms the increase was small, mainly in transit outwards from West Germany. The smaller

groups continued to see a decline in their percentage share of port trade, with the exception of groups 5 and 6.

The changes in the commodity composition of this port between 1956 and 1975 consisted of increases in the share of groups 0, 1 and 3, and group 4 (with the exception of 1970-75), and substantial decline in the share of group 2 (coal). The smaller groups also showed a decline so that trade in 1975 was more concentrated than in 1956, with bulk commodities gaining a larger share of trade.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	8.9	10.5	24.1	19.4	21.7
1	3.5	3.1	12.4	9.9	16.0
2	28.4	13.1	9.9	6.6	10.7
3	7.0	10.8	12.1	22.1	24.2
4	10.7	21.6	18.8	31.7	18.1
5	1.8	3.1	1.5	0.7	1.0
6	4.2	3.3	2.6	1.4	2.0
7	3.5	4.4	3.5	1.1	0.7
8	1.8	2.4	3.6	2.9	2.2
9	1.7 (2.8)*	3.5 (2.2)*	5.3 (3.3)*	4.0	3.6

Table 21. Amsterdam: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75. Source: see p. 108.

*bunker materials.

5.4.2.2. Zaandam

Zaandam's trade was dominated by the import of group 0 (mainly wood) in 1956, and since this commodity accounted for almost 90% of all trade, concentration on a single commodity group was greater at this port in 1956 than at any other port in the range. In 1975 group 0 still accounted

for 62% of trade, though its dominance had meanwhile been reduced by group 8, which had experienced very rapid growth since 1956 to gain 21.7% of total trade in 1975, during which time it had changed from mainly starch to mainly cellulose products. Group 1, though retaining roughly the same share of total trade, had slipped from third place in 1956 to the lowest place in 1975. Group 9, which featured in port trade for the first time in 1965, also grew steadily, consisting mainly of imports of machinery and transport equipment and other finished articles. Some diversification in Zaandam's trade flows did therefore take place in this period.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	88.9	91.3	87.4	72.1	62.0
1	4.0	2.6	2.8	3.9	3.7
6	-	-	-	-	7.8
8	3.1	0.3	5.0	21.5	21.7
9	-	-	0.7	2.2	4.4

Table 22. Zaandam: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75.

Source: see p. 108

5.4.2.3. IJmuiden

This port had a commodity composition in 1956 led by exclusively direct imports of group 4, with 56.3% of total trade. Group 2, also direct import, formed the second main item, followed by group 5, largely direct export of semi-finished metal products. Over the period 1956-75 the share of group 4 showed a steady increase, with group 2 undergoing a slight decline in its relative share of trade up to 1970, after which it increased to second place in 1975. Group 5 in which export growth was

particularly vigorous, also saw a steady rise in share of port trade 1956-70. Other groups were of comparatively minor importance, with group 0, having 6% of port trade in 1956, declining to less than 1% by 1975: this was due mainly to a decrease in the import of wood products connected with the paper mill at the port. Group 8, mainly the import of cellulose, increased its relative share of trade 1956-65, after which there was a decline both in relative and absolute terms. The percentage share of groups 6 and 7 also declined. Generally, therefore, IJmuiden showed a fairly stable commodity structure over the period, with increased concentration on fewer products and continued reliance on locally generated trade.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	6.0	2.5	2.0	2.3	0.9
2	18.3	11.3	13.0	11.5	18.5
3	-	-	-	-	1.3
4	56.3	61.2	59.7	63.2	61.1
5	10.6	12.1	15.2	16.8	14.7
6	-	3.1	1.2	1.9	0.3
7	-	2.4	2.0	0.5	0.8
8	2.4	4.6	4.6	3.3	2.0

Table 23. IJmuiden: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75.

Source: see p. 108.

5.4.3. The northern ports.

5.4.3.1. Delfzijl

Delfzijl's trade, like that of IJmuiden, was fairly strongly linked to local activity, although there was some transit at the port, redistribution of fertilizers in 1956 being the main item. In this year the largest trade item was group 2, the import of coal, with just over 22% of port trade. Group 0, with 20.7% of all trade in that year, formed the second item, characterized by the import of wood and the export of potatoes and grain. Groups 6, 7 and 9 all had a fairly important share of trade in this year, with group 8 (export of starch products) and 4 (export of ferruginous earth) providing lesser elements in trade. By 1960 there had been a shift in the relative shares of commodities, with group 2 declining to third place, and with group 6 (primarily the direct export of salt) becoming the major trade item. Group 0 still retained second place, with imports of wood and potatoes (for starch) predominating. There was a decline in the percentage share of groups 9, 7 and 8. The export of ferruginous earth fell away completely, so that by 1960 a major structural change had taken place in trade.

The position of group 6 continued to strengthen 1960-65, whereas group 2 became insignificant. There was a decline in the percentage share of group 0, mainly due to a reduction in wood imports. Growth occurred in trade in groups 7 and 8, with the increased import of cellulose and raw materials for paper making. Group 9 also increased its share of port trade. In the period 1965-70, group 6 continued its dominance, claiming just under half of all port trade in 1970. Group 8, with rapid growth, moved up to second place with 24.8% of trade, due to the location of a number of chemical industries at the port in the 1960s. Group 9 (mainly imports), although increasing in absolute terms, saw a decline in its percentage share, as did group 7. Other

groups were of minor importance, although there had been an increase in group 1, with the import of sugar and animal feedstuffs rising. At the end of the period, 1975, group 6 had increased its share of trade even further, although a decline in the percentage share of most other products took place, with the exception of group 5 in which direct export increased, and groups 2 and 3. Delfzijl's trade pattern over the whole period showed increasing specialization in certain commodities, and by 1975 the trade composition of the port was quite different from that of 1956.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	20.7	18.1	13.1	9.8	7.5
1	-	-	1.6	4.7	4.2
2	22.3	13.2	0.8	0.4	1.2
3	-	-	-	0.1	0.4
4	2.7	-	-	-	1.1
5	-	-	0.4	0.6	6.6
6	14.8	42.5	45.2	49.5	53.3
7	13.9	3.8	7.1	2.6	2.4
8	7.3	6.8	11.3	24.8	18.0
9	12.5	10.7	11.5	7.3	5.0

Table 24. Delfzijl: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75.

Source: see p. 108.

5.4.3.2. Groningen

There was considerable variation in commodity composition at this port over the period 1956 to 1975. Group 0 dominated trade in 1956, with imports of wood the major element, and this dominance continued

up to 1970, although after 1965 the percentage share fell as the import of wood declined. Other groups remained small in size and showed considerable fluctuation, with the exception of group 1, which increased in importance from 6.6% of trade in 1960 to 41.6% by 1975. Group 8 was important in 1956, but declined over the period, with a reduction in the export of starch products. Group 6 also remained fairly constant up to 1975. Over the period trade at the port showed some signs of diversification, although by 1975 agricultural products (group 0 and 1, mainly import of grain and export of other prepared agricultural produce) had increased their dominance.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	65.6	68.1	74.1	67.7	49.3
1	-	6.6	8.4	19.2	41.6
2	-	-	1.3	1.0	-
3	-	10.2	-	-	-
4	-	-	-	-	1.3
5	-	0.5	0.7	-	1.3
6	1.4	4.4	3.4	3.7	2.6
7	0.3	-	-	-	-
8	15.2	0.5	11.9	0.9	1.3
9	-	-	0.4	7.1	2.6

Table 25. Groningen: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75.

Source: see p. 108.

5.4.3.3. Harlingen

Harlingen's trade structure was also dominated by group 0, consisting mainly of potato exports which claimed almost a third of all trade in 1956. Group 9, with just over a quarter of trade, formed the second item, mainly export of paper and cardboard, followed by group 1, the export of animal feedstuffs.

By 1960 the situation was similar, with a slight increase in the share of the two main commodities, and also of group 8, export of cellulose and starch products, which moved up to third place.

From 1960 to 1965 group 0, due to increased wood imports, showed an even greater dominance, after which its relative position declined slightly. Group 9 saw a slight decrease in its relative share, and the position of most other commodities declined, with the exception of groups 6 and 2. Group 8 declined in importance after 1960 with the falling away of starch exports.

By 1970 there had been a fall in the share of group 0, but a rise in the shares of groups 1 and 2, and a fall in the shares of groups 9 and 8. From 1970 to 1975, however, group 2 disappeared from trade, and group 0 regained its position. An increase in imports of prepared foodstuffs to the port strengthened the second position of group 1, with group 9 as third. Other groups were of minor importance, with the exception of group 8, so that the same commodity groups dominated trade throughout the period, although it became slightly more concentrated. In absolute terms, however, all groups declined except groups 0 and 1.

Groups (N.S.T.R.)	1956	1960	1965	1970	1975
0	30.9	32.0	40.4	34.7	41.6
1	17.4	12.5	11.9	21.0	25.0
2	3.3	-	4.9	6.2	-
4	-	-	-	3.1	-
5	-	-	-	4.7	2.7
6	1.5	1.2	3.9	4.5	2.7
7	-	-	-	4.7	2.7
8	11.0	14.1	11.4	9.6	9.3
9	25.7	27.3	24.3	10.9	15.7

Table 26. Harlingen: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75.

Source: see p. 108.

5.4.4 The Schelde ports

5.4.4.1. Terneuzen

In the trade of this port three main commodities were represented in 1956, group 2 with the largest share, group 4, and group 7. In all these groups except group 7 direct import predominated, although there was some transit. The only other commodity represented in this year was group 6. By 1960 group 2 had increased its share of total trade at the port to just under half, thereby showing a trend contrary to that of other ports such as Rotterdam and Amsterdam. This was because demand for coal at Terneuzen was almost entirely from local industry. The relative share of group 4 declined slightly, although there was an absolute increase up to 1960. Group 7 showed an absolute decline, whereas trade in group 6 (almost entirely transit inwards) increased. Group 8 featured in trade for the first time, though with only a small share of the total.

These trends continued between 1960 and 1965, with group 2 now having over half the total trade of the port. There was, however, a dramatic decline in the trade of group 4 in this period. This was in contrast with the increase in this trade at Rotterdam, Vlaardingen and Amsterdam. Group 6 was the second item in trade in 1965, with increased transit of this group. Groups 7 and 8 increased their share of total trade, with an increase in both imports and exports of the latter. Other groups remained of minor significance.

In 1970 the dominance of group 2 had fallen for the first time, although it still remained the major item in trade. Group 3, mainly the direct import of oil products, had now become the second item in trade. The share of group 6 declined. Transit trade of commodity group 7 increased once more (mainly transit inwards). Group 8 also continued to increase its share of total trade, and there was a slight recovery in the trade in group 4. There was also growth in trade in most other commodities except group 5. By the end of the period, group 3 was the leading group in the trade of the port, with group 2 in second place, and group 8 in third position. Group 7 (fertilizers) was the only other major element in trade

Terneuzen's trade pattern therefore showed several important shifts in its composition during the period, with a major decline in the import of group 4 (iron ore), a relative decline in the importance of group 2 from first place in trade to second, and a rapid increase from the mid-1960s onwards in the trade of groups 3 and 8. Although there were some signs of diversification at the end of the 1960s, by the end of the period trade was still concentrated on bulk commodities.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	-	-	2.5	3.9	0.9
1	-	-	1.2	1.4	0.8
2	37.7	43.3	53.3	31.8	24.4
3	-	-	2.0	21.8	29.1
4	31.9	28.7	1.5	5.1	3.1
5	-	-	0.4	0.2	-
6	3.4	6.8	18.4	9.8	3.1
7	19.6	9.8	10.9	15.1	16.4
8	-	0.4	7.2	10.4	18.5
9	-	-	-	0.4	3.7

Table 27. Terneuzen: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75.

Source: see p. 108.

5.4.4.2. Vlissingen

Vlissingen also saw considerable diversification in trade over the period. In 1956 two main groups dominated port trade: group 3 (the import of oil and oil products) and group 9 (export of bunker materials). There was a small trade in group 2 (mainly imports), which had declined even further by 1960. The trade in bunker materials had increased to over half of the port's total trade by this year, with imports of oil products taking second place. In this period there was also a small export of group 9 (other than bunker materials) and of group 5.

By 1965 the share of bunker materials had decreased, with group 3 now the major commodity (with imports dominant). Imports of group 4 were showing for the first time, but the share of groups 5 and 9

declined. Two other elements in trade appeared for the first time, groups 0 and 6: import of wood and export of sand and gravel.

By 1970 group 0 had become the third item in port trade, while the position of bunker materials declined further. Group 9, if bunker materials are included, accounted for 17% of total trade in 1970. Group 7 (fertilizer import), at one time an important item, had declined by 1975. Group 3 remained fairly stable, while of the smaller groups, 4, 5, 6 and 9 showed a decline. In 1975 group 3 still retained its leading position in port trade, but a fundamental change took place in its structure, with exports forming only a fraction of the total in 1970, whereas they formed three-quarters of all trade in this group by 1975. Group 6 had shown strong growth in imports to form the second item in trade and the role of group 8 had also increased. Group 0 saw a relative decline in trade, although this was one of the few ports where an absolute increase in the import of wood took place over this period, so that the group increased in absolute terms. There was a slight increase in the percentage shares of some of the smaller groups such as groups 1, 4, 5 and 9. Generally throughout the period there was increased diversification at the port, a decrease in dependence on bunker materials after 1960, and group 3 (oil and oil products) remained the dominant trading group. Growth from the end of the 1960s occurred in the trade of groups 6 and 8. It is interesting to note that the increase in imports of wood (the main element in group 0) at the end of the 1960s and early 1970s contrasts with the decline in imports of this item at other ports, notably the northern port range. This showed a shift in functions between ports in the range.

Group (N.S.T.R.)	1956	1960	1965	1970	1975
0	-	-	3.9	15.9	5.9
1	-	-	-	0.7	1.5
2	4.3	0.2	-	6.2	0.5
3	47.8	38.2	47.3	45.2	46.5
4	-	-	12.0	0.8	1.3
5	-	1.2	0.6	0.2	2.6
6	-	-	3.8	3.6	19.8
7	-	-	-	21.4	8.6
8	-	-	-	4.0	10.2
9	(45.5)*	4.1(50.1)*	2.0(28.3)*	1.6	2.8

Table 28. Vlissingen: percentage share of commodity groups N.S.T.R. in the trade of the port 1956-75.

Source: see p. 108.

*bunker materials

5.4.5. Scheveningen.

Finally the port of Scheveningen, 1970-75, showed a port commodity structure dependent largely on the export of groups 0 and 1, and the import of group 9. As statistical information is only available from 1969, it is, however, impossible to make comparisons at this port throughout the whole period.

5.5. Summary

This chapter has instanced some of the major changes taking place over the Dutch port range 1955-75, and has investigated the development of trade in terms of the whole range as well as of individual ports.

From the commodity analysis we can see that for most ports similar trends could be identified, as, for instance, the growth in importance of oil products and of chemicals (group 3 and 8) and the decline in group 2 (coal). The ports formed a definite range with interlinkage between trade developments at one port and neighbouring ports.

Each individual port performed an important function, a function which altered over time and was also dependent on developments at other ports.

The decline in the transit of ore at Dordrecht, for instance, was matched by a simultaneous increase at other ports such as Rotterdam.

Some ports saw increased specialization in trade, whereas others increased diversification. The internal selection process within a port

range is dependent on changes in internal and external forces, which affect the trade structure of each individual port and its position

within the range. The changing structure of trade at each port in

turn affects the position of other ports within that range. A large

number of factors therefore influence the relative position of ports

within a range and in order to investigate further the forces at work

in the selection processes at individual ports within the range,

attention will now turn to their relationship to one individual foreland,

the United Kingdom, with an analysis of the importance of this trade to

Dutch ports singly and collectively during the period 1955-75.

By concentrating on one particular foreland in this way, a greater

understanding of the forces at work in the shifts in trade, commodity

flows and position in the total range of each port concerned can be

established.

NOTES

Chapter 2

- 1 See for instance B. Ogundana, 'Patterns and problems of seaport evolution in Nigeria', in Seaports and Development in Tropical Africa, edited by B.S. Hoyle and D. Hilling (London, 1970), pp. 166-182.
- 2 H.C. Kuiler, 'De Haven in de Tweede Verkeersrevolutie', Rotterdam-Europoort-Delta, 3 (1970), pp. 1-6.
G. Küster, 'De Tweede Scheepvaartsrevolutie en de Haven van Antwerpen', Aardrijkskunde/Geografie 21 no. 2 (1969), pp. 73-81.
- 3 G. van den Burg, Containerization: a Modern Transport System (London, 1975), p. 24.
- 4 H. Reuchlin, 'De Grote Handelsvaart' in Rotterdam Europoort 1945-1970, edited by G.E. van Walsum (Rotterdam, 1972), pp. 191-221.
- 5 G. Alexandersson and G. Norström, World Shipping: an Economic Geography of Ports and Seaborne Trade (New York, 1963).
- 6 J.G. Abert, Economic Policy and Planning in the Netherlands 1950-1965 (New Haven, Connecticut, 1969).
- 7 See Dudley Stamp, A Commercial Geography (London, 1973).
- 8 E. Wever, 'Pernis-Botlek-Europoort', Tijdschrift voor Economische en Sociale Geografie, 57 (1966), pp. 131-140.
- 9 De Nederlandse Economie in 1980, Centraal Planbureau ('s-Gravenhage, 1976), p. 274.
- 10 See Inleiding, Maandstatistiek van de zeevaart en van het havenverkeer, January-December 1960 ('s-Gravenhage).
- 11 'Het Goederenvervoer in de Nederlandse Zeehavens' in Maandstatistiek van de zeevaart en van het havenverkeer, January-December 1956 ('s-Gravenhage), p. 7.

- 12 This was due to a discrepancy between total trade and commodity totals recorded in the figures published by the Centraal Bureau voor de Statistiek: according to commodity totals slight growth was shown for most commodities.
- 13 The year 1970 has been chosen in this instance due to the disruption caused by the oil crisis of 1973.
- 14 'De ontwikkeling van het Goederenvervoer ter Zee te Amsterdam en Rotterdam in 1965' in Maandstatistiek van de zeevaart en van het havenverkeer, January-December 1965 ('s-Gravenhage), p. 5.
- 15 B. Ogundana, 'Patterns and Problems', p. 167.
- 16 F.W. Morgan, Ports and Harbours (London, 1958), p. 16.
- 17 R.E. Carter, 'A comparative analysis of United States ports and their traffic characteristics', Economic Geography, 38 (1962), p. 171.
- 18 J.N.H. Britton, 'The external relations of seaports: some new considerations', Tijdschrift voor Economische en Sociale Geografie, p. 171.
- 19 P. Sargant Florence, 'The technique of industrial location', The Architectural Review, 93 (1943), pp. 59-60.
- 20 J. Bird, 'Traffic flows to and from British Seaports', Geography, 54 (1969), pp. 284-302.
- 21 A.O. Hirschman, National Power and the Structure of Foreign Trade (California, 1945).
- 22 For instance D. Hilling, 'The evolution of a port system: the case of Ghana', Geography, 62 (1977), pp. 97-105.
- 23 Concentration may be defined as an increasing concentration of trade flows in fewer ports, whereas diffusion is the dispersal of trade flows over a larger number of ports.

- 24 D. Hilling, 'The evolution of a port system', p. 104.
B. Ogundana, 'Patterns and Problems', p. 172.
- 25 P.J. Rimmer, 'Recent changes in the status of seaports in the New Zealand coastal trade', Economic Geography, 43 (1967), p. 235.
- 26 W. Zelinsky, 'A method of measuring change in the distribution of manufacturing activity in the United States, 1939-47', Economic Geography, 34 (1958), pp. 95-126.
- 27 It was not possible to include Hoek van Holland in this analysis due to the anomolous total trade flow at the port in 1975 (see p.90). To give some indication, however, the growth figure for this port in 1974 was 110.
- 28 P.J. Rimmer, 'Recent changes in the status'.
- 29 'Samenvattend overzicht van de internationale goederenbeweging per haven volgens goederengroepen' in Maandstatistiek van de zeevaart en van het havenverkeer (1956-75).
- 30 Maandstatistiek van de zeevaart en van het havenverkeer, January-December 1956 and January-December 1960.
- 31 Maandstatistiek van de zeevaart en van het havenverkeer, January-December 1965.
- 32 Maandstatistiek van de zeevaart en van het havenverkeer, January-December 1970.
- 33 Maandstatistiek van de zeevaart en van het havenverkeer, January-December 1975.
- 34 See E. Schmitt, Deutschland, Band I (Hamburg, 1970), p. 130.
- 35 'De ontwikkeling van het goederenvervoer ter zee te Amsterdam en Rotterdam in 1965', Maandstatistiek van de zeevaart en van het havenverkeer, January-December 1965, p. 5.

CHAPTER 3

THE DEVELOPMENT OF ANGLO-DUTCH TRADE FLOWS 1955-75 OVER THE DUTCH PORT RANGE

0. The discussion in this chapter will fall under four headings:
 1. Introduction
 2. Changes in trade flows throughout the port range
 3. Changes at individual ports
 4. Commodity flows

1. Introduction

1.1. United Kingdom trade with the E.E.C. 1955-75.

As was shown in Chapter 1 (p.3) the post-war era was one in which the British economy showed an increasing orientation towards European trading partners in its trade flows. From 1958 to 1974 the percentage share of trade with the E.E.C. countries in terms of value rose from 14.2% of all United Kingdom trade to 27.4% (Boyd, 1975, p.56),¹ a faster increase than any other trading area. At the same time, however, the share taken by trade with the United Kingdom in the total trade of the common market countries declined from 5.6% to 4.5% for imports, and 6.5% to 5.1% for exports, mainly as a result of the declining competitiveness of the British economy during the 1960s, which led to the series of balance of payments crises culminating in the devaluation of sterling in 1967. Britain's major exports were of engineering products, especially transport equipment and machinery, and chemical products during this period, while the E.E.C. countries were experiencing expansion in these same areas. The United Kingdom, with older industries, was facing

severe competition on the world market for its products, as well as in the E.E.C.² At the same time there was a rapid growth in the demand for imports within the United Kingdom, especially during the 1960s, resulting in a doubling in imports 1960-1975. Imports of finished products especially rose rapidly, with a ninefold increase in volume between 1956 to 1959 and 1973 to 1975. Imports from the Common Market countries rose by 7.2% between 1958 and 1971, and following Britain's entry to the E.E.C. in 1972 the rise was even greater, with a 6% rise between 1971 and 1974. Exports from the Common Market countries underwent varying fortunes over the period, and actually fell during the period 1963 to 1967. Following Britain's entry to the Common Market exports also saw rapid growth, increasing by 5.8% between 1971 and 1974.

British trade therefore, especially after entry to the Common Market, showed increasing orientation towards Common Market countries as trade partners, although the reverse was true of Common Market trade with the United Kingdom. By the end of the period Britain showed a stronger reliance on the European Community for its imports than as a market for its exports. Nevertheless, relative to Britain's other trading partners, exports from the United Kingdom to the E.E.C. countries underwent growth, and by 1970 exceeded exports to the Commonwealth countries. Another factor which must be borne in mind in any examination of trade between the Continent and the United Kingdom during this time is that in general there was an increased flow of high-value products between the West-European industrial centres and a decrease in the demand for raw materials and foodstuffs in intra-European flows (Couper, p. 167),³ although in terms of weight, high bulk, low value goods remained important.

The consequences of this shift in Britain's trade patterns toward a stronger emphasis on short-sea trade with Europe in the post-war era had several important effects. The first was the stimulation of trade at a number of smaller east coast ports of the United Kingdom, although trade with European partners at west coast ports such as Liverpool and the South Wales ports also underwent an increase over the period. The second main effect was an alteration in the commodity structure of Britain's trade, as this became more orientated towards the needs of European markets. Naturally these movements had important consequences for the development of trade with the United Kingdom at European ports in general, and therefore also at Dutch ports.

1.2. Anglo-Dutch trade 1955-75

Trade with the Netherlands played an important part in the relationship between the E.E.C. and the United Kingdom over the period. 36% of imports at the United Kingdom ports from the E.E.C. were from the Netherlands, whereas 30% of exports to the E.E.C. from British ports went to the Netherlands.⁴ This made the Netherlands one of the most important trading partners for the United Kingdom on the short-sea trades. When examining diagram 1 (p. 10a) showing the development of trade between the Netherlands and the United Kingdom over the period 1955-1975, it becomes apparent that imports into the Netherlands from the United Kingdom grew more slowly than exports from the Netherlands, which saw especially rapid growth in the 1960s. Exports steadily grew from 8.5 million tons in 1955 to 21.5 million tons in 1975, whereas imports increased from 2.8 to 9.9 million tons, undergoing considerable fluctuation. 13% of the Netherlands' sea-borne trade was with the United Kingdom in 1955, in 1975 the figure had shrunk to 10%. Despite the entry of Britain into the Common Market in

1972, therefore, the United Kingdom became a less important trading partner for the Netherlands, although the reverse was true for the United Kingdom. The weakening of the United Kingdom's position in trade in the total Dutch trading pattern was evident in both imports and exports, and was largely a result of increased trade in energy and raw materials with the rest of the world, supplying the European market, rather than any decline in trading links with the United Kingdom.

In 1955 imports from the United Kingdom constituted 4.9% of all imports into the Netherlands, in 1975 this was 4.2%. Exports to the United Kingdom made up 31.8% of all exports from the Netherlands throughout the period, especially for exports. In the following section a closer look at the development of imports and exports between the two countries will be taken.

Another interesting development in the trade flows between the Netherlands and the United Kingdom over the period 1955 to 1975 was the declining role of transit trade. In 1955, transit (excluding imports to and exports from storage) took the lion's share of the Anglo-Dutch trade, with 55.5% of total trade between the two countries. Transit inwards from the United Kingdom was of lesser importance, constituting only 25.2% of all imports from this country into the Netherlands. Transit outwards from the Netherlands to the United Kingdom, however, formed 65.8% of all exports. By 1975, although in absolute terms the transit trade had increased slightly, there was a considerable decline in its relative importance. In this year transit constituted 24.4% of total trade between the Netherlands and the United Kingdom. Transit inwards actually increased its share to 31.4% of imports from the United Kingdom, whereas transit outwards from the Netherlands declined to 21.2% of all exports. So the major growth in trade between the Netherlands and the

United Kingdom over the period was in direct imports and exports rather than in transit. The decline in the role of sea/sea redistribution is perhaps rather surprising in view of the growth of especially the ports of Rotterdam and Amsterdam as redistribution centres for Europe. It must be borne in mind, however, that only seaborne trade is under consideration in this study and that the transit figures do not include exports from storage which are included in direct export. Notwithstanding this, the reduced dependency of the Netherlands on transit trade from 1955 to 1975 as noted in the previous chapter was also valid for trade with the United Kingdom.

1.3. Trends in total Anglo-Dutch trade 1955-75

In order to examine these trends in more detail over the period 1955-1975, they will, as in previous chapters, be discussed in five-yearly periods.

1.3.1. 1955-60.

From diagram 1 it can be seen that over this period there was a decline in total trade with the United Kingdom. This decline was mainly due to decreased exports from the Netherlands to the United Kingdom. Imports showed a slight increase. If we examine the transit figures, the main decline in export was in the transit outwards, with only 17.3% of all exports to the United Kingdom through the Dutch ports being transit trade in 1960, as opposed to 65.8% of all exports in 1955. The main reason for this was the decrease in the transit outwards of coal (group 2). At the same time transit inwards increased its percentage share to 26.7% of all imports from the United Kingdom. Direct imports also showed an increase over the period 1955 to 1960. In terms of total trade, by

1960 the transit trade no longer dominated the Anglo-Dutch trade, with only 21.4% of trade in this year. The United Kingdom's share in all trade over the Dutch port range declined from 13.3% in 1955 to 9.2% in 1960.

1.3.2. 1960-65.

During this period total Dutch sea-borne trade with the United Kingdom grew from 9.3 million tons to 13.5 million tons. Imports, after an initial increase declined once more, so that the 1965 figure was little greater than in 1960. Imports exceeded exports briefly in the years 1962 and 1963, but by 1965 exports dominated Anglo-Dutch trade once more with 65% of total trade. Exports from the Netherlands to the United Kingdom saw a rapid increase from 1961 to 1965. The transit trade recovered slightly, with 29% of trade in 1965. Transit inwards from the United Kingdom (mainly destined for West Germany) continued to grow to 33.5% of all imports in this year, whereas transit outwards took 26.6% of all imports in 1965. The major growth, however, occurred in the development of direct exports over the period. The percentage share of the Anglo-Dutch trade in total trade of the Netherlands declined less rapidly over this period, with 8.7% in 1965.

1.3.3. 1965-70.

Growth in total trade between the United Kingdom and the Netherlands accelerated during the latter half of the 1960s. The increase was again especially marked in the development of exports from the Netherlands to the United Kingdom, although imports also increased, after a decline in 1963-66. Transit inwards fell over the period to 25% of all imports, and transit outwards to 16.5% of all exports in 1970. Transit trade with the United Kingdom in fact reached its lowest level yet in this year with only 19.3% of all trade. There was little change in the United

Kingdom's share in total trade, with 8.5% of all Dutch trade in 1970.

1.3.4. 1970-75.

Trade with the United Kingdom continued to grow up to 1973, the year of the Arab oil embargo on the Netherlands, after which a slight decline occurred. Growth in imports, after an initial decrease in 1970-71, was continuous up to 1975, the 1973 recession having little effect. Exports showed rapid growth from 1970 to 1972, but from 1973 onwards a decline took place. The transit element in imports became more important, but the role of this in exports continued to decline. There was an increase in the role of the United Kingdom as a trading partner for the Netherlands, with just over 10% of all the trade through the Dutch seaports in 1975.

1.4. Commodity survey.

Again it is necessary to examine the commodities involved in these trade flows in order to achieve an explanation for the changes taking place during the period 1955-75. A general outline of the situation in 1955 was given in chapter 1, section 4. In this year the predominant commodity in Anglo-Dutch trade was group 2, with solid fuels, constituting around half of all trade between the Netherlands and the United Kingdom. The bulk of this, 83%, was export, almost exclusively re-export of coal from the United States. The other main element in commodity flows in this year was group 3, largely refined oil products, a direct export from the Netherlands to the United Kingdom.

1.4.1. 1955-60.

By 1960 commodity group 2 no longer played a dominating role: exports to the United Kingdom fell from 5.6 million tons to 3,000 tons. Imports into the Netherlands from the United Kingdom increased slightly from

0.9 million tons to 1 million tons. 11.4% of total Anglo-Dutch trade was taken up by group 2 in 1960. It was entirely due to the decline in this commodity that the trade between the United Kingdom and the Netherlands declined during this period. Trade in group 3 showed strong growth from 2.4 in 1955 to 4.3 million tons in 1960, and with 47% of all Anglo-Dutch trade in this year it formed the leading item in trade flows. Exports of this commodity took the leading share; 68% in 1960, as opposed to 66% in 1955. The increase was mainly in direct trade, and together with the decrease in transit of group 2 this accounted for the decreased role played by the transit trade 1955-60 between the Netherlands and the United Kingdom (see section 1.3.1.). Another interesting development over the period was a decrease in the percentage share of group 9, finished products, with 8.1% of the total in 1955 and only 7.4% in 1960. Although there was an absolute increase in imports, exports halved in size. The main decline within this group was in bunkering of sea-ships. Trade in transport equipment and machinery, the other main element in group 9, increased. The third largest commodity group in Anglo-Dutch trade in 1960 was group 0, with 8%. In absolute terms there was growth from 0.5 million to 0.7 million tons, 1955-60. Exports remained the main element, with 68% of trade in this group, although imports doubled. This was particularly due to increased import of barley and potatoes from the United Kingdom. The increase in export was mainly due to increased sea/sea transit of grains through the Netherlands. Group 6 was the fourth commodity in 1960, with an increase in its share of trade from 2.9% to 6.9% over the period. Imports in particular showed growth, with increased transit inwards of other mineral products, (especially china clay). The percentage share of group 1 remained fairly constant, with 6.5% of trade, whereas group 5 increased in importance from 3.4% to 6.3%, due mainly to growth in imports.

Chemicals (group 8) grew in absolute terms from 0.2 to 0.4 million tons from 1955 to 1960, the percentage share in Anglo-Dutch trade increasing from 2.2% to 4.8%. Imports showed the most rapid increase. The remaining groups, 4 and 7, remained of minor importance with less than 1% of trade each. Group 4 decreased slightly in importance over the period, whereas group 7 showed a slight increase.

If this is compared with the total trade of the Netherlands during this period (Chapter 2, section 4.2), a number of similarities between the developments in total trade and the Anglo-Dutch trade can be identified, with a shift from the dominant position of the coal trade to that of oil and oil products. The major difference, however, was in the whole of group 4, ore, which increased in total trade through the ports, but remained an unimportant element in Anglo-Dutch trade flows, declining slightly in importance.

1.4.2. 1960-65.

Group 3 continued to display strong growth during this period, although in absolute terms imports of oil products from the United Kingdom declined slightly. Exports, however, showed strong growth and in absolute terms trade increased from 4.3 to 6.5 million tons over this period. Group 3 accounted for 50% of all Anglo-Dutch trade in 1965. The role of transit could not be determined as export of oil from storage was only registered as a separate item from direct export in 1965, and this made up the bulk of the transit of oil. The increased export to the United Kingdom in this group consisted for the most part of light fuel oils. Group 2 continued to show a decline in trade in relative terms, to only 8.9% of all Anglo-Dutch trade by 1965, but both imports and exports showed slight absolute growth. Imports from the United Kingdom dominated, with 95% of trade in this commodity. Trade in

commodity group 0 showed an increase to 11.8%, exports showing rapid growth from 0.5 to 1.4 million tons, but imports decreasing. Group 0 formed the second commodity group in Anglo-Dutch trade in 1965. The bulk of the increase in this group was due to growth in sea/sea redistribution of grains through the Netherlands to the United Kingdom 1960-1965. Of the remaining trade, groups 9, 6, 1 and 5 showed a decline in their relative share of trade over the period, and groups 8, 4 and 7 an increase. The decline in group 9 (machinery and transport equipment and other manufactures) from 7.4% to 5.5% of trade was due mainly to decreased exports from the Netherlands to the United Kingdom. This was particularly true of bunker materials. Group 6, with 4.4% of all Anglo-Dutch trade in 1965, showed a decrease in transit inwards, while exports to the United Kingdom increased in absolute terms. Group 1 underwent decline in both imports and exports, its percentage share of total trade declining from 6.5% to 4.2% of all trade, as did group 5, whose percentage share decreased from 6.3% to 3.3%. The rise in trade in group 8 was particularly due to increased exports from the Netherlands to the United Kingdom. The percentage share of this group in Anglo-Dutch trade rose to 5.3% by 1965. Growth in the chemical sector at the larger ports such as Rotterdam influenced the growth in exports (see chapter 5), but the increase was also due to greater exchanges of chemical products between European centres in the post-war era. The volume of trade in group 4, which had declined 1955-60, increased over this period, its percentage share of trade rose from 0.6% to 3.8%. The rise was particularly in transit inwards of scrap metals from the United Kingdom, and the redistribution of iron ores through the Netherlands to the United Kingdom, which had previously been a relatively unimportant part of trade between the two centres. Obviously the increase in ship size mentioned earlier (see chapter 2, p.68)

resulted in limited access for the larger dry-bulk ore carriers at ports with shallow depths in the United Kingdom, and increased economies could be obtained by importing bulk commodities through ports in the Netherlands where large ships could be received. These bulk imports, mainly of grains and ores, were then transshipped to smaller vessels for transport to the United Kingdom. Finally, group 7 increased its share of total trade to 2.2% by 1965, although this remained the smallest item in Anglo-Dutch trade flows. Most of the increase in this group was in transit outwards. When compared with total commodity flows through the Netherlands in this period, the increase in trade of oil and oil products and chemicals was in line with the increases in total trade of these commodities through the Dutch ports. Ore and grain, however, which showed strong growth in Anglo-Dutch trade, underwent fluctuating fortunes in total trade, 1960-65.

1.4.3. 1965-70.

The dominant position of group 3 in trade, despite almost doubling in size to 12.4 million tons in 1970, underwent a slight relative decline to 47.7% of Anglo-Dutch trade in this year. The main absolute increase was again in direct exports, due to the increased refinery capacity in the Netherlands. The export element in the trade in this group increased from 80% to 88%, although there was a slight absolute increase in the import of oil products from the United Kingdom. Heavy fuel oils and crude oil formed the largest items in this trade in 1970. The growth in export of crude oil to the United Kingdom over this period was especially significant, as this was a relatively unimportant item in trade in 1965. Export from storage formed the main element, consistent with the overall increase in the export of oils from storage from the Netherlands, 1965-70 (Chapter 2, p.80). Light

fuel oils showed only slight growth, partly as a result of increased competition from British refineries. The second main feature in the development of Anglo-Dutch trade over this period was the rapid growth of group 6, particularly in direct imports from the United Kingdom of sand and gravel and china clay, so that this commodity claimed 12% of total trade between the two countries in 1970. The expansion of the port of Rotterdam was part of the reason for the increased trade in this commodity.

Trade in group 4 continued to expand from 0.5 million tons in 1965 to 2.2 million tons in 1970, making this the third commodity in Anglo-Dutch trade with 8.4% of the total. Again transit outwards showed the greatest growth, so that the position of the Netherlands as a redistribution centre for ore was strengthened. The relative share of group 0 declined from 11.8% to 8.2%, 1965-70, although an absolute increase in trade (from 1.5 to 2.1 million tons) occurred. The seaward redistribution of grain through the Netherlands to the United Kingdom grew at a slower rate than in the preceding period and accounted for the fall in the relative share of this group. In contrast, chemical products, group 8, showed a rapid increase in its relative share of trade to 8.1% in 1970; both imports and exports increased with a threefold increase in the former and a fourfold increase in the latter, making this the fastest growing commodity group after group 6 in the period 1965 to 1970. All the remaining commodity groups underwent a decline in their relative share of Anglo-Dutch trade, group 2 showing the greatest decline. The relative share of this group in trade declined from 8.9% to 2.6% over the period. This was mainly due to the fall in the import trade from the United Kingdom for the first time in the post-war period, as part of the general decline in British exports of coal with increasing competition from other fuels, especially oil.

Group 1, although showing an absolute increase from 0.5 million to just under 1 million tons, showed a decline in its relative share of Anglo-Dutch trade. Similarly the absolute trade in group 9 increased from 0.7 to 1.1 million tons but its relative share decreased to 4.4%. The share of group 5 also declined slightly to 3% although, as in groups 1 and 9, there was an absolute increase. Group 7 remained the smallest group in Anglo-Dutch trade, decreasing to only 1.3% of the total despite an absolute increase.

Developments in Anglo-Dutch trade between 1965 and 1970 showed a similar pattern to developments in total trade through the Dutch ports over this period, with increased exports from the Netherlands of oil and oil products and growth in the redistribution of ore (see chapter 2, p.80). Exports of groups 0 and 1 showed only slow growth in Anglo-Dutch trade, similar to the development of these commodity groups in total trade. However, growth in finished products, group 9, was faster for total trade than for the Anglo-Dutch trade.

1.4.4. 1970-75.

The percentage share of the largest group, group 3, remained virtually unchanged over this period, with 47.7% of total trade (in 1975 14.7 million tons of oil and oil products was traded between the two countries). It is interesting to note that the fastest growth was recorded in imports, which almost doubled over the period, whereas exports grew only by around 8%, although these continued to play the dominant role, with 80% of all trade in this commodity group in 1975. There was a rise in the direct import of heavy fuel oils into the Netherlands from the United Kingdom at this time, and lighter fuel oils also showed growth. This indicated growing competition from British refineries over the period, but also resulted from the oil embargo on the Netherlands in 1973 and the

temporary inability of the Dutch refineries to fulfil demand for oil products.

In 1975, group 0, with 10.7% of Anglo-Dutch trade, had regained its 1965 position as the second commodity group in trade. Trade increased to 3.3 million tons by 1975, exports, with 85% of trade in this group, increased by 42%, with a rise especially in the exports of grains from storage. Imports, however, rose much faster, with a threefold increase over the period; again, grains were the major commodity item, indicating a rise in demand for British grain (particularly barley).

Group 6 increased its share in trade to 8% in 1975, the third commodity in this year. There was an absolute decline in trade in this group, however, from 3.2 to 2.5 million tons. The decline was greatest in imports (with 83% of trade in 1975 in group 6), and was partly a result of the completion of major construction projects at the New Waterway ports (Maasvlakte).

Group 4 also showed a decline, so that by 1975 only 2.9% of all trade between the Netherlands and the United Kingdom was ore (mostly iron-ore). In absolute terms exports decreased to just over a quarter of their 1970 figure, although there was a very slight rise in imports. The United Kingdom, therefore, showed a reduced dependence on the Netherlands for the import of iron-ore 1970-75, after the expansion in this trade during the 1960s. Undoubtedly the provision of new deep water terminals in the United Kingdom in the early 1970s (for example Port Talbot and Immingham) was one reason for the decreased transit of this product through the Netherlands, as was the contraction in the steel industry in the United Kingdom.

Group 8, in contrast with the previous period, showed a decline in its percentage share to 7.4%, also decreasing in absolute terms. Again it is interesting to note that although exports declined, there was a rise

in the import of chemical products through the Dutch ports from the United Kingdom.

Commodity group 2, solid fuels, showed an absolute increase, and, for the first time since 1955, a relative increase in its share of Anglo-Dutch trade to 6.3%. The main reason for this was increased demand for fuels other than oil following the oil crisis of 1973, although there was a large rise in the demand for foreign imported coal in the United Kingdom, due to disputes in the British mines causing increased transit outwards of coal through the Dutch ports.

Foodstuffs and animal fodder, group 1, showed an absolute increase in trade, 1970 to 1975, from 1.1 to 1.9 million tons, and its percentage share increased to 6.3%. Both imports and exports showed growth, almost doubling in size. A variety of products were involved, particularly the import and export of animal feedstuffs and the export of prepared fruit and vegetables.

Group 9 showed a rise in its percentage share of the Anglo-Dutch trade to 5% over the period, equal growth occurring in both imports and exports. The growth in the provision of roll-on/roll-off facilities at Dutch and British ports in the late 1960s and early 1970s stimulated growth in this sector. Nevertheless, in view of developments in the general cargo trades and the increasing demand for finished products in intra-European trade, trade in this group continued to lag behind.

Group 5 underwent substantial growth in trade over this period, and accounted for 4.9% of Anglo-Dutch trade in 1975. The main rise was in exports of iron and steel rolled products from the Netherlands, a four-fold increase. Transit outwards from the Netherlands of these products from West Germany showed an increase, as did direct exports from the Hoogovens (Estel) plant at IJmuiden.

Finally, group 7 showed a decline to under 1% in its share of Anglo-

Dutch trade 1970-75. Exports decreased while imports from the United Kingdom showed a slight increase.

In comparison with all commodity movements over the Dutch ports 1970-1975, the position of oil in total trade declined, whereas in Anglo-Dutch trade it remained constant. However, there was a shift within the trade to increased imports from the United Kingdom, so that the oil crisis during this period did not leave the Anglo-Dutch trade totally unaffected. The decline in ore trade between the two countries was similar to an overall decline in the trade in this commodity through the Dutch ports over this period, as was the decrease in the trade in chemical products and fertilizers. The growth in the coal trade was also part of an overall increase in trade of this commodity through the Dutch ports, as was the growth in the grain trade and groups 1 and 9.

1.4.5. Conclusion

From the developments in the commodity trades through the Dutch ports and the changes taking place in Anglo-Dutch trade between 1955 and 1975, we can describe the Anglo-Dutch trade relationship as one in which redistribution of bulk products initially played a major role, particularly of coal, and later of oil and oil products. During the 1960s redistribution grew again in importance (export, also from storage, of crude oil, ore and grain), but at the end of the period this function had decreased once more in significance. By 1975, therefore, the direct exchange of products between the two centres was much more important than in the initial period. The initial disadvantages suffered by ports in the United Kingdom with regard to the limitations in depth and the rapid growth in ship size between 1955 and 1975, particularly for the bulk trades, resulted in a 'lag' in the provision of facilities and

the diversion of trade through ports in the Netherlands where larger ships could be received and transshipment take place. By 1975, due to new facilities for larger ships at certain British ports, the effect of this was much less. It is also partly for this reason that the trade relationship between the Netherlands and the United Kingdom appeared to weaken over this period (see p.141). By the end of the period Anglo-Dutch trade more closely reflected the direct exchange of products between the two centres.

The Anglo-Dutch trade pattern resembled that of total trade over the Dutch ports, especially with regard to the changes in main commodity groups during the period.

2. The development of the Anglo-Dutch trade 1955-75 and the Dutch port range.

This section will take a closer look at the development of Anglo-Dutch trade flows through the Dutch port range, the degree of concentration of this trade, and changes which have taken place over the period. Again, as in chapter 2, Hirschmann's Index of Concentration is used as the most useful measure of concentration for a particular trade in a port range.

2.1. The concentration of trade in the Dutch port range.

Table 29 below shows the changes in the concentration index for Anglo-Dutch trade passing through the Dutch ports over the period both for total trade and for imports and exports.

Year	Total	Imports	Exports
1955	82.80	68.82	88.48
1956	79.84	71.08	85.97
1957	75.81	64.56	85.41
1958	76.83	72.22	80.24
1959	74.11	74.37	74.36
1960	75.10	70.10	79.06
1961	67.63	63.51	72.72
1962	72.50	68.79	77.01
1963	70.97	66.68	76.79
1964	70.16	60.17	78.69
1965	73.76	63.56	80.03
1966	75.32	65.67	79.67
1967	76.10	62.52	81.15
1968	69.30	54.84	80.25
1969	76.02	73.16	77.65
1970	76.62	73.38	78.44
1971	71.71	68.29	72.83
1972	77.15	71.06	79.01
1973	79.56	71.24	82.16
1974	76.60	68.21	81.13
1975	75.27	63.76	81.01

Table 29. Indices of Concentration for the Anglo-Dutch trade through the Dutch port range, 1955 to 1975.

If a comparison is made between the above table and that in chapter 2 (table 11), relating to total trade through the Dutch ports over the

same period, a number of differences become immediately apparent.

With the exception of the initial years 1955 and 1956, the Index of Concentration for Anglo-Dutch trade is consistently below that for all trade, showing that trade with the United Kingdom was less concentrated than total trade over the period. In addition, whereas the index for all trade showed increasing signs of concentration over the period 1955-75, with the exception of the late 1950s, the index for Anglo-Dutch trade underwent considerable fluctuation, but an overall decline occurred from an index of 82.8 in 1955 to 75.3 in 1975, so that there were increasing signs of diffusion in the Anglo-Dutch trade flows.

Explanations for this are not difficult to find, and are related to the changes in commodity composition discussed in the previous section, especially the movements in coal and oil. For overall trade, the increasing importance to the Netherlands of imports of crude oil in large bulk carriers, requiring specialized facilities and deep water access, resulted in the growing dominance of the port of Rotterdam, with 80.6% of all trade over the range in 1955 and 84.4% in 1975 (see chapter 2, p. 87). For the United Kingdom trade, however, oil products and the redistribution of bulk products in smaller sea-ships were of greater importance. These had less stringent depth requirements and enabled the smaller ports to compete with the larger ports for the trade. Initially in 1955 and 1956 the concentration index was higher for the United Kingdom trade than for all trade due to the high concentration of the main element in trade, coal, in the large ports of Amsterdam and Rotterdam. Over the period 1955 to 1960, however, the index rapidly decreased and by 1960 was several points below that of total trade. It is also interesting to note that the lowest index for all trade occurred in 1960, after diffusion in the late 1950s, whereas the lowest point for the United Kingdom index was reached in 1964, indicating a delay in the major ports

recovery of their position of importance for the United Kingdom trade.

2.2. Index of concentration for imports and exports

Several other important factors emerge in an examination of the indices of concentration for imports and exports. On the whole the index of concentration for imports from the United Kingdom through the Dutch ports was considerably lower than that for exports to the United Kingdom, in other words, exports were concentrated in fewer ports than imports. Again the explanation for this must be sought in the type of commodities involved in the trade. For exports to the United Kingdom, the indices declined 1955-61, and thereafter, despite one or two fluctuations, showed signs of increasing concentration. With the falling away of the re-export of American coal the index initially declined, but in the 1960s bulk exports of grains and oil products to the United Kingdom led to an increase in concentration once more, although the index of concentration never regained its 1955 level. For imports from the United Kingdom, bulk goods played a less dominant role and the index was much lower, suggesting that imports were more spread out over the Dutch ports. By 1975 a slight decline had taken place in the index.

Comparing this to the indices of concentration for all imports and all exports (see table 11, chapter 2), both show, in contrast to the figures for the United Kingdom trade, an increase in concentration over the same period, especially for imports. There is little diversion between the indices for all imports and all exports, also unlike the indices for Anglo-Dutch trade. The degree of concentration in exports to the United Kingdom and all exports were, however, at a similar level, since the average index for all exports 1955-75 was 81.7, that for exports to the United Kingdom 79.6. The degree of concentration for all imports was considerably higher than for United Kingdom imports, the average index

for all imports being 80.9 over the period, and for the United Kingdom imports 67.4.

2.3 Conclusions

From the above it may be concluded that trade between the Dutch ports and the United Kingdom showed a pattern which was less concentrated than that of total trade through the Dutch ports, especially with regard to imports; and that, over the period 1955 to 1975, trade with the United Kingdom showed a pattern of diffusion, whereas overall trade became increasingly concentrated in fewer ports.

3.0. Anglo-Dutch trade and its development 1955-75 over individual ports in the range.

For a more detailed examination of developments in Anglo-Dutch trade over the Dutch port range, it is once again necessary to turn to a port-by-port analysis of trade flows. In this way it is possible to take a closer look at some of the changes and relative shifts occurring within the port range as illustrated by the changing Indices of Concentration in the previous section. It is also useful in any discussion of Anglo-Dutch trade to examine the individual ports involved in this trade.

3.1. The New Waterway ports.

Collectively, this group of ports took the largest share of trade with the United Kingdom over the period under consideration, with 84.7% in 1955 and 81.9% in 1975. For individual ports, however, considerable changes occurred in the absolute and relative importance of Anglo-Dutch commerce within their total trade patterns.

3.1.1. Rotterdam

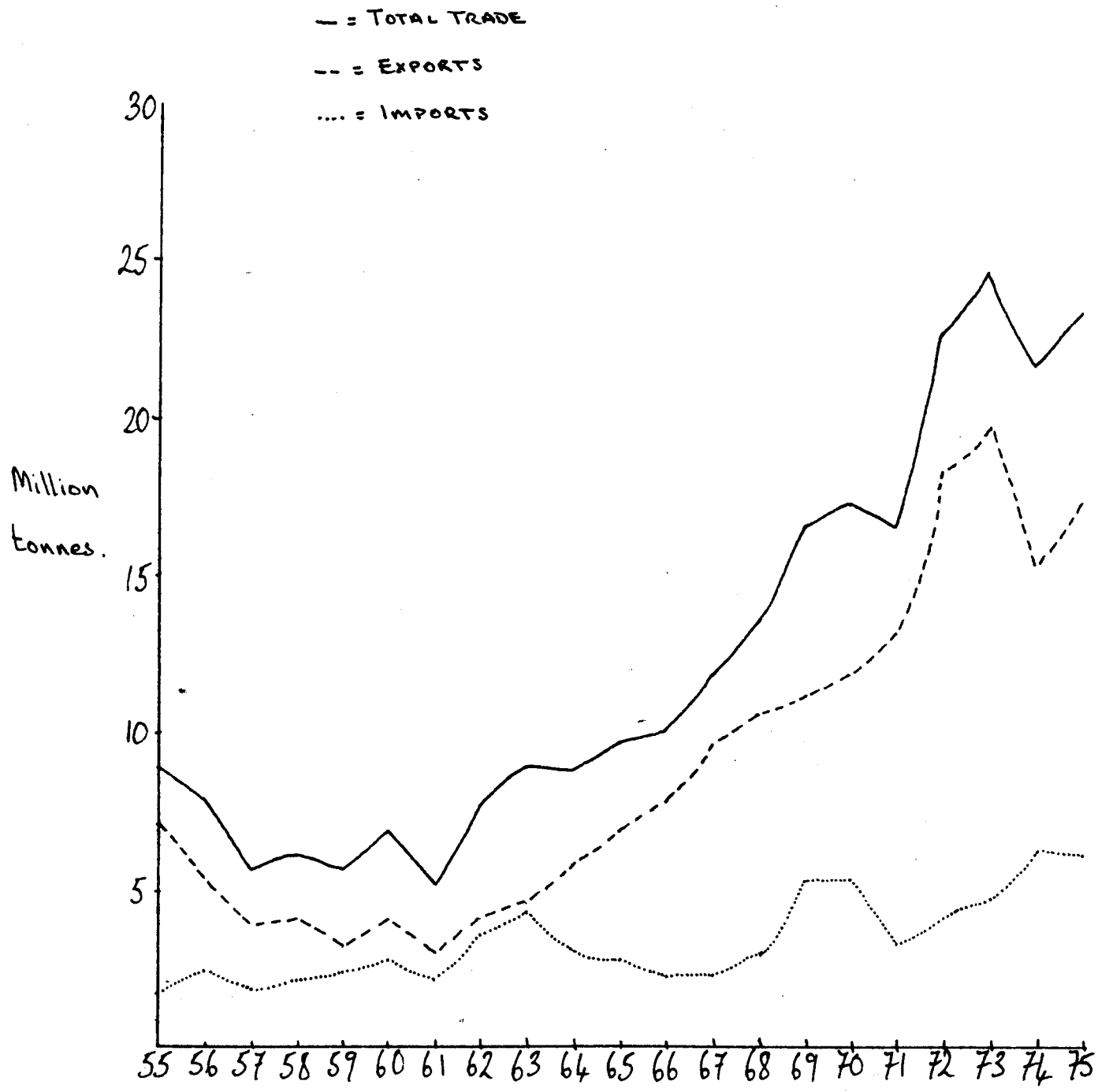
In absolute terms, Rotterdam's trade with the United Kingdom increased

from 9 million tons in 1955 to 23.4 million tons in 1975. Exports to the United Kingdom formed the major element in this trade throughout the period, with 80% of all United Kingdom trade in 1955 and 74% in 1975. Imports, however, showed a rapid growth rate, with an average increase of 1.8% per annum, whereas growth in exports was only 6.6% per annum over the same period. The relative share of trade with the United Kingdom in total seaborne trade through the port of Rotterdam fell from 13.5% in 1955 to 8.9% in 1975. If we leave out liquid fuels, which constituted a third of Rotterdam's trade in 1955 and two-thirds in 1975, trade with the United Kingdom increased from 21.9 to 23.7% of total trade.

Transit trade with the United Kingdom showed a rapid decline over the period. In 1955 61% of all trade between Rotterdam and the United Kingdom was made up of transit trade. Most of this was transit outwards; only 19% of imports into the port were destined for through transport, whereas 70% of exports were in transit. This showed a dependence on goods flows external to the Dutch economy, and there was a weak direct trading relationship between the two countries. By 1975 a fundamental change had taken place in this situation. The share of transit trade in the total trade with the United Kingdom had fallen to 22.9%. This was in common with the general decreased significance of the transit trade for the port of Rotterdam (see chapter 2, p. 87). However, the share of transit inwards from the United Kingdom in total imports rose to 36%, whereas only 18% of exports were in through transit. Relatively therefore, the share of goods destined for through transport from the United Kingdom to other industrial centres through the port of Rotterdam increased, as did direct exports from Rotterdam to the United Kingdom.

One other point must be borne in mind in any consideration of the transit trade through the port during this period. The major decline in

DIAGRAM 17. TRADE FLOWS BETWEEN THE PORT OF ROTTERDAM AND THE UNITED KINGDOM, 1955 to 1975.



this trade with regard to Anglo-Dutch trade at the port took place at the beginning of the period; by 1960 only 20% of Anglo-Dutch trade was in transit at the port of Rotterdam, and for the rest of the period the relative share of transit remained at a similar level. Again the transit of coal at the port was the main reason for the high transit element in 1955.

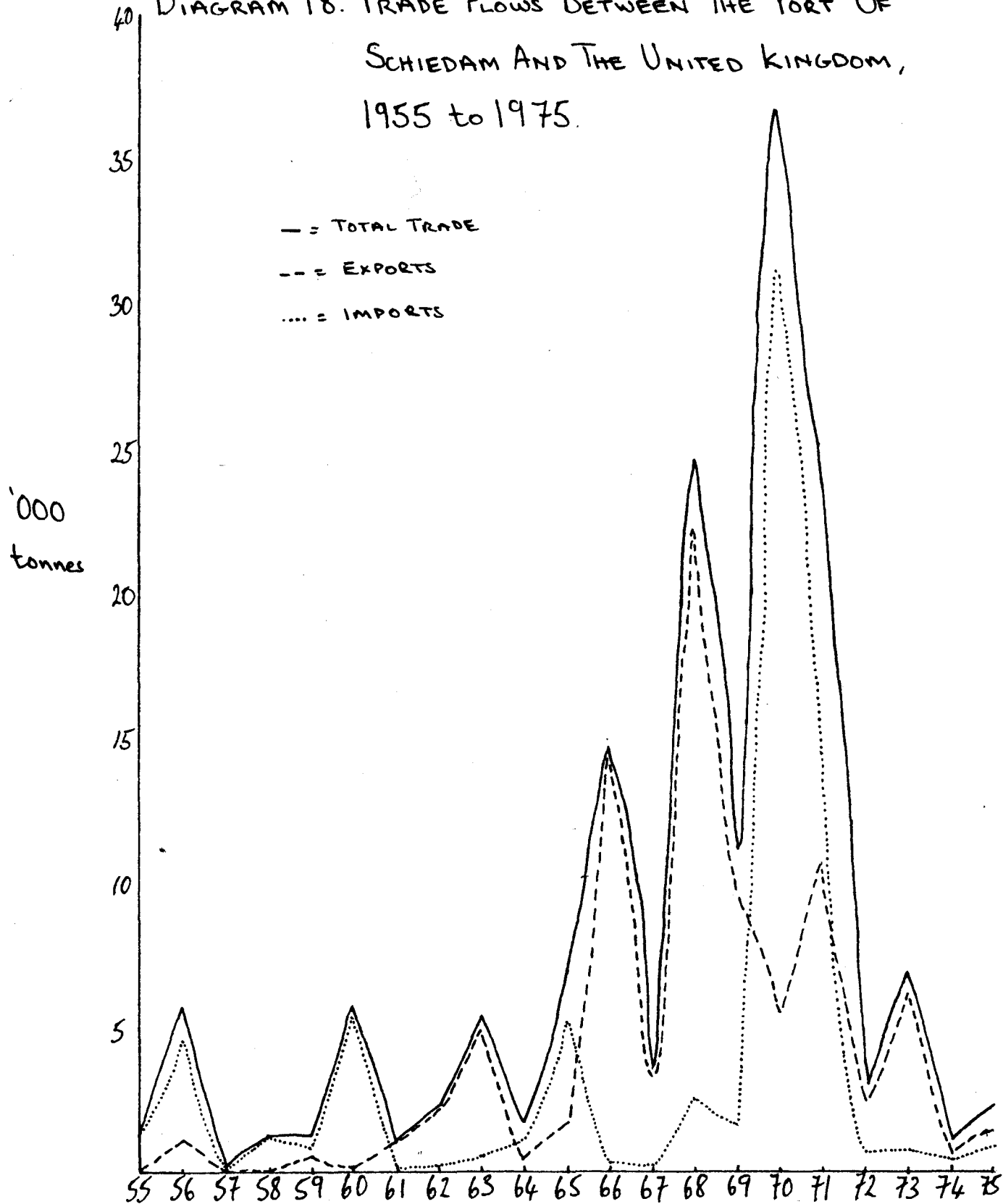
When viewed in relation to Anglo-Dutch trade flows over the whole Dutch port range 1955-75, Rotterdam's share fell from 82.1% in 1955 to 74.6% in 1975. Again the major decrease in its share in this trade took place in the late 1950s and early 1960s; by 1960 the figure was 73.9% and in 1961 only 65.2% of the Dutch port range's trade with the United Kingdom went through the port of Rotterdam. As to be expected, the main decline was in exports. In 1955 Rotterdam took 64% of all imports from the United Kingdom into the Netherlands, and 88% of exports. By 1960 this was 68% of imports and 78% of exports, and by the end of the period, 1975, the figures were 62% and 80%.

In general, therefore, Rotterdam retained its position as the main port in Anglo-Dutch trade flows, but its importance declined slightly in relation to the rest of the range over the period.

3.1.2. Schiedam.

In terms of absolute tonnage through the port, excluding bunker materials, Anglo-Dutch trade underwent considerable fluctuations over the period. The highest totals were recorded in the 1960s; declining to just over 24,000 tons in 1968 and further still by 1975 when tonnage was only slightly in excess of the 1955 figure. Up to 1961 imports were greater than exports in the United Kingdom trade, but from then on, with the exception of 1964-65 and 1971, exports predominated. Increased trade totals during the 1960s were also due to increased exports.

DIAGRAM 18. TRADE FLOWS BETWEEN THE PORT OF SCHIEDAM AND THE UNITED KINGDOM, 1955 to 1975.



Transit trade was initially of very little importance in the port's trading relationship with the United Kingdom, with less than 1% of trade, but by 1975 a third of the trade at the port was transit (two-thirds of imports and a third of exports). The relative share of Anglo-Dutch trade in total trade (including bunker materials) was 13.1% in 1955, by 1975 the figure was 12%, showing little change by the end of the period. In the peak year of trade, 1968, 17% of the port's trade was with the United Kingdom.

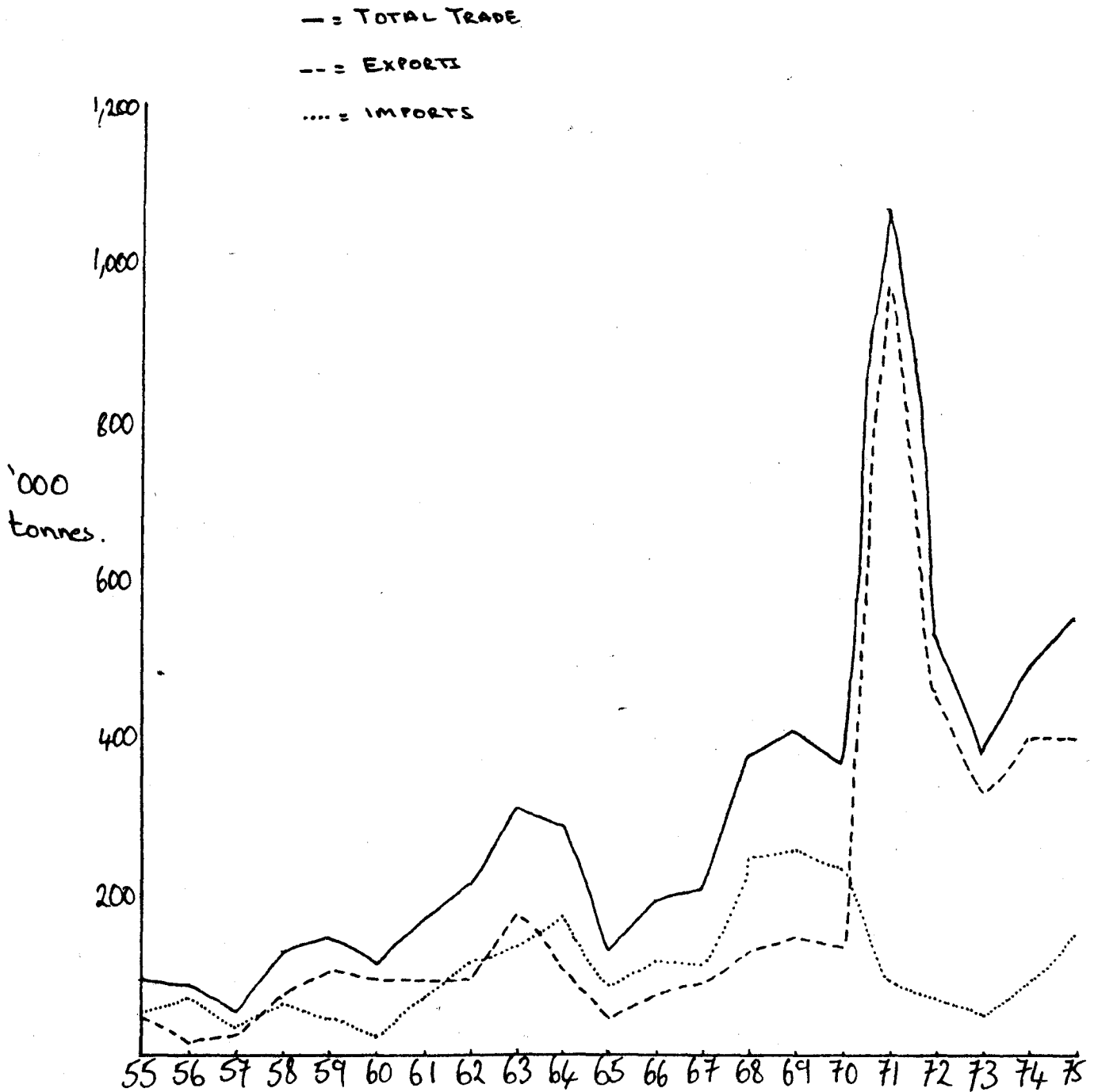
Relative to other ports in the range, Schiedam took the smallest percentage of Anglo-Dutch trade through the range in 1955 (0.01%). At the end of the period the port remained in this position, but its share of Anglo-Dutch trade had fallen further to 0.007%. In 1968, the peak year of this port's trade with the United Kingdom, 0.1% of all Anglo-Dutch trade over the range went through the port. The decline of the port of Schiedam in its trading relation with the United Kingdom was in line with the decline in the position of the port for total trade over the range (see chapter 2, p. 88).

3.1.4. Vlaardingen

Diagram 19 shows the development of trade with the United Kingdom at the port of Vlaardingen over the period 1955-75. Trade increased in absolute terms from 94,000 tons to 550,000 tons, growth being especially rapid during the 1960s. If this is compared with graph 4 of total trade over the period, a similar increasing trend may be observed, but a number of fluctuations in the Anglo-Dutch trade through the port did not apply to total trade; for instance, the initial decline in the late 1950s, and the 'abnormal' total for trade with the United Kingdom through the port in 1971 (a slight decline took place in this year in total trade through the port). In 1955, imports from slightly exceeded exports to

DIAGRAM 19. TRADE FLOWS BETWEEN THE PORT OF VLAARDINGEN AND THE UNITED KINGDOM

1955 to 1975.



the United Kingdom. From 1958 to 1961, and in 1963, exports exceeded imports, but in all other years imports predominated, up to 1971. From this year onwards exports were considerably greater than imports, rising to 80% in 1975. This was in contrast with the situation for total trade through the port. Regarding the importance of Anglo-Dutch trade to the port of Vlaardingen, this considerably strengthened over the period. In 1955, only 3.6% of the port's trade was with the United Kingdom. By 1975, this was 13.5%, and in the peak year of this trade, 1971, the figure was just under a fifth of total port trade flows. Transit trade with the United Kingdom, the major element throughout the period, increased from 54% to 81%. Direct imports and exports showed only a slight increase. This was in line with the developments in total trade at the port, in which the transit element also increased over the period.

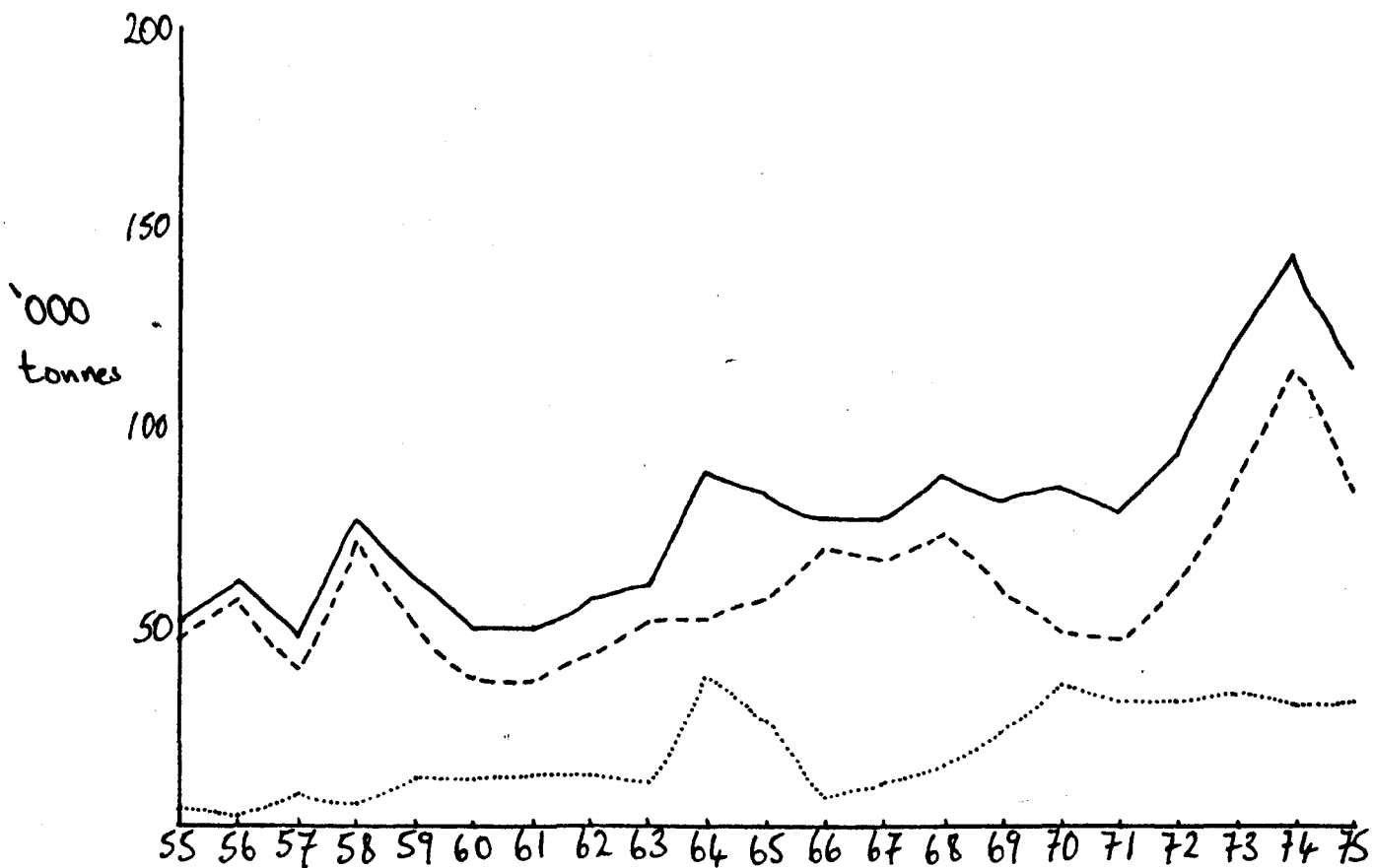
Vlaardingen's share of all trade with the United Kingdom through Dutch ports increased from 0.9% in 1955 to 1.7% in 1975, showing that the trading relationship between this port and the United Kingdom considerably strengthened over the period.

3.1.5. Maassluis.

The port of Maassluis, which was one of the Netherlands' smallest ports in terms of tonnage, showed a doubling in trade with the United Kingdom 1955-75 in absolute terms, from 50.6 thousand to 115.4 thousand tons. This trade declined in the late 1950s, showed a gradual growth in the 1960s, and the most rapid development and growth from 1971 to 1975 (see diagram 20). In general, these developments were similar to the movements in total trade at the port (see chapter 2, paragraph 5.2.1.4). Trade with the United Kingdom remained export orientated throughout the period, although more so in 1955 (when exports claimed 92% of the trade)

DIAGRAM 20. TRADE FLOWS BETWEEN THE PORT OF
MARSUIS AND THE UNITED KINGDOM
1955 to 1975

— = TOTAL TRADE
-- = EXPORTS
.... = IMPORTS



than in 1975, with 73% of trade being exports. Exports merely doubled in size over the period, whereas imports displayed a much faster growth, with a sevenfold increase in 1955-75. In absolute terms the highest trade figure was in 1974 when 144,000 tons of trade with the United Kingdom passed through the port.

Transit trade with the United Kingdom was a fairly important element here: in 1955, 30% of the United Kingdom trade was in transit (almost 50% of exports, to the United Kingdom, but only 6% of imports). By 1975 the figure had fallen to 24%, but there was a substantial rise in transit inwards, so that as much as 80% of imports from the United Kingdom were in transit in this year, when the figure for exports had fallen to 19%. Again, this was in line with the developments in total trade over the period. The Anglo-Dutch trade was of paramount importance to the port of Maassluis, and this was strengthened over the period 1955-75. Initially, 81% of the port's trade was with the United Kingdom by 1975 the figure was 91%, making this port more dependent on the Anglo-Dutch trade than most other ports in the Dutch range. Nevertheless, when considering this port within the total port range, the part played by Maassluis was small and declining, with 0.5% of total United Kingdom trade flows in 1955 and only 0.4% in 1975.

3.1.6. Hoek van Holland.

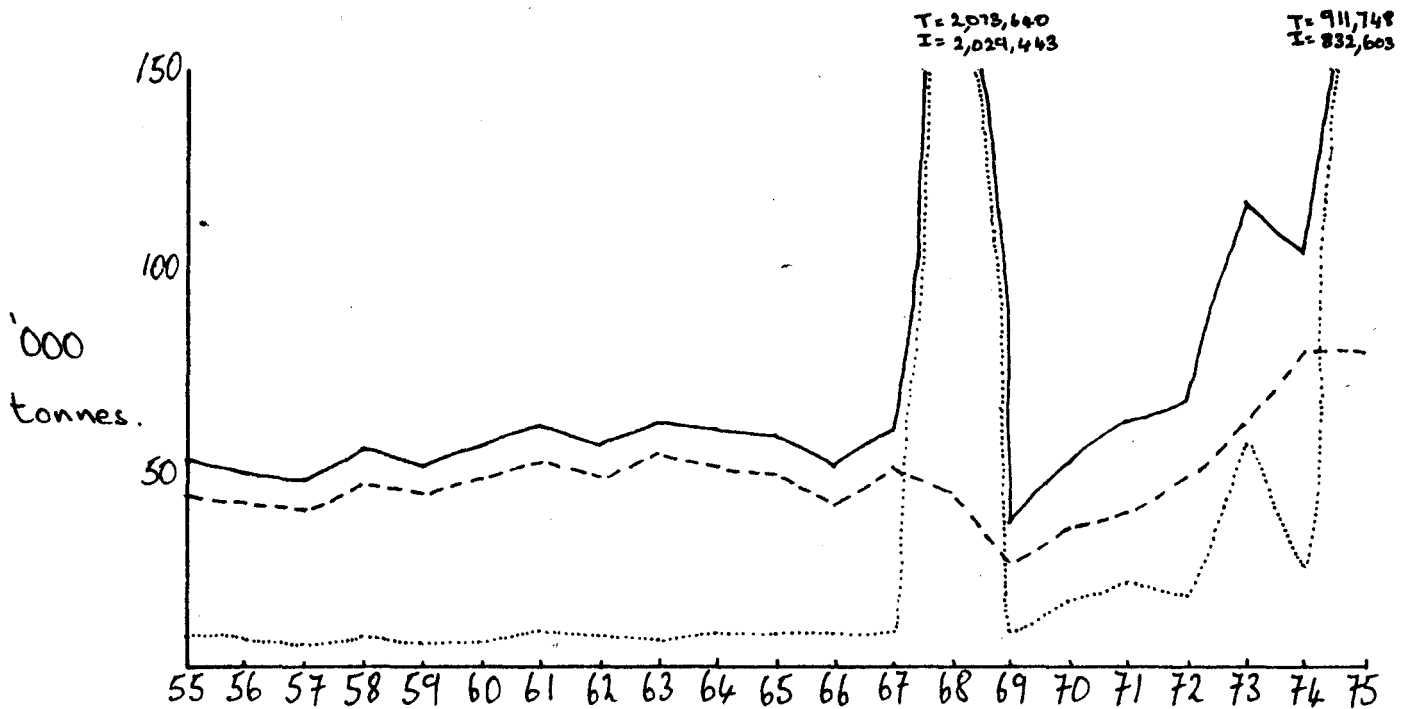
Up to the late 1960s, trade with the United Kingdom at the Hoek showed a relatively stable pattern. The peak year of trade was in 1973, leaving aside for the moment the abnormally large totals in 1968 and 1975. As in the discussion of total trade over the port, 1974 is taken as the terminal year for the analysis at this port (see chapter 2, paragraph 5.2.1.5.). In 1955, trade with the United Kingdom amounted to just over 52,000 tons and in 1974 104,000 tons. As at Maassluis, exports

DIAGRAM 21. TRADE FLOWS BETWEEN THE PORT OF
HOEK VAN HOLLAND AND THE UNITED
KINGDOM 1955 to 1975.

— = TOTAL TRADE

- - - = EXPORTS

... = IMPORTS



dominated Anglo-Dutch trade, with the exception of 1968 and 1975.

In 1955, 81% of all trade with the United Kingdom was export, in 1974 75%.

Transit trade with the United Kingdom through the port increased 1955-74, from 22% to 45% of this trade. Of this figure, 24% of the imports and 22% of the exports were in transit in 1955; by 1975 as much as 70% of the imports and 38% of the exports were in transit. At the end of the period, therefore, with almost half of its trade with the United Kingdom in transit, this had become an important element of the port's trading relationship with the United Kingdom, unlike Maassluis, where transit became less important.

There was a substantial increase in the port's dependence on Anglo-Dutch trade over the period. In 1955, just over half of the port's trade was with the United Kingdom; in 1965, this had increased to just over 70%, and by 1974 98%, making the port more dependent on Anglo-Dutch trade than any other port in the range. Despite this significant local increase, however, Hoek van Holland, like Maassluis, took a minor role in total trade from the United Kingdom to the Netherlands and there was a decline in the percentage share of this port over the period, from 0.5% to 0.4%.

3.1.7. Dordrecht.

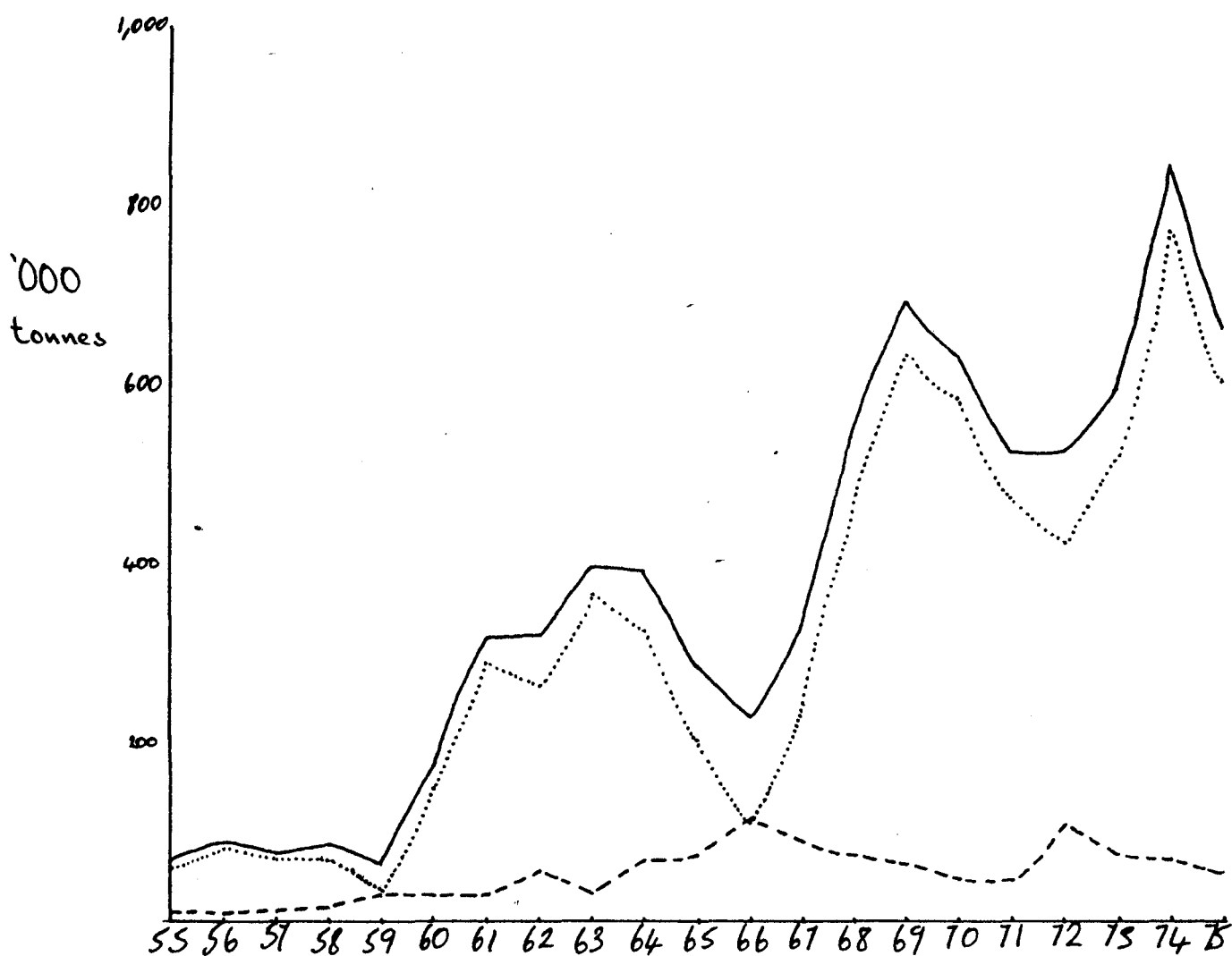
As with total trade, trade with the United Kingdom at this port showed considerable fluctuation 1955-75. In absolute terms a substantial increase took place, however, with trade in 1975 being nine times the size of the 1955 figure, making the growth rate for Anglo-Dutch trade at this port one of the fastest of all ports in the range. Imports from the United Kingdom predominated, with the exception of 1966, and formed the major growth element, with a tenfold increase in size, whilst exports

DIAGRAM 22. TRADE FLOWS BETWEEN THE PORT OF
DORDRECHT AND THE UNITED KINGDOM
1955 to 1975.

— = TOTAL TRADE.

--- = EXPORTS.

.... = IMPORTS.



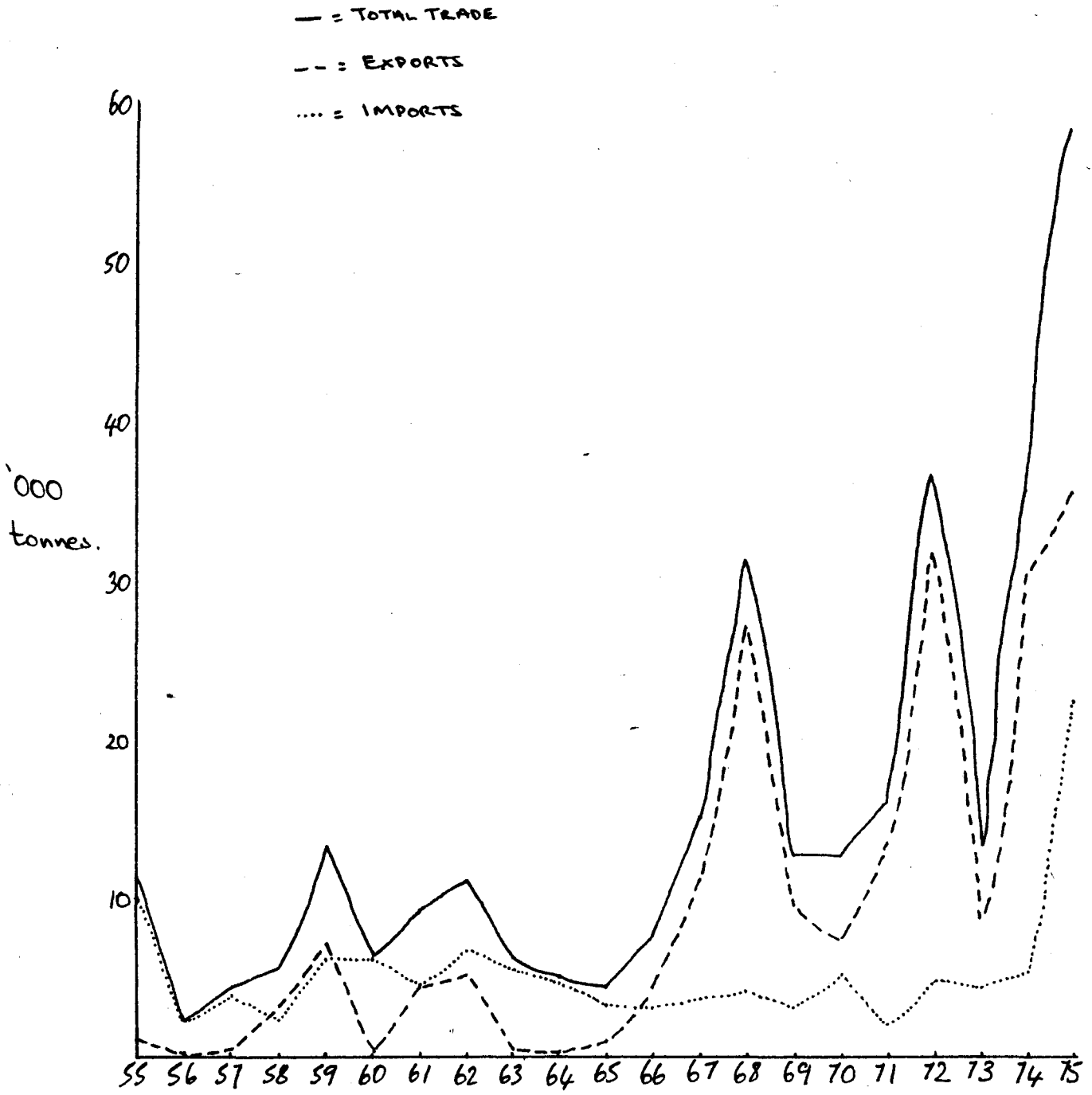
experienced only a fivefold increase. Seaborne trade with the United Kingdom increased from 70,000 tons in 1955 to 662,000 tons in 1975. The most rapid growth was in 1959-61, 1966-69 and 1972-74. Imports formed 85% of the trade with the United Kingdom in 1955, increasing to 91% of trade in 1975. There was a considerable reduction in the role of transit in this trade over the period. In 1955, 84% of trade with the United Kingdom was transit, 92% of imports and 34% of exports. In 1975 only 24% of the trade was in transit, 24% of imports and 26% of exports. Direct imports, therefore, provided the main growth over the period. The decline in the role of transit in the United Kingdom trade was similar to trends in total trade at the port.

In 1955, trade with the United Kingdom formed only a minor part of the port of Dordrecht's trade, with 6% of the total. By the end of the period the figure had risen to just under a third of the total, making the United Kingdom one of the most important trading partners of the port. At the same time there was a considerable increase in the port's share, from 0.6% to 2.1%, of all trade with the United Kingdom over the Dutch port range 1955-75.

3.1.8. Zwijndrecht.

The last of the ports in the New Waterway group, Zwijndrecht, also saw increased trade with the United Kingdom 1955-75, from 11,000 to 58,000 tons. However, as shown from the developments in this trade in diagram 23, the trade underwent considerable fluctuation and it was not until the late 1960s and early 1970s that any substantial growth occurred. The fluctuating trade pattern was similar to that of total trade (diagram 8), although for total trade the increase at the end of the period was less marked than for the United Kingdom trade. Imports dominated trade with the United Kingdom at the port up to 1966, with the exception of

Diagram 23 TRADE FLOWS BETWEEN THE PORT OF
ZWITNDRECHT AND THE UNITED KINGDOM
1955 to 1975.



the years 1958-59. From 1966 exports were more important than imports. In 1955 almost 90% of the trade was import, and in 1975 almost two-thirds was export. In the early period, therefore, Zwijndrecht's trade with the United Kingdom bore less resemblance to total trade (in which exports were dominant) than at the end of the period.

The share of the Anglo-Dutch trade in total trade at the port initially weakened from 25% in 1955 to only 8% in 1965. After this date, however, trade with the United Kingdom became increasingly important, so that by 1970 29%, and by 1975 as much as 74% of the port's trade was with the United Kingdom, making this the port's most important trading area. Transit here, as in total trade, was an important element, with less than 1% of trade in 1955 and 6% in 1975. The share of the port in the Anglo-Dutch trade relative to the whole range also increased from 0.1% in 1955 to 0.2% in 1975.

3.1.9. Conclusion.

From the above survey of the changes in the New Waterway ports' trade with the United Kingdom over the period 1955-75, it may be seen that the port of Rotterdam is of paramount importance. However, when examining the importance of the United Kingdom to the port itself, this actually declined over the period, whereas for all the smaller New Waterway ports the United Kingdom became an increasingly important trading partner, in some cases (such as Vlaardingen) quite dramatically so. The smaller ports along the New Waterway therefore showed an increasing orientation towards the United Kingdom in their trade flows over the period 1955-75, particularly in the late 1960s and 1970s.

3.2. The North Sea Canal ports.

This group of ports took the major part of the remaining trade with the United Kingdom. However, as with the New Waterway ports, the percentage share of the group also declined, from 11.6% of all United Kingdom trade in 1955 to 9.4% in 1975.

3.2.1. Amsterdam

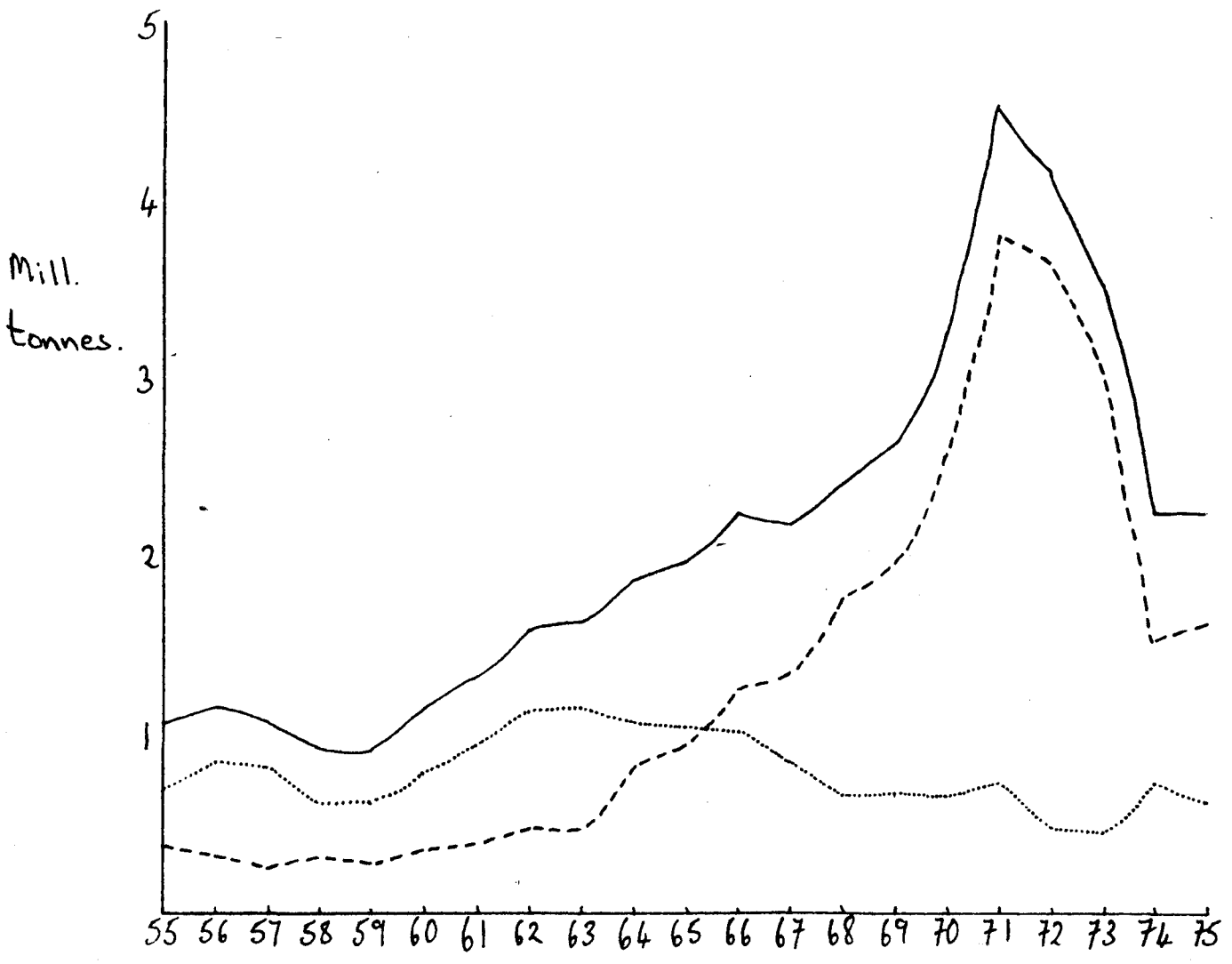
Trade between the port of Amsterdam and the United Kingdom, as can be seen from diagram 24, saw a considerable increase in absolute tonnage 1955-75, especially between 1959 and 1971. Initially, and after 1971, however, there was a decrease in the trade. This contrasts with the situation for total trade, which was relatively stagnant during the early 1960s, although a sharp increase occurred after 1967.

Up to 1966 the port's trade with the United Kingdom showed a fairly marked predominance of imports; in this year, exports to the United Kingdom exceeded imports for the first time and by 1975 over two-thirds of all Anglo-Dutch trade through the port was export. This compares with the situation in 1955, when 61% of Anglo-Dutch trade was imports. There was therefore a fundamental change in the direction of this trade at the port between 1955 and 1975. Figures for trade with the United Kingdom doubled at the port over the period. Imports showed an absolute decline, whereas exports underwent a fourfold increase.

The share of the United Kingdom trade in total trade of the port remained relatively unaltered over the period at around 14%. By 1975, however, this had dropped to 13%. Of this trade, 35% was in transit in 1955, 28% of imports and 42% of exports. By 1975 transit trade with the United Kingdom had increased to 42% of the total. Transit inwards declined to 18% of all imports, whereas transit outwards now formed half of all exports (52%). The port's share of all Anglo-Dutch trade through

DIAGRAM 24. TRADE FLOWS BETWEEN THE PORT OF
AMSTERDAM AND THE UNITED KINGDOM
1955 to 1975.

— = TOTAL TRADE
-- = EXPORTS
.... = IMPORTS



the range fell from 9.8% in 1955 to 7.2% in 1975.

3.2.2. IJmuiden

Trade with the United Kingdom through this port showed a considerable increase over the period, especially from the mid-1960s. There was greater fluctuation in Anglo-Dutch trade than in total trade, however, although the accelerated growth in the late 1960s and 1970s was in line with developments in total trade. Exports exceeded imports in Anglo-Dutch trade flows, with the exception of 1957, and these became more important over the period. In 1955, 77% of trade with the United Kingdom was export, by 1975 the figure was 94%. Transit trade, which was only a minor element in the total trade through the port in 1955, was entirely absent from Anglo-Dutch trade in this year. In 1975 it remained insignificant, forming less than 1% of trade with the United Kingdom. In absolute terms, imports from the United Kingdom increased slightly over the period, whereas exports to the United Kingdom showed a fourfold increase.

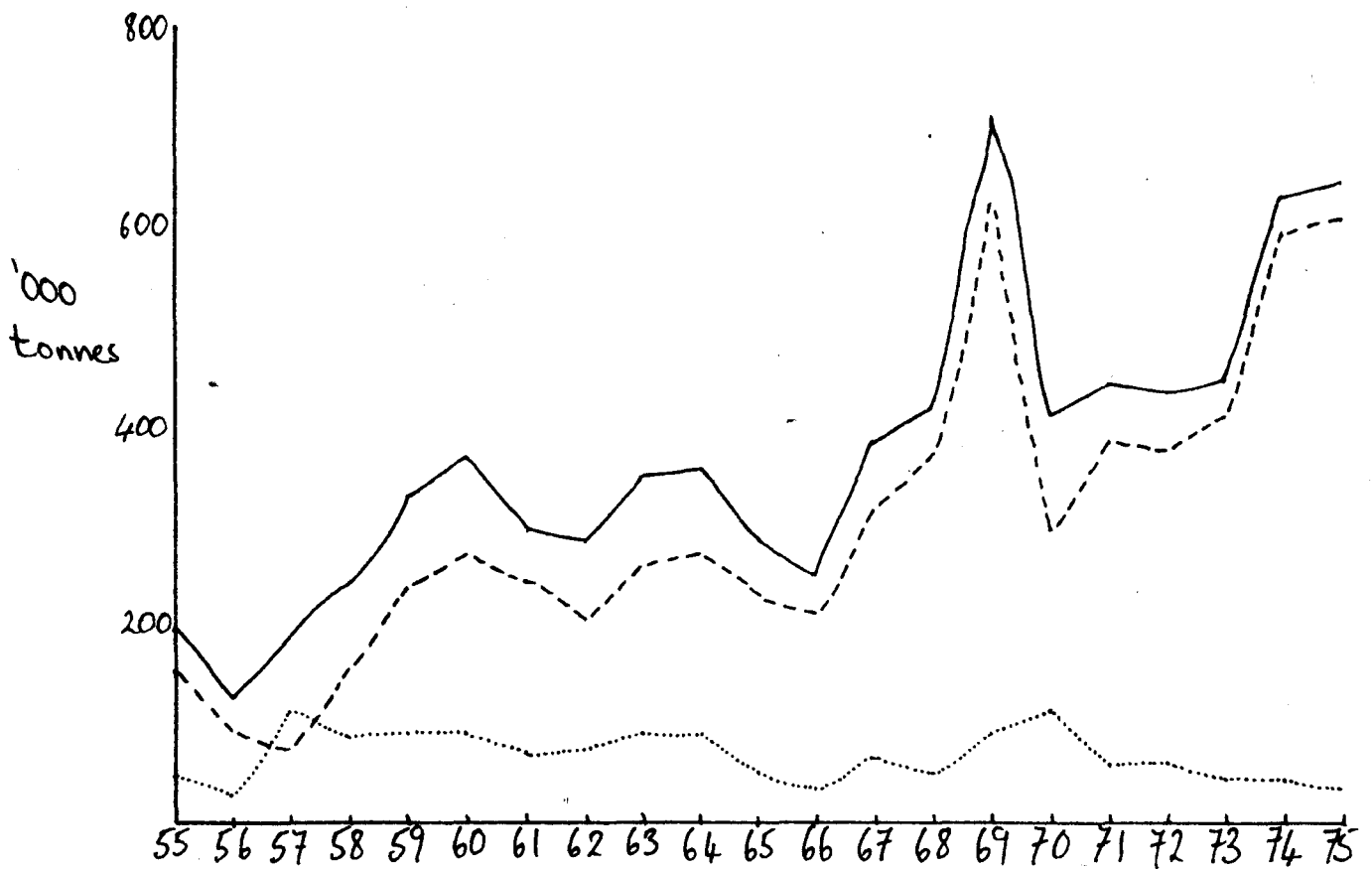
Compared to the port's total trade, Anglo-Dutch trade declined over the period. In 1955, 10% of the trade of the port of IJmuiden was with the United Kingdom. By 1975, only just over 5% of the trade of the port was with this foreland, despite the large absolute increase in the trade figures. The port's share of all Anglo-Dutch trade over the Dutch port range increased, however, from 1.8% in 1955 to 2% in 1975.

3.2.3. Zaandam

Anglo-Dutch trade at this port fluctuated considerably in volume, with the peak trading totals being recorded in the late 1960s and 1970s, as at IJmuiden. An initial increase in trade occurred in the 1950s, after which a decline set in. Increased trade with the United Kingdom was especially marked, however, in the period 1964-68, and by the end of the

DIAGRAM 25. TRADE FLOWS BETWEEN THE PORT OF IJMUIDEN AND THE UNITED KINGDOM 1955 to 1975

— = TOTAL TRADE.
-- = EXPORTS.
.... = IMPORTS.



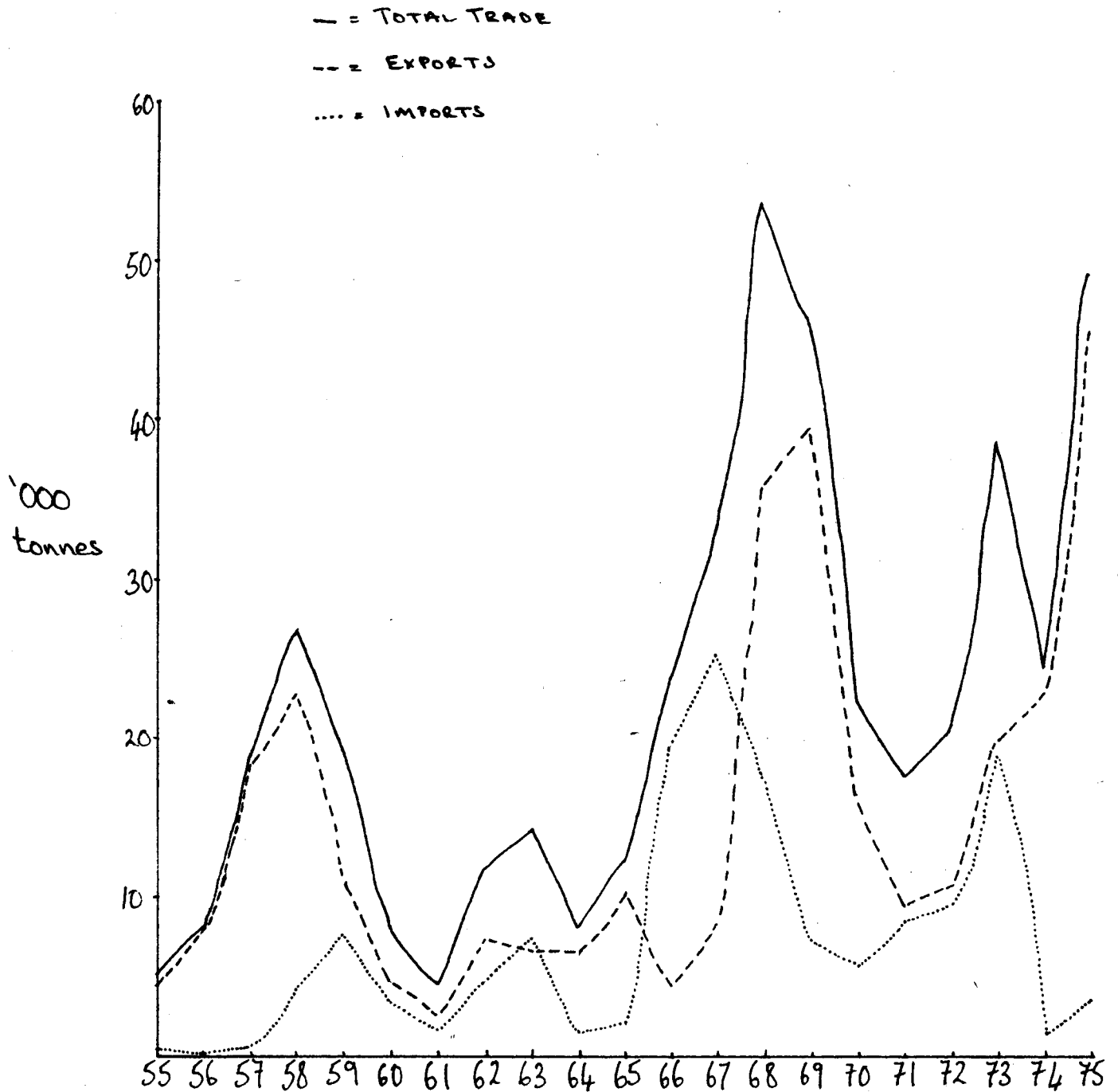
of the period it was ten times the volume of that in 1955. In most years exports to the United Kingdom exceeded imports, with the exception of the years 1963 and 1966/7. At the start of the period 89% of all Anglo-Dutch trade at the port was export, in 1975, 93%.

At at IJmuiden, transit played only a minor role, with less than 1% in both 1955 and 1975. Anglo-Dutch trade was also only 2% of the port's total trade in 1955. Especially during the late 1960s and early 1970s the importance of trade with the United Kingdom to the port increased, reaching just under 17% in 1975. In the peak year, 1968, as much as 22% of the port's trade was with the United Kingdom. The trading relationship between the United Kingdom and the port of Zaandam therefore strengthened over the period 1955-75. Its share in the total trade with the United Kingdom over the range also increased from 0.05% in 1955 to 0.2% in 1975.

3.2.4. Conclusion

Looking at the trading relationship between the North Sea Canal ports and the United Kingdom 1955-75, a similar pattern to that observed for the New Waterway ports emerges, in that for the large port, Amsterdam, the Anglo-Dutch trade became a less important element in total trade, while for the smaller port, Zaandam, it became more important. IJmuiden, which was the Netherlands' fourth port in terms of tonnage in 1955 and third in 1975, despite a large absolute increase in trade with the United Kingdom over the period, showed a decline in this trading relationship relative to total trade.

DIAGRAM 26. TRADE FLOWS BETWEEN THE PORT OF
ZAANDAM AND THE UNITED KINGDOM
1955 to 1975.



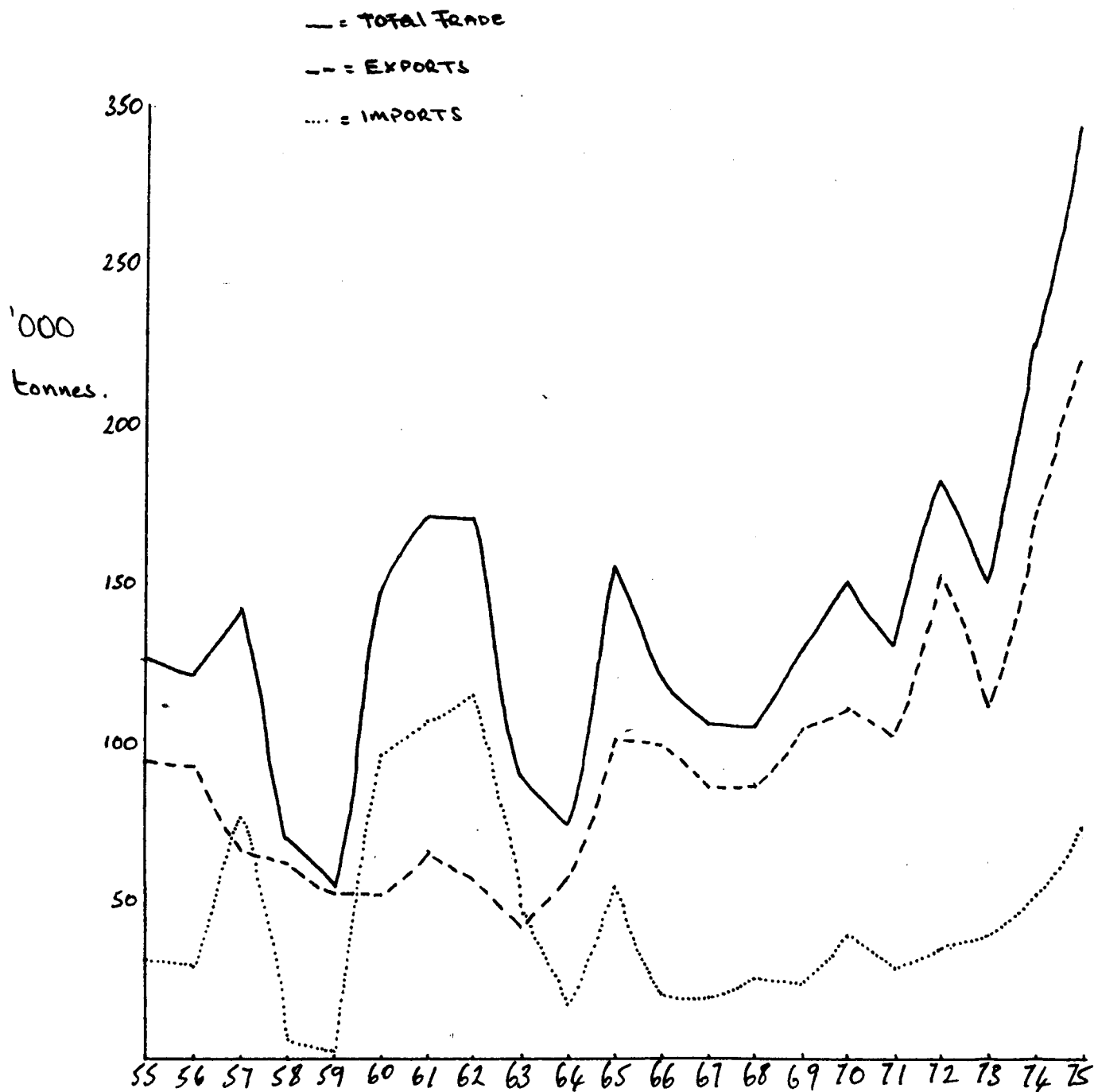
3.3. The northern ports.

The northern ports include some of the smallest ports in the Netherlands, which collectively accounted for only 2.2% of all Anglo-Dutch trade in 1955. By 1975 the figure had declined to 1.1%. The northern ports suffered from greater geographical isolation in relation to their hinterland, and to the foreland of the United Kingdom, than the other ports in the Dutch port range.

3.3.1. Delfzijl

The growth of Anglo-Dutch trade at the port contrasts in many ways with that of total trade in the period 1955-1975. After an initial decline in the late 1950s, in common with that of total trade, trade with the United Kingdom fluctuated considerably and by the end of the 1960s was at much the same level as in 1955. For total trade, however, there was a considerable increase over the same period. By 1975 there were signs of an increase in Anglo-Dutch trade, and this was again in contrast with total trade, which declined at the end of the period. Exports predominated in total trade, as they did in Anglo-Dutch trade with the exception of 1957 and 1960-64. At the end of the period about three-quarters of the trade of the port with the United Kingdom was exports. By 1975 trade with the United Kingdom through the port was twice as large in absolute terms as in 1955. Transit trade, as in total trade, was an unimportant element with less than 1% of the trade in 1955 and 3% in 1975. Initially a large part of its trade (42% of the total), during the 1960s the role of Anglo-Dutch trade in the port's total declined rapidly, so that by 1970 as little as 8% was with the United Kingdom. At the end of the period, this had increased to 14% of the total. The share of Delfzijl's Anglo-Dutch trade in the whole port range also declined from 1.1% in 1955 to 0.9% in 1975.

DIAGRAM 27 TRADE FLOWS BETWEEN THE PORT OF
DELFTZIJL AND THE UNITED KINGDOM
1955 to 1975.



Delfzijl's trading relationship with the United Kingdom therefore weakened considerably over the period 1955-75.

3.3.2. Groningen

Trade with the United Kingdom at this port showed considerable fluctuation over the period, with peak trading years in 1963-66 and 1973-75. The 1975 figure was considerably larger than the 1955 figure, eleven times as large in fact. The rise in trade with the United Kingdom in the 1970s contrasts with the situation in total trade, where a decline took place (see chapter 2, p. 94).

Up to 1963 imports dominated the Anglo-Dutch trade of the port, with the exception of 1955 and 1961, after which exports to the United Kingdom from the port became more important. In 1955, 55% of trade was exports. In 1975 as much as 85% of Anglo-Dutch trade was exports. Transit trade with the United Kingdom was non-existent in 1955, and insignificant in 1975.

The increasing importance of the United Kingdom as a trading partner for the port can be seen from the growth in trade. In 1955, trade with the United Kingdom was of little importance, with only 6% of all trade. In the 1960s, there was a steady increase in Anglo-Dutch trade, so that by 1975 over half (53%) of the port's trade was with the United Kingdom. In addition, its trade with the United Kingdom increased from 0.05% of Anglo-Dutch trade throughout the port range in 1955 to 0.13 in 1975. Groningen therefore became increasingly dependent on trade with the United Kingdom over the period 1955-75.

3.3.3. Harlingen

As illustrated by diagram 29, Anglo-Dutch trade through the port of Harlingen 1955-75 declined in absolute terms, especially from 1964 onwards. This decline was similar to developments in total trade over the

DIAGRAM 28 TRADE FLOWS BETWEEN THE PORT OF
GRONINGEN AND THE UNITED KINGDOM
1955 to 1975.

— = TOTAL TRADE

- - = EXPORTS

... = IMPORTS

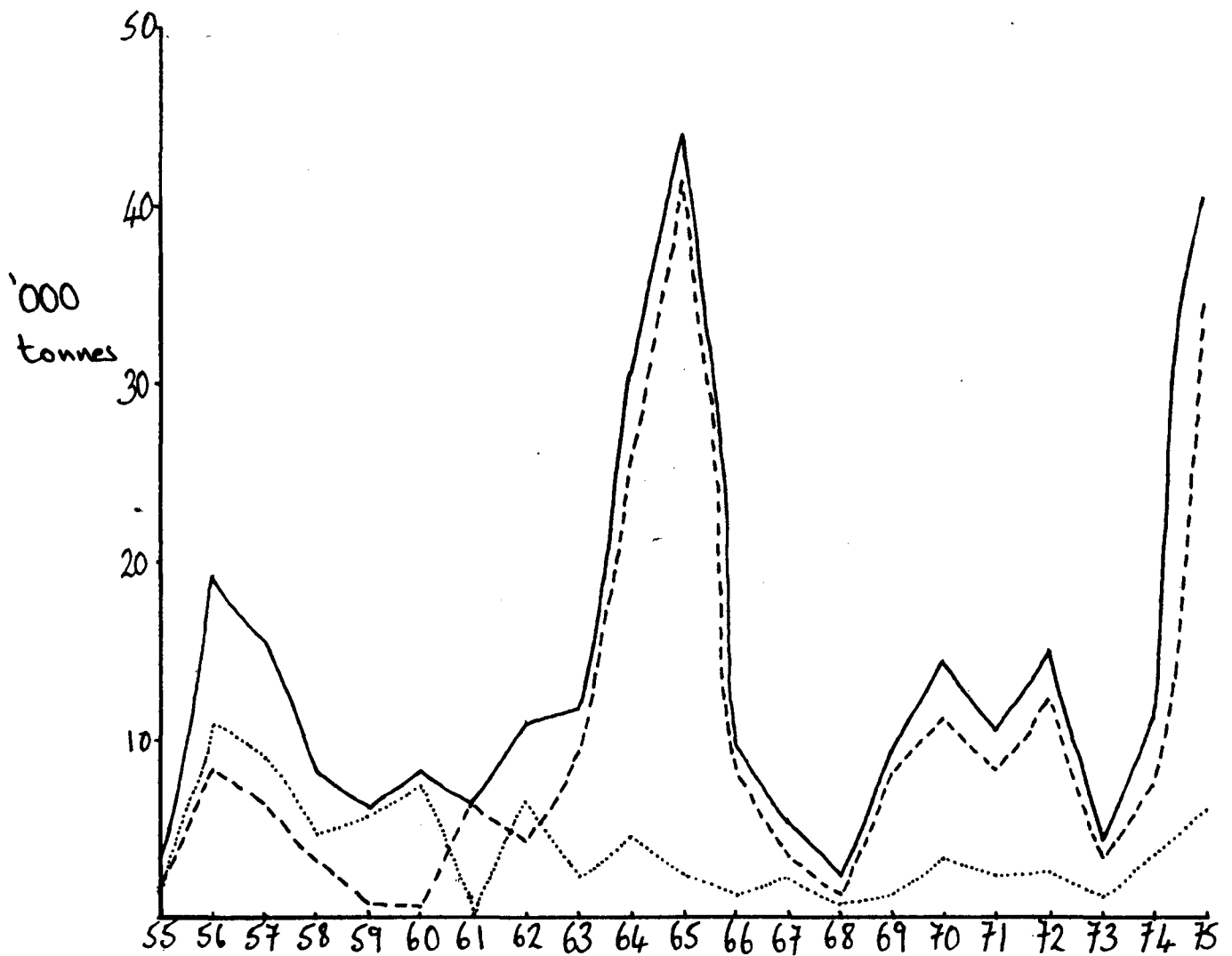
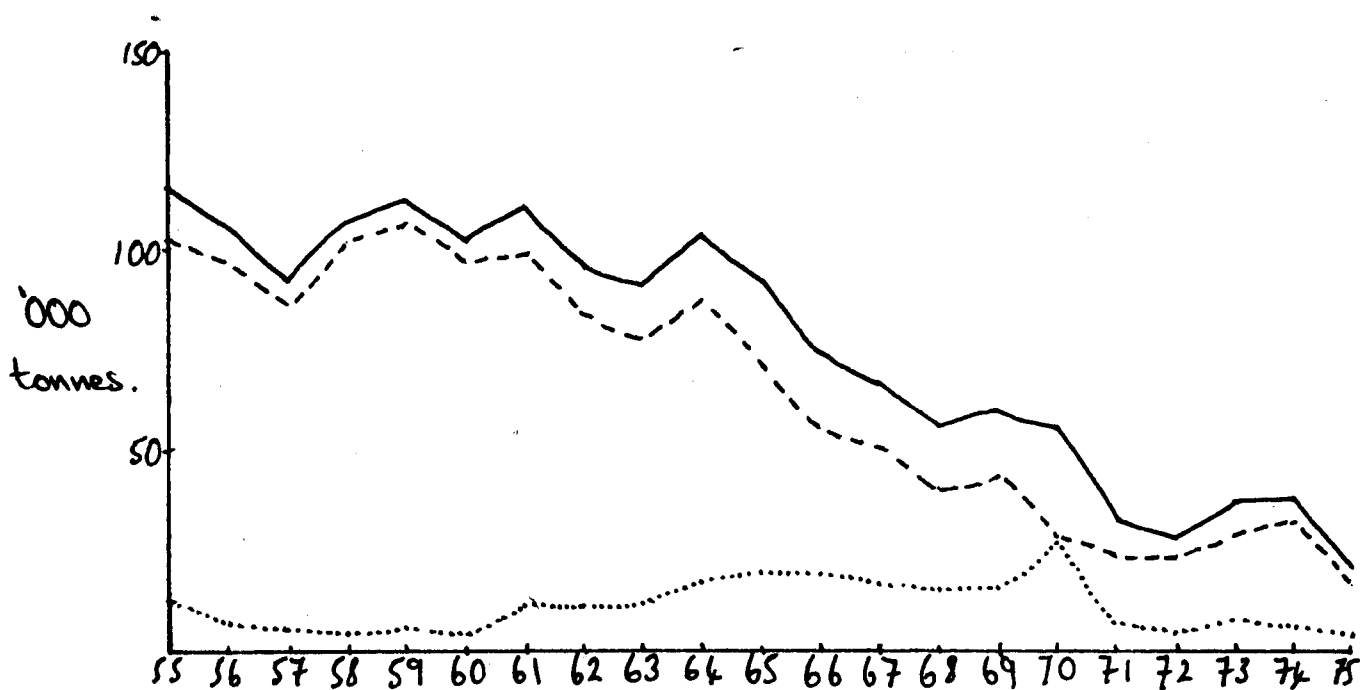


DIAGRAM 29. TRADE FLOWS BETWEEN THE PORT OF HARLINGEN AND THE UNITED KINGDOM 1955 to 1975.

— = TOTAL TRADE
-- = EXPORTS
.... = IMPORTS



period, although the increase in total trade in the late 1950s and early 1960s was not reflected in the Anglo-Dutch trade figures. Both imports from, and exports to the United Kingdom were affected: over the period 1955-75 both imports and exports declined to a third of their former size. Exports predominated, with 88% of all trade with the United Kingdom in 1955 and 79% in 1975. Transit trade through the port was non-existent in 1955, and only 5% in 1975. A relative decline also took place over the period in the share of Anglo-Dutch trade in total trade at the port. By the mid-1960s the figure was just over half (52% of all trade, and by 1975 as little as 19%. So there was a shift in trade flows away from Anglo Dutch trade over the period. The port's share of Anglo-Dutch trade in the whole Dutch port range declined from 1.1% in 1955 to 0.06% in 1975.

3.3.4. Conclusion

With the exception of the smallest port in the northern range, Groningen, trade relations between the United Kingdom and the northern Dutch port range considerably weakened over the period 1955-75. There was an absolute increase in trade at the ports of Delfzijl and Groningen, but an absolute decline in trade at the port of Harlingen. By 1975 tonnage of Anglo-Dutch trade at Harlingen was less than at the smallest port, Groningen.

3.4. The Schelde ports.

The role of the Schelde ports in Anglo-Dutch trade over the whole port range increased between 1955 and 1975. In 1955, as little as 0.7% of all Anglo-Dutch trade over the range passed through the two Schelde ports. By the end of the period the figure had increased to 2.8%.

3.4.1. Terneuzen

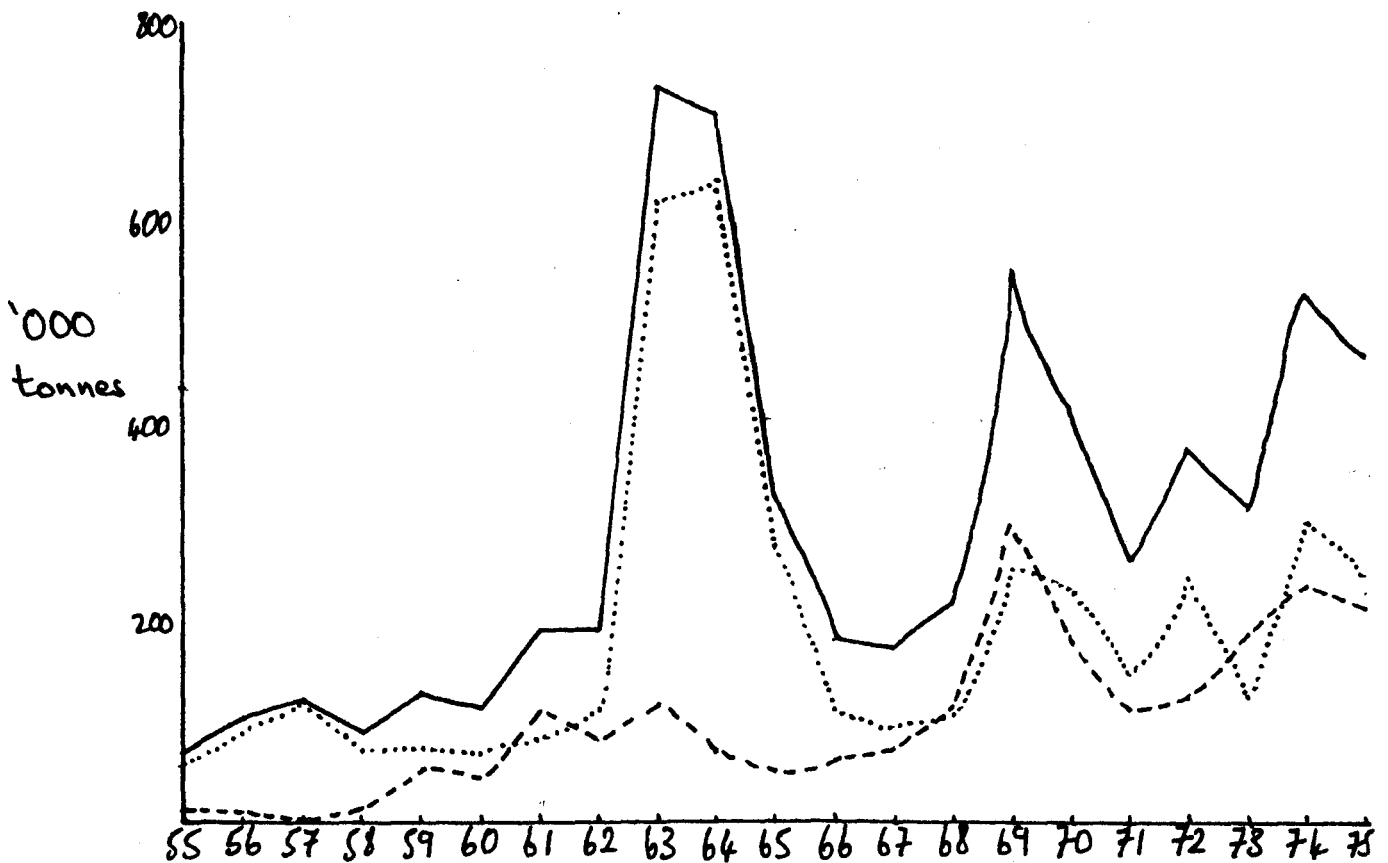
Despite fluctuations in trade with the United Kingdom at this port, there was an overall increase 1955-75 similar to the increase recorded in total trade, although the latter was subject to fewer fluctuations. In common with total trade, the fastest growth was recorded in the latter part of the 1960s and early 1970s, although a very large increase took place in the period 1962/3 and 1969/70. In these years abnormally large totals were recorded, caused mainly by an increase in the volume of imports from the United Kingdom (which is further discussed in section 4.4.1). Over the whole period imports were predominant, with the exception of 1961 and 1968/9, although by the end of the period imports and exports were more evenly balanced. In 1955, 81% of trade with the United Kingdom was imports; by 1975 the figure had shrunk to 53%. In absolute terms trade with the United Kingdom through Terneuzen was six times as large in 1975 as in 1955.

An interesting development took place in the transit through the port during this period. In 1955, almost all of the trade with the United Kingdom was in transit; 94% of the total. Of this, 99% of all imports from the United Kingdom and 69% of the export were in transit. Trading relations with the United Kingdom were thus strongly orientated towards the Belgian hinterland in this year. By 1975 only 62% of trade with the United Kingdom was in transit, so that the direct trade showed a considerable increase over the period. In 1975 85% of imports were transit trade, but the figure for exports had fallen to 34%. Thus, direct exports from the port to the United Kingdom formed the major growth element over the period.

The declining role in transit trade was similar to developments in total trade at the port over the same period (chapter 2, p.96). In the peak year of trade with the United Kingdom, 1963, 85% was in transit, mainly

DIAGRAM 30 TRADE FLOWS BETWEEN THE PORT OF
TERNEUZEN AND THE UNITED KINGDOM
1955 to 1975.

— = TOTAL TRADE
-- = EXPORTS
.... = IMPORTS



inwards. There was a slight decline in the importance of Anglo-Dutch trade at the port over the period 1955-75, from 14% to 10%. Nevertheless, its share of Anglo-Dutch trade over the whole Dutch port range increased from 1.1% to 1.5% during the same period.

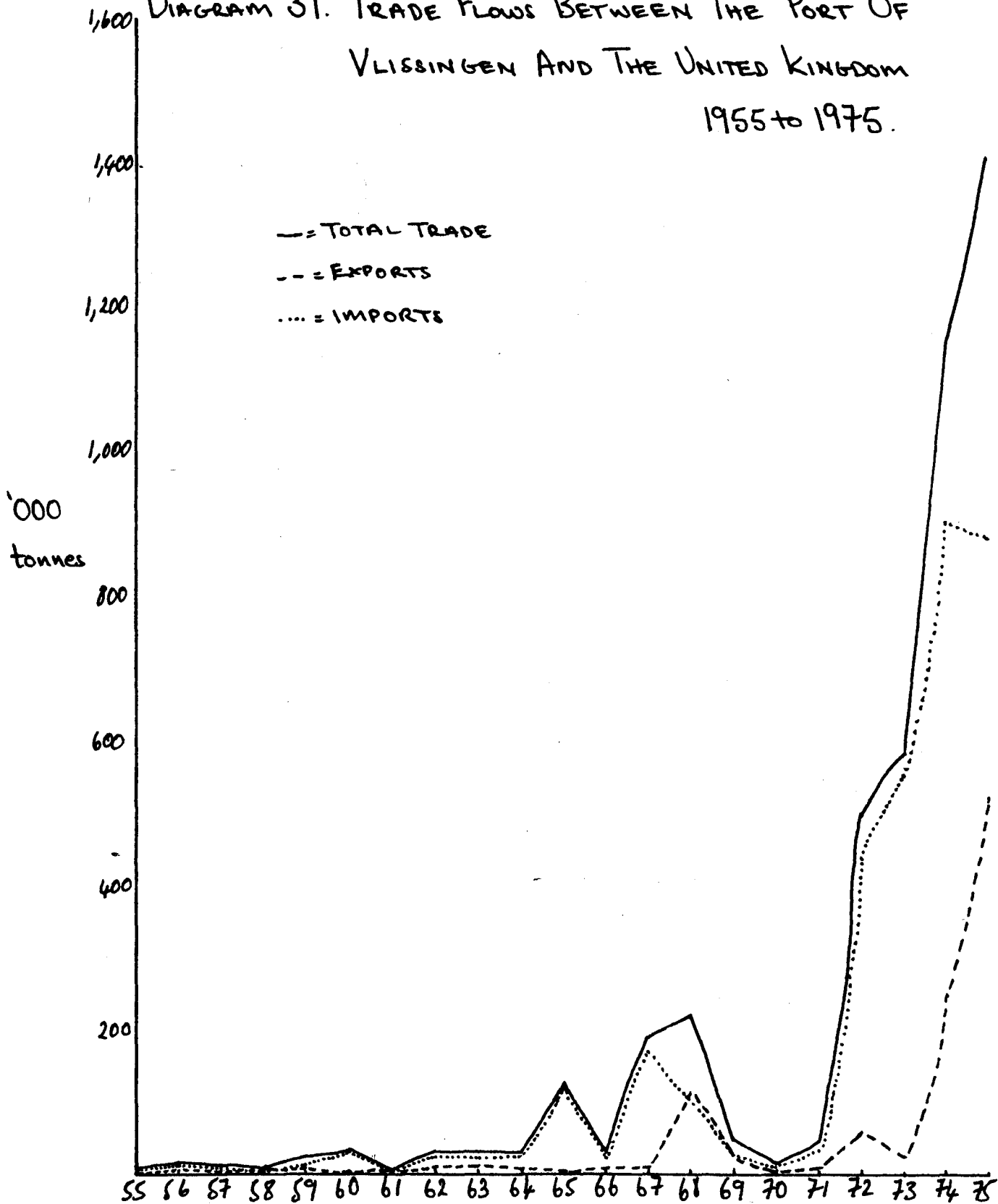
3.4.2. Vlissingen

Trade with the United Kingdom at this port showed a relatively stable pattern up to the late 1960s, but from 1971 onwards a spectacular increase occurred. Imports exceeded exports throughout the period with the exception of 1958. Total trade with the United Kingdom in absolute terms showed faster growth than at any other Dutch port 1955-75, being 158 times its 1955 figure by 1975. In 1955, 73% of the trade was import, and at the end of the period 63%. The transit trade dominated initially, with 73% of trade, but by 1975 only 12% of all trade with the United Kingdom was in transit. Direct trade therefore showed the main increase over the period. There was a marked increase in the port's dependence on Anglo-Dutch trade 1955-75. In 1955, only 1% of trade was with the United Kingdom, but by 1975 this had risen to 35%. The port's share of Anglo-Dutch trade over the whole Dutch port range also increased from 0.08% to 1.1%. There was therefore a considerable reorientation of this port's trade towards the United Kingdom 1955-75, particularly in the early 1970s.

3.4.3. Conclusion

In general, the Schelde ports showed a considerable increase in their absolute trade totals with the United Kingdom. Terneuzen showed a decreased dependence on Anglo-Dutch trade, but there was a large absolute increase and with the decline in the role of transit direct trade between the United Kingdom and the port grew in importance. For Vlissingen Anglo-Dutch trade grew from an unimportant part of the port's trade in

DIAGRAM 31. TRADE FLOWS BETWEEN THE PORT OF
VLISSINGEN AND THE UNITED KINGDOM
1955 to 1975.



1955 to a major element in 1975. Anglo-Dutch trade over the Schelde ports therefore showed strong growth over the period 1955-75, by contrast with the northern port range.

3.5. Other ports.

Of the remaining Dutch seaports (Brouwershaven, Den Helder etc.) most were too small to be included in the C.B.S. statistics. Nevertheless, the growth of one of these ports, Scheveningen, was so rapid that it became necessary to include this in the statistics in 1969 (see chapter 2, p. 101). A brief survey of this port's trading relationship with the United Kingdom is therefore included below for the period 1969-75.

3.5.1. Scheveningen

Anglo-Dutch trade at this port displayed a fairly rapid rise over the period 1969-75, so that by the end of the period the figure was four times the size of the 1969 total. Up to 1975 exports to the United Kingdom from the port exceeded imports, although by 1974 imports were almost equal to exports and in 1975 exceeded them. Perhaps surprisingly in view of the lack of waterway access to the hinterland the transit element in Anglo-Dutch trade at this port was quite a large one, with 23% of the trade in 1969 in transit, 39% of imports and 13% of exports. This was entirely redistribution by sea. By 1975 the transit element had increased to 40% of all Anglo-Dutch trade through the port, 61% of imports and 19% of exports.

The role played by the Anglo-Dutch trade in the total trade through this port was an important one, increasing over the period. In 1969 71% of Scheveningen's trade was with the United Kingdom, and by 1975 this had increased to 96%, making the port second only to Hoek van Holland in its

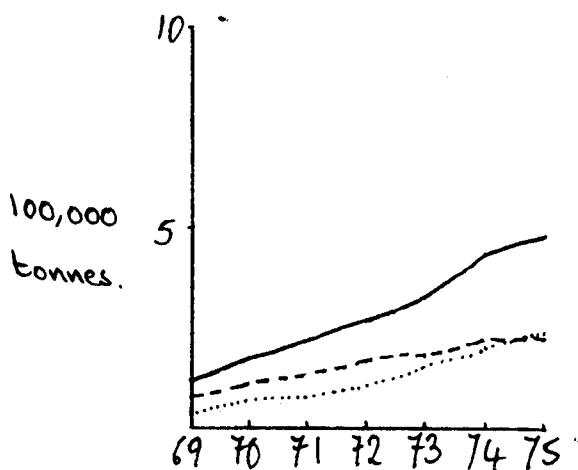
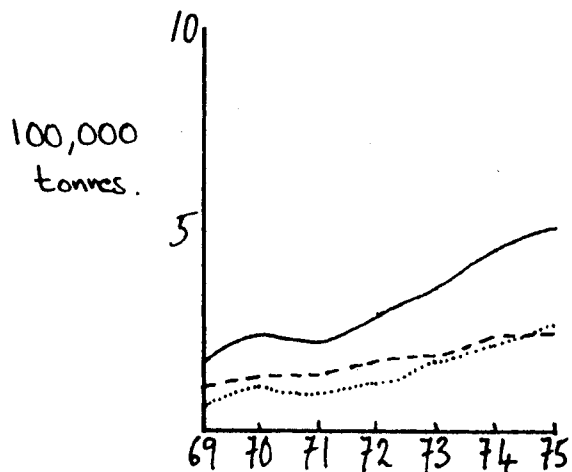
DIAGRAM 32. TOTAL TRADE AND ANGLO-DUTCH TRADE
FLOWS THROUGH THE PORT OF SCHEVENINGEN

1969 to 1975.

— = TOTAL TRADE.

-- = EXPORTS.

... = IMPORTS.



reliance on Anglo-Dutch trade. The port's share of all trade with the United Kingdom over the Dutch port range also increased from 0.5% in 1969 to 1.5% in 1975.

3.6. Conclusion

A summary of the major trends in the Anglo-Dutch trade flows over the Dutch port range 1955-75 would show that of the New Waterway ports, Vlaardingen, Maassluis, Hoek van Holland, Dordrecht and Zwijndrecht all showed increased dependency on trade with the United Kingdom. Of the three ports in the North Sea Canal area, only Zaandam showed an increased reliance on Anglo-Dutch trade. The northern ports initially showed great reliance on trade with the United Kingdom, but by 1975 this had declined for all the ports except Groningen, which showed an increased dependence on the Anglo-Dutch trade flows through the port. At the Schelde ports, Vlissingen showed increased dependency on Anglo-Dutch trade, although there was a considerable increase in total trade with the United Kingdom through both ports. The port of Scheveningen also showed increased trade orientation towards the United Kingdom as a trading partner over the period for which trade statistics are available.

In view of the above, there can be no doubt about the reliance of the smaller ports in the Dutch port range on the United Kingdom as a trading partner. None of the major ports (Rotterdam, Amsterdam, IJmuiden) showed increased dependence on the United Kingdom, whereas all the smaller ports relied increasingly on the United Kingdom as a trading partner with the exception of Delfzijl, Terneuzen, Harlingen and Schiedam.

Table 31 (p. 179) provides a summary of the changes in the Dutch port's dependence on trade with the United Kingdom, 1955-75.

3.7. Analysis of growth in Anglo-Dutch trade over the period 1955-75.

To explore this matter further it is useful to look at the growth rates of trade with the United Kingdom through the Dutch ports over the period 1955-75. Table 30 below shows the growth rate of Anglo-Dutch trade through the individual ports (base year 1955 = 100).

Port	1975	average yearly increase	ranking order in terms of average yearly increase
Amsterdam	210	5.5	13
Rotterdam	261	8.0	10
IJmuiden	328	11.4	9
Zaandam	942	42.1	4
Schiedam	175	3.7	14
Vlaardingen	581	24.0	7
Maassluis	228	6.4	12
Hoek van Holland	1737	81.8	2
Dordrecht	842	42.1	4
Zwijndrecht	516	20.8	8
Delfzijl	234	6.7	11
Groningen	1196	54.8	3
Harlingen	18	-4.1	15
Terneuzen	632	26.6	5
Vlissingen	15807	785.3	1
Scheveningen (1969)	350	25.0	6

Table 30. Growth rates of Anglo-Dutch trade over the Dutch port range 1955-75.

Table 30 shows that the greatest growth rates for trade with the United Kingdom were at the smaller ports. Vlissingen experienced the largest growth rates, while Hoek van Holland, Groningen, Dordrecht and Zaandam

also showed strong growth trends. Rotterdam, Amsterdam and Delfzijl showed much slower growth rates, as did, rather surprisingly, Maassluis. Only one port, Harlingen, displayed a negative growth rate for Anglo-Dutch trade. This further supports the conclusion that trade with the United Kingdom became more important for the Dutch port range over the period, and that this became increasingly concentrated at the smaller ports. It also illustrates the point that between 1955 and 1975 there was a shift in trade flows with the United Kingdom away from the northern port range towards the southern ports of the Netherlands. This corresponds to a shift in trade towards the more southern ports observed by Kuiler⁵ with regard to total trade over all the ports in the Le Havre-Hamburg range in the post-war period.

Table 31 below summarizes the changes in the relative shares of the ports in Anglo-Dutch trade over the Dutch port range 1955-75.

1955	% share	1975	% share
Rotterdam	82.2	Rotterdam	74.6
Amsterdam	9.8	Amsterdam	7.2
IJmuiden	1.8	Vlissingen	4.5
Delfzijl	1.1	Hoek van Holland	2.9
Harlingen	1.0	Dordrecht	2.1
Vlaardingen	0.9	IJmuiden	2.0
Terneuzen	0.7	Vlaardingen	1.7
Dordrecht	0.6	Scheveningen	1.5
Hoek van Holland	0.5	Terneuzen	1.5
Maassluis	0.5	Delfzijl	0.9
Zwijndrecht	0.1	Maassluis	0.4
Vlissingen	0.08	Zwijndrecht	0.2
Zaandam	0.05	Zaandam	0.2
Groningen	0.03	Groningen	0.1
Schiedam	0.01	Harlingen	0.07
		Schiedam	0.007

Table 31. Percentage share of Anglo-Dutch trade over the whole range of individual Dutch ports, 1955 and 1975.

It is clear from the above that the dominance of the major ports in trade with the United Kingdom considerably lessened over the period. The share in this trade of all ports in the range increased from 1955 to 1975, with the exception of Harlingen, Delfzijl, Schiedam and Maassluis, and the larger ports, Rotterdam and Amsterdam.

At this point it is useful to apply the technique of determining the hypothetical tonnage for the ports with regard to Anglo-Dutch trade in 1975, based on the situation which existed in 1955. This gives a clearer view of the shifts in emphasis which have occurred away from certain ports towards others with reference to Anglo-Dutch trade flows, showing some of the changes in the flow patterns over the range. Table 32 below illustrates actual and hypothetical tonnage (HP) for ports in the Dutch port range, and the comparative change (YP - HP) experienced by each port by 1975. (See chapter 2, p. 99).

Port	actual tonnage (000 tons)		H.P.	YP-HP
	1955	1975		
Amsterdam	1072	2254	3055	-801
Rotterdam	8981	23428	25596	-2168
IJmuiden	197	647	561	+86
Zaandam	5	49	14	+35
Schiedam	1	2	3	-1
Vlaardingen	95	551	271	+280
Maassluis	51	115	145	-30
Hoek van Holland	52	912	148	+764
Dordrecht	70	662	199	+463
Zwijndrecht	11	58	31	+27
Delfzijl	126	295	359	-64
Groningen	3	41	8	+33
Harlingen	116	21	331	-310
Terneuzen	74	467	211	+256
Vlissingen	9	1410	26	+1384

Table 32. Hypothetical tonnages of Anglo-Dutch trade based on the 1955 figures, and comparative change over the port range. (Figures are taken to the nearest '000 tons).

The above table shows that the largest comparative gains in trade were made by the ports of Vlissingen, Hoek van Holland, Vlaardingen, Dordrecht and Terneuzen. These were all ports in the southerly part of the Dutch port range and also smaller seaports. The largest losses were made by the larger ports of Amsterdam and Rotterdam, and also by the northerly port of Harlingen. If we compare the above table to table 13 (chapter 2), however, we can see that for trade with the United Kingdom at least nine ports (the majority) showed a comparative gain over the period 1955-75, whereas for total trade only Rotterdam, IJmuiden and the Schelde ports showed a positive gain. We can conclude therefore that the Anglo-Dutch trade flows became an increasingly important element in most ports' trade, particularly for most of the smaller ports in the range, whilst a decline took place at the major ports. Clearly there was a shift in emphasis for this short-sea trade over the period 1955-75 to the smaller Dutch seaports 1955-75, and away from the ports where Anglo-Dutch trade was traditionally concentrated such as the large ports of Rotterdam and Amsterdam and the port of Harlingen, and to a lesser extent the other northerly port of Delfzijl. The importance to the ports themselves of the Anglo-Dutch trade element also increased for the majority of ports in the range.

4.0 Commodity flows.

As with the survey of total trade over the Dutch port range (chapter 2, paragraph 5.4.), any study of Anglo-Dutch trade would not be complete without looking in more detail at the actual commodities involved in each port's trade with the United Kingdom over the period in question. As in chapter 2, when commodity structure for total trade was examined for each port in the range, the C.B.S. figures have been adapted to the

N.S.T.R. classification using the 'Goederen naamlijst N.S.T.R. en de sleutel of the naamlijst C.S.T.E. en de Goederen naamlijst B'; this is to enable comparisons to be made. Again, due to the volume of statistical material involved, the survey will be limited to five-yearly intervals rather than a year-by-year analysis.

4.1. The New Waterway ports.

4.1.2. Rotterdam

As discussed in chapter 2 (paragraph 5.4.1.1.), there was an increasing predominance of commodity group 3 in the total trade at this port throughout the period 1955-75, and it was this group which also formed the major item in all Anglo-Dutch trade at the port over the same period, although initially group 2 was the major group. In total trade, however, the main item within group 3 was crude oil, whereas in Anglo-Dutch trade, oil products were the most important item.

4.1.2.1. 1955-60

In 1955, over half the port's trade with the United Kingdom consisted of group 2, 90% of which was re-export outwards (sea/sea transit). By 1960, however, this had declined dramatically and the group formed only the second item in 1960 with less than 10% of the Anglo-Dutch trade through the port. In this year, 87% of the trade was import of coal from the United Kingdom (direct imports rather than transit). Hence there was not only a decrease in the volume of trade in this commodity group 1955-60, but also a reversal in the structure.

Group 3, the second item in 1955, showed considerable growth over the period, so that by 1960 over half of the port's Anglo-Dutch trade was in this commodity. Exports formed the main part, with 67% in 1955 and 70% in 1960, but imports also showed growth. Petrol was the main export item,

while gas and diesel oils formed the main imports.

Group 9 formed the port's third trading group with the United Kingdom in 1955, but showed a decline, particularly in exports, over the period, the main decrease being accounted for by the decrease in bunkering of British sea-ships at the port. There was, however, an absolute increase in the import of this commodity group into Rotterdam from the United Kingdom.

The relative importance of commodity group 1, the fourth item in Anglo-Dutch trade in 1955, declined over the period. Initially, 80% of the trade in this group was export, and 75% in 1960. Imports also showed a decline. A number of commodities were involved, but in particular the transit outward of raw sugar showed a marked decrease (this accounted for a third of the trade in this group in 1955), and also there was a fall in imports of refined sugar from the United Kingdom.

Group 0, of which 90% was export, especially the transit of grains, showed growth, so that by 1960 it was the third trading group in Anglo-Dutch trade. Both imports and exports increased, but there was an especially rapid rise in imports from the United Kingdom of grains such as barley, so that in 1960 only 73% of the trade was export in this group. The growth in exports was accounted for by the increase in the transit outwards of wheat and maize.

Of the trade in group 5 in 1955, 63% was imports of semi-finished metal goods, and this grew over the period so that the relative share of this group was greater in 1960. Group 6, in which exports predominated in 1955, saw considerable growth particularly in the transit inwards of raw minerals. Group 8 also grew rapidly to over twice its 1955 figure; exports, which accounted for 59% of the trade in this group in 1955 and 52% in 1960, doubled in size while imports trebled. The smallest trade

item in 1955 was group 4, with a small transit inwards of scrap metals, mainly to West Germany. This showed a slight increase in trade 1955-60. There was also a small export of fertilizers (group 7) in 1960, although there was no trade in this in 1955.

4.1.2.2. 1960-65

Group 3 continued to dominate the port's Anglo-Dutch trade structure, with strong growth particularly in the export of oil products to the United Kingdom, as a consequence of the growth in refinery capacity at Rotterdam. Imports in this group declined slightly in absolute tonnage.

Group 0 formed the second item in Anglo-Dutch trade over the period, with an increase especially in exports (transit) of grains. Exports formed 90% of trade in this group in 1965, and over the period 1960-65 imports underwent an absolute decline.

The growth of trade in the chemical sector (group 8) continued over this period, doubling in size. Exports formed almost 60% of trade in this group in 1965, whereas in 1960 imports had dominated the trade, the growth being particularly in exports of chemical-based products and synthetic fabrics.

Trade in group 2 continued to fall, with a decrease in imports of coal from the United Kingdom which formed the main item in this group.

Imports of group 9 from the United Kingdom showed growth, and trade in this increased in absolute terms despite a relative decline. Exports declined slightly but in 1965 imports predominated in this group, with 60% of trade, whereas in 1960 exports had been more important. A variety of items were involved, with a marked increase in imports of transport equipment and machinery. About half of the import in 1965 was transit inwards to the German hinterland.

Trade in group 1 remained fairly stable over the period, although a

relative decline in its role in the port's Anglo-Dutch trade occurred. Group 6 also showed a fall in its relative share, although an absolute increase took place particularly in the transit inwards of clay and clay products. Imports in this group continued to constitute the major element.

Trade in group 4 showed a considerable increase over the period, especially in exports, which exceeded imports in 1965, whereas for 1960 the reverse was true. The major increase was in the transit of iron-ore through the port, of very minor importance in 1960 but making up one-third of trade in 1965.

As for the two remaining commodity groups, group 5 showed both an absolute and relative decline, in both imports and exports, but trade in group 7, fertilizers, showed strong growth to over nine times its 1960 figure. Exports of nitrogenous fertilizer, mainly transit outwards, formed 95% of the trade.

4.1.2.3. 1965-70.

Trade in group 3, despite a relative decline, showed continued growth, and almost doubled in volume over the period. Exports were the main growth element, since in 1970 imports remained at a level similar to that of 1965.

Commodity group 6 formed the second item in Anglo-Dutch trade in 1970, almost 90% of this being imports, mainly direct import of sea-sand and gravel in connection with the Maasvlakte extension of Europoort. Although the origin was registered as the United Kingdom, much of this was in fact material which originated offshore in British territorial waters. A small transit outwards of sulphur formed most of the rest of the trade in this group in 1970.

The continued growth in the chemical sector (group 8) was such that over the period this group became the third item in the port's trade with the

United Kingdom. Again, exports showed the main increase, with a particularly marked growth in the export of chemical-based products. This was in line with the growth in the petro-chemical sector at the port. However, there was also a growth in the import of chemical-based products.

Group 0, despite an absolute increase, declined over this period in relative importance, with a slowing down in the transit of grain in relation to the previous period. In contrast, group 4 continued to show a growth both in relative and absolute terms, with continued transit outwards of iron-ore forming the main growth element. Import of scrap fell in absolute terms. In 1970, 65% of trade in group 4 was transit outwards of iron-ore.

Despite the increase in both imports and exports of commodity group 9, its relative share of the port's trade with the United Kingdom continued to fall. The transit inwards of machinery and transport equipment remained the main items in this trade. Exports, much of which was in transit, were also mainly of machinery and transport equipment (particularly ships), paper and cardboard. These items formed over half the export. 80% of export in this group was transit outward, mainly from the hinterland.

Of the smaller groups, group 1, despite a decline in its relative share, showed an absolute increase in import and export, especially the latter which doubled in size 1965-70: group 5 showed a similar absolute increase, particularly in the import of tubes and pipes and of non-ferrous metals. There was only a very slight absolute increase in trade in group 7, the bulk of this being the export of chemical fertilizers. Group 2, mostly imports, was now the smallest item in port trade, showing a continued decline.

4.1.2.4. 1970-75.

By 1975, the position of oil and oil products (group 3) remained little changed, with further growth in the volume of both imports and exports. Group 0 doubled in volume of trade, the growth again being especially marked in the grain trade. However, the bulk of the export of grains in 1970 was in transit, whereas in 1975 it was direct export of grains which predominated. An increased demand for European grain was partly the reason, but also a rise in the export of grain from storage. Imports in this group also showed an increase, with growth particularly in the import of synthetic fibres and hides and pelts. It must be borne in mind that the increase in trade in this group was facilitated by the United Kingdom's entry to the European Economic Community over this period.

Group 8 remained the third item in Anglo-Dutch trade over the period, although there was a particularly rapid increase in imports, so that in 1975 imports and exports almost balanced. Chemical-based products remained the major trading item within this group for both imports and exports.

Rapid growth was also recorded in trade in commodity group 1, which quadrupled in volume over this period, making it the fourth item in trade by 1975. The main increase was in the export of dairy produce and the transit of soya beans and tea, although many other products were involved. In 1970 the export of prepared fruit, flour and animal feedstuffs had formed the major items within this group. Imports of alcoholic and non-alcoholic drinks, and of refined sugar, were the items in this group that showed most growth over the period.

Growth in relative and absolute trade of group 9 occurred, both imports and exports continuing to grow, the main trade items within this group remaining as in 1970. There was also considerable recovery, for the first

time since 1955, in trade in commodity group 2. The increase was especially in the transit outwards of coal to the United Kingdom (sea/sea redistribution).

By 1975 the large trade in group 6, the import of sea-sand and gravel, connected with the extension works to the port of Rotterdam, had declined in importance: this was due to the completion of the Maasvlakte during this period. Exports remained at a stable level, however.

The transit of iron-ore to the United Kingdom (group 4) also declined, but there was a rise in the import of scrap metal from the United Kingdom once more. Group 5 showed an increase in its relative share of trade due to a slight absolute increase in imports and exports, especially of the latter. Group 7, the smallest item in trade, continued to show a relative decline; in absolute terms there was also a decrease, exports declining but imports increasing.

4.1.2.5. Summary.

Table 33 below summarizes the shifts in emphasis in the commodity composition of Anglo-Dutch trade through Rotterdam 1955-75, showing the relative share in total Anglo-Dutch trade over the five-year periods for each commodity group (0 - 9 N.S.T.R.) for the port.

Group	1955	1960	1965	1970	1975
0	3.2	7.7	8.0	5.6	9.7
1	5.1	4.5	4.0	2.9	6.0
2	56.0	9.4	4.8	1.0	3.4
3	25.0	60.5	63.0	58.2	59.0
4	0.3	0.5	3.3	4.6	2.7
5	2.0	4.4	2.5	2.0	2.7
6	1.2	4.1	3.7	12.0	3.2
7	-	0.3	2.0	1.2	0.7
8	1.1	3.8	4.9	8.3	7.4
9	5.5	4.7	4.4	3.9	5.0

Table 33. Percentage shares of commodity groups 0-9 N.S.T.R. in the Anglo-Dutch trade through the port of Rotterdam 1955-75. (Source: extrapolated from United Kingdom commodity flow figures, extracted from Maandstatistiek

voor de Zeevaart en van het zeehavenverkeer 1955-75; goederensoorten per haven land van herkomst/ bestemming, Centraal Bureau voor de Statistiek, Den Haag).

4.1.2. Schiedam

This port had only a minor trade with the United Kingdom, and up to 1970 only one trade item featured, commodity group 9.

4.1.2.1. 1955-60

In 1955, 93% of the trade in group 9 with the United Kingdom consisted of the export of bunker material. There was also a small import of machinery and transport equipment. By 1960 there was an absolute decrease in trade with the United Kingdom: in this year 99% of the trade was import of transport equipment, and virtually no bunkering took place.

4.1.2.2. 1960-65

Slight growth in absolute terms took place 1960-65, and imports still predominated, mainly transit inward from the United Kingdom of heavy fuel oil (for bunkering sea-ships). There was no import of transport equipment, but some export of this commodity.

4.1.2.3. 1965-70

An absolute decline took place in the port's trade with the United Kingdom 1965-70. In 1970 imports still predominated and were largely of group 6, being the direct import of sand and gravel, related to the New Waterway projects. This claimed 90% of trade with the United Kingdom. Export was of transport equipment (ships).

4.1.2.4. 1970-75

The trade in group 6 had disappeared by 1975, and trade with the United Kingdom declined once more. There was a small import of alcoholic drink in this year, so that group 1 accounted for just over half the trade.

In addition there was some import (transit) of transport equipment and export of machinery.

4.1.3. Vlaardingen

In 1955 the most important commodity in the trade was group 1, with exports dominant. Oils and fats formed the main export, with some import from the United Kingdom of soya oil. The second largest trading item was coke and coal (group 2), 90% of this being imports, all of which was destined for through transport to the hinterland. Group 3 was also an important trade item in 1955. There was no export, trade being direct import of heavy fuel oils from the United Kingdom. Export of bunker materials (group 9) was important, and the transit inwards of group 6, along with some direct export in this group, deserves note. Trade in group 4 consisted entirely of re-export (transit) of iron-ore. Group 8 was of minor importance, imports of chemical products exceeding exports. Group 0 formed the smallest trading item, with transit outwards of wood. By 1960 group 1 had increased in size to form over half of all trade with the United Kingdom. Direct export of molasses and oil-seeds accounted for most of the trade. Of the other groups, only group 7 was of significance in 1960, 82% of this being exports. This was not a trade item in 1955. The transit inwards of chemical fertilizers formed the main element. Of the smaller groups import of group 8 dominated, group 0 consisted entirely of export of vegetables, group 5 was export-dominated, mainly direct export of raw iron and steel ingots, and there was some export of group 6. The other groups (9, 4, 3 and 2) were insignificant. The transit outwards of iron-ore had ceased and only a fraction of the import of coal and oil products remained. Considerable structural change took place therefore in 1955-60: group 1 remained the leading item, but groups 2 and 3 saw a considerable decline in trade.

4.1.3.2. 1960-65

By 1965 the dominant position of group 1 had also been eroded, so that it was only the fourth trading item in this year. A considerable import (transit) of scrap metal (group 4) from the United Kingdom formed the major item in port trade in this year, with no exports. Import of group 2 formed the second item in 1965, again with no export. Group 8 had seen considerable growth especially in exports, to form the third item. There was growth in particular of exports of group 0 and the export of group 5 remained important. Group 3 saw a slight recovery in trade while groups 7 and 9 formed unimportant trade items in 1965. Group 6 had declined to the smallest element.

4.1.3.3. 1965-70

There was considerable change in commodity structure over this period. Group 4 remained an important item, but export (transit) of non-ferrous metals was more important than the import of scrap, and group 4 was only the third trading item in 1970. Considerable growth had taken place in group 2, imports remaining dominant, so that in this year this was the main trading item with the United Kingdom. Group 6 also saw a considerable increase, as at Rotterdam and Schiedam, mainly imports of sand and gravel, and by the end of the period it was the second trading item. Trade in group 5 trebled in size. Import was twice the size of export, with transit inwards of iron and steel ingots as the main item, and transit outwards of the same product making up the bulk of the exports. Group 8 also showed an absolute increase 1965-70, imports and exports almost balancing in 1970. Group 7, 0, 3 and 9 were minor items in trade.

4.1.3.4. 1970-75

Group 2 had continued to show strong growth, especially in transit outwards of coal to the United Kingdom, so that this group formed almost half

the trade in 1975. Trade in group 1 had doubled, constituting the second trading item in 1975. Group 5 also saw strong growth, especially in export (transit) of pipes and tubes. Of the other groups, there was an increase in the transit inwards of scrap (group 4), but a fall in export took place. Imports of group 6 declined considerably and group 0 showed a continued absolute increase. Group 8 declined, both in imports and in exports, but there was growth in the import of oil products (group 3) from the United Kingdom, and also of fertilizers (group 7), although exports remained stable. There was an increase in both import and export of group 9 (transport machinery and construction metals).

4.1.3.5.

Table 34 (below) summarizes the main trends in the commodity trades of Vlaardingen with the United Kingdom 1955-75.

	1955	1960	1965	1970	1975
0	0.2	4.2	5.3	1.2	1.2
1	38.6	52.7	10.3	13.2	18.4
2	29.0	0.3	11.0	27.4	46.9
3	11.5	0.3	4.9	0.8	1.2
4	5.0	0.5	44.4	17.8	8.3
5	-	3.8	8.6	9.2	16.9
6	6.8	1.7	0.3	23.8	3.3
7	-	30.7	2.3	1.4	2.0
8	2.0	4.7	10.5	5.0	1.2
9	7.3	1.2	1.5	0.2	0.5

Table 34. Percentage share of commodity groups 0-9 N.S.T.R. in the Anglo-Dutch trade at the port of Vlaardingen, 1955-75.

Source: see table 33.

4.1.4. Maassluis

Agricultural produce (groups 0 and 1) dominated the trade with the United Kingdom 1955-75, although by the end of the period group 1 had

taken the place of group 0, the most important group up to 1970.

4.1.4.1. 1955-60

In 1955 exports of group 0 formed most of the port's trade with the United Kingdom, mainly fresh vegetables and potatoes. There was no import of this group. Import of group 9 (transport equipment) formed the rest of the trade: this was direct import. By 1960 there was a decline in the export of vegetables and potatoes, and some import of live animals took place (group 0). Group 9 saw an increase in trade, mainly import of transport equipment, but there was also a small export. Group 1 formed a minor item in trade, with the import of animal feedstuffs.

4.1.4.2. 1960-65

In 1965 only group 0 featured as a trade item. A considerable increase in import and export had taken place, mainly of live animals for import and of fresh vegetables for export.

4.1.4.3. 1965-70

In 1970 a number of other products were involved in the port's trade with the United Kingdom. Group 0 remained the main item, with no import in this year and exports of vegetables predominating. Group 9 was an important trade item in this year, 95% of this being import of machinery and other manufactured items. Group 1 was the third item, imports and exports almost balancing, with the import of alcoholic drink and glucose, and the export of dairy produce and meat preserves. There was some import of chemical-based products and detergents. Import of clay (group 6) and coal (group 2) was also present, with export of pipes and tubes (mainly transit).

4.1.4.4. 1970-75

By 1975 group 1 dominated the trade (88% being export, mainly of dairy

produce). Group 5, export mainly of non-ferrous metals, was the second commodity. Trade in group 9 stagnated, with imports and exports almost balancing. Group 0 declined considerably in its export of vegetables and rice. Group 8 increased in importance, with imports and exports of chemical-based products. Group 6 formed the smallest trade item, with the export of slag and other minerals.

4.1.4.5.

Table 35 shows the changing relative importance of commodities in the United Kingdom trade at the port. Diversification of products over the period was a major feature.

	1955	1960	1965	1970	1975
0	93.5	83.9	100	53.3	9.2
1	-	0.2	-	17.1	54.9
2	-	-	-	0.5	-
3	-	-	-	-	-
4	-	-	-	-	-
5	-	-	-	1.5	13.7
6	-	-	-	2.6	3.6
7	-	-	-	-	-
8	-	-	-	3.8	8.7
9	6.5	15.9	-	21.3	9.4

Table 35. Anglo-Dutch commodity flows through the port of Maassluis, 1955-75. Source: see table 33.

4.1.5. Hoek van Holland

Group 9 was the main item in 1955, and 90% of this was export of machinery and bunker material. Group 0 formed the second commodity group, in which there were no imports. Exports were mainly of vegetables and fresh fruit. Group 1, in which export also predominated, formed the remainder of trade, mainly of prepared meat and fish products. In 1960

group 0 was the main commodity, exports having grown over the period, with vegetables forming the bulk of the trade. Group 9 was the second item, exports still predominating, although there was an absolute decline, due especially to decreased export of bunker materials. Group 1 showed a slight growth.

4.1.5.2. 1960-65

In 1965 export of group 0 (vegetables) still remained the main item in trade. There was a slight growth in exports of group 9, although imports remained static. Trade in group 1 declined, and there was a small import of plate steel (group 5).

4.1.5.3. 1965-70

Trade in group 0 continued to grow over the period, vegetables remaining the most important item. Export of group 9 declined, whereas import grew and exceeded export in 1970: import of transport equipment (especially cars) formed the main element. Export of group 1 also declined to a sixth of its 1965 size in absolute terms, and there was a small trade (mainly import) of chemical products (group 8) in 1970.

4.1.5.4. 1970-75

For 1975 the figures were distorted by a massive import of sand at the port. In absolute terms, however, group 0 continued to show growth over the period, and group 9 trebles in volume. The main increase was in the export of vehicles and import of a variety of manufactured produce. Group 8 also showed growth in trade, both in imports and exports, the latter predominating. Group 1 also saw a doubling in volume of trade (mainly the transit outwards of beer and the import of oilseeds).

4.1.5.5.

The commodity structure, summarized in table 35 below, remained relatively stable for this port's Anglo-Dutch trade 1955-75, with the exception of 1975, when the import of sand connected with New Waterway engineering projects formed the main item.

	1955	1960	1965	1970	1975
0	22.7	46.2	45.0	66.9	4.5
1	10.6	22.4	13.9	31.4	0.2
5	-	-	1.9	-	-
6	-	-	-	-	90.1
8	-	-	-	3.1	0.4
9	70.8	31.4	39.0	26.8	4.7

Table 35. Anglo-Dutch commodity flows through the port of Hoek van Holland, 1955-75. Source: see table 32.

4.1.6. Dordrecht

The port of Dordrecht showed considerable fluctuation in commodity structure: in general groups 6, 8 and 2 were important in trade with the United Kingdom.

4.1.6.1. 1955-60

Trade in group 6 formed almost half of the port's trade with the United Kingdom in 1955: 98% of this was transit inwards of mineral products to West Germany. The transit inwards to West Germany of basic slag formed all the trade in group 4, the second item in port trade. Other commodity groups had much smaller volumes, such as group 8, two-thirds of which was the transit inwards of chemical products. Group 1 consisted of direct export of prepared meat. Group 9, 92% of which was import of machinery, transport equipment and military equipment, came next, together with group 2, imports of coal. The transit inwards of oil products (group 3),

export of rice (group 0), and transit outwards of a small quantity of rolled steel products (group 5) made up the rest of trade in 1955. By 1960 group 2 had grown considerably in importance, due to a large increase in the direct import of coal. Group 6 grew slightly in absolute terms, with transit inwards of mineral products remaining dominant. Group 8 saw considerable growth, in which the import of chemical-based products (mainly direct import) was the main item. Of the other groups, groups 0 and 3 saw absolute growth in trade, the former consisting mainly of direct export of vegetables, and some import of potatoes, the latter mainly import (direct) of oil products. There was an absolute increase in trade in groups 1 and 9 with the export of meat preserves and prepared fruit (group 1), and export of machinery, transport equipment and other non-classified manufactures. Trade in groups 4 and 5 was non-existent in 1960.

4.1.6.2. 1960-65

Growth in group 2 continued, so that the import of coal and coke formed almost half of the port's trade in 1965. Trade in group 8 doubled in size 1960-65, with especially rapid growth in exports, which exceeded imports by 1965 with 56% of the trade. Export from storage of chemical-based products and chemical derivatives from coal were the main items. Group 3 also showed rapid expansion in exports, which formed the bulk of the trade in 1965. Export from storage and transit of kerosine was the main item. Of the lesser groups in trade, group 4 (inward transit of bauxite and iron pyrites) was present once more in trade in 1965, as was group 5 (mainly the import of tubes and pipes). Group 1 no longer figured in 1965, and groups 0 and 9 underwent a decline. Group 6 saw the largest decline, with only a small residual transit inwards of clay.

4.1.6.3. 1965-70

In 1970 group 6 formed the major trading item with the United Kingdom, 95% of this trade being the direct import of sand and gravel. Again this can be connected, as at other New Waterway ports, with engineering works. Group 8 continued to grow in importance, although exports declined, whereas imports increased, imports of base products and coal-based chemicals remaining the main items. Group 2 grew slowly over the period in absolute terms; there were still no exports of this group. Group 3 saw an absolute decline in trade, with export remaining the main element; group 0 also saw a further decline in trade (wheat and potatoes). Group 1 was featured once more in trade, import of seeds and animal fodder forming the main element. Groups 4 and 5 underwent an increase in trade, with the transit of scrap and import of tubes and pipes forming the main elements. Trade in group 9 also increased: exports of construction materials slightly exceeding import of transport equipment and machinery.

4.1.6.4. 1970-75

Group 6 remained the major trade item of the port with the United Kingdom over this period, and group 8 saw continued growth, especially in imports which claimed 91% of the trade in this year. Group 0 also saw considerable growth, to form the third item in trade in 1975, with the export of wheat (direct export) and of potatoes growing rapidly, along with some import of barley. Trade in group 2 halved, with a fall in the import of coal. There was continued growth of group 4 and group 9 (for the latter especially in exports of construction metal). Group 7 featured as a trade item for the first time (mainly direct export of nitrogenous fertilizers). Groups 3, 1 and 5 showed an absolute decline in trade.

4.1.6.5.

The variations in commodity composition of the port's trade 1955-75 are shown clearly in table 37:

	1955	1960	1965	1970	1975
0	1.1	2.1	1.5	0.4	23.0
1	5.5	1.8	-	1.1	0.8
2	4.5	43.0	44.7	19.9	7.7
3	2.4	1.4	13.0	2.9	2.7
4	24.4	-	2.7	2.1	3.1
5	0.4	-	1.7	0.5	0.3
6	48.5	26.3	0.5	51.5	48.7
7	-	-	-	-	2.6
8	8.6	23.9	35.3	20.7	29.2
9	4.6	1.4	0.5	0.7	2.4

Table 37. Anglo-Dutch commodity flows through the port of Dordrecht, 1955-75. Source: see table 33.

4.1.7. Zwijndrecht

Up to 1970 only three groups featured in the trade of the port with the United Kingdom, groups 1, 5 and 0, and throughout most of the period these remained the main items in trade.

4.1.7.1. 1955-60

In 1955 most of the port's trade consisted of group 1, imports predominating (95%). Direct import of oils and fats (from fish, soya and groundnuts) was the main element, with a small export of tubes and pipes (group 5). In 1960 trade in group 5 had doubled (import of tubes and pipes), while trade in group 1 fell, with only the import of soya oil remaining.

4.1.7.2. 1955-65

Trade in group 1 fell further over the period and no trade took place in this group in 1965. Trade in group 5 also halved in size over the

period, while group 0 featured in trade for the first time.

4.1.7.3. 1965-70

Trade in group 5 continued to decrease in volume, but trade in group 1 recovered a little: however, contrary to 1955-60, exports of animal feedstuffs formed the main trade item. There was no import of group 1 in 1970. Group 9, the export of construction materials, formed the main trading item in 1970. Group 0 was also important, imports of oats forming two-thirds of the trade, with some export of wheat. There was also a small import of coal (group 2) and of artificial fabrics (group 8).

4.1.7.4. 1970-75

Considerable growth took place in trading in group 1 over the period, with exports of animal feedstuffs (oil-seed cake) and other vegetables and fats showing rapid increases. Trade in group 0 quadrupled, three-quarters of this being the export of wheat in 1975, with some import of barley. Group 8 also showed a large increase, with imports (for storage) of chemical-based products. Trade in group 9 remained static with the import of construction materials a prominent feature. Group 5 increased in absolute terms, with the import of tubes and pipes, and a small export of the same products (transit outwards). The smallest trade item was the import (transit) of clay earth (group 6).

4.1.7.5.

The above trends are summarized in table 38 overleaf:

	1955	1960	1965	1970	1975
0	-	-	31.9	26.8	21.1
1	74.8	19.4	-	17.6	44.3
2	-	-	-	5.0	-
5	25.2	80.6	68.1	16.4	6.3
6	-	-	-	-	6.1
8	-	-	-	0.5	14.6
9	-	-	-	33.6	7.4

Table 38. Anglo-Dutch commodity flows through the port of Zwiindrecht 1955-75. Source: See table 33.

4.2. The North Sea Canal ports

4.2.1. Amsterdam

A number of commodity groups were important in this port's trade with the United Kingdom 1955-75, especially group 2, 6 and 9 initially and group 0 later.

4.2.1.1. 1955-60

Group 2 was the largest group in trade in 1955. 87% of this was direct import of coal, with some transit outwards also taking place. Trade in group 1, 86% of which was in exports, consisted of a variety of products, especially meat preserves, 'colonial' products (tea, coffee), and other food products. Group 9, in which export and import almost balanced, was important in 1955, the main imports being machinery and transport equipment, with a variety of exports. Group 6, in which the transit inwards of crude minerals was the main item, was the fourth element in port trade in 1955. Of the smaller groups, group 0 showed a predominance of exports, amongst which the transit of wood and direct export of vegetables and potatoes were major items. Imports and exports of group 8, the

largest item being the transit of base products and direct export of starch, almost balanced in 1955. Groups 3, 5, 4, and 7 all formed minor trading items. The direct export of heavy fuel oil, the import of rolled iron and steel products, the export of scrap metal and of transit outwards of chemical fertilizers respectively formed the main elements in these groups. By 1960 trade in group 9 had increased so that this was now the second largest item in trade with the United Kingdom. Exports declined, however, so that imports were twice the size of exports. Transport equipment and machinery (about half of which was destined for through transport) were the main items in 1960. Group 2 continued to constitute the most important element in trade, although there was an absolute decline in the import of coal. Import of group 6 (transit inwards of minerals) grew, so that this group was the third item in trade in 1960. In group 1 there was a slight increase in exports, while group 3 showed rapid growth in imports of oil products over the period. There was a decline in trade in group 8 and group 0, whereas there was growth in import of rolled steel products (group 5) and export of iron-ore in transit (group 4). There was no trade in group 7 in 1960.

4.2.1.2. 1960-65

By 1965 group 0 had become the main item in trade with the United Kingdom. A large increase in the transit outwards of grain was responsible. Group 3 showed further growth over the period, although mainly in export (transit) of heavy fuel oils, so that exports predominated by 1965. There was some growth in the direct import of coal (group 2). Of the smaller groups, there was a decline in the import and export of group 9. Group 1 saw slight growth in import but a decline in export, as did group 8, and group 6 also declined, with trade in clay and clay earth (about half of which was transit) the main element in 1965. Group

Group 4 saw a large increase in trade, especially in the transit of iron-ore. There was an absolute decline in the trade in group 5, and a small export of chemical fertilizers (group 7) by 1965.

4.2.1.3. 1965-70

Growth in group 4 accelerated considerably over the period, so that by 1970 almost a third of trade with the United Kingdom consisted of transit outwards of iron-ore. Group 0 also showed continued growth in exports, remaining the second item in trade with transit of grain the main element. There was also continued growth in the (mainly direct export) trade in group 3. Of the smaller groups over the period all but groups 9, 1 and 5 showed an absolute decrease in trade. A large variety of products were involved in the increased trade in group 9, especially the import of transport equipment (tractors forming an important element) and machinery. For group 1, greater exports of animal feedstuffs and soya beans were the main elements, while for group 5 there was growth in the import of tubes and pipes. Imports of coal (group 2) almost halved over the period, and the (mainly direct) import of clay and clay earth (group 6) declined slightly. Commodity group 8 showed a slight increase, mainly imports of chemicals from the United Kingdom, but a fall in exports. Exports of group 7 had ceased by 1970.

4.2.1.4. 1970-75

By 1975, group 0, although undergoing an absolute decline, was the main trading group, with the transit of grain remaining important. Some recovery of trade in group 2 took place over the period, especially in the transit outwards of coal to the United Kingdom, so that this group formed the second group in this year. Group 3, despite an absolute decline, was the third group in trade, although by 1975 imports of oil products predominated, rather than exports. A considerable decline in the transit

outwards of ore (group 4) over this period resulted in a decline in this group. Group 1 also declined in absolute terms, with a fall in exports of dairy produce and other items. Trade in group 9, both imports and exports, halved over the period. All other groups also underwent an absolute decline in trade 1970-75; with the exception of group 7, with some transit and direct export of chemical fertilizers: this, however, remained the smallest group in trade.

4.2.1.5.

Changes in the relative significance of commodities in Amsterdam's trade with the United Kingdom over the five year period are summarized in table 39.

	1955	1960	1965	1970	1975
0	8.7	5.6	28.4	23.7	32.2
1	16.1	16.4	8.4	5.5	5.9
2	28.7	19.9	15.6	5.0	27.7
3	3.9	10.2	16.1	15.2	18.0
4	0.2	0.9	6.4	38.8	7.2
5	3.3	4.6	1.4	1.1	0.8
6	14.9	17.2	8.1	4.4	3.1
7	0.1	-	1.0	0.02	0.1
8	8.4	6.8	5.0	2.8	1.2
9	15.7	17.7	0.5	6.5	3.8

Table 39. Anglo-Dutch commodity flows through the port of Amsterdam 1955-75. Source: see table 33.

4.2.2. IJmuiden and Velsen

Throughout this port's trade with the United Kingdom 1955-75, group 5

was the major element, and its relative importance had increased by the end of the period. Exports predominated.

4.2.2.1. 1955-60

In 1955 group 5 was the main element in trade of which 97% was export, mainly pig iron and steel, and semi-manufactured rolled products. There was a small import of iron and steel castings and forgings. The import of coal (group 2) formed the second item. Of minor importance was the import and export of scrap (group 4), the export of bunker products (group 9) and the import of other chemicals (group 8). In 1960, exports of iron and steel products (staves, rails, wire coil etc.) and semi-manufactured iron and steel products formed the bulk of the port's trade with the United Kingdom. There was an absolute increase in trade in group 5 over the period, especially in exports. Import of group 6 (crude minerals) formed the second item in 1960: this was non-existent in 1955. A fall in coal imports 1955-60 took place. Trade in group 9 increased both in imports and exports, with the latter predominating. Imports were mainly of machinery, with exports of transport equipment. There was no export of bunker materials in 1960. Trade in group 4 declined, with a small export of scrap metal. Imports of chemical products (group 8) also declined. In 1960 there was a small trade (mainly import) in fresh and prepared fish (group 1).

4.2.2.2. 1960-65

Over this period there was an absolute decline in trade in group 5, plate steel export forming the main item in 1965. Export of nitrogenous fertilizer, a new element in trade, formed the second item in this year (group 7). Imports of coal (group 2) continued to decline and trade in group 6 decreased, with exports of clay and clay earth the only trade items in this group in 1965. There was a rise in the import of machinery

from the United Kingdom, but no export of transport equipment. Exports of scrap (group 4) halved in size, as did imports of fish (group 1).

4.2.2.3. 1965-70

This period showed an increase in the exports of group 5, with continued export of plate steel and increased exports of rolled and crude steel. There was also a small import of tubes and pipes in 1970. The second item in trade was, as in 1960, group 6. However, in 1970 the main element was the import of sand and gravel and clay rather than 'other minerals'. Group 7 saw a halving in trade in 1965-70, mainly in the export of nitrogenous fertilizer. All other groups showed an absolute decline in trade over the period with the exception of group 1, where the import of fish increased and there was some import of animal feedstuffs. A decreased import of machinery (group 9, a considerable decline in coal import (group 2) and a further decline in the export of scrap (group 4) were the main elements. A small trade in group 0 (meat and other unspecified agricultural produce) occurred in 1970 for the first time.

4.2.2.4. 1970-75

Continued growth in the trade in group 5 was the main feature over this period, increase in exports of plate steel forming the major feature, although there was also an increase in the export of semi-manufactured iron and steel blooms, billets and coils. A considerable decline took place in exports of group 6: crude minerals and building bricks were the main imports with some export of cement. Exports of group 7 (nitrogenous fertilizer) increased once more. A further fall in trade in group 9 occurred; in 1975 exports exceeded imports, export of trailers and metal fabrics being the major items. Group 8, export of chemical-based products,

featured for the first time in 1975. Other groups formed very minor elements. There was a fall in trade in group 1 over the period, especially in fish imports. Some growth in the import of barley and wood from the United Kingdom occurred (group 0), while group 3 featured in trade for the first time in 1975 with a very small export of lubricating oil. Trade in groups 2 and 6 ceased.

4.2.2.5.

The main commodity movements over the period for IJmuiden's trade with the United Kingdom are shown in table 40.

	1955	1960	1965	1970	1975
0	-	-	-	0.08	0.7
1	-	0.7	0.2	2.3	0.9
2	17.8	8.2	7.4	0.07	-
3	-	-	-	-	0.008
4	3.5	1.0	0.5	0.2	-
5	76.0	67.9	59.5	69.0	87.1
6	-	15.6	6.7	20.3	5.9
7	-	-	20.9	5.8	3.8
8	1.2	0.2	-	-	1.2
9	1.5	6.4	4.7	2.2	0.3

Table 40. Anglo-Dutch commodity flows through the port of IJmuiden 1955-75. Source: see table 33.

4.2.3. Zaandam

Commodity trading with the United Kingdom showed considerable variation during the period, but groups 8 and 1 formed fairly consistent elements

in trade.

4.2.3.1. 1955-60

In 1955 the only trade with the United Kingdom was the direct export of starch (group 8). Diversification took place over the period, however, and by 1960 the direct export of animal feedstuffs (group 1) formed over half of the trade. Some direct import of scrap metal (group 4) formed the second item and import of transport equipment was also important in 1960 (group 9). Imports of rolled steel (group 5) and of cellulose (group 8) formed the rest of the trade, the latter group being the smallest element with export of starch having ceased by 1960.

4.2.3.2. 1960-65

Group 0 featured as the main trading item in 1965, mainly direct exports of wheat, with a small import of barley. There was a slight absolute decrease in group 1's trade, export of glucose and animal feedstuffs forming the main items in 1965. Groups 4 and 5 no longer formed part of the port's trade with the United Kingdom. Imports of group 8 had also ceased, although some export of 'other chemical products' took place. Trade in group 9 (transport equipment) declined to a third of its size.

4.2.3.3. 1965-70

Growth in both imports and exports of group 8 resulted in this category forming over half the trade in 1970. 90% of this was export, mainly of starches. Some import of paper waste (group 8) also took place. Trade in group 1 more than doubled, with growth especially in imports, although exports retained 56% of this trade. Growth in the import of animal feed-

stuffs and dried vegetables were the main items, with exports of glucose and animal feedstuffs. There was no import in group 9 in 1970, although some export of ships and boats (transport equipment) took place. Trade in group 0 declined considerably, but there was a small export of oats in 1970.

4.2.3.4. 1970-75

A new element, group 6, formed the largest item in trade in 1975, with exports of fabricated building materials (direct export). There was no import of group 8, but exports of starch doubled in size. There was a small import of barley (group 0) from the United Kingdom, but exports had ceased. A considerable decline took place in group 1, exports of glucose and animal feedstuffs having declined to a quarter of their 1970 size: there was no import in this group in 1975. Trade in group 9 had ceased by this year.

4.2.3.5.

A summary of commodity movements of Zaandam is contained in the table below:

	1955	1960	1965	1970	1975
0	-	-	47.6	3.8	4.8
1	-	53.3	41.0	34.7	3.5
4	-	17.0	-	-	-
5	-	7.3	-	-	-
6	-	-	-	-	48.5
8	100	7.0	7.9	56.0	43.2
9	-	15.4	3.5	5.5	-

Table 41. Anglo-Dutch commodity flows through the port of Zaandam, 1955-75. Source: see table 33.

4.3. The northern ports

4.3.1. Delfzijl

There was considerable fluctuation in the commodity composition of this port's Anglo-Dutch trade over the period. Up to 1970 trade in group 9 was the main element, after which group 8 became an important trading item.

4.3.1.1. 1955-60

In 1955 group 9, the main element in trade with the United Kingdom, consisted entirely of exports, 95% of this being export of paper and cardboard, with a small export of transport equipment. Trade in group 8, 60% of which was export, consisted of exports of starch, and some export of cellulose and chemical-based products. The bulk of the remaining trade consisted of the import of coal (group 2) and the export of ferruginous earth (group 4). There was also a small import of animal feedstuffs. Over the period trade in group 9 fell, but a large increase in the import of potatoes (group 0), placed this group in second position. Increased imports of group 2 also took place. A considerable fall in the export of starch and the import of chemical-based products accounted for the decline in trade in group 8. Exports of animal feedstuffs exceeded imports in 1960, but there was an absolute decline in trade in group 1. A small export of natural fertilizer (group 7) and sand (group 6) completed the picture of Anglo-Dutch trade in 1960. Exports of group 4 had ceased.

4.3.1.2. 1960-65

In relative terms group 9 remained the main trading item, but a further fall in the export of paper and cardboard resulted in an absolute decline. Transit outwards of kerosene (group 3) figured in the trade in 1965 for the first time, forming the second trade item. Imports of group 0 declined

considerably, but there was a growth in exports, mainly of grain. Group 2 showed a considerable decline in imports, while group 8 saw growth especially in imports of chemical-based products, but also in the export of 'other chemical products'. There was growth in import and export of the smallest group, group 6, with the import of bricks and the export of salt featuring in this trade for the first time.

4.3.1.3. 1965-70

In 1970 group 8, 85% of which was export, formed the main trading item. Starch products formed the largest export element, while for import, chemical-based products remained important. Export of group 9 (paper and cardboard) continued to decline in absolute terms, although some growth in the import of paper and cardboard took place. Trade in group 0 declined, with imports and exports almost balancing in 1970. Import of oats and export of grain formed the main trading items. Group 1 featured once more in trade: exports predominated with a variety of products, especially molasses, glucose and flour. Group 2 showed slight growth, mainly in coking coal. Import of group 6 (bricks) remained at-a constant level, and the export of salt increased slightly.

4.3.1.4. 1970-75

A considerable alteration in the port's trade took place over this period. All commodity groups except group 3 were included in trade in 1975. Group 5 featured for the first time and took the largest share. Export of tubes and pipes made up 98% of the trade. Group 8 remained an important element, with slight growth in trade 1970-75. Group 0 showed considerable growth, especially in direct exports of wheat and the import of barley, as did group 6, mainly imports of limestone for industrial use and building materials, though a rise in the export of salt also occurred. Group 4 featured for the first time since 1955 as a trade item, for which the

import of iron-ore was responsible. Import of coal and coke (group 2) doubled over the period. There was a fall in both imports and exports of paper and cardboard (group 9). Group 1 underwent a considerable decline, especially in the export of glucose and grain products. Group 7 featured in trade for the first time since 1960, with a small export of phosphate in 1975.

4.3.1.5.

An analysis of the commodity composition at the port over the period is shown in the table below:

	1955	1960	1965	1970	1975
0	-	38.5	17.8	9.0	11.3
1	4.2	1.2	-	9.5	0.7
2	13.1	24.7	6.9	5.1	4.4
3	-	-	38.2	-	-
4	11.6	-	-	-	5.0
5	-	-	-	-	35.8
6	-	0.1	2.7	2.2	7.5
7	-	0.4	-	-	0.6
8	21.8	3.7	11.3	56.3	30.6
9	49.3	31.5	33.1	17.9	4.1

Table 42. Anglo-Dutch commodity flows through the port of Delfzijl, 1955-75. Source: see table 33.

4.3.2. Groningen

With the exception of the early period (1955-60), this port's trade with the United Kingdom was predominantly in agricultural produce (groups 0 and 1).

4.3.2.1. 1955-60

Group 8 was the largest trading group in 1955, with 73% of this trade

being the export of starch and starch products. Imports were also of the same product. Imports of group 1 (refined sugar) and of group 0 (oats) formed the remaining trade with the United Kingdom in this year. By 1960 trade in group 0 had grown so that imports of oats formed the largest element in trade. There was no export in this group. Group 8 was not featured in trade in 1960. Group 1 showed a trebling in trade in absolute terms, due mainly to the import of refined sugar, as in 1955, but there was also a small export of groundnuts. Group 5 featured in trade for the first time with the import of iron and steel bars and rails.

4.3.2.2. 1960-65

Over this period a considerable absolute growth occurred in trade in group 0. Imports, however, declined, and there was only a small import of barley in 1965, the trade in oats having ceased. 96% of trade in this group was direct exports of grain to the United Kingdom. Export of flour, grain products and animal feedstuffs made up trade in group 1 in 1965; import of refined sugar had fallen away over the period. Trade in group 5 had also ceased. There was a small import of coal (group 2) for the first time in 1965, and some export of group 8 (other non-specified chemical products).

4.3.2.3. 1965-70

Although there was a dramatic fall in the volume of trade in group 0 during this period, it remained the major item in trade with the United Kingdom. Exports of wheat remained important, but there was growth in the import of oats once more, whereas in 1970 wheat exports were less than a quarter of their 1965 size. There was a slight decrease in trade in group 1, with exports of refined sugar and flour as the main items. There was a small export of group 9 (ships and boats: transport equipment)

for the first time in 1970, and import of coal (group 2) continued, despite a decline in volume. There was no trade in group 8 in 1970.

4.3.2.4. 1970-75

Trade in group 0 remained almost static over this period: barley formed the main import, with wheat and oats the main export. Trade in group 1 showed considerable growth, with exports of grain products and animal feedstuffs, so that group 1 was the major item in trade in 1975. Trade in group 2 had ceased, while trade in group 9 (other manufactures) consisted solely of imports by 1975. There was some import of group 6 (clay and clay earth) and a small export in group 8 (starch and starch products) the latter featuring in trade for the first time since 1955

4.3.2.5.

These trends are summarized in table 43:

	1955	1960	1965	1970	1975
0	7.6	78.8	79.2	54.1	25.8
1	15.0	16.9	14.1	27.9	65.1
2	-	-	5.8	5.7	-
5	-	4.3	-	-	-
6	-	-	-	-	5.9
8	77.4	-	0.9	-	2.6
9	-	-	-	12.3	5.6

Table 43. Anglo-Dutch commodity flows through the port of Groningen, 1955-75. Source: see table 33.

4.3.3. Harlingen

Commodity groups 9, 1 and 0 formed the bulk of trade at this port over the period. Trade in most commodities showed a dramatic decline in volume,

and by 1975 few commodity groups remained in trade (see section 4.3.3.5.).

4.3.3.1. 1955-60

Group 9, entirely export, was the main commodity group in 1955 claiming almost half of the port's trade with the United Kingdom. Only one item featured in this group, the export of paper and cardboard. Group 1, the second item in trade, consisted largely (over 99%) of export: the main items were prepared meat and dairy produce. Group 0 was entirely made up of exports of potatoes, vegetables and wheat. The import of coal (group 2) and the (mainly export) trade in group 8 of starch and other chemical products, together with a small export of ferruginous earth, made up the rest of trade in 1955. By 1960 there was a slight decline in exports of paper and cardboard, with some import (transit) of machinery and transport equipment. There was also a slight decline in the export of group 1, with a fall in meat exports but slight increase in the export of dairy produce. A considerable decrease in the trade of group 0 took place: by 1960 export trade was one eighth of its 1955 figure. There was no export of wheat or potatoes, only the export of vegetables. There was also a considerable fall in coal imports through the port (group 2). Group 4 no longer figured in 1960. Growth in exports of cellulose and paper (group 8) was considerable, but no export of starch took place in 1960, although there was an increase in trade in other chemical-based products. There was a small import of iron and steel products (group 5) in 1960.

4.3.3.2. 1960-1965

Exports within group 9 continued to decline 1960-1965, with a fall in the export of cardboard and paper. There was a slight rise in the import of machinery, especially agricultural tractors. Group 1 also

showed a further fall in trade, exports of meat disappeared and there was a fall in the export of dairy produce. Trade in group 8 was almost halved in absolute terms, with exports of other chemical products dominant in 1965. Group 2 showed recovery in imports. Trade in group 0 also recovered slightly, with exports of vegetables and some wheat, and some import of livestock. A slight rise in imports in group 5, with a small import of road surfacing materials (group 6), completes the picture.

4.3.3.3. 1965-70

The fall in exports of paper and cardboard was especially marked over this period, declining to a third of its 1965 figure by 1970, so that despite a slight rise in the import of transport equipment group 9 no longer formed the main item in port trade in this year. There was a continued decline in exports of group 1 (dairy produce), but a considerable rise in import, mainly of dried leguminous vegetables. In absolute terms there was a slight rise in the import of coal (group 2). Exports of group 8 halved, the decline being mainly in 'other chemical products'. There was some export of starch once more in 1970 and continued growth in the import of metal products (group 5), mainly non-ferrous metals (finished products). Group 0 showed a slight decrease especially in exports: imports and exports almost balanced, with exports of vegetables and imports of livestock and potatoes.

4.3.3.4. 1970-75

By 1975 a dramatic change in trade had occurred. There was a further fall in the export of paper and cardboard, and also decreased import of transport equipment (group 9); nevertheless this now once again formed the largest group in trade. Trade in group 8 halved once more, with only a small export of 'other chemical products' remaining in 1975. Trade in

group 4 had ceased, as had trade in groups 0 and 5. Group 1 shrank to a fraction of its 1960 figure, both imports and exports declining in absolute terms, with a small import of animal feedstuffs and export of glucose, butter and cheese.

4.3.3.5.

The relative changes in the commodity structure of the port's trade with the United Kingdom 1955-60 are shown in table 44:

	1955	1960	1965	1970	1975
0	15.1	2.5	4.9	5.9	-
1	21.2	20.9	17.1	27.2	11.5
2	9.8	1.5	10.8	18.4	-
4	1.0	-	-	-	-
5	-	0.2	0.3	2.8	-
6	-	-	0.7	-	-
8	9.1	25.7	18.0	20.6	26.6
9	43.8	49.2	48.1	25.1	61.9

Table 44. Anglo-Dutch commodity flows through the port of Harlingen, 1955-75. Source: see table 33.

4.4. The Schelde ports

4.4.1. Terneuzen

Imports of coal in transit (group 2) made up almost half of trade with the United Kingdom in 1955. The second item, commodity group 6, consisted entirely of this import in transit of other mineral products. Transit outwards of raw phosphate (group 7), import (transit) of scrap (group 4) and group 8, mainly export in transit of base products, formed the bulk of the remaining trade. A small export of group 0, 84% of which was of

vegetables and wood, and import of rolled metal products (group 5) completed the picture. Over the period imports of coal halved in size, and in 1960 the transit inwards of crude minerals (group 6) formed the major part of trade. A large direct export of roasted iron pyrites (group 4) was the second item in trade in 1960. Exports of natural fertilizer (transit) replaced exports of phosphate in group 7, and there was a small transit of group 3 (refined oil products). There was no trade in groups 8 or 5; trade in group 0 declined, with only a small import of barley in 1960.

4.4.1.2. 1960-65

A large increase in the import of coal in transit, and coke, resulted in this group dominating trade by 1965. 77% of this group was import of coal and coke and the rest exports mainly of coke. Group 6 showed an absolute decline in import of crude minerals. Of the smaller groups in trade, group 0 saw considerable growth, especially in exports of wheat which formed 95% of trade in this group in 1965, and trade in group 7 doubled, mainly transit outwards of natural fertilizers, but there was also some import of phosphate in this year. Group 8, the transit of other chemical products, featured once more in trade. The transit of iron-ore outwards was only a fraction of trade in group 4 in 1960.

4.4.1.3. 1965-70

Diversification occurred 1965-70 in Terneuzen's trade with the United Kingdom. Group 6 formed the largest part of the trade, claiming almost a third in 1970. 97% of this was import. Transit of clay earth increased, but there was also a considerable direct import of sand, gravel and limestone. There was a small transit outwards of slag and ashes. Trade in group 0 trebled in size, especially exports which formed 96%

of the trade in this year. The main growth was in the direct export of grain from the port, largely wheat and maize. The coal trade (group 2) declined considerably, and there was no export of coke, but transit inwards of coking coal formed the main item in this group in 1970. Other groups of note were group 8 (60% of which was export) which showed a large transit element (around 50%), the major item being chemical-based products. A considerable increase occurred in the trade in group 7, entirely transit outwards, largely consisting of the export of phosphate fertilizers. Of the smaller groups in trade in 1970 (3, 1, 4, 5 and 9), group 3 was the largest, with imports of oil products only slightly exceeding exports. Direct export of refined sugar (group 1), transit inwards of iron and steel scrap (group 4), transit outwards of paper and cardboard (group 9) and transport equipment, and a very small transit outwards of rolled steel products made up the rest of the trade in 1970.

4.4.1.4. 1970-75

A large decrease in trade in group 6 occurred over this period. In 1975 this consisted entirely of import, mainly transit inwards of clay earth and direct import of limestone. Considerable growth in the import of coal (group 2) resulted in this group predominating in 1975. Trade in group 8 was second in importance, of which 9% was export of tar and other coal derivatives, and of chemical-based products. Exports (in transit) of phosphatic fertilizer, nitrogenous fertilizer and other chemical fertilizers increased over the period. There was a decline in the export of wheat, and growth in the import of barley, with imports exceeding exports in 1975. Growth in group 3 also occurred; here imports decreased but exports of lubricating oils (in transit) saw a marked increase. A slight decline took place in transit inwards of scrap (group 4), and there was a small import of rolled steel in 1975. Trade in

group 9 had ceased by this year.

4.4.1.5.

The above movements in commodity trading are summarized in table 45:

	1955	1960	1965	1970	1975
0	3.4	0.5	8.5	18.4	7.4
1	-	-	-	1.7	0.6
2	48.9	17.3	72.8	16.2	36.7
3	-	0.7	-	3.0	5.3
4	7.2	26.0	0.2	1.6	1.0
5	0.2	-	-	0.02	0.06
6	24.1	47.3	11.9	32.7	10.0
7	10.0	8.0	6.3	12.2	15.0
8	6.2	-	1.6	13.9	23.9
9	-	-	-	0.3	-

Table 45. Anglo-Dutch commodity flows through the port of Terneuzen 1955-75. Source: see table 33.

4.4.2. Vlissingen

Excluding the initial year, 1955, group 3 formed the main item in the trade of this port with the United Kingdom over the period. There was, however, a considerable diversification in the commodities.

4.4.2.1. 1955-60

Only three groups were involved in trade in 1955. Group 9 formed the bulk of trade: 83% of this was export. Export of bunkering oil and other bunker materials, and a small import of briquettes for use in bunkering seaships formed the total in this group. A small export of oil and fats

from fish (group 1) and of potatoes (group 0) made up the remaining trade. By 1960 a considerable decline in bunker materials had occurred, and the import of heavy fuel oil (group 3) formed 90% of all trade in this year. Several new groups featured in 1960. These were import of rolled steel (group 5) and scrap (group 4) and the export of sand and gravel (group 6). Trade in agricultural produce (groups 0 and 1) had ceased by 1960.

4.4.2.2. 1960-65

Trade in group 3 almost trebled in size 1960-65, of which 99% was the import of heavy fuel oils. A considerable increase also took place in the import of scrap, group 4, (mainly in transit). There was a small trade in group 0 once more by 1965, mainly in the export of wheat and a small import of potatoes. Group 9 also saw a continued decline in trade, with no exports and only a small import of transport equipment. Trade in group 5 and 6 disappeared.

4.4.2.3. 1965-70

The import of heavy fuel oils ceased during this period, with only a small import of liquid gas (group 3) remaining (transit inwards). Imports of coal formed the main movement in 1970, featuring in trade for the first time. Export of grains and potatoes (group 0) increased in absolute terms 1965-70, but the import of scrap (group 4) saw a considerable decline. Imports of limestone (group 6) and of chemical-based products (group 8) made up the rest of trade, with the latter featuring for the first time.

4.4.2.4. 1970-75

A fundamental change took place in the structure of trade over this period. The largest item in 1975 was group 6, 96% of this being made up of

sand and gravel, with some export of slag and ashes. Group 3 was second in importance, a large increase since 1970. Exports, however, formed 98% of trade, whereas previously imports had dominated. Direct export of petrol and heavy fuel oils were the main items, but there was also some export of kerosene, liquid gas, and other oil derivatives. Import was mainly of diesel oils. The remaining groups were of minor importance to trade. A considerable increase in absolute terms occurred in the export of group 0, with a variety of products especially grain, wood and potatoes involved. Trade in group 4 also increased, with the import of scrap iron and steel and scrap from non-ferrous metals. Group 8 showed a marked increase, especially in the imports of chemical-based products, waste products from paper manufacture, synthetic materials and other products. There was an absolute increase in trade in group 2, mainly in the import of coal and coke. Of the remaining commodity groups in 1975, group 9 was important, 66% of this being import of a variety of finished products, including textiles, clothing and other manufactured items, with export of paper and cardboard. Import and export of cars was also an important item within this group. Commodity group 5, 56% of which was export, was also of note; exports were mainly of non-ferrous metals, while imports of pipes and tubes, rolled steel and a variety of other iron and steel products took place in 1975. Group 1 featured for the first time since 1955: 60% of this was import, largely of fresh and frozen meat and fish, while dried and salted meat formed the main export.

4.4.2.5.

Table 46 shows the relative changes in the port's commodity composition with regard to trade with the United Kingdom 1955-75.

	1955	1960	1965	1970	1975
0	2.5	-	1.7	14.8	2.8
1	3.5	-	-	-	1.0
2	-	-	-	33.4	1.2
3	-	90.0	91.0	31.5	28.8
4	-	0.6	7.1	0.8	0.3
5	-	2.0	-	-	3.0
6	-	1.4	-	13.0	55.1
8	-	-	-	6.0	2.3
9	94.0	6.0	0.2	-	5.3

Table 46. Anglo-Dutch commodity flows through the port of Vlissingen 1955-75. Source: see table 33.

4.5. Scheveningen

Finally the trade of this port with the United Kingdom bears brief examination in terms of commodity composition. Comparison is only possible for the period 1970-75, due to the absence of statistical material prior to 1969. There was a considerable diversification in commodities over this period. In 1970 the largest group was group 1, with just over a third of trade, mainly export of dairy produce and prepared meat. Fish was the main import. Group 0 was also important, especially export of fresh and frozen vegetables. Import in this group was almost entirely of livestock. Group 9 was the remaining important item in trade, over three quarters of which was import. Imports of transport equipment (cars, tractors and trailers) were important, along with a variety of other manufactures. Exports were mainly transit of machinery and textiles, and direct export of paper and cardboard. Of the smaller groups in trade in 1970, group 8, in which imports and exports

balanced, was the most important, with its trade in chemical-based products. Group 6 was also of some importance, mainly exports of cement. Import of rolled steel products and some export of tubes and pipes and other products (group 5), the import of a small amount of lubricating oils (group 3), and the import of a very small volume of scrap (group 4) completed the trading pattern in 1970.

By 1975 group 1 had shown a considerable increase in trade, especially the exports of dairy produce, margarine and prepared meat; imports of butter and cheese and fish also showed growth. Growth in group 0 was mainly in the export of potatoes and vegetables. Together these groups accounted for over half the port's trade. Imports of group 9 doubled in absolute terms and exports trebled, although the former remained dominant. Trade in a large variety of manufactured items took place, tractors and agricultural machinery, and cars remained the major items in import; export of machinery, paper and cardboard and wood veneer were the major export items in 1975. Growth in the chemical trade (group 8) was especially marked in imports of chemical-based products and synthetic fabrics. Group 5, four-fifths of which was export, also showed rapid growth 1970-75, the main imports being tubes and pipes, rolled steel products and plate steel, with plate steel being the main item in export. The remaining groups were of little significance: import of building materials and industrial sand and chalk (group 6), import of non-ferrous metal scrap (group 4, in which there was very considerable growth in absolute terms, 1970-75), and increased imports of lubricating oil (group 3). Considerable diversity was the salient feature in this port's trade with the United Kingdom. Trade in agricultural produce (groups 0 and 1) and finished items (group 9) claimed most of trade in the period 1970-75.

	1970	1975
0	26.7	21.6
1	34.0	32.0
3	0.1	0.3
4	0.05	2.6
5	2.8	10.7
6	4.4	3.1
8	5.0	8.5
9	26.9	21.0

Table 47. Anglo-Dutch commodity flows through the port of Scheveningen, 1970-75. Source: see table 33.

5.0. Concentration of Anglo-Dutch commodity flows through the Dutch port range 1955-75.

At this point it is useful to examine changes in the pattern of commodity flows between ports during the period in question, both as a means of summarizing observations in the previous section, and of examining relative shifts between ports in the Dutch port range.

5.1. Indices of concentration

As a general measure, we again turn to Britton's Index of Concentration for the best comparison of relative changes over the period, for the whole Dutch port range.

Commodity group	1955	1960	1965	1970	1975
0	66.7	73.9	63.0	64.8	72.5
1	68.9	62.3	69.2	65.6	74.3
2	92.3	67.1	53.0	46.1	54.9
3	97.7	96.4	92.8	95.8	94.3
4	46.1	58.3	66.6	68.4	73.7
5	64.6	64.7	65.3	64.7	56.7
6	59.8	56.3	68.3	76.0	48.0
7	87.1	61.9	70.2	79.1	62.3
8	55.4	66.4	70.1	80.9	76.6
9	61.7	57.7	64.4	72.5	77.6

Table 48. Indices of Concentration for commodity flows with the United Kingdom, 1955-75.

Several factors emerge from the above. Over the period there were signs of increasing concentration in groups 0 and 1, agricultural produce and foodstuffs. Part of the reason for this was undoubtedly increased use of unit loads, making it more economic to concentrate at fewer ports. This was especially true for grain shipments, which were carried in large bulk carriers, and were then redistributed to the United Kingdom in smaller vessels. However, it should be noted that there were some signs of diffusion in the period 1955-70, and concentration in these groups seemed especially marked in 1970-75. Diffusion in the 1960s can be linked to increased regular sailings to the United Kingdom during this period (see chapter 5), many of which were concerned with the transport of agricultural produce. Group 2 showed the greatest diffusion, caused by the cessation of cheap imports from the United States which were redistributed to the United Kingdom in the early part of the period. This had ceased by 1960.

Rather surprisingly in view of its tendency to be highly concentrated, group 3 showed signs of diffusion, although it remained the most highly concentrated commodity group in Anglo-Dutch trade. Redistribution of this product in smaller vessels for a variety of destinations in the United Kingdom, and the location of refineries at ports other than Rotterdam over the period were factors in this.

Group 4 showed a strong tendency towards concentration, as the importance of iron-ore in particular, insignificant in 1955, grew over the period, and also due to the cessation of elements within the group which led to a more diffused pattern in 1955, such as the export of ferruginous earth from Delfzijl in that year.

The index of concentration for group 5 remained constant over the period, with slight diffusion 1970-75.

For group 6, there was marked concentration between 1960 and 1970, but diffusion in 1970-75. The very high totals recorded in this group in the latter part of the 1960s, connected often to major engineering works at the mouth of the New Waterway, was the cause of this; by 1975 much of this had ceased, hence the diffusion.

Group 7 also showed a similar pattern, with concentration 1960-70, and diffusion in the latter part of the period. This group was only a minor element in Anglo-Dutch trade over the period, however.

Group 8 showed distinct concentration 1955-75. This was partly a result of the cessation of traditional movements, such as the export of potato starch from the northern port range, and strong growth in petrochemicals which were produced in the large ports in the range.

Finally, group 9 also showed increasing concentration over the period. On the face of it, this may seem surprising in that it is the category which contains the products, mainly finished manufactures,

in which smaller ports can compete most successfully with the large port, so that one could expect a diffused pattern. Part of the reason for this was the fall in bunkering of sea-ships at the small ports, such as at Vlissingen. New unitized methods also favoured concentration at fewer ports, although these were not necessarily large parts (the growth of Scheveningen, for instance).

5.2. Concentration of commodity groups in individual elements in the Dutch port range with regard to Anglo-Dutch trade, 1955-75.

The above is useful for a general outline of concentration over the period with regard to the commodity groups, but does not distinguish or identify the individual elements. It is therefore useful to look at the distribution of each commodity group over the whole range. This is shown in table 49, for the years 1955 and 1975.

The most striking factor in table 49 is the obvious predominance of Rotterdam in most commodity groups, with the exception of the (relatively minor) trade in group 7 in 1955, and group 6 in 1975. For the latter, the increase in trade at a number of smaller ports in the range in the early 1970s has already been noted. Rotterdam was especially dominant in groups 2 and 3 in 1955, and groups 3, 0, 1, 4, 8 and 9 in 1975. The increase in percentage share of Rotterdam for commodity flows was greatest in groups 0, 7, 8 and 4 over the period 1955-75, while a decline in its percentage share for groups 2, 5, 6 and 3 was recorded. It would appear, therefore, that for trade with the United Kingdom, it is in these groups that smaller ports have been able to compete most successfully. This conclusion must be looked at critically, however, as with the exception of group 5 the groups involved bulk commodities, where it

would be expected that smaller ports were able to compete better in low-bulk/high-value commodities. Movements in groups 2 and 6 have already been dealt with. The decline in Rotterdam's role in group 3 was largely due to new refineries at Amsterdam and Vlissingen, and was relatively small. It must also be borne in mind that the figures in table 49 deal with relative changes over the period, whereas in absolute terms there were large increases recorded for a number of commodities at the smaller ports in their trade with the United Kingdom. In the light of their importance to smaller ports, groups 0 and 1, and group 9, deserve further mention. The increase in redistribution of grains through the larger ports over the period was a result of increasing size of dry bulk carriers in the world fleet and the routing of these vessels to maximize economies of scale. This had a profound effect on trade figures for group 0. As the percentage shares in this trading group for a number of smaller ports did increase (see table 49), it follows that there was growth in products other than grain at a number of smaller ports, since the bulk grain carriers concentrated on Rotterdam and Amsterdam. As in group 0, the number of ports involved in trade in group 1 had also increased over the period. For group 9 a number of smaller ports showed an increase, added to which there was a strong influence exerted within this group in 1955 by the bunkering of sea-ships; an element which was scarcely present in 1975. A case in point is Vlissingen; with 3.95 of the trade in this group in 1955 and 4.8% in 1975 the increase does not appear marked until it is borne in mind that almost all this trade in 1955 was export of bunkering materials, whereas in 1975 it was in finished products.

Year: 1955.

	0	1	2	3	4	5	6	7	8	9
Amsterdam	19.8	23.6	5.5	1.7	2.3	9.3	48.8	14.0	36.7	18.7
Rotterdam	32.8	64.4	92.2	97.7	33.8	50.0	34.1	-	39.6	56.6
IJmuiden	-	-	0.6	-	9.1	39.8	-	-	0.9	0.3
Zaandam	-	-	-	-	-	-	-	-	1.6	-
Schiedam	-	-	-	-	-	-	-	-	-	1.0
Vlaardingen	*	5.1	0.5	0.5	6.4	-	2.0	-	0.8	0.8
Maassluis	9.4	-	-	-	-	-	-	-	-	0.3
Hoek v.Holl.	3.5	1.1	-	-	-	-	-	-	-	5.7
Dordrecht	0.1	0.5	0.1	0.1	20.9	0.1	9.7	-	2.3	0.3
Zwijndrecht	-	1.1	-	-	-	0.7	-	-	-	-
Delfzijl	-	0.7	0.3	-	19.1	-	-	-	11.1	6.9
Groningen	0.1	0.1	-	-	-	-	-	-	1.0	-
Harlingen	3.5	3.2	0.2	-	1.4	-	-	-	4.0	5.3
Terneuzen	0.5	-	0.6	-	6.9	*	5.3	86.0	1.8	-
Vlissingen	0.2	0.2	-	-	-	-	-	-	-	3.9

Year: 1975.

	0	1	2	3	4	5	6	7	8	9
Amsterdam	21.6	6.8	32.3	2.7	17.6	1.2	2.4	1.2	1.2	5.5
Rotterdam	69.0	73.3	41.3	94.2	71.3	42.6	26.2	56.5	75.8	76.9
IJmuiden	0.1	0.3	-	*	-	35.9	1.3	8.2	0.3	0.1
Zaandam	0.1	0.1	-	-	-	-	0.8	-	0.9	-
Schiedam	-	*	-	-	-	-	-	-	-	*
Vlaardingen	0.2	5.1	13.2	*	4.9	6.0	0.6	3.7	0.3	0.2
Maassluis	0.2	2.6	-	-	-	0.8	0.1	-	0.3	0.5
Hoek v.Holl.	1.2	0.1	-	-	-	-	27.7	-	0.2	2.7
Dordrecht	0.5	0.3	2.7	0.1	2.3	0.1	11.1	5.8	8.4	1.0
Zwijndrecht	0.4	1.3	-	-	-	0.2	0.1	-	0.4	0.3
Delfzijl	1.0	0.1	0.7	-	1.6	6.9	0.8	0.6	3.9	0.8
Groningen	0.3	1.3	-	-	-	-	0.1	-	0.1	*
Harlingen	-	0.1	-	-	-	-	-	-	0.2	0.6
Terneuzen	1.0	0.1	9.0	0.2	0.5	*	1.6	24.0	4.9	-
Vlissingen	1.2	0.7	0.8	2.7	0.5	2.8	26.6	-	1.4	4.8
Scheveningen	3.1	7.7	-	*	1.3	3.3	0.5	2.6	2.6	6.4

Table 49. Percentage share of individual ports in commodity flows with the United Kingdom, 1955 and 1975.

* denotes an insignificant percentage: that is, less than 0.1%;

5.3 Conclusion

Despite increased dominance in a number of areas by the main port in the range, over the period 1955-75, there were signs of diffusion in a number of commodity groups. The greater involvement of the smaller ports in a variety of commodity groups is evident from table 49. The role of smaller ports in the range in their trade flows with the United Kingdom was considerably more important in 1975 than in 1955.

NOTES

Chapter 3

- 1 L. Boyd, Britain's search for a role (Glasgow, 1975).
- 2 The United Kingdom Economy, National Institute of Economic and Social Research (London, 1976).
- 3 A.D. Couper, The Geography of Sea Transport (London, 1972).
- 4 Digest of Port Statistics (London, 1970).
- 5 H.C. Kuiler, 'Verschuiving in General Cargo Le Havre-Hamburg-range', Economisch Dagblad, 27 January 1977, number 446.

CHAPTER 4

THE CHANGING STRUCTURE OF THE DUTCH PORTS 1955-75, AND THE EFFECT ON TOTAL TRADE FLOWS THROUGH THESE PORTS.

0. In the preceding chapters emphasis has been on a descriptive examination of physical flows through the ports of the Netherlands, particularly with regard to Anglo-Dutch trade flows over the period 1955-75, with little attempt at explanations for these flows. In this chapter a closer look is taken at each port area and changes which have taken place over the period under examination, the effect on trade flows, and changes in the relative significance of ports in a range.

1. Introduction.

A large number of factors affect changes in the significance of a port within a range over a given time period, not the least of these being the changing emphases of trade flows between individual forelands and the ports. This is basically a function of factors internal to the port: provision of new industries which generate trade, and of additional port facilities which serve to increase trade, etc., and external factors (some of which have already been discussed, e.g. economic development of the foreland and hinterland and the development of industrial structure) which may be defined as all those activities which take place outside the port area, including the influence of the development of alternative and competitive facilities at other ports within the range. External factors, due to the complexity of the elements involved, and their effect on the trade flows through the ports, are much more difficult to isolate than

internal factors. Nevertheless, it must be borne in mind that internal factors and external factors are by no means mutually exclusive, and one is often indirectly the cause of another. For example, the siting of additional refinery capacity and/or oil storage facilities in a port area will give rise to additional import/export of oil and oil products in most cases. The investment decision, however, is often a result of the expansion of demand (external factor). External factors also result in pressure to improve internal facilities at the port. The importance of the provision of new facilities and industries at a port is therefore of paramount importance and internal changes reflect external developments. As Hilling¹ points out for the tropical world, strongly dependent on overseas trade, 'the seaport becomes a major determinant of economic growth and the stage of economic development in the hinterland becomes a function of the capacity and degree of sophistication of the port facilities'. For the Netherlands (which was also strongly orientated towards overseas trade), port capacity, the facilities offered, the quality of connecting services and location with regard to the hinterland, were major factors in the changing emphasis in trade flows between the Dutch ports and foreland areas. In the post-war period in particular, industrialization of the port area has become an especially important element in trade flows through the ports, especially the larger ports in the Dutch port range. The expansion of the port area to accommodate new industries and to meet the changing demand from world shipping has also become crucial in determining whether a port can maintain its position in the port hierarchy, and this problem became especially acute during the period 1955-75. A major question posed by port planning authorities has been the problem of whether to invest in port facilities and expect growth in trade through the port as a consequence of these new facilities and industrial develop-

ments in the port area, or to wait until growth has been created and exerts a demand on existing facilities in the port area which necessitates the provision of new facilities.² A careful analysis of trends in a port's trade is needed over a period of time before this problem may be approached, and particularly a study of how improvements and location of existing facilities and industries have affected trade through individual ports, and in turn affected their position within the national port hierarchy. Analysis of individual flows with forelands, particularly in cases where these form a large part of trade through an individual port, is particularly important before any planning decision can be made. In this chapter an examination is made of internal changes taking place at the ports in the Dutch port range over the period 1955-75, and their effects on the total trade flows passing through the ports. In the following chapter these internal changes will be analysed specifically with regard to Anglo-Dutch trade flows.

2. Factors common to the development of trade through all the ports in the Dutch port range.

2.1. The quality of the transport chain.

The hinterland links of a port must be considered to be an important factor in the routing of goods flows through any ports (Kieft, 1969).³ For the majority of the Dutch ports, however, the hinterland links in the post-war period were extremely good. Rotterdam enjoyed the most favourable position in this respect, with direct access to the Rhine, although since the opening of the Amsterdam-Rhine canal in the early 1950s the North Sea Canal ports enjoyed a similar position. For the Schelde ports, waterway access to the hinterland was also good, although this was mainly to Belgium rather than the national hinterland. Only the

northern ports suffered from limited waterway access, and for these ports inland communications in general were poorer than for the other Dutch ports. In a West-European context, however, the Dutch ports enjoyed hinterland connections which, on the whole, were adequate to serve the demands made on them and adapted where necessary to meet new requirements over the period 1955-75. However, particularly for the larger ports the problem of congestion has become increasingly acute during the period under consideration. Problems of the lack of co-ordination at border points, particularly for road and rail traffic,⁴ were a problem common to all the Dutch ports, and affected traffic to and from the hinterland accordingly.

2.2. Increased mechanization.

The shortage of adequate labour supplies to meet demand was particularly acute during the early 1960s and resulted in pressure to mechanize as much as possible and invest in labour-saving facilities at ports. Together with increased trade flows at most ports this factor added to the rapid modernization of many Dutch ports over the period.

2.3. Developments in shipping technology.

Developments in world shipping over the period have been briefly discussed in chapter 2. Suffice it to say that these developments had an important effect on port competition and affected the ability of ports to maintain their positions in the Dutch port hierarchy. In general the larger tankers and bulk carriers could be received at fewer ports, and to maintain their position the smaller ports had either to embark on expensive dredging programmes, not always physically possible, or to adapt their facilities in order to attract additional non-bulk trades through the possibility of faster turn-around times for ships, particularly

those on the short-sea routes. In general there was an increasing specialization and concentration of trade flows at particular ports for these reasons. The proliferation of container and ro/ro services during the 1960s was partly a result of the attempts by port authorities to provide attractive facilities for the non-bulk trades and maintain trade flows through their ports and hence the position of the port in the port hierarchy.

2.4. Commodity type.

Increasing specialization by ports in certain commodity flows as a result of developments in large carriers had important consequences for ports, but the overall increase in the European imports of raw materials had consequences for most of the Dutch ports so that, despite this specialization, bulk raw materials increased in importance over the period at many of these ports. The tendency was, however, for bulk trades at the smaller ports to be concentrated on serving local industries with transshipment having taken place from larger carriers at the main ports, or bulk-commodities traded on the short-sea routes, where the use of smaller ships was more economical.

2.5. Industrial development

One of the major factors in the post-war development of ports in western Europe, particularly in the Netherlands, has been the location of modern industrial concerns, particularly in the heavier industrial sectors, which have been attracted by a port location. In some instances these developments have overshadowed existing traditional port industries and activities concerned mainly with the processing and re-working of imported products. Winkelmans⁵ points out that many of these newer industries have

an uncertain effect on the primary functions (import and export of commodities and other cargo handling activities) of a port, whilst others are not port-related in this sense at all, being attracted more by the availability of flat land, accessibility (good inland transport networks) and agglomeration effects (closeness of nearby markets). Nevertheless, it is undeniable that in many cases the location of new industries at a port has had a considerable effect on trade flows, with the import of raw materials and the export of re-worked and finished products.

2.6. General economic development in the hinterland and foreland.

As already discussed, there was a considerable number of external influences on commodity flows through ports, which affected development in trade over all the Dutch ports in the range during the period under discussion. The effect of external economic developments such as the Benelux union and the enlargement of the E.E.C. at the end of the period, together with changes in the Dutch economy and those of its trading partners, cannot be ignored: however, these developments often indirectly influence developments at the ports, as mentioned earlier. In addition the quantification of the effects of these developments in external factors is extremely difficult. Regression analysis between the changes in National Income and/or production (such as that by Monnikhof - van Driel⁶ in a study of passenger flows between United Kingdom ports and the Dutch ports) would be able to achieve little more than a descriptive analysis, due to the number and complexity of variables that must be taken into consideration when examining commodity flows and changes over the period. On the other hand, an analysis of the physical changes taking place at the port and the effect of these changes

on the trade flows at these ports is a less complicated exercise and enables meaningful statements about the effect of the provision of extra facilities and location of new industries on trade flows through the Dutch ports.

3. Physical changes occurring at the Dutch ports 1955-75.

In this section changes in the physical make-up of the ports in the Dutch port range over the period 1955-75 will be examined, and in the following section an attempt will be made to tie up these changes with the developments in the commodity trades at the ports concerned. As in the preceding chapters, the division of the Dutch seaports into four main groupings is maintained.

3.1. The New Waterway ports.

Considerable development of these ports, particularly Rotterdam, took place over the period 1955-75, with spatial changes in port areas and the location of new industries. The smaller ports such as Maassluis and Hoek van Holland showed fewer changes, but benefited from the developments at nearby Rotterdam and the improvements to the approach channel.

3.1.1. The port of Rotterdam

Since the second world war, Rotterdam showed the most spectacular increase in port area and activity in its history as a seaport (Weigend, 1973).⁷ The maximum size of ship able to reach the port increased from around 45,000 tons d.w.t. in 1955 to 250,000 tons d.w.t. in 1975.

A series of major expansion plans and the continued deepening of the seaward approach route, together with the location of new industries in these areas, had an important effect on the trade passing through the port over the period.

3.1.1.1. The Waterway area and physical expansion of the port

The Botlek development in the late 1950s exceeded even the most ambitious planners expectations, and it became increasingly obvious that, if the port wished to remain an attractive location for industry, particularly in the oil sector, new areas of land for industrial development had to be created, as well as seaward access for ships over the envisaged 45,000 tons d.w.t. maximum depth for the Botlek area. As early as 1955, Rotterdam port authority had offered a provisional option on an area of land in the Botlek region to Shell Petroleum for the building of an additional storage and refinery area, but the area was not large enough to meet the company's requirements. In addition the company required access to a deep water area which would be able to receive tankers over 45,000 tons d.w.t. (38 feet draught). At the same time, several oil companies with sites in West Germany were planning the development of a crude oil pipeline to the Ruhr industrial area from a seaport able to receive large oil tankers of 65,000 tons and above. The possible sites considered were Wilhelmshaven and Rotterdam, although at Rotterdam the requirement of 65,000 ton tankers could not be met at that time. As early as 1940 the idea of further development of the port by an extension to include the island of Rozenburg had been raised, and this was now revived by the port authority to enable the expansion of Shell to take place, and the development of a terminal for oil which would be able to meet the 65,000 ton d.w.t. requirement. In 1956, 100 hectares of land were offered to Shell on the western tip of the island of Rozenburg, and in November 1957 the decision was taken to develop a new harbour complex opposite Hoek van Holland, to be named Europoort. At the same time the Shell Company in conjunction with Caltex decided on the construction of a pipeline from the Europoort area to

West Germany rather than from Wilhelmshaven. The new Europoort extension would be connected by a separate canal to the sea, and was originally planned to be located behind lock gates, but this was abandoned in favour of a canal with open access to run alongside the existing New Waterway and connected to the sea through the Maasvlakte nature reserve area (the Caland Canal). Hereby a division between traffic destined for the Europoort area, and that destined for the Botlek and Pernis areas was achieved, as increased traffic was already causing congestion along the existing New Waterway. The Europoort area was to be mainly allocated to the bulk handling of oil and ores and plans were put forward for the establishment of a blast furnace complex, but despite much discussion these never came to fruition. On the other hand, trade in oil and oil products showed a spectacular increase exceeding all expectations, and this activity came to dominate the Europoort area. The initial intention was to make the area accessible to ships of up to 65,000 tons d.w.t. with the fourth petroleum harbour as the main harbour, along with an ore harbour (later the Beneluxhaven). As there was some urgency in the late 1950s to develop Europoort in order to anticipate the by-passing of the port by large supertankers unable to enter the port due to limited depth, the first stage of the plan was rapidly completed, and the first oil tanker entered the Europoort area in December 1960 after the completion of the first part of the plan (the fourth petroleumhaven and the first part of the Caland Canal). In 1961 a plan was brought forward to develop a new mouth for the New Waterway and Caland Canal by the lengthening of the southern pier, and at the same time the first tentative plans to develop the Maasvlakte as a logical extension to Europoort were produced. By 1962 the development of the fifth petroleum harbour was well under way. Meanwhile, the

size of oil tankers in the world fleet continued to increase, so that Europoort was now planned to be further dredged to a depth of 47 feet, enabling 100,000 ton d.w.t. tankers to berth at the harbours, in answer to demand from the oil refineries in the area. In 1961 the entrance to the New Waterway was dredged to enable 100,000 ton tankers to enter Rotterdam and Europoort.

The fifth petroleum port was opened in 1963, with the arrival of the first oil tanker. By 1964, further dredging had made Europoort accessible to tankers of 130,000 ton d.w.t. Meanwhile the oil companies were pressing the port authority to deepen the mouth of the New Waterway even further to enable 200,000 ton d.w.t. tankers to enter Europoort. The Botlek area was also deepened at this time to receive ships of 65,000 d.w.t. Pressure from the oil companies, the need to maintain a competitive position, and plans by the port authorities at Amsterdam to build a pipeline for crude oil from the Europoort area to Amsterdam to supply the Mobil refinery led to the decision to go ahead with the 1961 plans for a new mouth for the port, and by the development of a deep approach channel (Eurogeul) to make the port accessible to ships of up to 225,000 tons (62 feet draught). The decision to go ahead with this costly project was taken in 1967, after tense discussions about the financing of the project between the port authority of Rotterdam and the State. By 1969 the excavation of the Eurogeul was completed, and in the early 1970s through further deepening to 65 feet depth the port was accessible to 250,000 ton tankers (fully laden). In 1975 plans were underway to deepen the channel even further to 72 feet.

3.1.1.2. New harbours and facilities.

Over the period 1955-75, there was, therefore, considerable expansion

of the port and of the facilities offered, particularly with regard to the accommodation of V.L.C.C.'s.⁸ As the centre of gravity for the oil industry moved from Pernis to Europoort, however, the expansion of the bulk handling of goods, particularly oil, was mainly in these new areas, and the older traditional bulk-handling areas of the port (especially the Waalhaven) declined in importance. At the same time these older areas became more important for the handling of general cargo which also showed expansion, needing extra storage area. In 1955 the decision was taken to develop the Eemshaven into a general cargo-handling terminal. During the early 1960s, as new terminals were opened in Europoort, several parts of the Waalhaven were adapted from bulk to general cargo handling, and the area was gradually transformed into a predominantly general cargo-handling centre, with the consolidation and outward movement of the bulk-handling concerns.

The advent of the container ship at the port in the mid-1960s (the first container ship entered the port in 1966) heralded a new era for the handling of general cargo and facilities provided in the traditional areas of the port. The Eemshaven became the main centre for the new unitized handling of cargo, with the opening of the European Container Terminal (ECT in 1967 at the Prinses Margriethaven. New roll-on/roll-off (ro/ro) facilities were also developed during this time in various parts of the port. The idea was not a new one for the port of Rotterdam; as early as the mid-1950s pier 2 at the Waalhaven had been in use for this purpose. In 1966 a major new area for ro/ro facilities at the port dawned with the opening of a ro/ro service to the United Kingdom from the Benelux-haven in the Europoort area.

The main new harbour facilities to be created since 1955 were:

1) Botlek: completion of third Petroleumhaven; Chemiehaven and St. Laurens haven built. All these were completed by the end of the 1960s.

2) Europoort: Caland Canal, 4th, 5th, 6th, 7th petroleum harbours, Beneluxhaven, Seine and Dintelhavens (bargetraffic), Brittanniëhaven.

3) Maasvlakte: 8th Petroleumhaven, Mississippihaven.

By 1975 roll-on/roll-off facilities were offered at the Waalhaven (2), Prins Wilhelm Friso haven (3), Eemshaven, Prinses Margriethaven, Beneluxhaven and Brittanniëhaven. The total port area was increased from around 3,000 hectares in 1955 to over 24,000 hectares in 1975. Over half of this area was occupied by industries.

3.1.1.3. Industrialization.

The spectacular development and growth of industry at the port of Rotterdam, particularly in the chemical and oil sectors, has been one of the main features of the growth of the port in the post-war era, and one of the most well-documented.⁹ The following is only a brief outline of major developments in this field, 1955-75, in three sections (a, b and c).

(a) The Botlek area.

The first terrain to be allotted in the Botlek went to DOW Chemicals in 1955, soon followed by the Verolme Shipbuilding Company (1957) and N.V. Pakhuismeesteren. In 1958 a number of chemical industries rented areas of land in the Botlek: N.V. Cyanamid-Ketjen, a titanium-dioxyde factory. Muller & Hanna cargo handling also moved in at this time. A major development in the Botlek area was the completion of Rotterdam's third oil refinery at the third Petroleumhaven (Esso) in 1960. A year later Nieuwe Matex (storage of mineral oils etc.) was established,

and with the location of Alu-chemie in 1964 the available terrain was almost completely occupied, although as late as 1967 a new grain-handling terminal (Graan Elevator Maatschappij) was opened at the Chemiehaven.

(b) Europoort.

After the official acceptance of the Europoort plan in 1957, partly as a result of the limitations of the land available in the Botlek for the planned expansion of Shell,¹⁰ a number of applications for industrial land in the Europoort area were made, particularly by the oil industry for which the new areas of land with access to deep water were especially attractive. Plans for a new blast furnace complex (integrated iron and steel works) at Europoort were also proposed, but were rejected by the Dutch iron and steel industry in favour of expansion at the existing coastal site, IJmuiden, due to the cost of setting up a new 'greenfield' site in the area.

The first Europoort site to be offered by the port authority to industry was therefore offered to Shell, an area to the south of the 4th Petroleumhaven, for the receipt and storage of oil. Caltex (Chevron) was also allowed to rent an area nearby for the receipt and storage of oil, with a jetty opened in 1962 for this purpose. Later Caltex reached an agreement for the joint exploitation of these facilities with Esso. The first tanker to enter the Europoort area off-loaded at the Shell terminal in December 1960.

Gulf Oil Corporation (Pittsburg) rented an area to the south of the 5th Petroleumhaven in 1962 and began the construction of Rotterdam's fourth refinery on the site, officially opened in 1965, and two jetties were built for the receipt of oil. Also in 1962, I.C.I. Chemicals rented an area in the Britanniëhaven, and the factory complex was opened

there in 1963. A year later the Cementfabriek Rozenburg was opened in Europoort East.

In 1965, with the decision by Mobil Oil to construct a refinery at Amsterdam, to be supplied by pipeline with crude from the port of Rotterdam, land was reserved in Europoort at the 7th Petroleumhaven for the storage of oil for this company. In the same year British Petroleum built Rotterdam's fifth and last refinery between the Dintelhaven and the Beer Canal (6th Petroleumhaven), and this officially began production in 1967. Meanwhile there was further expansion in the chemical and petro-chemical sectors, with the opening of N.V. Konam (Methanol, Butanol, etc.) in an area adjacent to the Gulf refinery in 1967, and Climax Molybdenum in 1967.

In 1965 there was a number of developments in the roll-on/roll-off sector with the opening of a terminal for North-Sea ferries at the Beneluxhaven, followed by the transport ferry service (Atlantic Steam Navigation Company) which moved to the Beneluxhaven from the Merwehaven where it had started with a service to Felixstowe and Tilbury in 1960. In 1967 Bell Lines started a ro/ro/container service to Middlesborough from the Britanniëhaven.

The year 1967 also marked an important expansion in refinery capacity at the port of Rotterdam. Shell refinery, Pernis, expanded to 25 million tons per annum capacity, making it the largest refinery in the world at that time. Esso increased production at Botlek to 16 million from 8 million tons per annum; Chevron (Pernis) increased capacity from 5 to 12.5 million tons per annum and Gulf Oil expanded its activities by the construction of an ethylene and polyethylene plant in Europoort.

The Europoort area was initially planned as an area for the bulk handling of oil, ores and coal. Developments in oil far outpaced the

others. With the failure of the negotiations concerning an iron and steel concern, developments in the handling of ore at Europoort lagged. In 1967 a combine of Rotterdam shipping agents refused an offer of land for the bulk handling of ore and coal in the Europoort area, opting instead for an area of land on the Maasvlakte extension, and in the meantime increasing the handling capacity for these commodities at the existing Waalhaven terminal from 6 to 11 million tons per annum. The option on the Europoort site was taken up by a German concern importing ore for the German iron and steel industry, and in 1970 the Ertsoverslag Bedrijf Europoort C.V. was set up near the Dintelhaven where imported ore was transshipped into barges for transport to the German hinterland. The terminal at the Waalhaven for this purpose was phased out and Rotterdam Fruit Pier began operations at the Waalhaven as part of the change to general cargo-handling in that area. In 1970 Bunge N.V. began the construction of a new grain storage and distribution centre at the Beneluxhaven, starting operations in 1971, although the silo was not completed until a year later. Some expansion also occurred in the chemical sector, while Oxirane Chemie (Nederland) began the production of propylene and other products in Europoort East, followed soon afterwards by Air Products Nederland N.V.

Finally, in any survey of the industrialization of Rotterdam-Europoort the development of a number of pipelines from the Europoort area in the 1960s may not be ignored, as they were instrumental in the substantial increase of oil imports to Rotterdam. The crude pipeline to the Ruhr constructed in the early 1960s was replaced in 1968 with a pipeline of greater capacity, while the existing pipeline was used for the transport of oil products to the German hinterland. In the same year a pipeline to serve the Amsterdam refinery was opened, and in 1971 another

was added for the transport of crude oil to Antwerp (later extended to Vlissingen to serve the new refinery there). This made Rotterdam an important distribution centre for crude oil.

(c) Maasvlakte.

Work on the Maasvlakte, the last part of the port to be developed, was only completed in 1974. In 1973, at the Mississippihaven, an ore and coal-handling terminal, Europees Massagoed Overslagbedrijf (E.M.O.)¹¹ began operations and storage facilities for a consortium of oil companies were created on the Maasvlakte, the Maasvlakte Olie Terminal C.V. Apart from an electricity generating station the rest of the Maasvlakte was largely unoccupied in 1975.

3.1.1.4. Port administration 1955-75.

The administration of the port of Rotterdam during this period remained relatively unchanged, with the responsibility for the operation of the port remaining in the hands of the local authority. However, due to the enormous growth in the size of the port the 'Havenbedrijf' (branch of the municipal authority) was given more autonomy during the 1960s and was presented with the task of becoming self-supporting, so that the large losses incurred during the development of the port would no longer be borne by the local community.

3.1.2. The Port of Schiedam

There were few changes in the physical lay-out and facilities offered at the port of Schiedam over the period, partly as a result of competition from nearby Rotterdam. There were also no attempts to improve access to the port or deepen the existing harbour for larger ships. The principal

basin, Wilhelminahaven, remained accessible to ships of 7/8,000 tons d.w.t. maximum. Tankers up to 250,000 d.w.t. could be received on the east bank at the terminal of Tanker Cleaning N.V., at specially constructed jetties. Ship repairs and servicing remained the major activity at this port, although there was a reduction in bunkering facilities for sea-ships partly as a result of limited access. The Wiltonhaven was the main area for shipbuilding, being a private harbour owned by the Wilton Shipbuilding Company with large floating docks, and here facilities were improved to enable the repair of tankers up to 85,000 tons. During the 1960s a Unilever oil storage plant was closed and the site was taken over by Tanker Cleaning B.V.

3.1.2.1. Port administration.

The local authority of Schiedam was responsible for the exploitation of three of the four Schiedam harbours, the Voorhaven, Oude Spuihaven and Wilhelminahavens. However, Schiedam became more dependent on the the neighbouring port of Rotterdam and less competitive in the 1960s when the charges at the port were brought into line with those are Rotterdam. It lost its special 25% reduction offered to liner ships and sea-ships bunkering at the port. The exploitation of the fourth harbour, Wiltonhaven, remained in the hands of the Wilton company throughout the period.

3.1.3. The port of Vlaardingen.

As at Schiedam, despite the deepening of the New Waterway by the Rotterdam port authority, there was no attempt to improve access to the harbour basins. In fact the main harbour basin, the Koningin Wilhelminahaven, actually decreased in depth from 19 feet at low water to 17 feet between

1955 and 1975, due to silting.¹² The Oude Haven remained accessible only to barges and small coasters (maximum 10 feet low water). The Vulcaanhaven, privately owned, remained the main area for the bulk handling of coal and ore by Frans Swartouws Havenbedrijf. In 1955, ships of up to 30,000 d.w.t. could reach the port, representing some of the largest bulk carriers of the time. The situation in 1975 was similar, but relatively the port fell behind as the growth in the size of bulk carriers over the period meant that much of the traffic bypassed the port, which was unable to accommodate the large bulk carriers. The private harbours and jetties of Windmill Holland (phosphatic fertilizers) in the western part of the port showed little change over the period 1955-75, but the facilities of the Royal Shell wharves for mineral oil storage were increased considerably from six tanks in 1955 to 77 tanks in 1975. Nieuwe Matex N.V. also increased its storage capacity for mineral oils, molasses, creosote and chemicals from 110 to 424 storage tanks and the addition of an extra riverside berth brought the total to three. The maximum size for ships at these berths was 30,000 tons d.w.t. The jetty owned by Levers (soap and detergents) in the western part of the port was extended from 50 to 75 metres in length.

There were no major changes at this port over the period, but there was some increase in storage capacity for mineral oils.

3.1.3.1. Port administration.

The greater part of the port of Vlaardingen was under private ownership during the period. The whole of the Vulcaanhaven, and the harbour and jetties in the west of the port were privately owned, the former by Frans Swartouws Havenbedrijf and the latter by Windmill Holland, with a number of companies owning the jetties. The jetties in the east were

also privately owned by Nieuwe Matex. The Koningin Wilhelminahaven was municipally owned, and here facilities for general cargo-handling were available. The charges were the same as those for Rotterdam throughout the period 1955-75.

3.1.4. The port of Maassluis.

Only slight improvement in access to the port took place, 1955-75. Initially the port was able to receive small sea-going vessels and coasters up to a maximum size of 500 d.w.t. In 1975 800 ton vessels were able to enter the port due to additional dredging. Extra facilities were provided in the late 1960s for the export of vegetable produce from the port, with the commencement of a container service by Messrs. Waling van Geest. Apart from these developments the port remained much as it was in 1955.

3.1.4.1. Port administration

The port area of Maassluis was exploited by the municipal authority throughout the period.

3.1.5. The port of Hoek van Holland.

The main facilities for sea-ships at this port were the berths alongside the New Waterway (the Railway quay) for the ferry service to the United Kingdom. There were no other special facilities and no port dues were charged. The maximum draft of vessel able to berth at the port increased from around 30 feet in 1955 to 50 feet in 1975 due to the improvements in the New Waterway. The growth of the ferry terminal was the main development at the port during the 1960s, with new facilities for the storage of containers and flats and for other roll-on/roll-off

traffic with the United Kingdom. The latter was initiated in 1968 with the bringing into service of a new passenger roll-on/roll-off ship by the S.M.Z.¹³ in conjunction with British Rail. There was only one harbour basin at the port, the Berghaven, which was accessible only to pleasure craft and small fishing vessels.

3.1.5.1. Port administration.

The administration of this port was in the hands of the Rotterdam municipal port authority.

3.1.6. The port of Dordrecht

There were a number of changes in the physical structure of this port, particularly in the early part of the period. The Oude Maas was deepened in the 1930s, and in 1955 ships of up to 10,000 d.w.t. could reach the port. At this time there was only one main harbour for sea-going vessels, the Zeehaven. In 1958 the port area was enlarged with a second harbour basin, located to the south of the Zeehaven, the Julianahaven. At the same time the Zeehaven was renamed the Wilhelminahaven. Through further dredging of the Oude Maas ships of up to 20,000 d.w.t. were able to enter the port at high tide. The Wilhelminahaven had considerable bulk-handling, warehousing and storage facilities, as well as facilities for general cargo-handling in the western part of the basin. The Julianahaven had a number of private wharves including two sand and gravel jetties and a jetty for the receipt of animal fodder. In addition, a number of engineering and construction firms became established in the port area during the period.

Further development plans drawn up in the 1960s resulted in the damming of the Mallegat (the access channel from the Oude Maas to the

Wilhelmina and Julianahavens), both to the north and the south.

At the same time a new channel was dug through the island at the mouth of the Dordtse Kil opposite the seaport area, enabling direct access from the Oude Maas, adding 150,000 square metres of land to the port area. These various works were completed in the early 1970s. Additional facilities for the storage of ores at the Wilhelminahaven were created during the period, and storage facilities for mineral and liquid chemical products, and later for liquid natural gas, were set up by the Gebroeders Broere N.V.

There was a growth in the number of industrial concerns at the port, particularly in chemicals and oil products, with organizations such as the Verenigde Benzine Maatschppij, Ashland Oil, and I.C.P.A. (an American concern), being established in the 1960s. An new roll-on/roll-off service was started from the port in 1973.

The older port basins at the side of the Oude Maas were exclusively used by barge traffic, and underwent further silting during the period.

3.1.6.1. Port administration.

A number of changes in the administration of the port occurred during this period. Initially, the part of the port which was not under private ownership was exploited by the town of Dordrecht under a separate organization, the 'Naamloze Vennootschap tot exploitatie der Dordrechtse Haveninrichting'. In 1967 this organization went into liquidation and passed into private hands with the creation of the 'Zeehavenbedrijf Dordrecht N.V.', but the Dordrecht town council remained responsible for any improvement schemes at the port. Up to 1965 the port had its own charges, but in that year agreement was reached with the other New Waterway ports to adopt uniform harbour dues. This was initially disadvantageous

to the port, since it resulted in a 20% increase in the port's charges.

3.1.7. The port of Zwijndrecht.

No improvements of any note took place at Zwijndrecht, although the port benefited from the deepening of the Oude Maas. All the quayage was privately owned, mainly by the Unilever oil processing plant. There were no harbour basins.

3.2. The North Sea Canal ports

3.2.1. The port of Amsterdam

There were a number of improvements and developments at this port over the period, including important major improvements prior to 1955: the opening of the Amsterdam-Rhine Canal and the developments of a number of new basins in the early 1950s (e.g. Mercuriushaven, Jan van Riebeeckhaven, Sonthaven).

3.2.1.1. The approach channel.

Whereas in 1955 the depth of the North Sea Canal was sufficient to accommodate some of the largest ships of the time, by the early 1960s this was no longer the case. In addition the entrance to the Canal at IJmuiden was proving inadequate for ships entering the port of Amsterdam, despite the foresight of planners at the beginning of the century when the Noordersluis (northern lock) was built to accommodate ships up to 100,000 d.w.t., although the North Sea Canal was too shallow and narrow for ships over 40,000 d.w.t. Consequently during the period 1955-75 the North Sea Canal was deepened from 41 to 49 feet. The improvement work was begun in 1962 and completed in 1975, incorporating not only

a deepening but also a widening of the Canal. Between 1960 and 1967 work was carried out on a new harbour mouth at IJmuiden and a deepening of the seaward approach route. This resulted in ships of 85,000 d.w.t. fully laden being able to enter the port of Amsterdam. In addition, the waterway connecting the port to the Rhine was improved from 1967 onwards, with new locks completed in 1974 and 1975, enabling the largest push-tow barge units to reach the port.

3.2.1.2. The port area.

Expansion at Amsterdam resulted in the growth from 3,750 acres in 1955 to 6,900 acres in 1975. The main harbours to be opened in the early part of the period were the Usselinxhaven, the Carl Reinierszoonhaven, and the Zwaardcroonhaven (1956-58). Between 1959 and 1961 the Westhaven was lengthened, and the Suezhaven, Bosporushaven, Sonthaven, Beringhaven, and Hornhaven were dug. In 1960 the Adenhaven was also dug in the vicinity of the Jan van Riebeeckhaven.

The last major harbour building phase at the port was 1963-68, when the Amerika and Australiëhavens were developed. Apart from this there was some reclamation of the older port areas to create additional land space, such as in 1970 at the Coenhaven and the reconstruction of the Houthaven which was still under way in 1975. There was also some improvement made in access to the port area, with the construction of the IJ and Coen tunnels in the 1960s.

3.2.1.3. Developments in cargo-handling and industrialization.

There was considerable development at the port in the general cargo-handling sectors and in the bulk handling of oil, grain and ore. In 1956 the Overslag Bedrijf Amsterdam (O.B.A.) began operations at the

Westhaven primarily concerned with the bulk handling of ore imports. In 1959 an extension of the organization resulted in additional handling of phosphates and coal. The Benzine en Petroleum Handelsmaatschappij (Shell), which had storage facilities for mineral oil in the east of the port, built additional storage facilities for this product at the Jan van Riebeeckhaven in the late 1950s, at a site able to receive larger vessels. In the Usselincxhaven Comos N.V. (oil storage) was set up in 1960, followed by Amatex (vegetable and animal fat storage). Also in 1960 a wood-handling firm was given permission to rent an area in the Carl Reinierszoonhaven. Here, too, the Anthracite Handelsvereniging began importing coal for household consumption in 1961. In the same year at the Vlothaven the Internationale Graan Overslag Maatschappij Amsterdam (I.G.M.A.) began operations, with redistribution of grains from the United States and Canada to the United Kingdom. Blauwhoed (later Pakhoed) built a large general cargo warehouse at the same time at the Vlothaven. To the east of the Westhaven a start was made on a new redistribution and groupage centre for goods travelling to and from the port by road, rail and inland waterways (Vervoerscentrum) in 1960, which was not officially opened until 1970.

With the advent of containers and other forms of unitized transport in the 1960s, and new techniques in roll-on/roll-off, a number of general cargo-handling firms in the port of Amsterdam adopted these new methods. The Verenigde Cargadoors Kantoor (V.C.K.), which represented a number of Scandinavian interests in the port of Amsterdam and was previously concerned with the handling of wood at the Houtveemhaven and Vlothaven, began a pioneer roll-on/roll-off service in 1965 from the Coenhaven. The area had considerable potential for the storage of containers and parking space for lorries and trailers. In 1966 this new terminal was

officially opened with a service by the Tor line to Immingham and Göteborg. In the same year Container Terminals Amsterdam (C.T.A.), a joint operation by a number of leading stevedores and terminal operators at the port, opened a terminal at the Westhaven, making the port of Amsterdam the first port in western Europe to have an establishment equipped entirely for the handling of containers.

In 1968 a regular container service to the United Kingdom (Felixstowe) was begun from the terminal. In addition the handling of new cars and other unitized loads became a feature of the C.T.A. which had started out specializing in container units.

A major event in the industrial geography of the port occurred in 1968, when the Mobil oil refinery was opened at the newly dug Amerika-haven. Prior to this, the oil and chemical sector at the port remained underdeveloped, particularly in comparison with Rotterdam, despite fairly extensive provision of oil storage facilities. With the establishment of a refinery at the port it was hoped that this would provide the impetus for a petro-chemical complex in the area. Expectations were disappointed, however, and although some extra trade was attracted to the port by the refinery, the bulk of the increase in trade went to nearby Rotterdam, whence crude oil was imported and sent by pipeline to the Amsterdam refinery.

Industrial growth at the port after the location of the refinery was disappointing, and the only other new company to become located in the area was Oiltanking IJmond B.V., which completed a tank park in 1975.

There was expansion by existing concerns, however, especially in the container and roll-on/roll-off facilities. From 1973-75 C.T.A. expanded with a new ro/ro terminal and an increase in the length of wharfage at its disposal. In 1975 V.C.K. built a second freight and passenger terminal,

Scandia Ferry Terminal, in the Suezhaven for use by the Tor line, leaving the existing Coen Terminal to be used by Fred Olsen and Bergen lines. In the same year a new molasses terminal (Tradax) was constructed at the Westhaven.

Expansion also took place in the bulk-handling sector, with an important extension in 1975 of the O.B.A., with additional loading facilities for coal, wagon-loading installations for ore and coal, and other improvements. The handling of cargo, despite the increase in the industrialization of the port 1955-75, remained, in contrast to Rotterdam, the predominant user of port land, with considerable growth in the bulk-handling of ores, coal and grain, the development of roll-on/roll-off terminals and container facilities, and increased storage facilities for mineral oils.

3.2.1.4. Port Administration

The Havenbedrijf Amsterdam, a municipal body, was responsible for the administration of the port, with overall responsibility for the port resting with the Mayor and Corporation of Amsterdam. Prior to 1973 the body responsible for the day-to-day running was the Havendienst, which was amalgamated in that year with the Nautisch en Weerkundig Instituut to form the Havenbedrijf. In contrast to Rotterdam, although the Havenbedrijf collects dues it is not responsible for losses, which are born by the municipal authority, and could not be purchased for private use at the port.

3.2.2. The port of Zaandam

Improvements to the North Sea Canal and the IJmuiden entrance during the 1960s had little effect on the port as it was unable to receive

large sea-ships; in 1955 the port was accessible to ships of maximum 14 feet draught (3-4,000 d.w.t.). As was noted in chapter 1 (section 3.3.2), the Nieuwe Zeehaven was a failure due to rapid silting, so that the area was eventually sold to Bruynzeel as a location for its furniture factories, and was not used by sea-ships between 1955 and 1975. The Oude Zeehaven remained the main harbour for off-loading of sea-ships. Following improvements to the North Sea Canal and developments at neighbouring Amsterdam, however, plans were drawn up in the 1960s to enable access for larger sea-ships to the port of Zaandam, in the form of a new outer harbour basin to the south-east of the existing main port area, the Isaac Baarthaven. This was completed in the early 1970s. Two new timber terminals were opened at this harbour, which was built to receive timber ships of up to 18,000 d.w.t.(33 foot draught). At the same time, space became available in the Oude Haven on land formerly used for the import of wood for two berths which could be used for roll-on/roll-off traffic. There was an influx in the vicinity of the port of light engineering works with the improved communications with Amsterdam following the opening of the Coen Tunnel in the 1960s.

3.2.2.1. Port administration

The local authority of Zaandam was responsible for the management of the port (gemeente Zaanstad). Most of the port area was in private hands, however, particularly by woodworking and related industries. Throughout the period the charges remained the same as at Amsterdam.

3.2.3. The port of IJmuiden

In 1955 this port could admit vessels of up to 25,000 d.w.t. to the outer harbour (the entrance to the North Sea Canal), which included the

largest bulk carriers of the time. The maximum size of vessel offloading at the integrated iron and steelworks, however, was 20,000 d.w.t. (28 feet draught).

The most important development at IJmuiden was the construction of a new harbour mouth to enable better access for large ships travelling to Amsterdam, begun in 1960. New north and south piers were constructed and the approach channel deepened to allow access to ships of 85,000 d.w.t., fully laden, by 1967. By further dredging, the port of IJmuiden became accessible to 100,000 ton bulk carriers by 1975, which could be berthed at a new quay in the Outer Harbour (Buitenhaven), quay 2, for the offloading of ore. Quay 3, which was also taken into use in the 1960s, was used for loading steel products from the iron and steelworks into ships of maximum 35,000 d.w.t. The inner harbours (Rijksbinnenhaven 1 and 2, formerly East and West) and the Staalhaven remained accessible to small coasters and barge traffic mainly, although in the 2nd Rijksbinnenhaven small sea-ships up to 6,000 d.w.t. (19 feet draught) could enter. In the late 1960s a third inner harbour was constructed, the Derde Rijksbinnenhaven, constructed for the handling of some general cargo and loading and discharging of raw materials from small sea-going vessels of 6,000 d.w.t. This new inner harbour, and the reconstruction of quays 2 and 3 in the outer harbour to accommodate larger vessels, constituted the main development during the period, and was connected to the needs of the main port user, Hoogovens, which underwent a considerable expansion in size, particularly during the 1960s. Development of this industry and expansion was especially marked following the production agreement in 1966 with Hoechst A.G. of Dortmund, culminating in the merger to form the Estel group in 1972. Amongst others, a new pelletizing plant and an oxygen steelworks were constructed. Expansion of the IJmuiden site

followed the decision by the company not to invest in a new site at Rotterdam-Europoort in the early 1960s or to go ahead with a Maasvlakte site together with Hoechst in 1970. Otherwise the industrial geography at the port of IJmuiden remained much the same as in 1955. Plans were drawn up in 1964 for a possible crude oil pipeline from IJmuiden to supply the Mobil oil refinery, but were rejected in favour of the Europoort location where the largest crude oil carriers could be received.

3.2.3.1. Port administration.

IJmuiden was the only port in the Netherlands to be classified as a state port, administered by the harbour-master for the North Sea Canal appointed by the state. In practice most of the harbour area was in the hands of private enterprise. All the quayage in the Outer Harbour was the property of Hoogovens (Estel), but ships calling here were required to pay harbour dues. The state administered the southern fishing harbours and provided facilities for general cargo at the 2nd and 3rd Rijksbinnenhavens. Along the first Rijksbinnenhaven the coal yard, ammonia plant and cement works owned their own installations for loading and discharging. There was no change in the administrative structure at the port over the period 1955-75. Harbour dues payable were not in line with those at Amsterdam, in contrast to Zaandam.

3.3. The northern ports

The northern ports showed stagnation and decline over the period 1955-75, with the exception of the port of Delfzijl, which through government regional policy benefited from development-area status from the early 1950s.

3.3.1. The port of Delfzijl.

Two major events occurred in the 1950s to transform the character of this port. The first was the reorganization of the port as a development centre in the government's new regional policy in 1952. The second was the discovery of a large salt deposit in the early 1950s near Winschoten, which led to the decision in 1957 by the Koninklijke Nederlandse Soda Industrie N.V. (K.N.S.I.) to invest in a factory at Delfzijl with access to sea-water for the export of salt. The factory was opened in 1958, manufacturing chlorine, soda and caustic soda. The existing port was inadequate to meet the needs of this industry, since the area available for industry was already occupied by such concerns as F.A. Karton-Boardexport N.V. at the Handelshaven (the main cargo-handling area in 1955). As a consequence, with the aid of the development funds available, the eastern pier was lengthened to include the new lock complex under construction for the Eemskanaal (opened 1959), thus releasing additional land to the south on which the K.N.S.I. factory was built. The factory was served by a pipeline connection with Winschoten for its raw material. A few years later, the A.K.U. (Algemeene Kunstzijde Unie) purchased a neighbouring site, attracted by the development area incentives, setting up a chemical works. This plant needed a connection to inland waterways and this led to the lengthening of the new inner harbour (in existence since the construction of the new entrance to the Eemskanaal) in an easterly direction. The A.K.U. plant began with the production of D.M.T. for the polyester works at Emmen, using paraxyleen imported from the United Kingdom in 1962. In the late 1960s K.N.S.I. and A.K.U. were merged into the A.K.Z.O. Combine. Soon after the arrival of A.K.U. an American firm, Upjohn, began the manufacture of

of polymers nearby. This was part of a general proliferation of firms operating in the chemical sector at the port in the 1960s, following the A.K.U. investment decision. This included a methanol factory and an alcohol production unit (a joint venture between A.K.U. and D.S.M.).

The last major industry to become established at the port was an enterprise set up by a combination of Alu-Suisse, Hoogovens, and Shell, ALDEL (Aluminium Delfzijl). Again the major factor in the location decision was the incentives available under development area status. In particular, the decision reached by the government in 1962 that industries establishing in the three northern provinces of the Netherlands should have cheaper gas supplies (including indirect users, e.g. the electricity generating station at Groningen which went over to natural gas from coal in 1963), was beneficial to this industry. The aluminium smelter was thus provided with cheap, abundant electricity supplies. Before the smelter could be constructed, however, a further extension of the eastern pier was necessary to provide additional land. The pier was again lengthened in 1964 and the smelter was completed in 1966, receiving anodes by rail from the Botlek area in Rotterdam (Alu-Chemie).

With this development the land available for industrial use at the port of Delfzijl was exhausted. As a result further development was sought elsewhere, and in 1970 a start was made on a new industrial seaport complex at Eemshaven, fifteen kilometers seaward of Delfzijl. In addition, a new harbour entrance was created to the east of the existing port, to enable easier access for sea-ships serving the industries (particularly A.K.Z.O.). At the same time the access route to the port was deepened using a costly dredging operation. Prior to the opening of the new harbour

entrance access was limited to ships of maximum 10,000 d.w.t. By 1975 ships of 18,000 d.w.t. (33 feet draught) could reach the port, the largest ships mooring at the jetties of the A.K.Z.O. chemical works.

The Eemshaven area, for which plans had existed in the 1950s and which were put into more concrete terms in the 'Eemshaven rapport' of 1964 and 1967,¹⁴ was destined ultimately to receive ships of 80,000 d.w.t. The area was planned as an industrial area and it was hoped that especially the oil and petro-chemical industries would be attracted to the site, and that a development would take place similar to that of Rotterdam-Europoort. It was also felt likely that, with the decision not to invest at Rotterdam, Hoogovens-Hoechst (Estel) would consider making an investment at Delfzijl, if the land was available. Unfortunately this was not to be, and in 1975 only a power station had appeared in the Eemshaven area, although the port of Eemshaven was already accessible to ships of 25,000 d.w.t. and could easily be deepened for larger ships if the need arose. Negotiations with other industrial concerns did take place, but bore little fruit in a time when recession and consolidation was the main feature of the Dutch economy.

Finally there was also an increase in the handling of general cargo from the port, with new freight forwarders beginning operations from the port, such as Veem and Factor in 1959.

The result of these developments was an increase in the size of the port of Delfzijl from 80 hectares in 1958 to 1,400 hectares in 1975. Of this, over half (850 hectares) was land available for industrial use at the Eemshaven.

3.3.1.1. Port administration.

Prior to 1958 the administration of the port of Delfzijl was alternately in the hands of the state and of the province of Groningen. In the post-war period, Delfzijl had been a state-owned port, but was exploited by a provincial 'havenbedrijf'. The ground on which the K.N.S.I. wished to build was owned by the local authority of Delfzijl (Gemeente Delfzijl). For the expansion of the port, therefore, co-operation between these three authorities was a logical requirement. On the 1st January 1958 the Havenschap Delfzijl was set up, being the first organization of this kind in the Netherlands. The state, province and local authority participated in the 'Havenschap' on a 50:30:20 basis. In 1971 a major extension of the area of authority of the 'Havenschap' was made to include the new Eemshaven area. The 'Havenschap' owned and exploited a general-cargo quay in the Handelshaven and in the Jachthaven (668 metres length). Most of the rest of the occupied area of the port of Delfzijl was in the private ownership of the industries located there: most of these had jetties for the import and export of raw materials and semi-finished or finished products used or produced by the industry in question. No dues were payable unless the firms themselves levied a charge. Of the quayage in the outer harbour (western side mainly) the only private quay was that of Wagenborg B.V. (cargo-handling).

3.3.2. The port of Groningen.

The small seaport of Groningen offered in 1955 accommodation for ships up to a maximum size of 750-800 d.w.t. at the Oosterhaven, accessible through the Eemshaven Canal from Delfzijl. In 1954, however,

important modernization works were started on the Eemshavenkanaal, which were eventually completed in 1967, and by 1975 the improvements to the port's link with the sea had been such that sea-ships of up to 1,500 d.w.t. could reach the port. In connection with the Eemshavenkanaal improvements a series of new harbours destined for sea-ships were dug in the early 1960s, namely the Finsehaven, Zweedsehaven, Hanzehaven (later called the Deensehaven) and the Eemshaven, which was completed in 1966. Only the latter, however, was extensively used by sea-ships in 1975: in fact, due to a careless policy of selling land in the new harbour area to any industrial clients, irrespective of their need to be located with water access or not, some of these harbours were never used by sea-ships or by inland waterway craft. New industries located in the area included Heineken, a wood importing firm, and an importer of Russian cars located at the Finsehaven. At the Eemshaven timber and other general cargo were handled, and this is where most of the cargo-handling at the port of Groningen took place, alongside the Eemskanaal. Initially cars were also imported by the Russian importer located at the Finsehaven, but the opening of a new factory elsewhere in 1975 resulted in the falling away of this trade, and parts and assemblies were supplied by rail.

3.3.2.1. Port administration

This remained the responsibility of the Sanitation, Market and Ports Division of the local authority (Gemeentelijke Reinigingsbedrijf, Markten Havenwezen). With the opening of a new office in the 1960s in the new port area, slightly more autonomy was given to the Havenbedrijf Groningen which operated under the above-mentioned authority. The Eemshaven and the Oosterhaven in the old port were the main areas operated

by the Havenbedrijf; in the latter, however, there were also private grain storage facilities and warehouses, whereas the whole of the Eemshaven (renamed Hunzehaven in 1975) was owned by the local authority, which provided warehouse facilities on lease, and several cranes.

3.3.3. The port of Harlingen

Although there was no extension of the port and little change in the facilities offered over the period 1955-75, a port extension at the north end of the port had been started in 1975 with a new industrial area and a roll-on/roll-off harbour which would eventually add 100 hectares to the existing port area. The main port basins of the Wilhelmshaven and Nieuwe Willems haven saw little change, with the largest ship size being 1,500 d.w.t. able to load and offload in the southern quay of the Nieuwe Willems haven. This was also due to the shallow access across the Stortemelk to the port of Harlingen, which made any improvement in depth a very costly exercise. The port had no industrial function, since industries were situated in the town and only cargo-handling firms and facilities were situated in the immediate port area. The port was initially an important base for regular liner sailings to the United Kingdom, but this underwent a considerable decline over the period 1955-75, particularly in the 1960s.

3.3.3.1. Port administration

The operation of this port and the provision of the cargo-handling facilities was the responsibility of the local authority's department of markets and ports, throughout the period.

3.4. The Schelde ports

There was considerable physical development of both Schelde ports over this period, matching the high growth rates of these ports over the period 1955-75.

3.4.1. The port of Terneuzen

In 1955 the port was accessible to ships of 15,000 d.w.t. through the Ghent-Terneuzen ship canal. Apart from a considerable transit trade to the Belgian hinterland, the trade of the port was almost entirely directed towards the main industries located here. In 1955 most of these were situated in the Sas van Ghent area near the Belgian border, including a glass factory, sugar factory and flour mill dating from the early part of the century, and a superphosphate plant (Zuid-Chemie), a starch and glucose factory, and a warehouse for textile products of later date. At Sluiskil the N.S.M. (Nederlandse Stikstof Maatschappij) was engaged in the manufacture of nitrogenous fertilizers, and a coking factory had been located here in the early 1900s (A.Cz. de Carbonization G.A.).

The second main impulse for industrialization occurred after the inclusion of Zeeuws Vlaanderen in the government's regional policy and the designation of Terneuzen as a primary development node in 1959. In the following year another important decision affected the development of the port, when agreement was reached between the Belgian and Dutch governments on the improvement of the Ghent-Terneuzen Canal. The Belgians would pay 80% of the improvement costs and the Dutch 20%. Consequently the canal was widened and deepened to allow access to ships of up to 60,000 d.w.t. (41 feet draught), the major works being completed by 1968. The enlargement of the canal led to improvements in

the harbours to the side of the canal at Terneuzen, with the deepening of the Noorderkanaalhaven and the extension of the Zuiderkanaalhaven. In addition two new harbours were dug, the Massagoedhaven and the ro-ro haven, which were completed in the early 1970s and were located between the Zuider- and the Zevenaarhavens. As at Delfzijl, a number of industries were attracted to the port with the benefits of development area status as an important location factor. In 1961 Meterfabriek Dordrecht (now Excelsior Tornado B.V.) and Philips invested at the port, but the most important investment decision was that of DOW Chemicals B.V., a petro-chemical industry which began production in the western part of the port in 1965. In the following year a pipeline for the movement of ethylene was completed between this concern and the Shell Pernis refinery at Rotterdam, and in 1968 between the Shell chemical plant at Moerdijk and DOW Terneuzen, with the movement of ethylene and propylene. A jetty was built for ships of 22,000 d.w.t., moving products to and from the concern. The DOW plant at Terneuzen took up 85% of the industrial terrain at the port. Naptha to be reworked at the plant was initially imported by sea-ship but after the establishment of a new refinery at Vlissingen in the 1970s a pipeline linked the refinery to the plant at Terneuzen which provided most of the naptha requirement. Soon after the location of the DOW concern, Air Products were established on a nearby site, producing industrial gases.

In 1971 the province of Zeeland, including Zeeuws Vlaanderen, lost its development area status and from this date no further industrial investment was made. By 1975 most of the existing industrial area had been occupied. However, plans were underway for a second ro-ro terminal at the Zevenaarhaven and a new harbour (the Braakmanhaven) with direct access to the Westerschelde in the west, able to receive larger bulk carriers.

3.4.1.1. Port administration

Prior to 1971 the port of Terneuzen was owned and administered by the state, along with the Ghent-Terneuzen Canal. New developments at the port in the 1960s, however, demanded a closer form of co-operation between state, province and local authority, and therefore in 1971 the Havenschap Terneuzen was set up. The state had a 40% interest and the province and authority each around 28%. There were nine members of the Havenschap, three representing the government, two the province, two the Gemeente Terneuzen and one the Gemeente Sas van Ghent. Most of the industries at the port owned their own land and facilities for off-loading sea-ships.

3.4.2. The port of Vlissingen

Port development at Vlissingen was considerable, especially in the latter part of the period, both with regard to infrastructure and facilities and the location of new industries. In 1955, ships of 18,000 d.w.t. could be received in the Buitenhaven, with smaller vessels entering the inner port area behind the lock gates.

Apart from the bunkering of sea-ships, the activities of the ship-building and repair firm 'De Schelde' were important to the port. Repairs could not be carried out to vessels in excess of 35,000 d.w.t., due to depth limitations, and this became an important handicap for this firm during the 1950s, so that it began to seek a location elsewhere where deeper water access was available. Also of note was the N.V. Haven van Vlissingen, which exploited much of the wharfage in the Buitenhaven and was a limited company in which considerable town interests were involved, including members of the local authority.

In 1953 the breaching of the dykes in Zeeland and the serious flooding

which occurred led to reclamation plans for the Sloe area to the east of Vlissingen, in accordance with the Delta plan's sea defence works. The question arose as to the designation of the area of land so created, and initially this land was designated for agricultural use. However, with the backing of the 'De Schelde' company which sought a new location, a plan was proposed to develop a repair yard with deep water frontage onto the Westerschelde at the site. This plan was supported by the province, since the extension of this company would create additional employment and might lead to the establishment of an industrial sea-port complex. As a result, work was started on a new harbour in 1961 in the Sloe district, the Sloehaven, which was officially opened in 1964. The new 'De Schelde' yard, 'Scheldepoort' was opened in the same year.

The designation of Vlissingen as a development area in 1965 resulted in the location becoming especially attractive to new industries, although the extent of the area available for industrial development was not known until 1968 when the regional plan for Zeeland was accepted, and the Sloe area, known as Vlissingen-Oost (to avoid confusion with the word 'slow') was officially allocated 1,200 hectares. In 1967 and 1968 the Sloehaven was extended by the Van Cittershaven in an easterly direction, the whole area having a depth of 41 feet so that ships of 60,000 d.w.t. could reach the new harbour. In 1970 a further harbour, the Krayeerhaven, was dug to facilitate the manoeuvring of ships, and between 1971 and 1972 the Van Cittershaven was lengthened further.

Industrialization was rapid from 1965 onwards. Prior to this date industrial activity in the area had been disappointing, with a small Japanese car-importing firm opening in the Sloe area but soon ceasing operations. The first major investment to follow that of the 'De Schelde'

was Billiton M & T Chemicals (later the wholly American owned M & T International), which began operations in 1967 producing agricultural fungicides, stabilizers and biochemicals. In the following year Hoechst Holland N.V. opened the first phosphor oven at the Sloehaven, benefiting from capital subsidies and cheaper fuel available under the development scheme for the region. In 1972 the firm opened a factory for the production of D.M.T. (raw material for Trevira, synthetic fibres). Hoechst needed a great deal of energy so that a conventional power station was opened in 1969, followed in 1973 by an atomic reactor at Borssele. The availability of this energy supply was one of the major reasons for the location decision by the French Aluminium concern, Pechiney, which became established in the area in 1969. This decision was made after agreement was reached with the electricity board (P.Z.E.M.) to provide low-cost energy for the aluminium smelter. In 1971 the first electro-smelters began operations, importing raw materials needed at their own quay in the Van Cittershaven.

In 1971, N.V. Haven van Vlissingen began cargo-handling operations at Vlissingen-Oost with the transit of Australian wool. On a neighbouring area, the fork-lift concern Big-Lift was established in 1971, and Alleghany Warehousing Europe B.V. began operations in 1973, with the transit of tobacco to other European destinations. Also in 1973 Deka Transport B.V. was established in the area behind the municipal quay, followed by De Feyter and N.A.P.M. (offshore pipelines) in 1974. The last major industry to locate in the new port area was a Total oil refinery (Compagnie Française de Petroles), which was opened in 1974. This industry was also the last industry at Vlissingen to benefit from the regional investment incentives as these were withdrawn in 1971. To supply the refinery a pipeline to Rotterdam was built, connecting

with the Rotterdam-Antwerp crude pipeline. Some use was also made of small tankers for importing crude oil and exporting oil-products, especially before the pipeline was opened. The refinery was also connected by an oil-product pipeline to the DOW chemical plant at Terneuzen.

In the older part of the port, the only major industry added during the period was a sand and gravel grading and sorting works, opened at the Buitenhaven in 1971. A new roll-on/roll-off service to the United Kingdom was begun from the Buitenhaven in 1974.

3.4.2.1. Port administration

Prior to 1971 the administration of the older port areas was the responsibility of N.V. Haven van Vlissingen, a limited company. This company was set up in 1933, but was only responsible for the exploitation and provision of superstructure at the port, and the collection of dues. The construction of harbours costs and maintenance costs was the responsibility of the state.

With the development of the Sloehaven area close co-operation was needed between the state (developing the area in accordance with the Delta-plan), the province, which was concerned with the industrial development of Zeeland, and local authorities. To administer the new port area a 'Havenschap Vlissingen' was set up, and came into operation on 1st February 1971. In the act establishing this authority, a clause¹⁵ was included which provided that the N.V. Haven van Vlissingen, would cease to manage and exploit the old port area of Vlissingen within two years of the establishment of the 'Havenschap'. This did not come about, due to the invested interests in the N.V. Haven van Vlissingen, some of which were represented in the Havenschap. In 1975,

therefore, there was in fact a dual administration system at the port of Vlissingen. The old port areas were administered by the N.V. Haven van Vlissingen, which collected the dues payable from this area, while the Havenschap Vlissingen was responsible for the maintenance of the old port area, this function having previously been undertaken by the state. The new area of Vlissingen Oost was entirely under the jurisdiction of the 'Havenschap', which collected any dues payable. Most of the industrial land in Vlissingen-Oost was in the private ownership of the various industries concerned, which also provided their own facilities for sea-ships, with the exception of M & T International, which leased the land from the 'Havenschap'. The 'Havenschap' provided a general cargo-handling quay at the Sloehaven (Sloekade) with cranes and other facilities, behind which was a container terminal and roll-on/roll-off facilities of the N.V. Haven van Vlissingen, which leased the land from the 'Havenschap'. The 'duality' of the Port Administration at Vlissingen resulted in an unhealthy competition between the two port areas, the old and the new, resulting e.g. in the negotiations between the Olau Company (Danish ferry company) and the 'Havenschap' and N.V. Haven van Vlissingen concerning a new roll-on/roll-off terminal. The company finally opted for a location in the old port area. The Havenschap Vlissingen consisted of four representatives of the government, two from the provincial authority, two from the municipality of Borssele (on whose ground the Total oil refinery and P.Z.E.M. power station were located) and two representatives of the municipality of Vlissingen.

The total development of the port over the period 1955-75 was such that the port area was increased from 145 hectares at the start of the period to 2,377 hectares at the end of it.

3.5. The port of Scheveningen

Scheveningen's trade activities were very limited up to 1960 when it was mainly noted for its activities in the fishery sector. In this year a regular service to the United Kingdom, exporting agricultural products from the 'Westland' area in small coasters, was set up by the Norfolk Line. In 1969 the service was considerably augmented by the inauguration of a roll-on/roll-off ferry service from Scheveningen by the same company. Initially, the port consisted of three harbours, the Buitenhaven and the Eerste and Tweede Havens. In 1973 a fourth harbour was opened, the Derde Haven, for the benefit of the main user of the port, the Norfolk Line, and the roll-on/roll-off service was moved from the Eerste to the Derde Haven.

The maximum size of vessel able to enter the port in 1975 was around 1,500 d.w.t. fully laden (17 feet draught). Hinterland connections by road were excellent, but the port had no rail connection.

3.5.1. Port administration.

The port of Scheveningen was administered by the Hague municipal authority, through the department for harbours and markets (Gemeentelijke Dienst van Havens en Marktwezen, 's-Gravenhage).

4. The effect of new facilities on total trade flows through individual Dutch ports, 1955-75.

In the following section the development of total trade flows over the Dutch port range (as described in Chapter 2) will be further considered in order to examine to what extent these changes can be explained by the changes in the physical structure at the ports, as described in the

preceding section. The analysis of the ports under four main groupings is maintained, and as in the commodity surveys of previous chapters a division of the period 1955-75 in quinquennial periods is adopted.

When discussing changes in trade and the provision of new industries and facilities, reference is made to 'internal' and 'external' factors influencing trade, and therefore a closer definition of this is necessary.

- Internal influences

These are factors within the port area that affect trade, e.g. new harbour basins and other port infrastructure, new facilities provided by port authorities or other private organizations (super-structure), and the establishment of industries at, or near, sea-water berths enabling import and export in sea-ships to take place.

- External factors

These may be defined as all influences on trade which are external to the port area, for example changes in demand and supply in both the hinterland and the foreland, changes in maritime technology especially relating to ship size, changes in world-wide commodity flow compositions, and the influence of changes at other ports in the range on trade at a port, both on a national and international level. A very great number of external influences operates in determining port flows, and it is exceedingly difficult to isolate these factors: often they have an indirect effect on 'internal' forces operating in the port. Nevertheless, the concept is a useful one in analysing changes in trade through a port over a period of time and the effect of port development on these flows.

4.1. The New Waterway ports.

As seen from the previous section, the development of the port of Rotterdam far outshadowed the development of the other New Waterway ports over the period 1955-75, although there were also substantial improvements at the port of Dordrecht. Development at other ports was stagnant or was limited to improvements in superstructure. With the exception of Hoek van Holland, where the activities of a regular ferry service and abnormal imports of sand were important, the greatest increases in trade were recorded at the ports of Dordrecht and Rotterdam.

4.1.1. The port of Rotterdam.

4.1.1.1. 1955-60

Total trade over this period stagnated in terms of volume passing through the port, and as was pointed out earlier (chapter 2, section 5.4.1.1.1.), this was mainly due to the fall in the transit of coal. The development of Europoort was begun during this period, though the first use of this new area was not made until 1960. Industrial development of the Botlek continued, and there was growth especially in the oil sector with the opening of the new Esso refinery in 1960, and the continued increase in import of oil and trade in oil products tended to offset the negative effect of the decline in the coal trade. Increase in the chemical sector led to the growth in group 8, although this remained a relatively small part of port trade, growth coinciding with the establishment of DOW Chemicals in 1955 at Botlek and other concerns such as Ketjen and Zoutchemie in the late 1950s.

Other developments in the trade of Rotterdam over the period 1955-60 cannot be linked with any developments at the port. As already mentioned, this was true for the movement of coal, influenced by factors

external to the port. The increase in the trade in ores was also mainly due to external influences, as were the developments in grain, animal feedstuffs and other commodities. The major changes in trade through the port during this period took place mainly as a result of external developments and the internal development of the port had only a slight effect, primarily on trade in oil and oil products and chemicals.

4.1.1.2. 1960-65

It was during this period that the development of Europoort and the industrialization of the port first made its impact on trade flows,¹⁶ with the first ship entering the port in 1960 to offload at the new Shell terminal, and the opening of the first crude oil pipeline to the Ruhr area from Europoort soon after. Together with the opening of Rotterdam's third refinery in Botlek in 1960, the absolute increase in the trade in oil and oil products (group 3) over this period is not difficult to explain. Nevertheless, as noted in Chapter 2, the relative significance to the port of the oil trade actually declined over this period, suggesting faster growth rates in other commodities and a delay in the full impact of the opening of the Europoort area.

The main increase in other commodities, such as group 6, were related mainly to external factors, although in this case the opening of a cement factory in 1964 in Europoort augmented the increase, which was mainly in transit outwards from the hinterland. Again, as in the period 1955-60, the growth in the relative share of ore (group 4) was largely a result of external factors and not related to the provision of any new facilities at the port. Nevertheless, the deepening of the New Waterway during the period in relation to the Europoort works enabled larger bulk

ore vessels to enter the port, although the depth in the main ore harbour, Waalhaven, remained limited to ore vessels of 20 - 30,000 d.w.t.

Of the commodities passing through the port during this period, some of the most rapid growth was recorded by the chemical trade (group 8), and this was a direct result of the establishment of a number of industries, particularly in the petro-chemical sector, in the Botlek and Europoort areas over the period 1960-65. This included I.C.I. and Aluchemie. There was also a relative increase in trade in group 1 over the period, which coincided with the opening of the Nieuwe Matex vegetable oil storage plant in the Botlek.

There was a relative decline in all other commodities passing through the port.

4.1.1.3. 1965-70

Total trade through the port showed a sharp rise, especially from 1968 onwards. A dramatic increase in trade in oil was the main reason for this, and the relative share of this group increased to almost two-thirds of the total port trade. Developments in the oil industry at the port were closely linked to the increased trade. Two new refineries began operation over the period, Gulf Oil in 1965 and B.P. in 1967. The sharp increase in trade after 1967-68 was a result of the decision by the major existing oil companies at the port (Shell, Esso, Chevron) to expand activities following the decision to substantially deepen the approach channel for large oil tankers. As a result the capacity of refineries in the Rotterdam port area increased over the period 1965-70 from 32 million tons per annum to 73.5 million tons. This resulted in a rapid rise in imports of crude oil which was supplemented by new pipelines to the Ruhr and to Amsterdam (Mobil).

The relative share of all other commodities at the port declined with the exception of group 8 (chemical products). The expansion of the chemical sector at the port was continuous and a number of new industries in this sector began operations at this time, amongst others Climax Molybdenum, Esso-chemie, Konam N.V., Alcoa, a chemical complex next to the Gulf refinery, I.C.I. Europoort, and Zoutchemie. Most of these developments were in the petro-chemical sector.

A surprising feature, in view of developments in facilities for the handling of general cargo, was perhaps that trade in group 9 (finished manufactures) showed only a slow growth 1965-70. The opening of the E.C.T. terminal also had little effect on trade figures in 1967. During the period, new roll-on/roll-off services (Bell Lines, Seinehaven, North Sea Ferries, Beneluxhaven), as well as developments at the Waalhaven (for example the Unit Centre owned by S.H.V.) and Eemshaven gave rise to an expectation of increased general cargo trade beyond the slow growth recorded by group 9.

4.1.1.4. 1970-75

Growth in oil trade was less spectacular during this time, but the growth in total trade continued with slight interruptions 1970-71 and 1973-74 as a result of the oil crisis. Rapid growth in oil trade up to 1973 continued with the opening of the Rotterdam-Antwerp pipeline, new storage facilities on the Maasvlakte, and the completion of the improved entrance to the Waterway (Eurogeul). After this period, however, the oil crisis and general world recession resulted in excess refinery capacity at the port and a reduction in oil imports. Few refineries were operating at full capacity in 1975. The net effect of these movements was stagnation in the relative share of this commodity in the total trade passing through the port.

Of the other commodity groups, the largest increase in relative share was recorded by group 0, mainly due to an increase in the grain trade. This was facilitated by the opening of a new grain-handling concern at the Beneluxhaven in 1971/2 (Bunge N.V.) and the extension of the G.E.M.'s terminal in the Botlek area. There was also a recovery in the ore trade through the port, which had declined in 1965-70, assisted by new handling facilities coming into operation, such as the German 'Ertsoverslag Bedrijf Europoort' in 1970, and a new bulk ore and coal handling terminal on the Maasvlakte in 1973. There was only a slight absolute increase in coal, despite the oil crisis, with the level of coal trade remaining almost static in terms of its relative share in the port's trade. Group 9 showed an increased trade 1970-75, suggesting that the developments in unitization took time to make itself felt. Growth in group 1 may also be connected to increasing unitization, although to what extent it is impossible to determine. The share of all other commodity groups underwent a decline, including, for the first time during the period 1955-75, group 8. The particularly rapid industrial growth in the chemical sector of the late 1960s had come to a halt in the early 1970s, due to consolidation and slight recession after 1973. The only industries of note to open at the port during this period were Oxirane-Chemie and Air Products.

From the above, it is clear that trade at the port of Rotterdam became much more dependent on internal developments over the period 1955-75, particularly the major component in trade, oil and oil products. In 1955 the trade flows at the port were still largely determined by factors external to the port, particularly with regard to the German hinterland and the redistribution of coal to foreland areas. Especially during the 1960s developments in trade flows closely paralleled industrial and physical expansion at the port.

4.1.2. The port of Schiedam.

Total trade through this port remained at a similar level up to the mid-1960s, followed by fluctuation and decline. Initially, the bunkering of sea-ships and trade in transport equipment formed the main elements (group 9), bunkering declined in importance but transport equipment remained an important part of trade. Although no major developments in infra-structure and industry at the port took place 1955-75, the trade of the port was initially strongly dependent on the facilities provided, especially for the bunkering of sea-ships. By 1975, the use of this port for offloading was of a much more incidental nature, and governed more by external factors than internal facilities. This was true, for instance, of the trade in group 6 in 1970. Trade at Schiedam was therefore initially strongly influenced by internal forces, but by the end of the period more influenced by external factors.

4.1.3. The port of Vlaardingen.

As at Schiedam there were no major improvements to this port, although trade was strongly connected with the facilities present at the port, especially handling facilities for goods in transit to the hinterland (mainly bulk commodities). This element continued to dominate trade up until the mid-1960s. By the end of the period there had been a slight increase in trade through the port. Group 1 showed the major increase 1955-75, mainly in direct imports. The provision of extra facilities by Nieuwe Matex for import of molasses (group 1) can only explain part of this increase, the rest being unrelated to any physical or industrial development of the port, but more to external factors such as demand from the nearby metropolis of Rotterdam.

Ores (group 4), which dominated trade through the port up to 1965, were related to Frans Swarttouws Havenbedrijf's activities at the port, but as was noted for Rotterdam this concern opted for a new bulk-handling terminal at the Maasvlakte¹⁷ for this commodity, thereby causing a reduction in ore trade through Vlaardingen, so that by 1975 group 4 was only fourth in commodities traded through the port. The change in the commodity structure noted in chapter 2 (section 5.4.1.3.) was a consequence mainly of this development. Nevertheless, it must be noted that there was a substantial increase in the handling of coal at the port of Vlaardingen by the end of the period, and this was in spite of the new Maasvlakte terminal. However, the increase in trade was due to external factors rather than to any improvement in internal facilities. Increased handling of coal following the oil crisis, especially re-exports to the United Kingdom during the miners' strike, was one of the major factors. As depths in the United Kingdom ports were more limited, this trade was carried in smaller ships able to reach the Vulcaanhaven, whereas the large bulk ore carriers could not reach the port.

As noted earlier, the major development at the port over the period was an increase in the storage space for mineral oils. This was not accompanied by any increase in trade in group 3 (oil and oil products), except early in the period 1960-65, when some expansion occurred. After this there was both a relative and absolute decline, and the close proximity of Rotterdam with its superior facilities for this trade was undeniably an important factor.

Of the other groups, only the movement of fertilizers (group 7), was closely connected to port activities (Windmill Holland) and showed a steady growth with increased output from this plant. The increase in the

role of most other commodities over the period 1970-75 can be explained more by the relative decline in the role of ore over this period than any major increase, although the increase in group 6, connected with the development of nearby Rotterdam, was an exception.

On the whole, the general cargo sector at the port of Vlaardingen remained relatively underdeveloped, with little attempt by the local authority to improve facilities for this, as it was felt that competition from nearby Rotterdam would not justify any investments in this direction. It may be concluded that over the period 1955-75 trade through the port of Vlaardingen remained strongly connected to port activity, although by the end of the period this was less so than initially due to the large decline in the ore trade, and external forces had gained in importance as at Schiedam.

4.1.4. The port of Maassluis.

Trade here showed only a slight increase over the period, the only improvements being a small increase in the size of vessels which could be accommodated and the provision of extra facilities for the export of agricultural produce through the port in the 1960s. A decline in the trade of fresh agricultural produce and an increase in the trade in prepared foodstuffs (respectively groups 0 and 1) were the main features of port trade. The decline in group 0 was mainly a result of an external influence - the development of a fast roll-on/roll-off service from nearby Hoek van Holland at the end of the 1960s. The diversification of commodities passing through the port at the end of the period was also mainly a result of external forces rather than of any new facilities or industries. General cargo (groups 1, 5, 9) dominated trade by 1975, with bulk cargoes playing a very minor role.

4.1.5. Hoek van Holland.

After a decline in total trade 1955-69, trade through this port showed a substantial increase. Improvements were limited to the activities of the main user, and this was also reflected in trade, for an increase in trade followed the opening of the new roll-on/roll-off service to the United Kingdom in 1968.

Increase in trade in group 0 was partly a result of this, but also of external factors (for example the decision by the Westland growers to use Hoek van Holland rather than Maassluis for exports to the United Kingdom, as a result of a faster and more reliable service. The main increase in the role of group 0 in the port's trade followed the opening of the new roll-on/roll-off service.

Trade in group 9, the other main commodity passing through the port, was also closely linked to the activities of the regular liner service from the port, and increased following the introduction of a new vessel in 1960 and particularly following the opening of the roll-on/roll-off facilities.

Trade through this port was linked closely to the activities of the liner company operating from Hoek van Holland and subsequent changes which took place in the provision of services by this company. In 1975, trade through the port was more dependent on this factor than in 1955, when bunker materials were the most important feature connected to the provision of facilities for this at the port rather than activities of the liner service. It is also important to note that the large totals in 1968 and 1975, due to the import of sea-sand connected with the extension of Rotterdam, were a result of external influences rather than any internal development.

4.1.6. The port of Dordrecht.

As at Vlaardingen this port's trade was initially strongly dependent on movements of commodity group 4, especially iron ore (transit inwards to the hinterland). Total trade passing through the port showed the most rapid rise after 1969, although there was also an increase during the period 1960-65. This increase followed the opening of a second harbour basin for sea-ships in 1959. Prior to this date trade had been declining due to a fall in the ore trade through the port. In fact this decline continued after the opening of the new harbour, but was offset by increased trade in other commodities. The expansion by organizations operating in the oil sector resulted in growth in trade (mainly imports) of oil products up to 1970, although a decline set in after this. The establishment of a sand and gravel jetty in the Julianahaven in the late 1960s had a marked effect on trade in group 6, which by 1970 was the major item in port trade. Prior to this import of crude minerals to the hinterland had also been growing in importance. In addition, activities in the chemical sector (increased storage for chemicals by Gebr. Broere for example) coincided with growth in trade in group 8, especially in 1960-65, during which period this formed the fastest growing item in port trade. Other commodities remained of minor significance, and the general cargo sector remained underdeveloped despite the provision of extra facilities for this in the new harbour.

In 1955, the movement of cargo through the port was mainly governed by external changes in demand from the hinterland, especially for ore, and fluctuations in the initial period were linked to this. Nevertheless, although the transit trade remained an important element, the extension and improvements in the port, particularly the provision of a new harbour basin and improvement in access at the end of the 1960s and early 1970s,

had an important effect on trade. By the end of the period direct trade had increased, especially in groups 6 (sand and gravel), group 3 (oil products), and group 8 (chemical storage), so that trade was more dependent on internal factors.

4.1.7. The port of Zwijndrecht.

Local port activity and industry formed the main factors in determining the trade passing through the port, so that internal forces were more important than external. Despite fluctuations, there was an overall increase in trade.

The predominance of commodity group 1 (mainly import of oil seeds for the Unilever plant) declined 1955-75, as a result of growth in trade in other commodities such as group 9 (metal manufactures) and group 5. This was due to external factors (growth in engineering firms at Zwijndrecht) rather than any development at the port. External factors also governed the movement in the other main commodity group: group 0, and this showed considerable fluctuation. There was an increased dependence on external influences on trade between 1955 and 1975.

4.1.8. Conclusion.

Trade flows through the largest port, Rotterdam, showed during the period the considerable impact of internal developments (both infrastructure, superstructure and industrial), especially with the Botlek and Europoort projects. At most of the smaller ports, changes in trade flows were governed more by external factors by the end of the period than internal developments, although initially trade was strongly connected to local activity in a number of cases. Due to the proximity of the ports, there was evidence of the influence of developments at

neighbouring ports on trade flows, and this was particularly true of the decline in iron ore through Vlaardingen and of fresh vegetables through Maassluis. Where trade became more dependent on internal factors at the smaller ports, this was normally due to new developments such as at Hoek van Holland and Dordrecht, although in the former case the activities of a liner company were the main determinants and in the latter external factors, although lessening, were still an important determinant of the port's trade.

4.2. The North Sea Canal ports.

The only major developments in port infrastructure and industry during this period were at Amsterdam, but the other ports also showed some structural development. The position of the North Sea Canal ports was different in that the smaller ports were highly specialized in the movement of certain commodities strongly related to internal factors (i.e. industry at the port), and less functionally competitive with the largest port. It also follows, therefore, that developments at these ports were mainly due to expansion of the main port activity, and an increased dependence on internal factors governing the movement of trade is to be expected.

4.2.1. Amsterdam.

4.2.1.1. 1955-60.

Despite the construction of a number of new harbours at the port during the period (Usselinxhaven, Carl Reinierszoonhaven, Zwaardcroonhaven) there was a slump in trade. This movement was almost entirely a result of external factors, particularly decreased seaward transit of coal as at Rotterdam. This decline took place in spite of the new installation

built at the Westhaven for the bulk movement of ore and coal (O.B.A.), although there was a considerable increase in the movement of ore through the port. Growth in group 3 accompanied an expansion in oil storage facilities. The other main increase during this period was in the grain trade (group 0) which was not prompted by any new developments at the port. The increase in ore, oil and grain trades through the port counteracted the negative effect of increased trade in coal.

4.2.1.2. 1960-65

Expansion of the physical area of the port continued, with an extension of the Westhaven in 1961 and the addition of several new harbour basins. A start was also made on the deepening of the North Sea Canal during this period allowing larger ships to have access to the port. There was some growth in total trade through the port, but the impact of these new developments was less than might have been expected as growth in trade was not much greater than in the previous period.

The increase in commodity group 0, especially import of grains and timber, coincided with the provision of a new wood importing installation at the Carl Reinierszoonhaven in 1960 and the opening of the I.G.M.A. terminal at the Vlothaven in 1961. The increase in trade in this group was so large that it formed the main element in trade in 1965. Other facilities provided at the port were, however, less successful such as the new coal-handling area at the Carl Reinierszoonhaven, since trade in group 2 continued to decline.

There was a decline in the ore trade due to external factors and the increase in trade in group 1 could only be partly explained by the Amatex vegetable oils and animal fat storage plant at the Usselinxhaven beginning operations in 1960. Additional storage created at this time

for mineral oil (e.g. Comos N.V.) was accompanied by a slight rise in trade in group 3 through the port. In the general cargo sector there was some development, such as the facilities for Blauwhoed, and a rise in group 9's relative share of trade, but the main developments in containerization and roll-on/roll-off transport were yet to come.

4.2.1.3. 1965-70.

The major developments at the port during this period were the completion of the new harbour mouth at IJmuiden and the subsequent access for larger ships to the port, the establishment of the Mobil Oil refinery and considerable provision of new facilities for the movement of unitized cargo. Growth in total trade accelerated over this period, the major increases being in the ore trade (this was due mainly to external influences) and in trade in oil products. The initial rise in trade in group 3 following the opening of the refinery was large, but the opening of the pipeline to Rotterdam took away some of the trade in crude oil, so that the rise in trade after 1969 was less steep. Transit inwards of ore was the main element in trade in 1970, governed by an increase in demand from the hinterland, and the transit outwards of this commodity also increased. Surprisingly, in view of the activities of V.C.K. and C.T.A. in opening new terminals for general cargo, the commodity groups most likely to benefit from these developments (groups 1, 5, 9) all showed a relative decline over the period in their share of total port trade.

4.2.1.4. 1970-75

Continued improvement and growth in the container and roll-on/roll-off facilities at the port characterized the main developments taking place

over this period. In addition the O.B.A. expanded its bulk handling terminal in 1975, although this was too late to have any significant effect on the 1975 trade figures. Despite these developments there was considerable decrease in total trade through the port, although only ore (group 4), chemicals (group 8), fertilizers (group 7), and finished products (group 9) showed a relative decline. The only commodities to show an increase in trade over this period were groups 1, 5, and 2. The decline in trade in group 9 is again surprising in the light of the expansion in the unitized handling of general cargo during this time. Group 1, which showed an absolute increase, was facilitated in its growth by additional storage facilities for vegetable oils at the Westhaven (Tradax). The growth in group 2 may have benefited from the extension of handling facilities for this commodity group by the O.B.A., although as mentioned earlier this must be treated with caution, the increase being mainly due to external factors. External factors were also the main influence in trade in group 5, which was mostly transit.

4.2.2. The port of Zaandam.

The timber trade (group 0) formed the major trade item through this port, and the main improvements were aimed at increasing trade in this sector. Despite these developments, however, an absolute and relative decline took place in this commodity group's role in trade. Decline was continuous despite the opening of the Isaac Baarthaven at the end of the period, providing access for larger timber vessels, with two new timber terminals. Nevertheless, total trade remained fairly stable up to the end of the 1960s and increased thereafter, suggesting more rapid growth in other commodities. In fact, the most rapid growth during the period

was in chemicals (group 8), particularly cellulose. This growth was related to external factors (increased demand by firms in the area) rather than the provision of any new facilities. Of the other groups, trade in group 1 declined, but the increase in the relative share of group 9 in trade was most rapid during the period 1970-75, coinciding with the provision of new roll-on/roll-off facilities at the Oudehaven. Overall, therefore, although internal activities remained important between 1955 and 1975, external influences on trade became relatively more important.

4.2.3. The port of IJmuiden

As at Zaandam, IJmuiden's trade was closely linked to internal factors. Total trade saw a continuous increase over the period, mainly as a result of the growth in ore imports to serve the integrated iron and steel works. Expansion of this industry in the 1960s resulted in an accelerated growth in trade passing through the port. Again this was mainly due to increased imports in ore to supply the furnaces and smelters. Growth in the trade of the other main commodities also coincided with these developments. Group 2, despite an initial decline, showed an absolute growth especially during the 1960s and early 1970s following the expansion of the iron and steel works, trade in this commodity being exclusively direct import. Export of iron and steel products (group 5) showed particularly rapid growth during the same period. Most other commodity groups declined in importance in relation to these three main groups. The completion of the new harbour entrance in 1967 was important for trade, as it enabled larger ore carriers to reach the port; from 1960-65 there was a decline in the ore trade's relative share of all trade through the port, but by 1970 there had been a

substantial increase. The new quays in the Buitenhaven for offloading ore and loading steel products were also opened during this period. However, the construction of extra handling facilities for general cargo at the Derde Rijksbinnenhaven did not result in any increase in trade. With the exception of general cargo, developments at the port were closely linked with increased trade, and by the end of the period IJmuiden's trade was even more dependent on internal factors than in 1955.

4.2.4. Conclusion

From the above it may be seen that the trade of IJmuiden and of Amsterdam by the end of the period 1955-75 showed a greater dependence on internal factors, whereas at Zaandam internal factors became less important. It is significant, however, that the physical developments at Amsterdam had less effect than might have been expected, and although there was a fairly close relationship between increased trade and the provision of new facilities in the 1960s, by the end of the period external forces were exerting a strong influence once again. This was especially so in the disappointing growth in general cargo trades in view of the provision of new roll-on/roll-off facilities at the end of the 1960s. It can be concluded that internal developments exerted less influence on trade flows at Amsterdam than at Rotterdam. Part of the reason for this was the increasing importance of the movement of bulk commodities to and from the hinterland through the Amsterdam-Rhine Canal.

As noted earlier, there was very little interdependence between the North Sea Canal ports, unlike those of the New Waterway, with regard to commodity flows, with Zaandam and IJmuiden functioning as specialized port units serving local needs. For Zaandam, the smallest port, external

factors became more important over the period, although new facilities provided were mainly to serve existing, established industries as at IJmuiden.

4.3. The northern ports.

The largest increase in trade over the period 1955-75 was recorded by the port of Delfzijl, which was also the port that underwent the greatest physical development. Groningen also saw some development in the 1960s, but from 1965 onwards there was a decline in trade here and at the end of the period trade was little more than in 1955. At Harlingen, where there was no physical development of any note, trade declined.

4.3.1. The port of Delfzijl

Factors external to the port were the main determinants of trade flows through this port in 1955, dominated by the export of agricultural produce from the local area, along with import of coal for the power station at Groningen, and timber for the Groningen furniture industry. The only trade related to activity within the port area was the export of strawboard and cardboard, a traditional trade for which specialist handling facilities were available at the Handelshaven.

By 1960 there had been a fundamental change in this situation, with the main trading commodity, group 6, linked to the location of the K.N.S.I. factory at the port in the late 1950s. Group 0, agricultural produce, gradually showed a decline in relative importance, although the absolute amounts remained the same. Throughout the period there was a rapid growth in trade in group 6, so that this formed over half the trade by 1975.

As noted earlier, physical expansion here was entirely related to the

needs of new industries at the port, and it was the location of these industries that had the greatest effect on port trade. The increase in industries in the chemical sector (AKU, Upjohn, etc.) in the early 1960s coincided with an important increase in chemical trade through the port, which had previously shown a decline as potato starch became a less important item. The impact of the ALDEL smelter on port trade was much less, however, since after the opening of this industry in 1966 group 5, metal products, showed only slight growth (although this accelerated in the early 1970s). Part of the reason for this was the preference of the rail link rather than sea transport for imports and exports through Rotterdam.

Trade in other commodities showed a decline, including the coal trade (especially 1960-65 when the Groningen power station switched to natural gas), trade in fertilizers (although the absolute total remained fairly constant), and group 9, the majority of which was formed by exports of card and strawboard which also remained at a fairly constant level.

It is also important to note that following the opening of the new harbour entrance in 1971, and the improved access for larger ships, trade increased substantially, although with the general recession in 1974/5 trade decreased.

For the port of Delfzijl, therefore, internal developments were of paramount importance in determining trade flows over the period 1955-75.

4.3.2. The port of Groningen

The major increase in trade through this port took place during the period 1955-65, prior to the completion of the improvements to the Eemskanaal and the excavation of the new harbour area. In fact,

following these developments there was a general downturn in trade in the 1960s. It may be concluded from this that external influences were the major factors influencing trade through the port at this time, and the internal developments had little effect on trade, with agricultural produce dominating trade flows throughout the period. The only increase in trade was in this sector, with group 1 playing a major part by 1975. Only groups 9 and 1 showed substantial increase following the opening of the new harbours; growth in the latter was almost entirely due to external factors, while growth in the former was a result of the import of cars through the port, which fell away in the early 1970s (see section 3.3.2, p.266), so that this was a result of internal factors.

In view of the bad management of the new port areas the lack of any major tangible effect on the seaborne trade at this port is hardly surprising. Developments at Delfzijl also took trade from Groningen, which suffered from access only adequate for small ships, so that larger vessels had to offload in Delfzijl. The general declining role of the agricultural sector in Dutch trade in the post-war period was a severe blow to this port, with its dependence on this commodity..

4.3.3. The port of Harlingen.

As already stated, there were no major improvement schemes or additional port industries located here over the period 1955-75, and trade declined especially from the mid-1960s. This decline was largely a result of the loss of a number of liner services at the port (see chapter 5), and of external factors such as the decreased import of wood and export of straw and cardboard as a result of competition from Delfzijl. In addition, as at Groningen, trade in agricultural produce declined, which was again partly a result of the reduction in regular sailings from the port.

Nevertheless, its share in total port trade increased, despite the absolute decline. Limited depth of access and a shortage of return freight were the major problems of the port. On the whole, changes which took place over this period were largely a result of external factors, along with the reduction in regular sailings.

4.3.4. Conclusion

In 1955 all three northern ports showed a heavy dependence on external influences on trade, and these remained important for Harlingen and Groningen over the period, despite improvements of access and new harbour facilities for the latter. Delfzijl became heavily dependent on internal factors, especially as a result of the industrialization of the port.

4.4. The Schelde ports.

Considerable growth, both in trade, industries at the port, and infrastructure, characterized developments at the Schelde ports, which had a considerable impact on the volume and structure of trade.

4.4.1. The port of Terneuzen.

Transit trade was an important element at this port in 1955, although some trade was connected with the activities of local industries at the port, particularly coal (group 2), iron ore (group 4) and fertilizers (group 7). Although much of the trade in ore was registered as direct import, a substantial part of this travelled by rail to Ghent so that the hinterland demand was an important factor. The role of group 4 declined considerably, especially after 1960: this was partly a result

of the Belgian policy of promoting national ports and the consequent re-routing of ore through Belgian ports such as Antwerp for the Ghent Sidmar iron and steelworks. Demand for coal for the coking factory at Sluiskil showed a steady increase over the period, and although there was some decline in the relative share of trade in this commodity after 1965, in absolute terms trade continued to increase. Transit outwards of coal also increased.

The diversification which took place in the port's trade from 1960 onwards was a result of the increase in industry at the port after its conclusion in the government's regional policy. The impact of some industries, such as Philips and Meterfabriek Dordrecht (established in 1961), on trade was slight, although group 9 (finished products) had shown some growth by 1975; before 1970, however, this did not register as a trade item. After the location of the DOW chemical works in the mid-1960s growth in trade accelerated. However, although there was an increase in trade in chemical products (group 8) the main increase was in imported oil products (group 3) as raw material for the DOW plant. This group continued to grow up to 1975, although a reduction was to be expected with the provision of the pipeline to the Vlissingen refinery. In 1975, the impact of this had not yet been felt on the seaborne trade flows, and by 1975 oil products formed the main trading item at the port. The increase in group 7 (fertilizers) was mainly transit, therefore connected with external factors rather than internal. The same was true of agricultural produce (groups 0 and 2), forming a minor and fluctuating element in trade. The rapid growth in trade after the mid-1960s was also a result of improvements to access and to the facilities at the port, with the improvement of the Ghent-Terneuzen Canal 1959-68, allowing larger carriers to have access to the

port. As bulk trade predominated at Terneuzen, this was of vital importance to transit trade.

Internal developments were therefore of paramount importance to the development of trade 1955-75, and with the weakening of trading relations with the hinterland (e.g. decline in group 4) by 1975, trade was more dependent on internal elements than in 1955, especially with regard to flows of oil products inwards for the DOW factory.

4.4.2. The port of Vlissingen

In 1955, Vlissingen's trade consisted almost entirely of bunker materials for sea-ships, and was thus connected with internal facilities provided for this. Group 3 (oil) and 2 (coal) were the main trade items, exported as bunker material (group 9) in 1955, and also in 1960.

The Sloe-project, with its first harbour opened in 1964, resulted in some diversification by 1965 but no large increase in trade: the main increase 1960-65 was in the ore trade, and although larger ships could reach the Sloehaven this was only a temporary increase resulting from external factors rather than internal development.

During the period 1965-70 the main industrialization of the new Sloe-area was underway, with the chemical concerns Billiton and Hoechst beginning operations in the chemical sector. Despite these developments, trade remained at a fairly constant level 1965-70, and although group 8 featured in port trade for the first time in 1970, it was only a minor element, suggesting that the impact of these new industries was less than might have been expected. The main increases in trade through the port in groups 7 (fertilizers) and 0 (agricultural produce) were also a result of external factors.

The major increase in port trade followed the opening of the oil refinery in 1974: with the growth in the export of oil products from the port. The expansion of Hoechst also coincided with growth in group 8. The other main increase was in group 6, following the opening of a sand and gravel sorting plant in the early 1970s at the Buitenhaven in the older port area. Of the smaller groups, growth in group 1 (1970-75) was a result of increased trade in tobacco through the activities of Alleghany Warehousing, while a rise in smaller general cargo trades also resulted from the new cargo-handling quay in the Sloe area, which explains some of the diversification in 1970. However, the relative role of these groups remained small. The Pechiney Aluminium smelter also had a minor impact on trade, with some increase in group 5, 1970-75.

During the 1960s, therefore, with the decline in bunkering trade through the port, it became more dependent on external influences, and internal industrial development in the late 1960s had less impact than would have been expected. During the early 1970s a number of developments had an important effect on trade flows through the port, especially the opening of the Total refinery, so that by the end of the period trade was once again strongly orientated towards internal activity at the port.

4.4.3. Conclusion

The end of the period found both the Schelde ports strongly orientated towards the activities of local industries in determining trade flows, although this applied later in the period to Vlissingen rather than to Terneuzen. Diversification and growth in trade at both ports was strongly linked to developments at these ports, especially the location of oil and petro-chemical industries.

5. General Conclusion

The problem of whether the provision of new facilities at a port or the location of industries generate additional traffic or not, is a complex one (see section 2.5, 2.6.), and difficult to measure in concrete terms; hence the descriptive approach adopted in this chapter.

Descriptive approaches have a number of obvious disadvantages, particularly since speculation can intrude. Nevertheless, treated with caution, this can highlight some of the more general effects of new facilities and industries on trade flows through a port. The most obvious fact to point out is that the provision of services and industries at a port will have varying effects on the trade of that port. In his study of port industrialization at Rotterdam and Antwerp, Winkelmans¹⁸ concludes that the oil industry had the greatest effect on trade flows at Rotterdam, generating around 85-90% of imports. For the chemical industry the figure was lower and effects on trade more difficult to determine. At Antwerp, the traffic generation arising from the oil industry was very much lower than at Rotterdam, as most of the crude imports were provided by pipeline. This clearly illustrates that the impact of the location of a particular industry will have varying effects at different ports, depending on a large number of factors often interrelated with the developments at other ports and the capacity of the port in question, as well as the nature and organization of the industry in question. Morgan¹⁹ identifies three types of port industries: (1) those carried out in industrial ports (for the Netherlands IJmuiden and Terneuzen are obvious examples); (2) general port industries; (3) industries which are attracted to a port as a centre of population. This classification is useful, in that it indicates different degrees

of port relatedness for industries, and hence varying effects on port trade, but matters are complicated by the varying impact of the same industry on a port's trade flows, depending on factors such as facilities provided and depth of access, particularly in the case of larger tankers. In many instances, such as the refineries at Vlissingen and Amsterdam, the impact of location on trade is reduced as raw materials are imported elsewhere to maximise economies. Some industries, e.g. oil refineries, boost trade through a port able to meet the industry's requirements. Winkelmans found that most port industries had a positive correlation with increases in a port's trade, although Winkelmans' study was limited to Rotterdam and Antwerp, but this is not always the case as has been shown in the previous section.

As for the provision of new handling facilities and port infrastructure, the effect of this is often even more difficult to determine, as the effect on trade flows is usually indirect and/or delayed. Again, however, general effects can be identified using the descriptive approach to changes in trade flows and the new structures provided at ports, especially in cases where the provision of new facilities has not led to increased trade, as at Groningen.

Using the approach adopted in this chapter a number of conclusions may be drawn about the impact of development and industrialization on trade flows through Dutch ports over the period 1955-75.

Undoubtedly the greatest impact by port improvements and the location of new port industries on trade flows was at the port of Rotterdam, especially with regard to the oil sector, although external influences such as the Mobil refinery at Amsterdam and the Total refinery at Vlissingen tended to boost trade figures. Bearing this in mind, developments at other ports as well as at Rotterdam tended to strengthen the

position of this port in the Dutch hierarchy, and for many industries trade flows at this port had a greater influence on their investment there. Changes in port infrastructure and industry were therefore of paramount importance in an examination of trade flows at this port. Most of the other New Waterway ports, in spite of development at some, showed a strong dependence on external factors for trade flows through the ports, and in some cases a strong relationship seemed to exist between them and changes in trade flows and developments at Rotterdam.

At Amsterdam, despite the considerable provision of new facilities and location of new industry the impact on trade flows was less marked, and although initial developments boosted trade through the port, external factors continued to be important; in cases such as the oil refinery the generation of trade was much less than for similar developments at Rotterdam. IJmuiden, which was initially strongly dependent on internal trade generation, remained so. For the smallest port in the range, despite the provision of new facilities, trade became more dependent on external factors.

In the northern port range, Delfzijl underwent the greatest internal development, showing the fastest growth in trade flows, and this had a positive connection with improvements to the port and especially new industries located there. New developments at the end of the period at this port, however, had little effect on trade; the opening of the Eemshaven did little to increase trade flows. The greatest trade generator at this port was the K.N.S.I. (AKZO), which served as a 'growth pole' around which other industries in the chemical sector were located.

At the port of Groningen, despite improvements to access and new harbour provision, external influences continued to dominate port trade

flows. Harlingen also became more dependent on external factors, with the decrease in trade generated by liner services, and no physical improvement of any note to the port.

Both the Schelde ports showed a heavy dominance of internal factors as determinants of trade, particularly from the activities of new industries located during the period. At Vlissingen, however, the effect of the improvements on trade flows were less evident, with the major effect following the location of the oil refinery there. Even for trade generated by the latter, however, much of the import came through the Rotterdam pipeline rather than by direct import and thus boosted trade at Rotterdam. With the construction of product pipelines such as that to Terneuzen, seaborne trade from the oil industry at the port faced a further decline. The increased use of pipelines for the activities of the DOW chemical plant at Terneuzen also threatened a reduction in trade through the port.

From the above, a number of important factors may be highlighted. On the whole, the smaller ports in the Dutch port range were more dependent on external influences for their trade than the larger ports over the period 1955-75, so that changes in the hinterland and foreland organization were more crucial to these ports, lacking the 'safety' of guaranteed trade flows from industries established in the area, and were thus subject to greater fluctuations. However, the simple provision of new port facilities or the attraction of industries to a port is not a sufficient guarantee of an increase in trade in all cases. In terms of trade generated, the most successful programme of improvement in port facilities and the location of new industry was at Rotterdam. In one or two cases, e.g. Vlissingen, the establishment of new industries actually boosted trade through the larger ports. This was especially true

of the oil and petro-chemical industries, due to the physical limitations of smaller ports. The attempt by the smaller ports to emulate the development of larger ports has led to inefficient industrial siting, overcapacity, and duplication of costly facilities which these small ports can ill afford. The success of the port of Rotterdam's policy of providing land for port industries has resulted in other ports considering this to be the 'magic formula' for increasing trade through a port, whereas it is more important for these ports to concentrate on a study of the existing trade, often subject mainly to external forces, and its developments, and then in the light of the capabilities of the port itself, to concentrate on developing those facilities from which trade is most likely to benefit. The lessons to be learned by ports such as Scheveningen, on the other hand, which showed strong growth through specializing in short-sea trade, with great success, bears closer study. In the following chapter, an examination of the provision of facilities and the location of new industries at the Dutch ports over the period 1955-75 concentrates on short-sea trading of especial interest to the smaller ports in their attempts to increase trade, namely trade with the United Kingdom. The role of liner trades in this foreland trade flow is of particular interest, and this will come under closer examination. It is essential that, for smaller ports, changes in the maritime organization of short-sea trade, such as the Anglo-Dutch trade, requiring less stringent depth requirements and provision of relatively inexpensive facilities, should be analysed and understood. In view of the smaller ports' dependence on external influences on trade, this is more sensible than an attempt to duplicate the success of Rotterdam by trying to attract large capital-intensive industry to the ports, which, in view of their

nature, require imports of large quantities of bulk raw materials in very large tankers and bulk carriers to achieve the maximum economies, and therefore the provision of costly infrastructure and improvements to the port. If this cannot be carried out, the trade is merely diverted to the larger ports in the range. Moreover, the dependence of a small port for its trade on one or two very large industries results in the loss of flexibility, which is one of the main assets of a small port.

NOTES

Chapter 4

- 1 D. Hilling, 'Port development and economic growth: the case of Ghana', in Seaports and Development in Tropical Africa, edited by B.S. Hoyle and D. Hilling (London, 1970), p. 127.
- 2 M.F. Tanner and A.F. Williams, 'Port Development and National Planning Strategy - the implications of the Portbury decision', Journal of Transport Economics and Policy, 1 (1967), 315-324.
- 3 M.C. Kieft, 'De Veranderende Functie van de Zeehaven' in Zesde Beneluxhavenstudiedagen, (1969), pp. 7-14.
- 4 W.E. Vahrenhorst, 'Der Strassengütertransport von und zu dem Rotterdamer Havengebiet mit einer besonderen Betrachtung der Warte und Umschlagzeiten' (doctoral dissertation, University of Rotterdam, 1971).
- 5 W. Winkelmann, 'De Moderne Havenindustrie' (doctoral dissertation, Brugge, 1971).
- 6 J.O. Monnikhof-van Driel, 'Een analyse van de wijzigingen in het globale ruimtelijke patroon van het reizigersvervoer tussen Groot-Brittannië en het Europese Continent over de periode 1870-1970' (unpublished dissertation, University of Rotterdam, 1975).
- 7 G.G. Weigend, 'Stages in the development of the ports of Rotterdam and Antwerp', Geoforum, 13 (1973), 5-15.
- 8 Very Large Crude Carriers. This includes oil and dry bulk-cargo vessels.
- 9 See for instance J.A. Beukers, 'De industrie in het havengebied' in Rotterdam Europoort 1945-1970, edited by G.E. van Walsum (Rotterdam, 1972), pp. 247-261.

- 10 Fifty acres in the Botlek area were offered, but Shell needed a hundred acres, so that the tip of the island of Rozenburg was offered to the company as an alternative site.
- 11 Europees Massagoed Overslagbedrijf, a combine, had two terminals, one on the Maasvlakte and one in the Botlek, the major shareholders being Frans Swarttouw (38 $\frac{1}{2}$ %) and Steenkolen Handels Vereniging (28%). Smaller shareholders included two German firms and one French, each with an 11 $\frac{1}{9}$ % holding.
- 12 See A. Hurd, Ports of the World (London, 1955), p. 684, and 1975, p. 322.
- 13 Stoomvaart Maatschappij Zeeland.
- 14 Eemshaven 1964 and Eemshaven 1967, Provinciale Planologische Dienst te Groningen (Groningen, 1964 and 1967).
- 15 'Wet van 10 September 1970 inzake gemeenschappelijke regeling van het havenschap Vlissingen' in Staatsblad van het Koninkrijk der Nederlanden ('s-Gravenhage, 1970), 457, p. 1069.
- 16 In 1962 the trade figures published by the Centraal Bureau voor de Statistiek included Europoort for the first time as an element in Rotterdam's trade flows.
- 17 See note 11.
- 18 W. Winkelmanns, 'De Moderne Havenindustrie'.
- 19 F.W. Morgan, Ports and Harbours (London, 1958).

CHAPTER 5

THE INFLUENCE OF CHANGES IN PORT INFRASTRUCTURE AND INDUSTRIALIZATION ON ANGLO-DUTCH TRADE FLOWS 1955-75, WITH SPECIAL REFERENCE TO THE POSITION OF LINER TRADES.

1. Introduction

So far this work has concentrated on an analysis of the movements of Anglo-Dutch trade through the Dutch ports, comparing these flows with the total trade flow through each port. However, the aim of this study is also, in as far as is possible, to provide explanations for the changing pattern of Anglo-Dutch trade. So far we have touched upon general factors involved in the changing pattern of trade, which may largely be classified as 'external' influences. In this chapter a closer look will be taken at the internal changes at the ports over the period 1955-75, and the effect on Anglo-Dutch trade, in a similar way to the previous chapter in which total trade flows were discussed.

1.1. The New Waterway ports.

The New Waterway ports, despite considerable development internally, showed a decline in their relative share of Anglo-Dutch trade 1955-75 (chapter 3, 3.1). This suggests that the impact of the provision of new facilities at these ports and the location of new industries on Anglo-Dutch trade was not as great as may have been expected.

1.1.1. Rotterdam

Rotterdam showed the greatest drop in its percentage share of Anglo-Dutch trade flows over the period, although in absolute terms there was

an increase from 8.9 to 23.4 million tons 1955-75.

1.1.1.1. 1955-60

Prior to 1961 Anglo-Dutch trade declined, suggesting that the impact of the opening of the Botlek area on this trade was negligible. The decline in total trade with the United Kingdom was mainly a result of decreased coal re-exports, disguising increased flows in chemicals and also in oil and oil products with United Kingdom ports as a result of the development of the Botlek area. In particular the rise in the export of oil and oil products coincided with increased output from the Shell refinery and the opening of the ESSO refinery in 1960. Other commodities in Anglo-Dutch trade which showed an increase were grain and grain products, metals, and minerals; this was largely a result of external developments rather than any internal expansion.

1.1.1.2. 1960-65

From 1961 a rapid absolute increase was recorded for Anglo-Dutch trade through Rotterdam. This followed the opening of the Europoort area. The new ESSO refinery in the Botlek and Gulf refinery in Europoort resulted in rapid growth in exports of oil and oil products in particular from the port to the United Kingdom. By 1965 this was the largest element in the Anglo-Dutch trade, with 63% of the total. Developments in the petro-chemical sector stimulated an increased export of chemical products to the United Kingdom over the period, such as the opening of the I.C.I. plant at Europoort. Continued growth in the grain trade and the redistribution of ore, although stimulated by the ability of larger ships to reach the port through improvements to the channel, remained largely a result of external influences; in terms of infrastructure no new facilities were provided for these trades at Rotterdam

over this period. Access to the older Waalhaven, where most of the handling of these materials was carried out, remained limited to medium-sized ships.

1.1.1.3. 1965-70

The growth in trade with the United Kingdom accelerated during this period, with an absolute increase in almost all commodity groups. The fastest increase was recorded in the import of minerals (group 6) and the export of chemical products (group 8). The former was linked directly to the development of the Europoort and Maasvlakte area, while the latter resulted from the continued growth of chemical industries at Rotterdam. Oil and oil products (group 3) also continued to display a rapid expansion. Imports stagnated, but with the location of the B.P. refinery at Europoort in 1967 and the expansion of existing refineries at Pernis and Botlek and also in Europoort, exports remained buoyant. There was thus a positive relationship between increased trade in the oil and chemical sectors between Rotterdam and the United Kingdom, and internal developments at the port. Trade in ores also continued to expand, benefiting from the opening of the Ertsoverslag Bedrijf Europoort in 1970. New grain handling facilities in the Botlek area also coincided with increased trade in grain between the port of Rotterdam and the United Kingdom, although the relative share of this commodity as an element in Anglo-Dutch trade did decline. This was also true of group 9, manufactured goods, which, despite an absolute increase declined in relative importance. This was at a time when the relative share may be expected to show an increase with new developments in the general cargo trades and subsequent new facilities provided, such as the opening of the E.C.T. container

terminal in 1967, and new roll-on/roll-off facilities opened in 1965 and 1967. Reorganization of the Waalhaven should also be mentioned in connection with general cargo, and would also be expected to lead to increased trade in group 9.

1.1.1.4. 1970-75

The rapid growth in the industrial development of the port seen in the previous decade slowed during this period, particularly as a result of the 1973 oil crisis. Development at the port continued nevertheless, with further deepening of the approach channel and the completion of the Maasvlakte extension. The growth of Anglo-Dutch trade through the port was especially marked during 1971-73, after which there was a slight decline. Group 3, oil and oil products, continued to play the largest role in trade, but during this period there was a growth in imports: exports declined slightly. The relative share of group 3 in Anglo-Dutch trade remained constant.

There was rapid growth in the grain trade, which was facilitated by the new distribution and storage centre opened in 1971/2 for grain in Europoort-West. The relative share of this group (0) also increased. Group 8 (chemical products) continued to show growth, with imports playing a greater role, although there was little expansion of the chemical industry at the port. Growth in group 2 (coal) coincided with the provision of new coal and iron ore handling facilities at the Maasvlakte: however, group 4 (ores) declined despite this new facility.

1.1.1.5. Conclusion

In general, Anglo-Dutch trade flows at the port of Rotterdam showed a fairly close relationship to the provision of new facilities and industries at the port, especially during the 1960s. It was especially

in the provision of bulk handling equipment and developments in the oil and chemical industries which were important for this trade: despite major provision of new facilities in the general cargo sector, this aspect fared much less well.

1.1.2. Schiedam.

The United Kingdom trade here was initially totally dependent on internal facilities; namely the provision of bunker materials for sea-ships. By the end of the period external factors were more important in determining this trade, especially with the large import of sea-sand (group 6) destined for Rotterdam in the late 1960s. The only improvements at the port were related to shipbuilding. There was stagnation in Anglo-Dutch trade flows through this port over the period 1955-75.

1.1.3. Vlaardingen.

Despite fluctuations, a general increase over the period in Anglo-Dutch trade was recorded here. Apart from the extension of the mineral oil storage capacity, there was little development at the port itself in terms of new facilities or industries. Group 1 initially grew in importance, but by 1965 this had declined. Group 2 also showed growth during the 1960s, as did group 4, making use of existing handling facilities for ore and coal at the Vulcaanhaven. There was, however, no attempt to extend these facilities. Anglo-Dutch trade flows and their development were, therefore, largely a result of the operation of external factors. Group 2, which showed the most rapid growth, especially during the 1970s, was influenced by such factors as the rise in demand for coal following the 1973 oil crisis. It must also be borne in mind that much of the trade with the United Kingdom passing

through this port was in transit, and therefore not strongly related to local port activities or industries.

1.1.4. Maassluis

As at Vlaardingen, the major development of trade with the United Kingdom through Maassluis over the period was largely a result of external factors, at least up to the late 1960s, dependent on the agricultural hinterland and trade in small sea-ships. With the opening of a new container service from the port to the United Kingdom, and facilities being provided for this service, trade with the United Kingdom received an unmistakable boost, and also led to greater diversification in commodities. By the end of the period Anglo-Dutch trade was much more dependent on factors internal to the port.

1.1.5. Hoek van Holland.

The development of the Anglo-Dutch trade at Hoek van Holland was closely related to the activities of the regular ferry services with the United Kingdom, and the changes taking place in these services. In fact stagnation occurred in Anglo-Dutch trade up to the late 1960s, when new roll-on/roll-off facilities at the port gave a much needed boost to this trade. The growth in trade in groups 0 and 1 (agricultural exports) was particularly marked, as was growth in the trade in manufactured articles (group 9). The abnormal totals for Anglo-Dutch trade in 1968 and 1975 were entirely due to external forces, leading to a temporary increase only.

1.1.6. Dordrecht

There was considerable growth in Anglo-Dutch trade passing through this port over the period 1955-75, coinciding with improvements and

additions to port facilities and industries. Following the extension of the port in 1958 and the creation of additional bulk-handling facilities there was an upsurge in commodity group 2 in United Kingdom trade. Through transit of ore declined (overside loading from larger to smaller sea-ships). Increased trade flows with the United Kingdom were also recorded at the same time that improvements to the port, in the form of the deepening of the approach channel and improved access to the port area through the Mallegat, were taking place. The opening of a sand and gravel jetty (private wharfage) at the Julianahaven in the 1960s had a particularly marked effect on Anglo-Dutch trade flows through the port, with a great upsurge in trade in group 6 (mainly import). By the end of the period group 2 had declined once more, largely as a result of external factors. Despite expansion in the oil industry at the port, movements in group 3 with the United Kingdom remained very small. Expansion in chemical storage did coincide with a considerable increase in Anglo-Dutch trade in chemical products, however. Movements in other commodities were mainly subject to external forces rather than internal developments - an example of this was increased trade in group 0, 1970-75, when there was a considerable export of wheat to the United Kingdom passing through the port due to a shortage in supply. Nevertheless, the provision of additional facilities and the improvements taking place at the port over the period 1955-75 had a considerable influence on Anglo-Dutch trade flows in general.

1.1.7. Zwijndrecht

Initially the Anglo-Dutch trade flows through this port were highly connected with internal activities, being almost entirely imports

of groups 1 and 5 for use in the local Unilever plant and construction industries. Access to the port was improved with the deepening of the Oude Maas during the late 1950s and 1960s, but on the whole there were no major new developments in industry or infrastructure at the port over the period. The trade in group 1 declined in importance, while that of groups 0 and 5 showed an increase. There was a considerable increase in Anglo-Dutch trade passing through the port in the 1970s, with growth in the export of animal feedstuffs (group 1), chemicals (group 8), and the export of metal manufactures (group 9). Most of these commodity flows were connected with the activities of local industries, but the main influence on these flows was external rather than internal improvements. As a consequence, by 1975 Anglo-Dutch trade flows through the port were less dependent on internal factors and more on external influences.

1.1.9. Conclusion.

Only at Rotterdam and Dordrecht did the provision of extra internal facilities and new industries have any marked positive influence on Anglo-Dutch trade flows, although some of the smaller ports such as Maassluis and Hoek van Holland benefited from extra roll-on/roll-off and container services provided, this being closely connected with Anglo-Dutch trade passing through the port. At Vlaardingen and Zwijndrecht, where there was a substantial increase in Anglo-Dutch trade and an increased dependence on this trade in terms of their total trade, there was very little in the way of port development or new industries, and the increase was therefore mainly a result of external factors. Schiedam, which showed a decline in Anglo-Dutch trade over the period, was the only New Waterway port to show stagnation;

as expected no extra facilities were provided to facilitate trade and there was no attempt to attract additional industries.

1.2. The North-Sea Canal ports.

In a similar fashion to the neighbouring New Waterway port group, as a whole the percentage share of this group's Anglo-Dutch trade in terms of the total range declined, again despite developments taking place at all three ports in terms of industrialization and port improvement. Despite the relative decline, there was an absolute increase in Anglo-Dutch trade passing through all three ports over the period 1955-75.

1.2.1. Amsterdam.

Throughout the period extensive improvements were carried out to the North Sea Canal and its entrance at IJmuiden, with a deepening and widening of the channel to enable access for larger vessels. In addition, a number of new port basins were dug in the late 1950s and early 1960s. At the same time there was also a considerable expansion in the industrial activity taking place at the port.

1.2.1.1. 1960-1965.

From the end of the 1950s trade with the United Kingdom accelerated. Growth was especially marked in group 0, grains, and followed the opening of the I.G.M.A. in 1961 at the Vlothaven, enabling an important redistribution through Amsterdam to the United Kingdom (transit outwards). Group 0 formed the largest trading element in Anglo-Dutch trade at the port in 1965. The import of coal (group 2) also showed an absolute increase, with the opening of the Anthraciet Handels-Vereniging in 1961, importing domestic coals. Additional storage capacity for oil

and oil products (group 3) during this time also ensured continued growth.

The provision of additional facilities for general cargo at the Vlothaven seemed to have little effect on Anglo-Dutch trade flows, with trade in group 9 showing a decline in both imports and exports. The transit outwards of iron ore increased, this was related to the extension of activities by the O.B.A. Movements in other commodities, of less importance in Anglo-Dutch trade flows, were mainly influenced by external forces operating, such as increased demand from the hinterland, which gave rise to increased transit inwards of group 6.

Group 8, chemical products, underwent a relative decline in importance: there were no major developments in the chemical industry at the port over the period, so that again external factors were predominant. Provision of new facilities and industries was important for the main commodity movements in Anglo-Dutch trade over this period.

1.2.1.3. 1965-70

The strongest growth in Anglo-Dutch trade passing through the port occurred in this period, particularly in the transit outwards of iron ore to the United Kingdom. External factors were the main cause, especially the inability of the United Kingdom to receive large bulk ore carriers at this time necessitating transit through larger European ports. There were no new handling facilities for this commodity provided at the port. Growth continued in the transit of grain and export of oil and oil products, but there was a relative decline in these groups (0 and 3) and the impact of the opening of the port's Mobil refinery in 1968 on Anglo-Dutch trade passing through Amsterdam was less than might have been expected. Trade in group 8, chemicals, declined both relatively and absolutely, so that as far as trade with

the United Kingdom was concerned the hoped for increase in this sector following the location of the refinery was not realized.

Despite considerable development in general cargo handling facilities at the port, especially the opening of the Coen terminal (roll-on/roll-off) and the C.T.A. (containers), there was only a slight absolute increase in trade in groups 1, 5 and 9, the main commodity groups likely to benefit from these facilities.

External forces therefore played an important role in trade flows with the United Kingdom over this period.

1.2.1.4. 1970-75

There were no major new developments at the port over this period, although the C.T.A., O.B.A. and V.C.K. all expanded. Anglo-Dutch trade passing through the port showed a decline. Only coal (group 2) and fertilizers (group 7) showed an absolute increase. The expansion of the O.B.A. coincided with an increase in the transit outwards of coal, but at the same time there was a massive decline in the ore trade, again as a result of external factors, with deeper water facilities becoming available in the United Kingdom (Port Talbot) for offloading ores. Trade in oil and oil products, despite the Mobil refinery, declined, and there was continued decline in trade in group 8. The transit of grain fell in volume as did groups 1, 5 and 9 despite increased activity by the C.T.A. and V.C.K.

1.2.1.5. Conclusion

In the initial part of the period the provision of new facilities had an important effect on Anglo-Dutch trade flows, particularly during 1960-65, although thereafter despite the location of the Mobil

refinery and new facilities for the movement of general cargo in the form of roll-on/roll-off and container terminals, external factors were more important. External forces were responsible for increased transit of ores in the 1960s, and the general decline during the 1970-75 period in trade in most commodity groups.

1.2.2. Zaandam.

Despite considerable fluctuation in this port's trade with the United Kingdom there was an overall increase particularly from the mid-1960s onwards. The general increase in trade occurred at the same time as the opening of the Isaac Baarthaven and the provision of the new roll-on/roll-off facilities at the port. However, if the commodities involved are examined (Chapter 3, 4.2.3.) it can be concluded that the increase was largely a result of external factors, as wood and wood products did not feature as an element in Anglo-Dutch trade through the port, and, as noted in Chapter 4, it was for this trade that the Isaac Baarthaven was destined. The impact of the provision of roll-on/roll-off facilities on Anglo-Dutch trade was more difficult to assess, with increased export of building materials (group 6) and starch products (group 8) possibly benefiting from the roll-on/roll-off terminal, and the increased orientation of the port's trade flows to the United Kingdom as an important trading partner seems to suggest a positive effect. However, the major development at the port (Isaac Baarthaven) had no effect on Anglo-Dutch trade flows.

1.2.3. IJmuiden.

As was the case with total trade, Anglo-Dutch trade at this port was strongly connected with local port activities, mainly the development of the integrated iron and steelworks. Growth in Anglo-Dutch trade

was especially rapid in the late 1960s, coinciding with expansion in this industry. Improvements to Quay 2 took place at the same time as an upsurge in trade in group 5 with the United Kingdom was recorded. Despite the extra general cargo handling facilities provided at the 3rd Rijksbinnenhaven at the end of the 1960s there was a decline in trade in group 9 over the period 1965-70. This was only a minor element in Anglo-Dutch trade flows, however. On the whole therefore developments in Anglo-Dutch trade coincided with the main developments in port industry and facilities for handling group 5 at the port which underwent important improvements. Movements in other commodities involved in Anglo-Dutch trade flows over the period were also closely connected on the whole with the activities of the iron and steel industry; for instance, the decline in the importance of coal imports as a result of the changeover to other energy sources, although competition from cheaper American sources (an external factor) was also responsible for this.

1.2.4. Conclusion.

For Amsterdam the provision of extra facilities and the activities of port industries was of great importance in the initial period, but later developments in this area were less important and by the end of the period external factors played a more important role in Anglo-Dutch trade flows. IJmuiden's Anglo-Dutch trade was very strongly connected with developments taking place at the port in terms of expansion of port industry in particular. For the smallest port in the North Sea Canal group, Zaandam, external forces were the main cause of developments in Anglo-Dutch trade flows through the port.

1.3. The northern port range.

Extensive port development marked the growth of Delfzijl, and at Groningen there were also structural changes over the period. For Harlingen, however, this was not the case. The relative share in terms of the Dutch port range of these ports in Anglo-Dutch trade declined, with the exception of the smallest port, Groningen.

The total role of the northern ports in Anglo-Dutch trade over the whole range also showed a decline despite developments at Delfzijl and Groningen.

1.3.1. Delfzijl.

As noted in the previous chapter, it was the decision by the K.N.S.I. to locate at this port in the late 1950s which gave the main impulse to port growth, with major exports of salt and salt products (group 6). This had virtually no effect upon the port's Anglo-Dutch trade, which showed only a slight absolute increase over the period 1955-60, with group 6 forming only a minor element. In total trade in 1960 group 6 formed the major element. Most of the trade with the United Kingdom passing through the port continued to be connected to traditional port activities, particularly the export of agricultural produce and the export of straw and cardboard. No new facilities or expansion of existing facilities for this took place at the port. This situation continued until the late 1960s, with developments in Anglo-Dutch trade flows bearing little relation to developments in the port's physical and industrial structure. Although there was a considerable increase in the importance of group 8 in the United Kingdom trade in the period 1970-75 this was not due to developments in the port's chemical industry, as the main growth occurred in

the late 1950s and early 1960s, and the major cause of this was the revival in the traditional exports of starch products.

Anglo-Dutch trade passing through the port in the early 1970s showed a rapid increase, which could be linked with the provision of a new harbour entrance at Delfzijl. However, the major element in this increase was the growth in the export of tubes and pipes (group 5), which were carried in smaller vessels.

Consequently it may be stated that external forces had the main influence on the development of Anglo-Dutch trade through Delfzijl 1955-75, with internal developments at the port having very little effect on these flows. Initially the Anglo-Dutch trade passing through the port bore a close relationship to the major port facilities and industries (agricultural produce, starch, straw and cardboard) but by the end of the period this was no longer so.

1.3.2. Groningen.

As with total trade, trade with the United Kingdom showed an initial growth during the early 1960s, but a decline thereafter. This increase followed improvements to the Eemskanaal, but after completion of the new harbour area at the port there was a decline. In chapter 3 (4.3.2.) it was noted that 1963 was a crucial date for Anglo-Dutch trade passing through the port, as after this date trade declined. Prior to this year imports from the United Kingdom were dominant, but after this exports became more important. Together with the conversion of the Groningen power station from coal to gas in 1963 (see chapter 4, 4.1.1.) the logical conclusion seems to be that the reduction in imports was due to a cessation of coal imports from the United Kingdom. In fact, as most of the coal needed was imported through the port of Delfzijl,

it was this port's trade which was affected (see chapter 3, table 41, group 2). Group 2 was not an element in the Anglo-Dutch trade of Groningen prior to 1963. It was mainly external forces which were responsible for the decline and changes in the structure of the Anglo-Dutch trade, with the changing demand for agricultural produce resulting in a decrease in the export of grain during the early 1960s.

Internal developments at the port of Groningen therefore had little effect on Anglo-Dutch trade flows over the period 1955-75, with external forces playing an increasingly important role.

1.3.3. Harlingen.

With little internal development at the port during the period under study the development of Anglo-Dutch trade, similar to total trade, was mainly a result of the operation of external forces. However, this was not entirely so since the decline from 1964 onwards in Anglo-Dutch trade, which was greater than the decline in total trade, was strongly connected to the cessation of liner sailings to the United Kingdom from the port. This was partly a result of the relative isolation of the port from the rest of the Netherlands, but also a result of the physical limitations at the port and the lack of development (see later, section 2.4.3.1), and the absence of return freight which diverted trade to other ports. External factors such as developments in the agricultural hinterland were also of great importance to the development of Anglo-Dutch trade flows through the port of Harlingen, with a fall in exports.

Harlingen's failure to maintain its Anglo-Dutch trade throughout providing new facilities and the subsequent diversion of trade to other ports in the range is illustrated in the declining role of Anglo-Dutch trade in terms of the port's total trade flows over the period.

1.3.4. Conclusion.

The provision of new facilities and industries at the ports of Delfzijl and Groningen had only a nominal influence on Anglo-Dutch trade flows passing through these ports, as external forces were of major importance. Commodities passing through these ports continued to show a strong connection with traditional activities. In absolute terms the trade flows with the United Kingdom in the 1970s were only slightly greater than in the 1950s, although at both ports there was a marked increase after 1973 caused mainly by an increase in agricultural produce. This was mainly a result of external forces. For Harlingen, where there was a dramatic decline in Anglo-Dutch trade, no attempt was made to increase trade by internal development of any sort, and trade was attracted away to other ports.

All this suggests that for the northern ports, with their eccentric position with regard to the rest of the Netherlands, close attention to the needs of existing trade flows is even more important for the maintenance or increase of these flows than for other Dutch ports. Failure in this respect could mean that all the northern ports may suffer a decline in their Anglo-Dutch trade similar to that at Harlingen.

1.4. The Schelde ports.

During the period under consideration there was substantial physical development at the ports of Vlissingen and Terneuzen, and together with a marked increase in trade with the United Kingdom between 1955 and 1975, it would seem logical to assume a connection between these two phenomena. To examine this, however, it is necessary to study trade

flows with the United Kingdom and physical developments at both ports individually.

1.4.1. Terneuzen.

Taking into consideration the overall increase in trade noted in chapter 3 (section 3.4.1.) with regard to Anglo-Dutch trade flows passing through this port, even when ignoring the abnormal totals of 1962-6 and 1968-71 (caused by increased imports of group 2 and group 3 respectively), this seemed to be strongly linked to physical development at the port. Anglo-Dutch trade accelerated after the completion of the improvements to the Gent-Terneuzen canal in 1968. However, it is important to note that it was in direct trade with the United Kingdom that the major growth occurred, with transit declining, so that it was access to the existing port and older industries along the canal and the improvement to this rather than improved access to the hinterland which benefited Anglo-Dutch trade. The commodity structure was almost the same at the end of the period as it had been in 1955 (Chapter 3, 4.4.1.5.), with the exception of group 8. It was therefore the traditional trade flows with the United Kingdom which showed the greatest increase rather than any increase in trade generated by new industries locating in the area. The major exception to this was trade in group 8, which showed a dramatic increase from 1965 onwards, a date which coincided with the location of the DOW chemical plant at the port. However, a closer look at this phenomenon shows that much of the increase was in the transit outwards of chemical-based products between 1965 and 1970, rather than direct export. By 1975 export of tar and coal derivatives formed the main element in trade with the United Kingdom in group 8, from the traditional industries

along the Gent-Terneuzen canal at Sluiskil and Sas van Gent, and there was very little trade in petro-chemical products of the kind produced by the DOW plant, although in the period 1965 to 1970 a modest trade in this did emerge.

In common with total trade, there was an obvious link between the growth in trade with the United Kingdom and the improved accessibility provided by the modifications to the Gent-Terneuzen canal. Anglo-Dutch trade flows showed an accelerated growth following the completion of improvements to the canal, particularly after the opening of the Massagoedhaven. The roll-on/roll-off harbour had only a slight effect on Anglo-Dutch trade flows, as the major movements between this port and the United Kingdom involved bulk commodities, especially groups 2 (coal), 7 (fertilizers), 6 (mainly china clay) and group 8 (chemicals).

In 1975 there was no trade in group 9, the commodity group most likely to have benefited from the opening of new roll-on/roll-off facilities. Other new industries at the port during the 1960s also had little effect on the patterns or volume of Anglo-Dutch trade: many of these industries were in the metal sector, and Anglo-Dutch trade in group 5 remained little changed.

Summing up, Anglo-Dutch trade passing through the port of Terneuzen became more directly connected to industrial activity at the port with the decline in transit trade, but the industries concerned were those traditionally established, rather than new industries which might have generated additional trade. However, improvements to the Gent-Terneuzen canal, enabling better access to the traditional industries at the port, was of major importance to Anglo-Dutch trade flows. Although there was a relative decline in the role played by United Kingdom trade, this was caused mainly by a decline in transit trade to the Belgian hinterland through the port.

1.4.2. Vlissingen.

In an initial examination, it would seem that the improvements to the port in the 1960s, particularly in the development of the Sloe area, had an important effect on Anglo-Dutch trade flows passing through the port. The main increase in these flows was recorded soon after the completion of the new Vlissingen-Oost port area, with important new industries locating in this area (Billiton, Hoechst, Pechiney etc.). Additional facilities for handling general cargo were also created in 1971 and this would also be expected to affect the Anglo-Dutch trade flows.

When considering the commodities involved in the increase recorded (see Chapter 3, section 4.4.2.), it becomes apparent that the major increase was due to group 6 (imports of crude minerals), rather than any increased trade in group 8 (chemicals), which would be expected with the development of the chemical sector at the port. In fact there was some increase in trade in group 8 over the period 1965-75, but this was mainly in imports of chemical-based products from the United Kingdom. Imports of sea-sand and gravel (group 6) accounted for most of the increase in Anglo-Dutch trade,¹ destined for the new grading and sorting plant which began operations at the old harbour in 1971 (Buitenhaven).

Another important development for Anglo-Dutch trade at Vlissingen was the commencement of roll-on/roll-off services from the Buitenhaven in 1972. The diversification in commodities noted over the period 1970-75 (Chapter 3, 4.4.2.4) was largely due to this fact, particularly the increase noted in trade in group 9.

Internal developments at the port were therefore of great importance to Anglo-Dutch trade flows, particularly new locations in the older

port area. The major development at Vlissingen over the period, the Sloe area, had little effect on these flows. Improvements to the older port area were minimal.

1.4.3. Conclusion.

For both the Schelde ports, increased trade with the United Kingdom over the period 1955-75 appeared to be largely a result of internal developments. However, on closer examination it appears that for Terneuzen it was increased output from older industries, facilitated by improvements to access, which accounted for the growth. For Vlissingen it is of interest to note that despite considerable port development at Vlissingen-Oost, this had little effect on Anglo-Dutch trade flows, whereas a new roll-on/roll-off service and sand and gravel sorting plant opened in the older port area had a very great impact on these trade flows.

Terneuzen, traditionally dependent on bulk trades to serve its heavy industry, proved more sensitive to improving access as trade using larger, more economic bulk carriers became possible, but even at this port it was improved access to the older port areas which had the greatest effect on Anglo-Dutch trade rather than the construction of new harbour areas.

1.5. Scheveningen

The port of Scheveningen provides an important indicator of the way in which Anglo-Dutch trade flows have developed with regard to the smaller ports in the Dutch port range, particularly since the late 1950s. Regular services with the United Kingdom were set up

in 1960, but the volume of trade passing through the port was at first insignificant. The rise in tonnage of trade passing through the port was almost entirely a result of a growth in Anglo-Dutch trade flows, particularly following the opening of a new roll-on/roll-off facility at the port in 1969. Growth was rapid following the opening of the new 'Derde haven' in 1973, especially constructed to meet the needs of the roll-on/roll-off service operating between the port and the United Kingdom. Group 0 showed the main growth, with export of fruit and fresh vegetables from the Westland area; rapid export services using the roll-on/roll-off facilities at the port were a major attraction to growers. Group 9 featured as the other main element in Anglo-Dutch trade, most of this being return freight from the United Kingdom (imports) of transport equipment and machinery, as well as other finished products.

Although these internal developments in terms of the improvements connected with the roll-on/roll-off service were of major significance, external developments were also important in increasing trade. The entry of the United Kingdom into the E.E.C., for instance, in 1973, enabled increased trade in agricultural produce between the two countries. Exports of dairy produce and meat in particular showed strong growth following this development, as did the import of a variety of manufactured products (group 9).

1.6. Conclusion.

Only for the larger Dutch ports (Rotterdam, Amsterdam, IJmuiden, Dordrecht, Terneuzen and Vlissingen) could a relationship be found between increased Anglo-Dutch trade and internal improvements or developments at the port over the period 1955-75. External develop-

ments determined the course of Anglo-Dutch trade at the smaller ports, with the exception of those ports where roll-on/roll-off or container services were involved (Hoek van Holland, Maassluis, Scheveningen). It is also of interest to note that growth in Anglo-Dutch trade at several of the larger ports was due more to improved access to existing industries, enabling expansion in trade, than from the establishment of new industries. At Amsterdam, initial improvements in bulk handling facilities coincided with an increase in trade, but later developments, particularly industries locating at the port in the late 1960s and early 1970s appeared to have little effect. It was only at Rotterdam, IJmuiden and Dordrecht that port improvements and the establishment of new industries coincided with increased Anglo-Dutch trade flows passing through the port.

Also of interest is the growth which occurred in Anglo-Dutch trade at Vlissingen, a large part of which was accounted for by the establishment of a new industrial concern in the old part of the port rather than the recently opened Sloe area with facilities for deep-water ships. This is significant, in that it suggests that the provision of deep water access is not necessarily an essential requirement in maintaining and increasing Anglo-Dutch trade flows through a port - flows which often involve smaller ships able to enter shallow ports in the United Kingdom. Where larger bulk flows are the major element in Anglo-Dutch trade, however, and depth is limited to allow access to small bulk carriers, as was the case at Terneuzen, then improved access can be beneficial, so that the nature of the commodity structure is of crucial importance.

The development of Anglo-Dutch trade at the northern ports presents an interesting case. The extensive development of Delfzijl over the period had very little effect on Anglo-Dutch trade passing through the

port. Although an increase was recorded, this was largely linked to external developments, with a growth in traditional products exported from the port to the United Kingdom. At Groningen, Anglo-Dutch trade declined following the completion of improvements to the port, so that external factors were again paramount in determining the course of trade flows with the United Kingdom. There was, nevertheless, an overall increase in Anglo-Dutch trade through the port by the end of the period, mainly due to increased trade in agricultural produce. Harlingen, where there were no improvements, showed a decline in Anglo-Dutch trade, which was mainly a result of the cessation of a number of regular sailings between the port and the United Kingdom.

Several smaller ports in the Dutch range showed an increase in Anglo-Dutch trade despite no provision of new facilities or improvements at the port (Vlaardingen, Zaandam, Zwijndrecht), and it is at these ports that the case for improving facilities with regard to Anglo-Dutch trade flows is strongest (see Chapter 6).

2. The effect of regular liner sailings on Anglo-Dutch trade flows.

It has been seen that the provision of regular liner sailings with the United Kingdom plays a crucial role in the trade flows of a number of smaller ports, particularly in the case of roll-on/roll-off and container services. The importance of this has already been shown with regard to Anglo-Dutch trade flows passing through the ports of Hoek van Holland, Maassluis and Scheveningen, and also for the decline in trade at Harlingen.

It is especially the development of Scheveningen in recent years which, as pointed out by Verhoeff,² shows the way in which small ports can profit from increased trade with the United Kingdom. The key to the rise of Scheveningen as a port has been the provision of facilities for

the liner service operating between the port and the United Kingdom. Roll-on/roll-off services in particular offer a method of increasing traffic on short sea routes such as those to and from the United Kingdom without necessitating heavy investment in expensive facilities which smaller ports can ill afford.³

2.1. The development of roll-on/roll-off traffic between the Netherlands and the United Kingdom, 1955-75.

At this point it would be useful to take a brief look at the development of roll-on/roll-off traffic in general over the Dutch port range with the United Kingdom, before moving on to an examination of the behaviour of liner trades between individual ports and the United Kingdom over the period. It has been in the field of roll-on/roll-off traffic in particular that Anglo-Dutch trade through the smaller Dutch ports has gained ground. Most of the developments in new roll-on/roll-off techniques took place in the mid to late 1960s, and the main reason for their successful application to Anglo-Dutch trade flows was that the method was most suitable when applied to short-sea routes. The roll-on/roll-off method is most economic here since the higher costs incurred during the voyage by the use of specialized ships, the loss of capacity due to a low loading factor (much of the space in roll-on/roll-off ships is underutilized, for manoeuvring vehicles etc.) and other factors may be offset by the faster turn round time and consequent reduction in terminal costs.⁴

It is hardly surprising therefore, that in a study of roll-on/roll-off trade through Dutch ports, Vaandrager (1978)⁵ concluded that at least 90% of this was with the United Kingdom. In terms of the importance of roll-on/roll-off traffic in Anglo-Dutch trade flows, Vaandrager also

calculated that as much as 25% of the total growth in trade flows between the two countries over the period 1973-76 was accounted for by the roll-on/roll-off transport technique. To place this in perspective, 10% of the total trade flow between the Netherlands and the United Kingdom in 1976 moved by the roll-on/roll-off method. It is also of interest to note some of the characteristics of this trade. Exports, in common with total trade, by roll-on/roll-off technique exceeded the imports from the United Kingdom by this method, so that an imbalance existed.

The types of commodity normally carried by the roll-on/roll-off method and liner services⁶ are as follows: agricultural produce, groups 0 and 1 (fish, dairy produce, grains, plant and animal basic products), manufactured products and finished items, group 9 (mainly machinery, transport equipment) and a small amount of basic chemical products (group 8) and of semi-finished metal products (group 5). In trade with the United Kingdom, it was especially in trade in groups 0 and 1 that the roll-on/roll-off technique was of great importance, whereas in the return flow it was group 9 which played the major role.

The changing relative share of individual Dutch ports in the roll-on/roll-off trade of the Netherlands (most of which is with the United Kingdom as already noted) between 1969 and 1975 is shown in table 50 below.

Although Rotterdam dominated the roll-on/roll-off trade flows, there was a decline in its share over the period. Amsterdam in particular showed a considerable decline in its share of roll-on/roll-off traffic between 1969 and 1975. On the other hand, the smaller ports showed an increasing involvement in roll-on/roll-off trade flows passing through

the Dutch port range. Again this is an important development for smaller ports and planning authorities since it indicated an important area in which small ports can compete successfully with larger ports. The success of Scheveningen in particular in attracting and maintaining roll-on/roll-off trade is adequately illustrated in the table.

Year	Rotterdam	Amsterdam	Hoek v.Holland	Scheveningen	Vlissingen
1969	70	9	5	16	-
1970	61	11	10	18	-
1971	63	7	9	21	-
1972	65	5	9	20	1
1973	69	5	6	18	1
1974	66	5	6	20	3
1975	62	4	8	20	6

Table 50.

Percentage share of Dutch ports in total roll-on/roll-off trade 1969-75 (percentages taken to nearest whole number).

Source: calculated from C.B.S. statistics included in Vaandrager, Appendix 4, p. 78.

2.2. Developments in the liner trades with the United Kingdom over the period 1955-75.

Having established the importance of the roll-on/roll-off trades between the United Kingdom and the Netherlands, especially for the small ports, it is justifiable to take a closer look at the changes which have taken place in the regular connections across the North Sea between these two countries, and also at their effects on the development of Anglo-Dutch trade at individual ports in the Dutch

port range. Conventional cargo liners dominated in general cargo flows between the two nations until the 1960s, when the developments in container and especially roll-on/roll-off techniques led to this element becoming more important, although conventional ships were still used in trade across the North Sea at the end of the period.

2.3. Definitions and nature of liner trades.

It is necessary to provide a definition of liner services before moving on to a further analysis of the changing nature of the Anglo-Dutch liner services over the period 1955-75.

In port literature, the regular connections which exist between two ports on any trade route are usually referred to as liner services. For a definition of this phenomenon Morgan⁷ provides a useful statement: 'The liner is a ship which sails on a line; that is, a previously advertised schedule of ports and times. The number of passengers carried in proportion to cargo space makes no difference to the definition, i.e. the ship may be a passenger liner taking some cargo, a cargo-passenger liner, or a cargo liner taking few or no passengers'. With the advent of the roll-on/roll-off ship these distinctions have become even less obvious, with many companies counterbalancing the seasonality of passenger flows with cargo traffic. It is the effect of liner services on cargo flows between the Netherlands and the United Kingdom that we are especially concerned with here, however.

The liner trades are of particular interest and value to smaller ports, as it involves movement of mainly low-bulk/high-value goods which do not require extensive areas of land for storage. However, this is not true of the more specialized form of liner service, the container ship, for which specialized handling equipment and extensive storage space is needed, often resulting in heavy investment requirements by port authorities.

Ports which have liner services often have the major advantage of serving an extensive hinterland, handling a great variety of goods. Liner services often lead to a 'snowball' effect on port trade, as the advantages enjoyed by the liner service operating from a particular port will also act as an attracting force for other services to start operating from that port. It is in this way that the changes which take place over a period of time in the distribution of liner sailings within a port range can be of great value in the study of trade flows. For Anglo-Dutch trade, the strengths and weaknesses of particular routes are revealed over the period 1955-75 within such an examination, and a pattern of the changing direction and nature of these flows emerges.

It has already been stated that liner trades are of particular interest to smaller ports in a range, as a result of the nature of these trades, the ability of smaller ports to accommodate the needs of liner companies, and the 'snowball' effect on trade flows which may be achieved. In the past, it was especially the largest ports in any range which were attractive for liner sailings, with the large range of facilities available, the probability of return cargoes, and the many other agglomeration factors such as extensive hinterland transport networks.

Although many of these advantages remained valid, the improvement of hinterland transport links from most ports in the Netherlands, and the advent of unitized and roll-on/roll-off methods enabling through transport from point of origin to point of destination (hereby guaranteeing regular cargoes), resulted in the smaller ports being able to compete against larger ports for regular services. The growing problems of congestion in large ports, together with high port dues, expensive rentals and leases, and the lack of individual attention all served

to strengthen the competitive position of small ports in the range.

2.4. Liner services between the Dutch ports and the United Kingdom, 1955-75.

As in the previous sections of this work, liner services at each port are examined under the four main port groupings.

2.4.1. The New Waterway ports.

The two main ports with liner sailings within this group over the period 1955-75 were Rotterdam and Hoek van Holland. The former enjoyed many of the advantages listed in the previous section (agglomeration advantages, regular return cargoes etc.), while the latter had special status as a main railway terminus for the Netherlands and western German hinterland, a historically important function.⁸ In addition, Vlaardingen and Maassluis also had regular connections with the United Kingdom during the period, mainly as a result of their relationship to the agricultural hinterland area (Westland), and the need for regular, fast export services for fresh vegetables to the United Kingdom. Schiedam, with its concentration on shipbuilding and related activities, had no regular connections with the United Kingdom over the period 1955-75. Dordrecht, with its concentration on bulk products in Anglo-Dutch trade likewise had no regular liner sailings, neither did Zwijndrecht, with Anglo-Dutch trade passing through this port depending largely on a fluctuating demand from local industries.

2.4.1.1. Liner connections between Rotterdam and the United Kingdom, 1955-75.

Most of the information in this analysis comes from yearly publications of the Rotterdam Chamber of Commerce (Kamer van Koophandel en Fabrieken

voor Rotterdam), 'Scheepvaartverbindingen ter Zee van en naar Rotterdam', 1956-75, and from personal communications with the port authority.

In 1956 (no figures were available for 1955) there were twenty-three liner services operating between Rotterdam and the United Kingdom. This does not include sailings from Harwich-Hoek van Holland, although these came under the jurisdiction of the Rotterdam port authority. By 1960 the number of services from Rotterdam to the United Kingdom had increased to twenty-four, and during the advent of containerization and the development of the roll-on/roll-off trades in the late 1960s the numbers remained fairly constant with twenty-three in 1965 and in 1970.

With the increase in trade expected with Britain's entry into the E.E.C. in 1973, liner trades also remained constant over the period 1970-75. As a result there were still twenty-three services operating between the port and the United Kingdom in 1975, despite considerable amalgamation. There was, in addition, a notable change in the direction of trade carried in liners between Rotterdam and the ports of the United Kingdom, reflecting changes in technology, demand, and other factors. A full pattern of the development of the liner trades with the United Kingdom, 1955-75, is contained in Appendix III.

In 1956, there were regular sailings between Rotterdam and forty-nine ports in the United Kingdom. By far the greatest number of sailings (12) were with the port of London. Second in importance were Hull and Goole, with three liner connections with Rotterdam. Liverpool, Manchester, Glasgow (via Leith), Grimsby, Grangemouth, Kings Lynn and Boston (Lincs.) followed with two liner connections. The ports of Southampton, Bristol, Swansea, Newport, Cardiff, Belfast, Aberdeen, Dundee, Newcastle, Sunderland, Middlesborough, Norwich, Lowestoft, Great Yarmouth, and Plymouth all had one regular service with Rotterdam in 1956.

By the end of the period there had been a substantial change in this situation. As a result of amalgamations and the increase in competition the number of ports in the United Kingdom which had regular connections with Rotterdam had fallen to thirty-five. The largest number of regular sailings between Rotterdam and a United Kingdom port were with Felixstowe. This port did not have any regular sailings with Rotterdam in 1956, but by 1975 there were five liner companies operating between the two ports. London had only four regular connections, a third of the 1956 total. Belfast and the west coast port of Liverpool had three regular services operating in 1975, an increase over the 1956 situation. This was largely a result of the deep-sea container connections operating between the United States, west-coast British ports (with deep water facilities) and Rotterdam. The ports of Leith, Grangemouth, Hull, Ipswich, Immingham, and Rochester (Medway) each had two liner services to Rotterdam in 1975. This meant that whereas Hull lost a connection, Ipswich, Immingham and Rochester each gained one. This was an important development, for it shows that the liner connections between Rotterdam and the east coast ports became more important over the period 1956-76. Newcastle (Tyneside), Middlesborough, Goole, Kings Lynn, Boston (Lincs.), Dover, and Newport, all had one regular connection in 1975. The decline in the west coast ports, in particular the Welsh ports, Bristol and Manchester, is especially striking in a comparison with the 1956 position, together with several Scottish ports. Great Yarmouth and Lowestoft no longer had regular connections in 1975, as a result of limited depth and the attraction of nearby Felixstowe with its specialized handling facilities for container and roll-on/roll-off trades. The decline in the position of Goole is also of interest; together with the decrease in the number of regular services from Hull to Rotterdam the 'centre of gravity' for liner services

between the United Kingdom and Rotterdam moved south-eastwards over the period. This was partly a result of the rise in roll-on/roll-off services, with its emphasis on shorter sea crossings to gain maximum economies. The trend was therefore towards an increasing emphasis on short sea crossings, and the shortest routes between the United Kingdom and Rotterdam. The decline in liner trading with Rotterdam from the South Wales and western ports may also be explained in this light, although Liverpool, where deep water container facilities were available remained important. On the whole, however, deep water was not a major requirement for the short-sea liner trades. It is hardly surprising therefore that ports on the eastern and south-eastern coasts of the United Kingdom benefited greatly from this trend. Felixstowe, one of the closest ports in the United Kingdom to Rotterdam (the distance to the entrance of the New Waterway was approximately 114 miles), became an important centre for liner services as a result.

The relative unimportance of deep-water facilities for the liner trades are in marked contrast to the requirements of the bulk trades over the period 1955-75. Although there was rapid development in large bulk carriers, especially for oil, there was only a slow growth in the size of liner vessels. Among the largest vessels in the liner trade (excluding deep-sea container vessels) were the roll-on/roll-off ships of the British/Dutch/German organization North Sea Ferries, operating between Hull and Rotterdam, with vessels of 3,800 d.w.t. and a draught of around 22 feet.⁹ This draught could be accepted by many of the smaller ports where large bulk carriers could not be accommodated. Speed of service was important, so that lock gates had to be adequate if needed, but again the smaller ports benefited from less congestion so that fast turn-around times (such as those achieved at Felixstowe)

were possible. Limited depth was therefore less important than a short-sea crossing and rapid turn-around. All this could be provided by smaller ports without necessitating heavy investment in expensive facilities (except in the case of containers, requiring specialized equipment; however, maximum economies on container trades could only be gained on longer routes due to the heavy investment needed). In the case of smaller ports which were able to set up these roll-on/roll-off facilities, the effect has been spectacular in attracting liner services, particularly during the economic expansion of the 1960s, when there was rapid growth in the number of roll-on/roll-off and also container services.

It is useful to take a closer look at the port of Felixstowe and its development over the period, in view of its importance for liner trades from and to Rotterdam. In 1965 the first modern roll-on/roll-off terminal was opened, followed in 1968 by a modern trans-atlantic container terminal, and a freightliner terminal in 1972. However, even before these developments the signs were that the port was becoming attractive for liner services on the short sea routes: that is, the geographical, economic and technological developments in the liner trades favoured the port. In 1958 J. Fisher and Sons began a ferry service between Felixstowe and Rotterdam. A year later the Great Yarmouth Shipping Company, already operating from Great Yarmouth, Lowestoft and Norwich to Rotterdam, extended its operations to Felixstowe. Both these companies ceased to operate on this route during the fierce competition of the mid and late 1960s, the former in 1967 and the latter a year later. Two new services came into operation in the mid-1960s, the Transport Ferry Service in 1966 (for whom the port's first roll-on/roll-off facility was built) and a year later Everard Lines began operating from the port, although this service was dropped in 1970.

It was in the 1970s that the greatest development of the port occurred, following the opening of the trans-Atlantic container terminal in the late 1960s. In 1971 Sea-Land began a through service for containers from the United States to Felixstowe via Rotterdam. This was followed in 1972 by the Trias Ferry Service and the United States Lines. In 1974 Metric Line, which had previously concentrated on container services between Rotterdam and the larger United Kingdom ports. (London and Liverpool) also began regular services from Rotterdam to Felixstowe. The commencement of Freightliner container trains in 1972 from Felixstowe, providing fast and efficient inland distribution, was an additional attraction for companies involved in the container trade, and one of the factors in the growing importance of Felixstowe as a centre for liner services between Rotterdam and the United Kingdom.

The lessons to be learnt from the development of Felixstowe provide important indications of the way in which small ports can compete successfully with larger ports in a range. It is not possible, however, to take this analogy too far, as the geographical situation and other factors such as inland transport links, etc. of each port are unique, and this must be borne in mind before any investment decisions are taken by smaller ports, particularly in those concerning expensive container facilities.

Before moving on to other New Waterway ports, a variety of other features of the liner trades between Rotterdam and United Kingdom ports over the period 1955-75 deserve illustration. The first is those services which emerged during the period and lasted only for a short time. Of those companies operating for six years and under (twelve in total over the period 1955-75), three continued operations under another name (by amalgamation), and four were operating for only

a year (two of these continued after amalgamations with other companies). Of the twelve lines concerned, about half were connections between Rotterdam and London/Medway area, a quarter with East Anglian ports (mainly Great Yarmouth), and the rest were split equally between connections with the South Wales/Bristol area, Liverpool/Merseyside and the north-eastern ports (Hull and Middlesborough). Two-thirds of these lines came into existence during the optimism of the 1960s, with the advent of roll-on/roll-off techniques and other developments in short-sea trade, but by the end of the period overcapacity had emerged and many companies were unable to compete.

Also of note is that only five liner services between Rotterdam and the United Kingdom managed to maintain services throughout the whole of the period in question. These were all services between Rotterdam and east coast ports in the United Kingdom, with the exception of the Holland-Ierland Line, which sailed between Rotterdam and Belfast. S.S.M. Lines had a service with the ports of Leith and Grangemouth in Scotland throughout the period, and also sailings to Kings Lynn and Boston (Lincs.), with sailings to the Humber ports and Medway as a later addition. The Tyne-Tees Steamship Company ran a service between Rotterdam and Newcastle, and the Thames Line and Zaan-London Line concentrated on services between Rotterdam and London.

2.4.1.2. The Liner services between Hoek van Holland and the United Kingdom, 1955-75.

As mentioned previously, Hoek van Holland came under the jurisdiction of the Rotterdam port authority. The port's existence was due to its function as a terminus for railway lines to the Ruhr area of Germany, continued to the United Kingdom by means of a ferry service to Harwich. In the past its importance lay largely in its function as a passenger

terminal, but the transport of goods became increasingly important, since the regularity of sailings became an important attraction. This was especially true of perishable agricultural produce, which required fast and efficient export arrangements. During the early 1960s the company operating this service (Stoomvaart Maatschappij Zeeland (S.M.Z.) in conjunction with British Rail) brought several new ships into operation on the route, partly to accommodate the requirements of the 'Westland' growers for the speedy export of vegetable produce. It was not until 1968 that substantial improvements were made in the speed of the service offered when roll-on/roll-off ships were brought into use on the route, and the terminal was adapted to facilitate this. By 1975 three roll-on/roll-off and one conventional vessel were in operation between the port and the United Kingdom, with day and night sailings. Further modernization of the terminal and marshalling area to accommodate the increase in trade was planned.

Although increased trade with the United Kingdom resulted from these developments, the possibilities of increased trade because of the United Kingdom's entry to the Common Market, and the demand for a regular, speedy and reliable service with the United Kingdom from the 'Westland' growers existed prior to these improvements. The potential for increased trade was seen by the liner company and suitable investments made.

2.4.1.3. The port of Schiedam and liner services with the United Kingdom, 1955-75.

The question of regular service from this port did not arise over the period, with trade being carried out in conventional ships with irregular sailings.

2.4.1.4. Liner services from Vlaardingen with the United Kingdom, 1955-75.

At the start of the period there were no regular services from this port. Feedstuffs and animal products (group 1), especially oils and fats, formed the main trading items in 1955, and this was carried out on an irregular basis. In 1964 the first regular service from the port to the United Kingdom was set up, to serve the needs of the agricultural hinterland, in particular, as at Hoek van Holland, the needs of the 'Westland' growers seeking a fast and efficient export outlet. The liner service was a joint undertaking by the 'Westland' growers, and the service bore the same title (Rederij Westland). The municipally-owned general-cargo handling area at the Koningin Wilhelminahaven was used. Depth was limited (see Chapter 4, 3.1.3.), with access only for small coasters and sea-going vessels. Two ships of this type were used on the service. Sailings were daily, mainly to small East Anglian ports such as Great Yarmouth. The service was ended in 1970, so that there were no longer any regular services from the port by the end of the period. The effect on total trade with the United Kingdom was negligible, however, with very little effect on the main commodity group involved, group 0 (mainly fresh vegetables). Over the period 1960-70, during which regular sailings occurred, there was a relative decline in this group (see Chapter 3, 4.1.3.). The introduction, therefore, of a liner service had little effect on the port's trade with the United Kingdom.

2.4.1.4. Liner services between the port of Maassluis and the United Kingdom over the period 1955-75.

As at Vlaardingen, most of the trade between this port and the

United Kingdom was initially carried out by coasters on an irregular basis. In the late 1960s, however, a container service with regular sailings was set up from the port to Rochester (Medway) and Ipswich. Again, as at Vlaardingen and Hoek van Holland (sharing the same hinterland) the export of fresh vegetables from the 'Westland' area was the main impetus behind this development. However, it was not until 1971 that the port's trade with the United Kingdom showed any substantial increase. Nevertheless, groups 0 and 1 showed an important increase in their share of total trade between 1965 and 1970, as did the 1975 figure (if the abnormal increase in the trade in group 6 is ignored). It may be concluded that for this port the establishment of a regular service with the United Kingdom had a definite effect on trade flows.

2.4.1.5. The ports of Dordrecht and Zwijndrecht and liner services with the United Kingdom, 1955-75.

Neither of these ports had any regular services with the United Kingdom over the period 1955-75, with trade in bulk commodities dominating Anglo-Dutch flows at the former, and fluctuating trade according to the demands of local industry at the latter.

2.4.1.6. Summary of the liner services between the New Waterway ports and the United Kingdom over the period 1955-75.

The majority of liner services were concentrated at the port of Rotterdam over the period, but there was some evidence of a 'spread' effect towards smaller ports. The number of liner sailings from Rotterdam declined, while at Hoek van Holland the service was considerably extended, and services from Maassluis and Vlaardingen were set up. The emphasis was increasingly on shorter routes to the southern and eastern ports of Britain, especially smaller ports such as Felixstowe.

2.4.2. Liner sailings between the North Sea Canal ports and the United Kingdom over the period 1955-75.

In 1955, two major organizations were involved in maintaining regular services with the United Kingdom. Starintex had a regular service to London, and the Hollandse Stoomboot Maatschappij (H.S.M.) had a joint service with the Stoomboot Maatschappij Nederland to Hull, London and Liverpool. Most of these services were run from the southernmost quay of the IJhaven. In 1964 the H.S.M. started a service to Goole, with Rotterdam included as a port of call on this route, and to Sheerness. Regular services to London were suspended in 1966, and with the opening of the Coen Terminal in 1968, the other services were transferred to this part of the port. This organization was also responsible for the setting up of a new container service from the C.T.A. to Felixstowe in the late 1960s, under the name Holland Container Line. However, the company was unable to survive the fierce competition with other liner trades. In 1972 the service to Liverpool was ended, and a year later all sailings from Amsterdam by the H.S.M. ceased.

The gap which was created by the cessation of the H.S.M. sailings to the United Kingdom from Amsterdam was filled by a number of companies in the general optimism of the late 1960s, further stimulated by the possible effects of E.E.C. entry on short-sea routes. All the new services were to east coast ports in the United Kingdom, in particular East-Anglian ports.

In 1966 a Swedish company, the Tor Line, started a service between Immingham and Amsterdam, but although still in operation in 1975, its future was looking uncertain. Metric Line began a service from Amsterdam to Felixstowe in 1974, and in the same year a roll-on/roll-off service to Hull was begun by the Continent-United Kingdom Line (Continuk)

and the Koninklijke Nederlandse Stoomboot Maatschappij (K.N.S.M.), in conjunction with the United States company MacVan, started regular services to Leith and Grangemouth in the same year. In 1975 Rotterdam Container Services began regular sailings between Amsterdam and Ipswich, using the C.T.A.

In 1975 there were six companies operating liner services between Amsterdam and the United Kingdom therefore: Starintex, Metric Line, Continuk, K.N.S.M., Rotterdam Container Services and Tor Line. This was an increase on the situation in 1955. The fate of the H.S.M. indicated a precarious position for liner trades with the United Kingdom operating from this port. Other companies involved in similar services were finding it difficult to remain in this highly competitive market. In 1972, for instance, Starintex's takeover by a British company (although it stayed under the same name) was necessary to save the line.

Of the new lines started in the optimistic mood of the years 1966-75, by the end of the 1970s only one was still in existence. By 1979 only two companies were still operating liner services between the port of Amsterdam and the United Kingdom (to Felixstowe and Leith). The growth in liner services between 1966 and 1975 was therefore only a temporary feature.

Liner connections between the port and the United Kingdom over the period 1955-75 showed a growth, therefore, but by the end of the period there were signs of overcapacity on the routes, and a number of these new companies were struggling. As at Rotterdam there was a change in the direction of liner services, away from the larger ports such as London and Liverpool, towards East-Anglian (Felixstowe/Ipswich), Humberside (Hull/Immingham), and east coast ports of Scotland. Smaller ports were involved in this new orientation.

2.4.2.2. The ports of Zaandam and IJmuiden and liner services with the United Kingdom, 1955-75.

At Zaandam, although roll-on/roll-off facilities were provided here in the early 1970s, there were no regular connections with the United Kingdom. At IJmuiden there were frequent sailings exporting crude and semi-finished materials to the United Kingdom, but none of these were of sufficient regularity to merit liner trade status.

2.4.2.3. Summary of liner services between the North Sea Canal ports and the United Kingdom, 1955-75.

As at the New Waterway ports, a change in the direction of liner trades with the United Kingdom could be seen, in favour of the smaller United Kingdom ports and shorter sea crossings. However, by the end of the period there were indications that the attractions of Amsterdam as a liner port were waning.

2.4.3. Liner services between the northern port range and the United Kingdom over the period 1955-75.

At Harlingen liner trades traditionally played an important role; Delfzijl regularly exported paper and cardboard and Groningen had no regular sailings to the United Kingdom.

2.4.3.1. Liner services from the port of Harlingen to the United Kingdom, 1955-75.

In 1955 there were several liner companies operating services from the port. These regular services were based mainly on the import of coal, destined for the hinterland after transshipment into smaller inland craft able to negotiate the canal network, and the export of

locally produced straw and cardboard and agricultural produce (especially dairy products). The General Steam Navigation Company had had a regular service with the United Kingdom since 1845, with three sailings a week to the port of London. In 1957 the service was extended to Felixstowe (prior to the major improvements at this port). But in 1965 this company ceased all regular operations from Harlingen.

S.S.M. Transport (Scheepvaart en Steenkolen Maatschappij) was the other company maintaining a regular service with the United Kingdom in 1955, with services to the ports of Hull, Goole and Leith. Again the cargo carried was mainly coal inwards and dairy produce outwards, with some export of potato-flour. These regular services ceased in the same year as General Steam, 1965, although the company still operated a limited service with chartered coasters to Goole and Leith. This was the situation in 1975, when the limited S.S.M. service to Leith and Goole constituted Harlingen's only remaining link with the United Kingdom.

The pattern of commodities traded through liner services also altered over the period, with the cessation of coal imports in 1960 (replaced by alternative fuels, especially since the discovery of gas in the northern provinces), and the movement to other ports of the export trade in straw and cardboard and dairy produce (Delfzijl, Scheveningen). In 1975 a variety of commodities were handled by the S.S.M. in its trade with the United Kingdom, mainly the import of whisky (group 1) from Leith and manufactured items (group 9) from Goole, with the export of German machinery (group 9) and some agricultural produce (groups 0 and 1) in conventional ships. There were no facilities in Harlingen in 1975 for roll-on/roll-off, although plans were underway to rectify this.

The declining fortunes of liner services with the United Kingdom had a dramatic effect on trade flows. Apart from the decline in group 2,

the actual commodity composition was little changed, but there was a considerable general reduction in trading in groups 1, 8 and 9. Harlingen's weak liner position in 1975 therefore shows a marked contrast to its strong position in 1955.

2.4.3.2. Liner services between the port of Delfzijl and the United Kingdom, 1955-75.

There was only one regular service during the period. In 1936 Carton Export (Board Export) B.V. Delfzijl began a liner service with thrice weekly sailings to Colchester. The main products carried were exports of potato-flour and cardboard (groups 1 and 9), and the import of agricultural machinery (group 9). The decline in paper and cardboard exports over the period, one of the main commodities carried by the liner service, was noted in chapter 3 (section 4.3.1.). Although potato-flour (group 1) was important in 1970, by 1975 it had become only a minor item in trade.

The increase in United Kingdom trade flows passing through the port in the 1970s coincided with the start of a regular service for the export of potato-flour, using mini-tankers from Delfzijl, although this service could not be classified as a liner service since sailings were on demand and to various destinations in the United Kingdom. It was, however, group 5 (export of tubes and pipes) which showed the greatest increase in this period, and this took place on an irregular basis, rather than in liners. As at Harlingen, the liner trades therefore played a decreasing role in total Anglo-Dutch trade passing through the port over the period 1955-75.

2.4.3.3. The port of Groningen and liner services with the United Kingdom, 1955-75.

Throughout the period trade was carried out on an irregular basis, mainly in small coasters, and prior to 1970 the major activity was the export of potato-flour to the port of London, but in this year services were switched to Delfzijl in view of limited depth. Non-liner sailings from Groningen were, apart from potato-flour exported to London, mainly with the smaller ports such as Colchester, Ipswich, Poole and Kings Lynn.

2.4.3.4. Summary of liner services between the northern port range and the United Kingdom.

There was a distinct decline in the role played by liners in Anglo-Dutch trade flows over the northern port range during the period 1955-75, particularly at Harlingen.

2.4.4. Liner services between the Schelde ports and the United Kingdom, 1955-75.

At the start of the period neither Terneuzen nor Vlissingen had any regular connections with the United Kingdom, but by 1975 the situation had changed, and liner services played an important part in trade flows through these ports.

2.4.4.1. Liner services between the port of Vlissingen and the United Kingdom, 1955-75.

Prior to 1970 there were no liner services on this route, and when, in the early 1970s, a regular service with the United Kingdom was started, it was operated from the older part of the port, despite adequate facilities in the nearby Vlissingen-Oost development.

In 1972 the first attempt at a regular service with the United Kingdom since the Second World War was made by the Channel Bridge Line, with a passenger/roll-on/roll-off facility. This was short-lived, but the following year a Danish company, the Tennet Line, showed interest in setting up a service. Using a chartered vessel belonging to another Danish company, the Olau Line, a service to Sheerness was introduced in 1974. Six months after the commencement of this service the Olau Line took over operations from the Tennet Line, and this was the position in 1975.

In 1975 a new regular service was started from the Vlissingen-Oost area by the Lovell Line, with six sailings a week to the east coast ports of Hull and Ipswich. The commodities carried were mainly export of chemical products (group 8) and import of army supplies for the forces on the Rhine (group 9). The effect on trade was obvious, as trade flows with the United Kingdom showed a very large increase. However, it must be borne in mind that an important part of the increase was made up of the import of sea-sand (group 6) for the sorting plant 'Merwede' at Vlissingen.

2.4.4.2. The port of Terneuzen and liner services with the United Kingdom, 1955-75.

Despite the fact that several new roll-on/roll-off docks were provided in the later part of the period (1972 and 1975), no regular services to the United Kingdom were attracted to the port, which remained dependent on bulk flows serving local port industries.

2.4.4.3. Summary of liner services between the Schelde ports and the United Kingdom, 1955-75.

There were definite indications of the growing attraction of the

Schelde ports for regular liner sailings with the United Kingdom over the period. Although there were no regular connections of this kind in 1955, by 1975 there were two liner companies operating services from Vlissingen, and new facilities for roll-on/roll-off trades at Terneuzen.

2.4.5. Liner connections between the port of Scheveningen and the United Kingdom, 1955-75.

As stated earlier, prior to 1960 trade at the port was insignificant but by 1969 it had increased to such an extent that the port was included for the first time in Dutch seaport statistics. This was almost entirely due to the decision by the Norfolk Line to begin regular sailings between Scheveningen and Great Yarmouth in 1960. The service was started using conventional coasters, mainly concerned with the export of vegetables from the Westland, in a similar manner to the services at Vlaardingen, Maassluis and Hoek van Holland. This service was particularly successful, so that activities were extended in 1969 when a new roll-on/roll-off service (still operating between the port and Great Yarmouth) was put into operation, with three daily sailings in both directions from the second inner harbour. The latter proved inadequate for the company's needs and so the port authority opened the third dock in 1973 especially for the Norfolk Line. Although statistics prior to 1969 are not available, the effect of this company's activities are plainly shown in the rising trade figures over the period 1969-75.¹⁰

2.4.6. Conclusion.

The example of Scheveningen is an important indication of the changing needs and direction of trade with the United Kingdom from the Dutch port

range over the period 1955-75, essentially favouring smaller ports in the range, particularly those in the central and southern areas of the Netherlands. The importance of this feature in Anglo-Dutch trade flows in providing an indicator for port planning (see chapter 6) cannot be understated. It is therefore useful to take this analysis of liner sailings between the Netherlands and the United Kingdom one step further, and as far as possible to assess reasons for the changing pattern of services over the period 1955-75.

2.5. Explanations of the changes taking place in the pattern of liner sailings with the United Kingdom from the Dutch port range, 1955-75.

It is clear from the preceding section that in 1955 the interests of companies operating services with the United Kingdom were concentrated on the larger ports. As costs on the sea route were relatively lower than the landward transport links a number of longer distance services to west coast British ports were important. The majority of liner sailings at this time were from Amsterdam, Rotterdam, Hoek van Holland (although largely passengers at this time), and Harlingen in the north. By far the most important destinations in Britain were the ports of London, Liverpool/Manchester and the Humberside ports. By 1975, although Rotterdam and Amsterdam still remained the most important in terms of number of liner services, there was stagnation in the number of services offered from the former and there were signs of instability in the liner trades with the United Kingdom at the latter. Harlingen had only one limited liner service still in existence. In the meantime a number of new regular services were being offered for the first time from smaller ports in the range, including Maassluis, Vlaardingen, Vlissingen and Scheveningen. A definite trend towards diversification in the liner trades was therefore evident over the period. In the United Kingdom it

was also the smaller east coast ports which showed a gain in regular line connections, partly as a result of the new roll-on/roll-off techniques and other trends towards unitized cargoes, and the consequent increase in the costs of the sea-crossing, placing an emphasis on shortening the seaward distances. As a result, the smaller east-coast ports such as Felixstowe gained considerably in importance. The reasons for these changes in the direction of liner services between the Netherlands and the United Kingdom over the period are complex, but several general statements can be made aided by the viewpoints of the liner companies involved.

The importance of the 'second transport revolution' and its effects on Anglo-Dutch trade have already been touched upon, in particular in relation to costs, with reference especially to the liner trades. Prior to the 1960s, most liner companies used the conventional-type lift-on/lift-off vessel, carrying a large number of different commodities of various sizes. With the advent of the unit load, more specialized terminal facilities and ships were needed, so that much of the conventional shipping needed replacing. At Rotterdam, for instance, all the liner companies operating between the port and the United Kingdom in 1956 used conventional-type ships. By 1975, out of the twenty-three companies operating services, eight operated exclusively container services with the United Kingdom, seven still operated using conventional vessels, four used only roll-on/roll-off vessels, two had combined conventional and container services, one had both container and roll-on/roll-off vessels in operation and one used a barge-carrying system (BACAT).¹¹ Much of the material carried by container was either grouped, from small assignments which were made up into larger elements of container size, or came from the deep-sea container routes for transshipment via Rotterdam. With the higher costs of specialized ships, it became essential to speed

up the time of the voyage and improve turn-around times to gain the maximum economies possible from the new methods, so the distance and time taken of the voyage became increasingly important. Responses from several liner companies involved in Anglo-Dutch trade confirm this. The Norfolk Line, operating from Scheveningen and for a brief period from Rotterdam (1963-65), stated as one of the main reasons for its concentration on the Scheveningen-Great Yarmouth route, that this route involved one of the shortest sea-crossings possible between the Netherlands and the United Kingdom. Table 51 below shows the distance of some of the main liner routes between the United Kingdom and the Netherlands in 1975.

<u>Port in the Netherlands</u>	<u>Port in the United Kingdom</u>	<u>Distance in miles</u> (approx.)
Rotterdam (Europoort)	London	175
Rotterdam (Europoort)	Felixstowe	114
Rotterdam (Europoort)	Great Yarmouth	106
Scheveningen	Great Yarmouth	108
Rotterdam	Hull	216
Hoek van Holland	Harwich	119
Harlingen	Goole	260
Delfzijl	Colchester	290
Vlissingen	Sheerness	118
Amsterdam	London	220
Amsterdam	Felixstowe	138
Amsterdam	Immingham	225

Table 51

Distances of some of the main liner routes between the Netherlands and the United Kingdom in 1975.

From the above table, it is obvious that the northern port range suffered from a distinct disadvantage in terms of distance, and this was a contributory factor in the decline of Harlingen as a liner port.

Changes in demand also resulted in an alteration in the pattern of Anglo-Dutch liner trades over the period. Liner services are often brought into operation when regular cargoes are likely to be available. An instance of this was the 'groentenlijn' operated from Vlaardingen by the Westland growers, 1964-70. With the growth in the trade in fresh and frozen vegetables between the Netherlands and the United Kingdom, fast and regular services were needed. However, when roll-on/roll-off ships were brought into operation from Hoek van Holland in the late 1960s it became more economic for the growers to use this port as an export outlet, and the Vlaardingen service was abandoned. Availability of cargo was of crucial importance in the decline in liner trades at Harlingen. In 1960, coal imports, providing one of the major cargoes for liners in trade with the United Kingdom, ceased as a result of the transition from coal to natural gas for industrial and domestic use. The export of straw and cardboard and of potato-starch also declined as a result of competition from Delfzijl. The failure of the liner services at Harlingen to adapt to the new ideas of the 'second transport revolution' together with the lack of foresight of the port authority in providing new facilities etc., resulted in the loss of exports of butter and dairy produce, traditionally an important element in Anglo-Dutch trade through the port. It became more economic to transport these products by road to Scheveningen from the northern provinces and use the roll-on/roll-off services at this port rather than to continue exports in conventional vessels from Harlingen. The decline in the liner trades at Harlingen was therefore inevitable, unless alternative

cargoes were found. With the port's relative isolation from the rest of the Netherlands, the decline in the fortunes of the G.S.M. and reduction in services by the S.S.M. are scarcely surprising. The latter was able to carry on a limited service by cornering the remnant of the freight flows with the United Kingdom and concentrating on cargoes which were not easily unitized, serving a number of factories in the northern provinces of the Netherlands and machinery and engineering works in Germany. The major part of the S.S.M.'s activities with the United Kingdom were concentrated at Rotterdam, with services to Rochester begun in 1959, Grimsby in 1963, and Goole in 1965.

The liner service at Delfzijl was able to enjoy a continued existence over the period as a result of the concentration of the remaining export of straw and cardboard from the northern provinces at this port, withdrawing trade in this commodity from Harlingen. The export of potato-flour also came to be concentrated at Delfzijl, with a corresponding decrease in exports of this commodity through Groningen and Harlingen. It was the specialist nature of this liner service which enabled continued survival.

The decline in the numbers of liner sailings particularly from the larger ports during the period was partly due to fierce competition on the short-sea routes, leading to the rise of short-lived liner companies and considerable amalgamation. Many companies consolidated activities at one port, combining with other companies, rather than maintaining services as they had done from several ports. An example of this is the H.S.M. 'Nederland' (now part of the Nedlloyd group), which discontinued services from Amsterdam and went into partnership with several other organizations operating a roll-on/roll-off service from Rotterdam to Hull (North Sea Ferries). Although a traditional centre

for the liner trades, Amsterdam's inland position adversely affected the turn-around time of ships, and other companies also discontinued services from Amsterdam to concentrate activities at Rotterdam.

The concentration of liner sailings at smaller ports became an increasingly marked feature over the period 1955-75, due to congestion and competition at large ports, and the individual attention and personal service which only smaller ports were able to offer. This was an important factor for several companies operating liner connections with the United Kingdom, in some cases outweighing economic considerations. Scheveningen offers an example of the individual attention given by a smaller port authority, by providing a new harbour from which the liner company could operate roll-on/roll-off services. Naturally this tendency for liner companies to favour small port locations was not without consequence for the port of destination in the United Kingdom, where the same advantages existed, that is lack of congestion, individual attention etc. This partly explains the reason for the change in direction of liner services away from London and Liverpool towards smaller east coast ports. Colchester, for instance, was chosen as destination port by the company operating a liner service from Delfzijl as a result of the personal care taken over the handling of cargo, and its freedom from industrial disputes as a result of its status as a non-union port. Hinterland links were adequate for most of the smaller Dutch ports, although several companies expressed a desire for improvement, for though road links were in most cases adequate, there was a lack of rail linkage at several smaller ports.

Another factor in the increasing interest shown by liner companies in a small-port location was the relative unimportance of depth, as the vessels used were seldom deep-draught (the maximum size of roll-on/roll-off ship on the North Sea route was around 4,000 tons d.w.t.).

This contrasted with the movement of bulk cargoes, which even on the shorter routes utilized much larger vessels. Only in a few cases, such as Harlingen, was depth therefore a limiting factor. Lower port charges at many of the small ports, lack of congestion, greater speed in handling, ownership of own facilities, and no compulsory pilotage dues were other factors mentioned by liner companies in favour of operating from smaller ports in the Dutch port range.

Finally, the role of port authorities was of great importance for liner companies wishing to operate a service from a port, particularly in the provision of adequate facilities, and the recognition of the needs of existing liner companies. The failure of port authorities to provide adequate facilities and new port development catering for liner companies at Harlingen was a contributory factor in the decline in trade here. At Vlaardingen the port authority also failed to provide extra facilities for the 'Westland' liner service, leading to the loss of this connection to Hoek van Holland, where the necessary services and facilities were available. The clash between the two authorities at Vlissingen (see chapter 4, 3.4.2.1.), where adequate facilities for roll-on/roll-off vessels were present, resulted in underutilization of these resources, and the offer of short-term incentives to liner companies, which partly accounts for the increased attraction of Vlissingen as a location for companies operating services to the United Kingdom.

To conclude, although the above is only a brief summary of the factors involved, a strong case emerges, with regard to liner services between the Dutch port range and the United Kingdom, in favour of the smaller ports. Unfortunately, many small port authorities failed to realize this potential in time, with, in some cases, subsequent loss of trade. It was particularly the southern and centrally placed ports in the Dutch range which, in the light of developments over the period 1955-75, found them-

selves favourably placed for Anglo-Dutch liner trades. Morgan, in his analysis of liner trades,¹² concludes that liner services are of exceptional importance for ports. If a port proves attractive as a location for a liner service, it will also be attractive to other liner companies, and this could result in a 'snowball' effect on trade. Even if additional services are not attracted, the influence of a liner service on a smaller port's trade can be very great, as at Scheveningen. The cargo carried in liners, often of high-value and low-bulk, can usually bear higher port charges than the bulk trades, using up less space, and requiring individual attention and care which a large port is not always able to offer. Developments in the past few decades have moved in favour of small ports as a location for liner companies, particularly by those involved in Anglo-Dutch trade. A greater understanding of Anglo-Dutch trade flows, and in particular of the role and potentiation of liner services, is important if port authorities are to make an accurate assessment of the situation. In this way more efficient planning of port facilities (e.g. in the provision of roll-on/roll-off facilities) to cater for these flows may be made. The consequences of this for port planning in the Netherlands are further discussed in the final chapter of this work.

NOTES

Chapter 5

- 1 This involved sand and gravel excavated from the sea bed, much of which was in British waters and therefore classified as an export.
- 2 J.M. Verhoeff, 'Havenconomie: een vak apart', Intermediair, 11 (1975), p. 19.
- 3 The provision of a landing ramp and a marshalling area for waiting vehicles and units are the main requirements, as this method dispenses with costly lifting equipment or warehouse facilities.
- 4 J. Bird, Seaports and Seaport Terminals (London, 1971), p.96.
- 5 G.M. Vaandrager, 'Roll-On/Roll-Off Vervoer' (unpublished dissertation, University of Rotterdam, 1978), p.67.
- 6 P. Lawrence, International sea transport, the years ahead (Massachusetts, 1972), pp. 137-138.
- 7 F.W. Morgan, Ports and Harbours (London, 1958), p. 93.
- 8 For a full history of liner sailings between this port and the United Kingdom, see L.J. Pieters, 'A hundred years of sea communication between England and the Netherlands', Journal of Transport History, 6 (1963/4), pp. 210-221.
- 9 See Rotterdam-Europoort-Delta, 1 (1974), pp. 25-32.
- 10 It should be noted that despite this increase there is little possibility of the port being further extended into an industrial future, as pointed out in a report by the Economisch en Technologisch Instituut voor Zuid-Holland, De Scheveningse Haven - een studie van de ontwikkeling tendenties (Rotterdam, 1968).
- 11 See Rotterdam-Europoort-Delta, 1 (1974), pp. 2-8.
- 12 F.W. Morgan, Ports and Harbours, p. 101.

CHAPTER 6

PORT PLANNING IN THE NETHERLANDS:

TOWARDS A MORE EFFECTIVE APPROACH TO SEAPORT DEVELOPMENT

1. Introduction

The major part of this study of Anglo-Dutch trade flows over the period 1955-75 has concentrated on establishing the extent and nature of these flows to and from individual ports in the Dutch port range, placing them in context with the total trade flows through each port and examining their development over time in relation to port development.

In the final part of this work it will be useful to draw some of the results of this work together and, in the light of existing seaport planning in the Netherlands and current trends of thought on this subject, to put forward certain pointers regarding the consequences for Dutch ports and the Dutch port range of the shifts in emphasis and nature of Anglo-Dutch trade flows between 1955 and 1975.

2. Seaport planning in the Netherlands

2.1. Background to the national seaport policy.

To achieve an understanding of the ideas behind current seaport policy in the Netherlands it is necessary to look at the post-war literature on the subject of port development as well as the actual developments taking place at the port. However, since the 1950s much more attention has been given to a functional approach in studies of seaports. Those who support this functional approach (see for instance Vleugels, 1969,¹ Kruijtbosch, 1970,² and Ottens, 1979,³) suggest a two-fold division of port activity. The primary function of a port, that is, trade, transshipment, and storage, and the secondary function of a port, mainly industrial activity

in the port area and distribution.

That the primary function of a port is trade and transport was an obvious factor to those studying ports and their development, but many ignored or dismissed the significance of the secondary functions until developments at the ports themselves forced their attention towards this factor. As early as 1951 Boerman,⁴ in an article deploring the sporadic attention given by geographers to the field of port geography, concluded that in particular more attention was needed to studying this secondary function of seaports, especially the location of seaport industry.

Boerman's observations were strongly underlined in the following decades by developments at the ports themselves, particularly in the oil, petro-chemical and metal working industries, where the 'drift to the coast' - attracted by cheap imported raw materials and low transport costs - was strongest. The focus of attention for those involved in port studies shifted accordingly, and this led to a spate of reports, case studies, and articles in academic journals on this phenomenon. So strong was this 'new emphasis' on port development through secondary activity that the primary function of seaports faded into the background and industrial development of seaports became a major objective for all those involved in port planning.

Port planners in the Netherlands were in the forefront of this new emphasis on industrial functions, with Rotterdam and its spectacular post-war development in this field in their own back yard. It is therefore not surprising that the industrial function of the seaport, though a secondary activity, came to dominate Dutch seaport policy. Rotterdam became the model for the successful development of a port, and a port's success or failure would be measured in the light of its ability to attract industries rather than its performance in terms of trade flows.

Port investment accordingly became geared towards the attraction of new industries to the ports. Governmental participation in the form of a national seaport policy actively supported this trend, in view of the benefits to regions and to the national economy which could be gained from seaport industries.

It is against this background that port planning in the Netherlands developed.

2.2. The 'Zeehavennota'

Prior to 1966, very little attempt had been made in the Netherlands to provide any comprehensive, central approach towards seaport planning. Major developments at ports needed central government approval, as substantial borrowing was often involved. The government was also responsible for waterway access routes to the ports and for the maintenance of these, as well as for paying towards the cost of deepening such channels. For the purposes of reviewing investments and needs each port was regarded as a separate entity, even when the government was more directly involved with a port such as in the 'Havenschappen'.

In 1966, the 'Zeehavennota; het Zeehavenbeleid van de Rijksoverheid'⁵ was published, and it was this document which laid down the basis of a Dutch seaport policy. The main objective of this publication was to determine the physical expansion which would be needed at each of the Dutch seaports, in order to accommodate increased trade and new industries locating at ports by the year 1980. Forecasts for the 1980 figure were based on (1) an estimate derived from current trends of the volume of trade in each of the major commodities (coal, oil, ore, fertilizers, grains, wood, oil seeds, and general cargo) and (2) an estimate of the likely land requirements for industries moving to the coast, attracted by lower

transport costs made possible by the use of the large bulk carriers for importing raw materials. These industries frequently encouraged 'secondary' industries to locate in the vicinity, dependent on locally produced raw materials. By calculating the likely increase in production and the possible production per square meter for the oil, chemical and metal industries in particular, a figure for the expected increased demand for land at seaports was calculated. The total figure arrived at on the basis of these two approaches was 11,000 hectares. By far the greatest part of the additional land requirement was destined for industrial purposes. It was estimated that in 1980 86% of land in seaport areas would be taken up by industries. The area for general and bulk cargo handling was also expected to double over the period 1960-1980.

The second section of the 'Zeehavennota' examined the possibility of matching existing and potential demand to supply of land in seaport areas. The authorities in control of seaports (mainly local government and 'havenschappen') were asked to submit plans for extending their port areas. Around 85% of the land which could be made available in this way was situated in the west, which was scarcely surprising in view of the extensions already under way at the ports of Rotterdam and Amsterdam. The south-west also formed an area where considerable extension was possible: in the north, relatively remote with regard to the rest of the country, considerable investment, including improvements to infra-structure and inland transport, was needed. In view of the fundamental importance of seaports to the Dutch economy, the government committed itself to the implementation of many of the plans submitted by port authorities, particularly with regard to improving access to the two largest seaports, and also to the implementation

of various further local studies on the desirability of these extensions. It was estimated that, by this means, the additional demand for land could easily be met. It was also decided that, in view of the undesirability of further expansion at Rijnmond for environmental reasons, a more critical approach would be taken when considering applications from industries wishing to locate at the port of Rotterdam. Only those industries needing direct access to deep water would be considered; other industries would be directed to the south-western and northern provinces. It was with this in mind that the decision to go ahead with expansion of the Vlissingen-Oost area, the Eemshaven near Delfzijl, and the improvement work at Terneuzen was taken.

2.3. The implication of the 'Zeehavennota'

One major criticism of the 'Zeehavennota' has been that the stated seaport policy objectives interfered with free competition between the ports in the Dutch port range. However, it is important to bear in mind that the major objective of the report was to influence the location of major seaport industries, and provide adequate space for these, especially with regard to the oil, petro-chemical and metal-working industries. The effects of the location of these industries on the port's trade flows were scarcely taken into consideration. Each port was analysed in the light of its potential ability to provide adequate space for industrial development, as this was one of the pressing problems at Rotterdam. Regional considerations were also given heavy emphasis, particularly with regard to the undesirability of further expansion of the already congested Rotterdam port area and the need to boost the northern economy.

The lack of sufficient attention to the primary function of the ports (trade flows) was a major failing in the proposals in the 'Zeehavennota'. Most of the industries which it concentrated on (oil, petro-chemicals etc.) could only benefit from a deep-water location, and the location of further

developments in these industries at seaports in the range other than at Rotterdam through government pressure did not lead to trade flows also being increased at those ports. Trade flows would continue where the demands of the industries (for example deep-water access) were met. Examples of this are not difficult to find. The decision to locate an oil refinery at Amsterdam was a direct result of government pressure to prevent location at Rotterdam, but the additional trade generated by the refinery went to Rotterdam as Amsterdam was unable to receive large crude carriers above 100,000 d.w.t. Little was achieved in relieving congestion at the port of Rotterdam, and very few benefits accrued to Amsterdam. For the smaller ports in the range, the benefits of attracting such major industries were even less. The land was often sold direct to companies rather than leased, while costly investments were usually required by the port authority to meet the industries' requirements.

A number of reports emerged following the publication of the 'Zeehavennota', almost all of which concentrated on the future development of Rotterdam and the Delta area.⁶ Several of these emphasized the need to further develop the northern part of the Delta, which was contrary to the government's aim as laid down in the 'Zeehavennota'. The estimates of additional land requirements varied considerably between one report and the other, according to the criteria used. Ruiter,⁷ 1970, concludes that seaport policy in the Netherlands is beset by great uncertainty, and he questions the validity of the findings of many of these reports.

2.4. An evaluation of Dutch seaport policy

Several factors emerge from the 'Zeehavennota' and from the reports which followed, which deserve further mention. The predominance of Rotterdam in most areas of seaport discussion has led to a division between those that support the further extension of Rotterdam, and those

that recommend the diversion of trade and industry elsewhere, hereby limiting Rotterdam's growth. Strong arguments are put forward on both sides. On the one hand it is argued that Rotterdam is the optimum location point for most modern seaport industries, due to its unique geographical position, with its advantageous infrastructure, and that therefore any interference with this natural selection process will result in a less-than-optimum location decision, where the maximization of economic resources is not achieved. Expansion at other seaports, where the demand for land is not great, or where governmental pressure has induced this demand, may easily lead to wasteful duplication of facilities already available at Rotterdam. The alternative view leans heavily on social and environmental, rather than economic, criteria; the undesirability of further environmental pollution at Rotterdam, the relative backwardness of the northern province (for whom a seaport development node, from which further industrialization could spread, would be beneficial), problems of congestion at Rotterdam, and other factors. Since the case for expansion at other ports rested heavily on the undesirability in the view of the central government of further expansion at Rotterdam, rather than any intrinsic value of the other ports in attracting trade flows of their own, Dutch seaport policy can be described as a 'main-port' or 'monoport' policy, with Rotterdam central to all planning policies.

2.5. Dutch seaport policy and the small port

With its orientation towards a 'main-port' policy, the development of the smaller ports in the Dutch port range was either coincidental or part of the attempt to divert traffic away from the congested port of Rotterdam. Even those more closely involved with the development of the small ports (Hartog, 1977),⁸ talked of expansion by attracting

'overflow' trade from the main-port of the Netherlands rather than expansion based on the local advantages offered by the port. In view of the smaller ports obvious unsuitability for large-scale industrialization, the attention of planners in considering the development of smaller ports has been concentrated on this aspect.

One of the main projects undertaken by the central government in the development of smaller ports was the Eemshaven project, and the consequences of this are of major importance in reviewing future port planning in the Netherlands. Hartog studied the subject of the development of the Eemshaven in some depth, but not in terms of natural advantages: he limited his observations to the possibility of attracting overspill trade from Rotterdam to the Eemshaven. As he pointed out, the assumption that this was possible was one of the main reasons for the central government's decision to go ahead with the project, together with the desire to create a development 'node' in the underdeveloped northern region. Hartog concludes that, due to the considerable differences in situation and hinterland linkages, it was unlikely that much overspill trade from Rotterdam would be attracted to the Eemshaven. Some overspill of industries from the western region was a possibility, due to incentives offered by the government, cheaper land availability, less congestion and less stringent pollution controls. However, this was unlikely to involve existing industries at Rotterdam, due to inertia, but would involve new investments. The Eemshaven was developed with this in mind, at a time when seaport industries were growing rapidly. Unfortunately the rise in oil prices followed by economic recession brought an end to the growth, and resulted in large areas of land at Eemshaven remaining unoccupied.

The Eemshaven project exemplifies a major failing in Dutch seaport policy. The project was an attempt to stimulate growth in the under-

developed northern provinces by providing an alternative seaport area in which to locate specifically those industries wishing to invest at Rotterdam. This would stimulate the northern economy, at the same time as relieving the overcrowded western area of growing congestion and pollution problems. However, the geographic, economic and other conditions are totally different at Delfzijl-Eemshaven to those at Rotterdam; an obvious statement, but apparently one not too familiar to those hoping to emulate the success of Rotterdam at a northern port. Provision of large areas of land suitable for industry near a (relatively) deep-water site will not lead to the attraction of 'overspill' trade from Rotterdam, unless linked to existing economic advantages and needs in the northern area. With unemployment higher than most regions of the Netherlands (apart from Limburg), the need was for seaport industries generating the maximum amount of employment. The Eemshaven was developed mainly with an eye to attracting capital-intensive industries (those needing deep-water access for imports, such as the oil and chemical industries). For these it was obvious that a northern location would not be the most economically efficient one. The possible location of other industries needing deep-water access at Eemshaven was also questionable, as the steel industry had already opted for expansion at IJmuiden rather than locating at a new 'greenfield' site, and the aluminium industry already had a plant at Delfzijl and was unlikely to move to Eemshaven, since it was supplied by inland transport from Rotterdam rather than using imports by sea.

In considering the Eemshaven project, the central government made little attempt to examine local economic structures, and to integrate the nearby expansion of Delfzijl with the development of the project, although some mention was made of cheaper energy supplies (local gas) and the nearby salt deposits. Developments at Delfzijl since the war, and the industri-

alization which had taken place, provided valuable indicators to further developments based on local resources, rather than a dependence on possible 'overflow' trade from Rotterdam. Heavy investment and subsidization was necessary to develop Eemshaven, and the attempt to model the development on that of Rotterdam, has resulted in misdirected investment, so that the Eemshaven area has become the 'white elephant' of Dutch seaport policy.

The dominance of the main-port idea, together with overconcentration on the industrial function of seaports in Dutch port policy, has dealt a considerable blow to the prospects of the smaller ports in the Dutch port range. Some have taken this limited view of ports and their development to an extreme: in 1976 a report by the Scheepvaart Vereniging Zuid⁹ even went as far as to propose that development of any port other than Rotterdam should cease, on the grounds that all additional trade could be accommodated by Rotterdam. The assumptions behind such a statement are that all trade flows to and from the Netherlands would naturally choose the main port, and that other seaports in the range are therefore superfluous. Such an assumption, as the earlier analysis has shown, is contrary to all the evidence available regarding the interaction between all the ports in the Dutch port range, and therefore dangerously misinformed. Each port, whether small or large, offers a unique package to the port user, and is not only competitive with other ports in the range but also complementary, having developed a 'niche' in the port hierarchy over time which is distinctive to other ports. To suggest that one port could fulfil all the requirements for the whole national range is nonsense. Although undeniably the major port in the hierarchy, Rotterdam cannot and must not be viewed as a separate element, able to accommodate all the demands made by trade flows passing through the Netherlands.

2.6. Conclusions

Dutch seaport policy reveals two major weaknesses. The first is its fixation with the idea of port industrialization, and the second, related to this, is a tendency towards 'Rotterdamism', that is, an orientation towards the main-port concept. The performance of all ports has come to be measured in terms of their success in attracting large-scale seaport industries, or providing costly container facilities; in other words, how closely a port is able to emulate the success of Rotterdam. The consequences of such a policy have been costly. Even if the Eemshaven project had proceeded as the government envisaged it, the additional trade which would have been attracted to the port by the type of large-scale industrial development considered would probably have been minimal. Overspill industries from Rotterdam, with inland connections to that port, would have been the result, creating an 'island' in the north, connected to Rotterdam, with a minimum effect on the local economy which it was supposed to boost. Specialized labour and capital would have to be imported from the west, and the effect on trade flows through the northern ports would be slight, as most of the additional trade would be generated through Rotterdam. Congestion at the port would not be relieved in this way, and the added strain on the inland transport network would add to the problem.

Dutch seaport policy has been fundamentally influenced by industrial development of the main port and has failed to take into account sufficiently the development of the small port. A major reappraisal is needed to correct the existing imbalance in planning measures, starting with a return to the study of the primary function of a port: trade and trade flows.

3. The place of trade flows in Dutch seaport planning

3.1. Introduction

At the beginning of the chapter, it was emphasised that the primary function of any port is trade, transshipment and the storage of goods. Industrial activity, though it should not be divorced from trade flows, is a secondary activity. It follows, therefore, that it would be more realistic to measure a port's performance in terms of movements in trade than the number of new industries that have been attracted, or could be attracted, to locate at the port. Posthuma,¹⁰ points out that a port must not become a purpose in itself, but should remain a means of providing an efficient service to port users. Too much emphasis on port industrialization could lead to scarce resources being concentrated on this secondary activity of the port and could lead to a decline in services to port users and an eventual loss of trade. Jürgenson¹¹ underlines this argument when he states that the primary motivation for a port in promoting industrial activity should be to increase its trade flow. It is unfortunate that port planners in the Netherlands, both national and local, have tended to ignore these arguments, or at best give them only scanty attention.

There is an urgent need for a greater understanding among port planners of the relationship between industries locating at the ports and their effect on trade flows, and especially of consideration of each unit in the port hierarchy as unique and of value in its own right, rather than measuring by its potential for industrial development. This can be easily achieved by refocussing attention onto the primary function of a port, with less emphasis on the secondary function. The attitude amongst planners of 'any industrial development of the port area will be beneficial to the port' is prevalent, and has led to

losses of trade and revenue. Only at Rotterdam has there been a serious attempt to limit industries moving into the port area to those needing direct access to the waterway for imports and exports by sea-ship. Elsewhere there are examples of misuse of port resources and loss in trade, or potential trade, through the indiscriminate attraction of industries to the port area, as at Groningen. Although in this case mismanagement was mainly at a local level, the lack of understanding of existing trade flows passing through the port was again to blame, along with the assumption that all new port industries would have beneficial effects on trade. This approach has been actively promoted by the attitude of central government port planning.

3.2. Post-war Dutch port development and trade flows.

At this point it would be useful to illustrate the importance of trade flows to port planners by making a number of observations about developments at several Dutch ports over the period under study, based on some of the findings in previous chapters.

A major feature of trade flows passing through Dutch ports since the war has been the 'second transport revolution', which affected large-scale movements of commodities in particular. The concentration of bulk commodities in large units to gain the maximum economies of scale resulted in the port selection process becoming much more stringent. The focal point for these bulk commodity flows for the Netherlands, and increasingly for the whole of Western Europe, was Rotterdam, which was able to meet most of these stringent requirements. Amsterdam, with its own access to the Rhine, also became a focal point for bulk flows, although the limitations imposed by the dimensions of the North-Sea Canal placed a restriction on the largest vessels entering the port. Traditionally, Terneuzen was a port handling bulk commodities for its heavy industries,

and bulk flows continued although it became necessary to substantially improve access to the port to accommodate the increasing size of bulk carriers. Vlissingen had the advantage of deep-water access for bulk carriers, but this was relatively under-utilized until the development of the Sloe area in the 1960s.

Smaller ports in the range were unable to compete for these bulk flows as a result of the limitations in depth of approach channels, and the expense of the new handling facilities required. Many faced a reduction in trade as bulk flows became concentrated at the large ports. Lack of action in attracting additional trade, often due to a fatalistic attitude by smaller ports in the face of the obvious advantages of the larger ports (and the failure to recognize the intrinsic advantages of the small port) meant, in many cases, stagnation and decline in trade flows. Examples are not hard to find. Port planners at Vlaardingen, for instance, being in close proximity to Rotterdam, adopted this attitude. This port's major function was the transshipment of bulk commodities, and it was unable to compete with the scope of developments at Rotterdam. It also served the agricultural 'Westland' area, although the volume of this trade was only small. Nevertheless, the advantages of the port were recognized in the early 1960s by a liner company which began operating sailings to the United Kingdom, trading in agricultural produce. With the complete failure of the port authority, steeped in the fatalistic attitude of 'we are unable to compete with nearby Rotterdam in any area of trade flows', to provide even the simplest of facilities, the service disappeared from the port in the same decade.

At other ports, planning measures taken resulted in an increase in trade flows, although even here the obsession with port industrialization resulted in a less-than-optimum utilization of the port's potential. An interesting example of this is that of Delfzijl. The discovery of new

natural resources in the area resulted in the attraction of new industries to the port, aided by general government regional policy. Developments at the port show that these industries based on the natural resources in the area which located at the port, and the resulting improvements at the port to meet the requirements of these new port users, led to a direct increase in trade. However, even here the indiscriminate application of central government regional policy led to inefficient use of scarce port resources. The decision to allow the location of an aluminium smelter at the port, was of very little benefit and led to a loss in potential trade. The smelter could have been located outside the port area, as long as adequate inland transport links were provided. No rent was payable to the port authority, as the land was purchased (at a cost for preparing the land which exceeded the price), and as the smelter was highly capital intensive the local employment generated was negligible. The net benefit to the port was therefore very small, and the failure to analyse closely the effect of this location on port trade resulted in inefficient use of scarce and costly port land area.

At Vlissingen, also, the failure to concentrate on increasing trade flows and the overemphasis on applying the 'magical solution' of port industrialization resulted in the loss of potential trade and inefficient use of part of the new Sloe development. Again, this area benefited from general regional policy, but failure to channel this efficiently by concentrating on increasing trade flows at the port rather than attracting any industry wanting to locate there, resulted in inefficient use of the land available. Encouraged by the regional incentives and with the additional advantage of a relatively short distance to Rotterdam a number of new industries moved into the area, mainly in the chemical sector. Many of these industries were strongly

connected with the Rotterdam industrial complex, including pipeline connections for transport of raw materials and finished items from the chemical plants. These industries therefore gave rise to very little additional trade. The location of an oil refinery was also of little benefit to trade, with only exports showing a significant rise: imports were provided by pipeline from Rotterdam, with its access for very large crude carriers. Indirectly, the location of the refinery increased the volume of trade passing through Rotterdam.

Trade at the port was significantly increased by the establishment of a sand and gravel sorting plant at the old Buitenhaven, but the nature of this trade (mainly concerned with the exploitation of resources within British territorial waters) was such that it was of little benefit to the port.

Vlissingen was therefore relatively successful in attracting industrialization, although like Delfzijl the effect on trade flows was not as great as might have been expected, and the advantages of the port itself played a minor role in location decisions, with regional incentives, especially with regard to capital, and its proximity to the Rotterdam port complex being more important.

Industrial development could not, of course, be adopted by all port authorities involved in port development. However, each port needed to adapt to the new demands made upon it as a result of trends in maritime shipping both in the field of bulk cargoes and of general cargoes. A few were able to maintain trade flows through their links with the hinterland, such as Maassluis (serving the agricultural Westland), even though there were no major improvements or development schemes at the port, but in these cases it may be argued that suitable port development could have attracted additional trade flows. Several ports concentrated on investing in new harbours of greater depth to enable larger ships to

enter the port and in roll-on/roll-off and container facilities. For all the smaller Dutch ports the question of where to direct investments in order to attract increased trade was more crucial than for larger ports, as misdirected investment could lead to decline and eventual extinction. As resources were more limited, investments made were often a once-off attempt to attract increased trade, and the type of action taken could determine the port's future course. For the large ports misdirected investment could be rectified by further development in another part of the port, as the possible range of investments was much greater.

Scheveningen's development indicates investment of the right kind at the right time, and the dramatic effect on the port's trade and its position in the Dutch port range. Being situated in a built-up area, possibilities of extension were very limited and it seemed unlikely that additional trade could be attracted. The port authority, however, was aware of two important advantages. First of all, although the hinterland links were limited to road access, the port was situated on the fringe of a heavily populated area, and also served an important potential hinterland, the agricultural 'Westland'. Secondly the distance between this port and the United Kingdom was one of the shortest in the whole port range, so that short-sea crossings and quick turn-around times were ideal for roll-on/roll-off services. Not least of the many advantages of these services was that they offered the least costly way of increasing trade flows. The vessels used could be relatively small, overcoming the problem of access, and the facilities could be provided without heavy investment which the port could not afford. Thus the natural advantages of the port could be exploited by providing the means whereby a regular, speedy service to the United Kingdom could be developed. The awareness of the advantages which the port had to offer,

together with the realization of the potential for increased trade, were foremost in negotiations between the port authority and a company anxious to set up regular services from the port in the early 1960s. As the new techniques in liner services became apparent, the company involved adopted modern roll-on/roll-off ships, working in close collaboration with a port authority anxious to provide the necessary facilities and additional space in order to increase trade flows. This close co-operation between port authority and port user, together with personal attention, lack of congestion, and lower port charges resulted in the survival and growth of the liner service from this port, providing a very valuable boost to trade flows. This example stands in sharp contrast to that of Vlaardingen mentioned earlier, serving the same agricultural hinterland as Scheveningen, and which also had a liner service with the United Kingdom operating in the 1960s.

From the above examples, a number of factors become obvious when considering planned port development and the effect on trade flows. Firstly, it seems that despite the efforts of planners, the optimum potential for increased trade has been achieved at very few of the Dutch ports. Where considerable success has been achieved in this field (such as at Scheveningen), the authorities have been aware of the basic advantages which the port had to offer, along with the limitations (in this case, that of depth of access, finance, and space for expansion). Secondly, increased port trade was based on the existing trade patterns, developing potential within these patterns, and encouraging growth. It is interesting to note that, unlike some of the Dutch ports, Scheveningen did not have access to government subsidies under regional policy; nevertheless, growth in trade was such that it did not feature as part of the Dutch port range in 1960, but by the end of the decade had taken its place among the older more established seaports in terms of volume of trade flows.

3.3. Conclusions

At present, seaport planning in the Netherlands has proved to be only partially effective, and many of the small ports have actually suffered loss of trade through inadequate, though well-intentioned, planning measures. The goal of port industrialization has blinded many to the potential of particularly the smaller ports in the Dutch port range. A return to careful analysis of trade flow patterns and trends would do much to redress the imbalance. For those ports where industrialization is possible, it would indicate how resources could best be used in order to increase the volume of trade. Conversely, it would show the small port operator where the strengths and weaknesses lie, and counteract the fatalism which has set in where industrialization of the port is not possible. This would be of benefit to the whole range, as each port attempts to maximize its advantages, aided by central government finance if needed. In this way, there would be no more 'white elephants' in Dutch seaport policy.

Finally, it is worth bearing in mind that movements in the liner trades at a number of ports show that these follow closely the trends in trade flows, as well as considerably stimulating these flows. Planners would do well to pay particular attention to these movements, as they indicate the value put on ports by those intimately concerned with increasing trade.

4. Anglo-Dutch trade flows 1955-1975 and their consequences for Dutch port planning.

4.1. Introduction

From the preceding section, it emerges that comparative studies of trade flows over all the ports in the Dutch port range are urgently needed, especially for the smaller ports, so that more effective planning

measures can be taken. In particular the nature of trade relations with forelands and the identification of the major flow patterns and trends form an important area of study. Any elements in trade flows with forelands which promise growth at that port, for instance, if the port shows an increased dependence on flows to certain forelands, will be an indication of the way that port's trade pattern is developing, and therefore also of the direction which appropriate port planning should take. Failure to do this often results in a loss of trade, and a decline in the port's overall position in the national port hierarchy. The loss in trade could mean a fall in the country's total trade. Each port offers a unique combination of resources, which may not be found elsewhere in the same national range. In the Netherlands trade lost by smaller ports will not automatically transfer to the main port of Rotterdam, as the combination of factors which attracted trade to the small port are not duplicated at a large port.

Although Anglo-Dutch trade forms only one element making up trade flows passing through Dutch ports during the period 1955-1975, a study in the shifts in emphasis in these flows reveals important indicators for port planners in the Netherlands.

4.2. The role of Anglo-Dutch trade with the Netherlands

Despite a slight decline in the role which the United Kingdom played in total Dutch trade flows over the period 1955-1975 (from 13% to 10% of all trade), strong growth did take place and the decline was only relative (see diagram 1, chapter 1). The growth in this trade was overshadowed by the massive increase in the import of oil and oil products through the Netherlands, but links with the United Kingdom strengthened for many ports over this period as this country moved towards entry to the Common Market and its trade flows became more

orientated towards Europe. Unlike the bulk trade flows such as oil, travelling over long distances in large units, Anglo-Dutch trade did not show an increasing concentration at the larger ports in the Dutch port range, but rather there was strong evidence of diffusion in these flows over the period in question (chapter 3, 2.1.). These flows were in small units travelling over short sea distances, which made them more flexible in terms of the port selected than the large bulk flows.

In a study of Anglo-Dutch trade such as this it has been found that these flows focused more strongly on the smaller ports in the Dutch port range over the period 1955-1975, and many of these smaller ports showed increasing dependence on trade with the United Kingdom. There is little evidence that this trend will change direction in the future, and it becomes clear that for the trade with the United Kingdom the small port plays a crucial role.

4.3. Anglo-Dutch trade flows and the small ports 1955-1975.

Table 52 compares the degree of dependence on this trade in 1955 and 1975. Those ports with the highest dependence in both years were the smaller ports. For the larger ports (Rotterdam, Amsterdam, IJmuiden, Terneuzen) dependence on Anglo-Dutch trade decreased over the period, while for all other ports except Delfzijl and Harlingen it increased. For the whole range there was a shift upwards in dependence. In 1955 four ports had a dependence figure of under 5%. In 1975 no ports showed a figure under 5%. It was particularly the smaller New Waterway ports which showed an increase. For the North-Sea Canal ports, the larger port became less dependent on these flows, while the smallest port showed an increase. Anglo-Dutch trade formed a growth element for the Schelde ports also, especially at Vlissingen, while at Terneuzen the fall

<u>1955</u>	100%	<u>1975</u>
	95	Hoek van Holland, Scheveningen
	90	Maassluis
	85	
Harlingen Maassluis	80	
	75	
	70	Zwijndrecht
	65	
	60	
	55	
Hoek van Holland	50	Groningen
	45	
Delfzijl	40	
	35	Vlissingen
	30	Dordrecht
" Zwijndrecht	25	
	20	
	15	Harlingen Zaandam
Amsterdam, Rotterdam Terneuzen IJmuiden	10	Vlaardingen, Delfzijl, Schiedam, Amsterdam
Groningen Dordrecht	5	Terneuzen Rotterdam IJmuiden
Vlaardingen Zaandam Vlissingen, Schiedam	0%	

Table 52. Percentage share of Anglo-Dutch trade in total trade at the Dutch ports in 1955 and 1975

recorded in this trade over the period was due to decreased transit to the hinterland, and direct trade between the port and the United Kingdom increased. With the exception of Groningen, the northern ports showed a decline in their trade with the United Kingdom over the period.

It is possible to go one step further, therefore, and point out from this that it is particularly the smaller ports in the central and southern parts of the range which have the greatest potential for increased trade with the United Kingdom.

Nevertheless, it is clear when making an examination of port improvements and the provision of facilities that few ports showed an awareness of the requirements or potential of this particular trade. The beneficial effects that any improvements may have had on Anglo-Dutch trade passing through these ports have usually been entirely coincidental rather than planned. This failure to recognize Anglo-Dutch trade potentials had little effect on the larger ports, but had serious results for the smaller ports.

There is strong evidence that the full potential of Anglo-Dutch trade flows has not yet been fully realized by many Dutch seaports. There has been a definite shift in these flows over the period 1955-1975 in favour of the small ports, showing that the advantages offered by these ports were attractive to this trade. However, effective trade flow studies at these smaller ports have often been lacking, due to limited resources. Trade flow studies have been undertaken for goods moving over the whole national range, but there is a need for studies of such movements over individual ports. Verburg¹² highlights the importance of trade flows with the United Kingdom when he lists the Netherlands-United Kingdom axis as one of the three major European trade axes. Kuiler,¹³ in a review of the European Community's relationship with the United Kingdom,

observes that after fuel oils, the major commodities involved are industrial products, the majority of which pass through small ports. The evidence in this study supports this. In chapter 3 (1.4.) apart from the initial dominance of coal (group 2) and fuel oils (group 3) it was shown that the main commodities involved in trade between the Netherlands and the United Kingdom were agricultural products (groups 0 and 1) and finished industrial products (group 9). Most of these flows can be more than adequately handled by the small ports as they involved small vessels over short-sea distances. Ports such as Scheveningen, that recognized the importance of these flows and actively encouraged them with the provision of the necessary facilities (such as roll-on/roll-off ramps) were rewarded by a large increase in this trade.

With the exception of Scheveningen, however, planners and planning measures at the smaller Dutch ports have shown a marked lack of awareness of the make-up and needs of the trade flows passing through the ports. This was shown in chapter 5, where it was seen that there was a weak connection between trade flows and internal development of the port at most of the smaller ports, with external influences on trade becoming more important over the period 1955-1975. Where ports showed an increase in Anglo-Dutch trade despite this lack of internal development over the period (such as at Vlaardingen, Zaandam and Zwiijndrecht), the argument for providing supporting facilities is strongest. Again, the failure to stimulate these trade flows in such a way on the part of port planners could result in the eventual loss of these trade flows to ports outside the national port range. For Anglo-Dutch trade, perhaps even more than for other trade flows passing through the Dutch ports, current Dutch seaport planning has been counter-productive through its overemphasis on industrial development.

4.4. The place of the liner services in Anglo-Dutch trade flows.

The movement in the liner trades between the Netherlands and the United Kingdom between 1955 and 1975 reveals important indicators with regard to trade flows (see appendix III). The main feature of these trades is the increasing emphasis on services between the smaller ports of the Netherlands and the United Kingdom, whereas initially the large ports tended to be the main focus for liner trades. In 1955 the pattern was one of concentration on the northern port range and the large ports, but by 1975 the smaller ports in the central and southern parts of the range had become much more important. Trends in the liner trades over the period therefore reinforce the conclusion that the small port has a strong appeal which is not duplicated automatically in the larger port, and this is especially the case with regard to Anglo-Dutch trade. The movements in liner trades over the period reveals a distinct pattern in identifying those ports with the strongest appeal, and this provides important indicators for planners on where to direct investments.

4.5. Conclusions

Anglo-Dutch trade became more important for the Dutch ports over the period 1955-1975 despite an overall relative decline (due largely to the dramatic increases in the import of crude oil to Rotterdam). Spectacular developments in the field of port industry have tended to overshadow developments in this trade despite a dramatic increase in its importance as an element in total trade at a number of smaller Dutch ports. Due to an overconcentration on the part of port planners on port industrialization there seems to be a general lack of awareness of the importance of this particular trade flow to certain ports. It is especially the small ports which have shown an increased importance in Anglo-Dutch trade

flows, and it is these smaller ports which have been largely ignored by port planners, as their potential for industrial development is limited. It is time that greater attention be paid to careful analysis of movements in trade over a period of time through individual ports, so that more effective port planning measures can be carried out.

Although such analysis is difficult where ports trade with a number of forelands, due to the complexity of the flows, liner services are useful indicators to the changing pattern of trade, as shown by the movements in Anglo-Dutch trade. To continue to ignore the importance of trade flows and the over-emphasis on port industrialization will mean a loss of potential trade particularly at the smaller ports in the range. This is shown clearly by the trade flows with the United Kingdom over the period studied.

5 Towards a more effective approach to seaport development in the Netherlands.

In conclusion, it is necessary to draw together some of the main indicators as to why port policy in the Netherlands has failed to achieve maximum trading potential at all ports, especially at the small ports, and then to point the way to a more effective planning approach.

The approach implicit in the 'Zeehavennota' on which general Dutch port policy is based had many of the right ideas (for instance the need for a general dispersal of resources over the whole range), but contained a fundamental flaw which has resulted in the smaller elements in the range failing to reach their full trading potential. In many ways, this has fuelled the arguments of those favouring further development of Rotterdam port, as shown by some of the well-argued attacks on the 'Zeehavennota' and its stated aim of dispersal following its publication.¹⁵

These attacks used the figures in the document to show that it was more logical, and especially of greater economic efficiency, to further develop the Rijnmond area rather than other port areas. In fact, it would appear from the approach made by central planners that the only argument supporting dispersal was that of social undesirability and possible future congestion.

The mistake made, as pointed out earlier in this chapter, was the underlying 'major-port-orientation' of planning through the concentration on bulk-flows and industrial development. As a result, planned development of any port in the Netherlands was seen in this light. Those that did not have the necessary extra land available were 'written off' in the eyes of the planners. This has led to an increased concentration of trade flows rather than the dispersal envisaged. In addition, scarce resources were channelled into attracting large-scale industrial complexes attempting to duplicate the success of Rotterdam. In the case of many smaller ports, this planning approach has been wholly unsuitable, resulting in land being made available at great cost which remains unused (such as Eemshaven) or being used by industries not requiring access to the port itself (such as at Groningen). In very few cases has the total trading potential of the small port been increased by this approach. Any study of Anglo-Dutch trade, an important or increasingly important element in the trade of most of the smaller ports, clearly demonstrates this lost potential.

Better management of the whole port range depends on, in the first instance, planning which restores to the smaller ports a recognition of their primary function, that of trade and transshipment. This can only be achieved by a retreat from the 'industrial seaport philosophy'. Careful studies of trade-flow patterns through ports will indicate the

potential based on a full range of local characteristics. This will enable investment to be aimed at encouraging greater flows and developing such industries as would contribute towards this end. In those cases where trade flows are complex, liner services give a good indication of areas in which the port has strong advantages. This approach benefits all the ports in the port range, as it encourages a more realistic attitude towards the resources of each port, and should lead to an increased trade over the whole range. At present, many of the industries moving to smaller ports have done so as a result of planning incentives, rather than the local benefits of the port, taking a 'second-best' location decision. Trade flows have been increased at the main ports rather than the small port, which has served to increase congestion at the former, while port industries forced to relocate by government incentives use up scarce land at the smaller ports. Present Dutch seaport policy has also given rise to a fatalistic and negative approach to those smaller ports unable to provide such land, or located near to a main port (for example Vlaardingen). The extent of the failure of this policy can only be fully realized when proposals such as that put forward by the 'Scheepvaart Vereniging Zuid' are considered. Although obviously faulty, its conclusion of ceasing all development of other Dutch seaports and concentrating on the development of Rotterdam, is the logical outcome of the philosophy on which present Dutch seaport planning is based. Studies of Anglo-Dutch trade flows show that such a proposal will lead to a loss in potential trade, as the small port plays an increasingly important role and offers special advantages based on its size which cannot be fulfilled by the large port. It is very clear that the importance of the contribution by the smaller ports has been increasingly overshadowed in post-war years by industrial

development at the larger ports, so that their significant role in trade flows has been overlooked by port planners.

Port planners in the Netherlands need, therefore, to adopt a fundamental change in their philosophy. Industrial seaport planning, desirable in large complexes, is unsuitable for small ports, where this approach has failed to increase trading potential and led to the mismanagement of scarce resources. The observations made by Boerman in 1951 now seem ironic, in that the then much neglected field of port industrialization has come to feature so prominently in current Dutch seaport thinking that there is now an urgent need to return to trade-flow studies if trade is not to be lost, and if the small ports are to exploit all their advantages to the full.

NOTES

Chapter 6

- 1 R.L.M. Vleugels, 'The economic impact of ports and the regions they serve and the role of industrial development', International Association of Ports and Harbours, Melbourne conference, (Melbourne, 1969).
- 2 E.D.J. Kruijtbosch, 'De betekenis van havens uit nationaal en internationaal gezichtspunt gezien', Zesde Beneluxhavenstudiedagen, (1969), pp. 15-23.
- 3 H.F. Ottens, 'De Internationale Goederen Uitwisseling Over Zee', in Aspecten van Europa - sociale en geografische beschouwingen over bevolking en bedrijvigheid, edited by J. Jansen, (Bussum, 1978), pp. 209-257.
- 4 W.E. Boerman, 'The need for special examination of particular aspects of port geography', Tijdschrift voor Economische en Sociale Geografie 42 (1951), pp. 347-349.
- 5 Zeehavennota: het beleid van de Rijksoverheid, Rijks Planologische Dienst, ('s-Gravenhage, 1966).
- 6 For a summary of these reports see R. Ruiter, 'Seaport development in the Netherlands', in The Future of the European Ports, Volume 1, edited by R. Regul, (Bruges, 1970), p. 438.
- 7 R. Ruiter, 'Seaport development in the Netherlands', p. 451.
- 8 F. Hartog, 'Als de overloop stukt', Twaalfde Beneluxhavenstudiedagen, Nederlands Vervoerswetenschappelijk Instituut, (1978), p. 24.
- 9 Memorandum inzake capaciteit Rotterdamse Havens, Scheepvaart Vereniging Zuid, (Rotterdam, 1976).
- 10 F. Posthuma, 'Port modernization: the lessons of Rotterdam', Progress, 52 (1968), p. 151.

- 11 H. Jürgensen, 'The regional impact of port investments and its consideration in port investment policy', The Future of the European Ports, volume 1, edited by R. Regul, (Bruges, 1970), pp. 576-601.
- 12 M.C. Verburg, Nederland in de Europese Ruimte (Amsterdam, 1966), pp. 232-248.
- 13 See for instance De behoefte aan zeehavenareaal in 1980, Rijks Planologische Dienst, ('s-Gravenhage, 1966).
- 14 H.C. Kuiler, 'Vervoersstromen tussen de continentale E.G. landen en het Verenigd Koninkrijk', Maandstatistiek van Verkeer en Vervoer, (May 1974), p. 191.
- 15 See Verkenning van enkele aspecten van de ontwikkelingsmogelijkheden voor Zeehavens in het Deltagebied, Overlegorgaan Zeehavenontwikkeling Zuid-West Nederland (Middelburg, 1969) and Rijnmond in de delta. Beoordeling der economische ontwikkelingsmogelijkheden van het Rijnmondgebied, Openbaar Lichaam Rijnmond (Rotterdam, 1969).

CONCLUSION

It remains now only to return to the aims and objectives outlined in the Introduction and to make a few general observations on the line of enquiry pursued in this study.

The major problem faced by researchers involved in the study of forelands of ports has been the large quantities of data which needed to be processed before even a static picture of the trade flows to and from particular ports emerged, and hence little progress has been made in this direction. Although the establishing of foreland trading links at one particular point in time is of undoubted value to port planners, it seemed probable that a more dynamic approach, taking into consideration the changes in the nature and emphasis of such flows over time and over the whole port range could prove to be of even greater value. However, such an approach, given the existing problems of excessive data for a simple foreland analysis, would be unmanageable, especially for an in-depth study. As a result this study set out to ascertain whether a slightly different approach to foreland trade flows, involving the isolation and in-depth study of one particular flow over a number of ports in a national range over a particular time period, could prove useful to those involved in port planning. The reasons for choosing ports of the Netherlands and trade flows with the United Kingdom for this have been discussed in the Introduction. In order to avoid losing proper perspective, continual comparison with the movements in total trade through each port in the range was adopted as an essential element to such an approach.

The pattern which emerges from this study is of considerable interest, as the isolation of one trade flow in this way reveals some important

indicators for port planners in the Netherlands, as pointed out in the last chapter of this study. The dynamism of trade flows over a period of time is of very great importance, as it identifies many of the major elements which affect the growth of ports, their competitive position within a national port range, and at the same time make it possible to identify those factors which make a port attractive to these flows. Such information is of obvious interest to those involved in port planning decisions, making it possible to adopt more effective investment policies and avoid some of the costly mistakes that have resulted from the over-emphasis of the role of port industries. This study should be viewed as the first exploratory step in the direction of a more dynamic approach to trade flows between ports and their forelands. Much work still needs to be done in refining the approach, and in further in-depth studies of individual trade flows with forelands of ports in a range. Such research will undoubtedly reveal further insights into the behaviour of trade flows and their effect on port development, enabling the port planner to make more accurate investment decisions in order to maximize the natural advantages of each port. In an era of recession, faced with the need to economize, information of this kind could prove invaluable for the future of many ports.

APPENDIX I

Commodity list N.S.T.R.

- GROUP 0 AGRICULTURAL PRODUCTS AND LIVE ANIMALS
- Sub-group 00 Live animals
0010 Live animals
- Sub-group 01 Cereals
0110 Wheat, spelt and meslin
0120 Barley
0130 Rye
0140 Oats
0150 Maize
0160 Rice
0190 Other cereals
- Sub-group 02 Potatoes
0200 Potatoes
- Sub-group 03 Other fresh vegetables and fruits
0311 Oranges and mandarines
0319 Other citrus fruits
0351 Bananas
0352 Apples and pears
0359 Other fresh fruits; nuts
0390 Vegetables, fresh and frozen
- Sub-group 04 Natural and synthetic textile materials and waste
0410 Wool and other animal hair
0420 Cotton
0430 Artificial and synthetic textile fibres
0451 Jute and waste of jute
0459 Other vegetable textile fibres
0490 Rags and waste materials from textile

Commodity list N.S.T.R. (continued)

Sub-group 05 Wood and cork

- 0510 Paperwood, pulpwood
- 0520 Pit props
- 0550 Other wood in the round
- 0560 Wooden sleepers and other roughly squared wood
- 0570 Fire wood, charcoal, waste of wood; cork, raw and waste

Sub-group 06 Sugar beets

- 0600 Sugar beets

Sub-group 09 Other crude animal and vegetable materials

- 0910 Hides and fur skins
- 0920 Rubber, natural and synthetic, crude or reclaimed
- 0991 Bulbs
- 0999 Other crude vegetable and animal materials

GROUP 1 FOODS AND FEEDING-STUFF FOR ANIMALS

Sub-group 11 Sugar

- 1110 Raw sugar
- 1120 Refined sugar
- 1130 Molasses

Sub-group 12 Beverages

- 1210 Wine and grape must
- 1220 Beer
- 1250 Other alcoholic beverages
- 1280 Non-alcoholic beverages

Sub-group 13 Various foods and allied products

- 1310 Coffee
- 1321 Cocoa bean
- 1322 Cocoa and chocolate preparations
- 1331 Tea and maté
- 1332 Spices

Commodity list N.S.T.R. (continued)

- 1340 Raw tobacco and waste
- 1350 Tobacco manufactures
- 1360 Other sugars and syrups; natural honey; sugar confectionary
- 1390 Food preparations n.e.s.

Sub-group 16 Non-perishable food stuff and hops

- 1600 Meal, flour and groats of cereals
- 1620 Malt
- 1630 Other products and preparations of cereals
- 1641 Dried fruits
- 1642 Preserved fruits and fruit preparations
- 1650 Dried leguminous vegetables
- 1660 Preserved vegetables and vegetable preparations
- 1670 Hops

Sub-group 17 Feeding-stuff for animals and waste of food stuff

- 1710 Cereal straw, hay and husks
- 1720 Bran and other feeding-stuff for animals, waste of food industry

Sub-group 18 Oil seeds, Oil-fruits and fats

- 1811 Copra
- 1812 Soya-beans
- 1813 Groundnuts
- 1819 Other oil-seeds
- 1821 Other animal oils and fats
- 1822 Linseed oils
- 1829 Other vegetable oils and fats

GROUP 2 SOLID FUEL

Sub-group 21 Coal

- 2110 Coal
- 2130 Coal briquettes

Commodity list N.S.T.R. (continued)

Sub-group 22 Lignite and peat

- 2210 Lignite
- 2230 Lignite briquettes
- 2240 Peat

Sub-group 23 Coke

- 2310 Coke and semi-coke of coal
- 2330 Coke and semi-coke of lignite

GROUP 3 CRUDE PETROLEUM AND RELATED PRODUCTS OF DISTILLATION

Sub-group 31 Crude petroleum

- 3100 Crude petroleum

Sub-group 32 Petroleum products

- 3210 Petrol
- 3230 Kerosine, white spirit
- 3250 Gas- and diesel oil
- 3270 Heavy fuel oil

Sub-group 33 Energy gas, liquid or compressed

- 3300 Energy gas, liquid or compressed

Sub-group 34 Other petroleum derivatives (non fuel)

- 3410 Mineral lubricating oils and lubricating fats
- 3430 Petroleum bitumen and bituminous mixtures
- 3490 Other petroleum products (non energy products)

GROUP 4 ORE AND METAL RESIDUES

Sub-group 41 Iron ore

- 4100 Iron ore except pyrites

Sub-group 45 Non-ferrous metal ores and scrap

- 4510 Residues of non-ferrous metals
- 4520 Copper ore and concentrates
- 4530 Bauxite (aluminium ore) and concentrates

Commodity list N.S.T.R. (continued)

	4550	Manganese ore and concentrates
	4591	Tin ore and concentrates
	4592	Zinc ore and concentrates
	4599	Other non-ferrous ore and concentrates
Sub-group	46	Scrap and blast furnace dust
	4620	Iron and steel scrap and residues
	4660	Blast furnace dust; iron slags
	4670	Roasted iron pyrites
GROUP	5	PRODUCTS OF METAL INDUSTRY
Sub-group	51	Pig iron and steel; ferro-alloys
	5120	Pig iron, spiegeleisen and ferro-alloys
	5150	Pig steel
Sub-group	52	Semi-manufactured goods of iron and steel
	5220	Rolled semi-manufactured goods of iron and steel (blooms, billets, slabs, sheet bars, coils)
	5230	Other semi-manufactured goods of iron and steel
Sub-group	53	Bars, rods, wire rod, railway track construction material of iron or steel
	5320	Rolled or shaped steel
	5350	Wire rod
	5360	Iron and steel wire
	5370	Rails and railway track construction material
Sub-group	54	Plates, strips and sheets of steel
	5420	Plate steel, universals
	5450	Hoop and strip of steel; tin plate
Sub-group	55	Tubes, pipes, iron and steel casting and forgings, unworked
	5510	Tubes, pipes and fittings of iron and steel
	5520	Iron and steel castings and forgings, unworked

Commodity list N.S.T.R. (continued)

Sub-group	56	Non-ferrous metals
	5610	Copper and alloys, unwrought
	5620	Aluminium and alloys, unwrought
	5630	Lead and alloys, unwrought
	5640	Zinc and alloys, unwrought
	5650	Other non-ferrous metals and alloys
	5680	Finished and semi-manufactured goods of non-ferrous metals (except manufactures)
GROUP	6	CRUDE AND MANUFACTURED MINERALS, BUILDING MATERIALS
Sub-group	61	Sand, gravel and slags
	6110	Sand for industrial use (Quartz sand)
	6120	Ordinary sand and gravel
	6130	Pumice stone, incl. pumiceous sand and gravel
	6140	Clay and clay earth
	6150	Slags not for recovery of metals, ash
Sub-group	62	Salt, iron pyrites, sulphur
	6210	Salt
	6220	Unroasted iron pyrites
	6230	Sulphur
Sub-group	63	Other stone, earth and similar minerals
	6310	Crushed stone, stone, macadam, tarred macadam
	6320	Building and monumental stone
	6330	Limestone for industrial purposes
	6340	Chalk
	6390	Other crude minerals
Sub-group	64	Cement, lime
	6410	Cement
	6420	Lime
Sub-group	65	Gypsum
	6500	Gypsum

Commodity list N.S.T.R. (continued)

Sub-group 69 Other fabricated building materials

6910 Fabricated building materials, except glass and
clay materials

6920 Bricks, roofing tiles and other ceramic building
materials

GROUP 7 FERTILIZERS

Sub-group 71 Natural fertilizers

7110 Natural sodium nitrate

7120 Natural phosphates, crude

7130 Natural potassic salts, crude

7190 Other natural fertilizers

Sub-group 72 Chemical fertilizers

7210 Phosphatic slag (thomas slag)

7220 Other phosphatic fertilizers

7230 Potassic fertilizers

7240 Nitrogenous fertilizers

7290 Other fertilizers

GROUP 8 CHEMICAL PRODUCTS

Sub-group 81 Chemical base products

8110 Sulphuric acid, oleum

8120 Sodium hydroxide and sodium lixivium

8130 Sodium carbonate

8140 Calcium carbide

8190 Other chemical base products

Sub-group 82 Aluminiumoxide and hydroxide

8200 Alumiumoxide and hydroxide

Sub-group 83 Chemicals from coal

8310 Benzole

Commodity list N.S.T.R. (continued)

	8390	Pitch, mineral tar and other crude chemical derivatives from coal and natural gas
Sub-group	84	Cellulose and paper waste
	8410	Cellulose
	8420	Paper waste and old paper
Sub-group	89	Other chemical products
	8910	Artificial stuff, unwrought
	8920	Dyeing, tanning and colouring materials
	8931	Medicinal and pharmaceutical products
	8932	Perfumery and cleansing preparations
	8940	Explosives incl. hunting ammunition and pyrotechnic products
	8950	Starches, gluten and gluten flour
	8960	Other chemical products
GROUP	9	MACHINERY, TRANSPORT EQUIPMENT, VARIOUS MANUFACTURED ARTICLES AND SPECIAL TRANSACTIONS OTHER ARTICLES
Sub-group	91	Transport equipment*
	9101	Rolling stock for rail- and tramway
	9102	Road motor vehicles (excl. motorcycles)
	9103	Cycles, motorcycles
	9104	Other road vehicles
	9105	Aircraft
	9106	Ships and boats
Sub-group	92	Agricultural tractors and machinery*
	9200	Agricultural tractors and machinery
Sub-group	93	Other machinery, apparatus, motors*
	9310	Electric machinery, apparatus, motors
	9390	Non-electric machinery, apparatus, motors

* Incl. parts

Commodity list N.S.T.R. (continued)

- Sub-group 94 Metal ware
- 9410 Finished structural parts and structures
 - 9490 Other manufactures of metal
- Sub-group 95 Glass, glassware, ceramics
- 9510 Glass
 - 9520 Glassware, pottery and other manufactures of mineral
- Sub-group 96 Leather, textile and clothing
- 9610 Leather, manufactures of leather and furs
 - 9621 Textile yarns
 - 9622 Woven cloths and fabrics and articles of textile materials (except clothing and footwear)
 - 9630 Travel goods, clothing, knitting and footwear
- Sub-group 97 Other manufactured articles
- 9710 Rubber, semi-manufactures and articles
 - 9720 Paper and cardboard, unwrought
 - 9730 Paper and cardboard manufactures
 - 9740 Printed matter
 - 9750 Furniture, new
 - 9761 Veneers, artificial wood and other wood, worked
 - 9762 Wood manufactures
 - 9763 Cork manufactures
 - 9790 Other manufactured articles n.e.s.
- Sub-group 99 Other goods
- 9910 Used packing
 - 9920 Construction materials, used, fair vehicles
 - 9930 Removals
 - 9940 Gold, coins of gold, commemoratives
 - 9990 Other manufactured goods not to be classified.

APPENDIX II

Part A

Total Seaborne Trade between the Dutch Ports and the United Kingdom
1955-1975 (five-yearly figures, 1,000 kg).

1955

Port	Imports	Exports	Total
1 Amsterdam	691,625	380,019	1,071,644
2 Rotterdam	1,764,823	7,216,471	8,981,294
3 IJmuiden & Velsen	43,920	153,491	197,411
4 Zaandam	564	4,653	5,217
5 Schiedam	1,300	31	1,331
6 Vlaardingen	50,459	44,376	94,835
7 Maassluis	4,161	46,491	50,652
8 Hoek van Holland	8,946	43,533	52,479
9 Dordrecht	60,157	10,158	70,315
10 Zwijndrecht	10,035	1,226	11,261
11 Delfzijl	31,856	94,200	126,056
12 Groningen	1,511	1,879	3,390
13 Harlingen	12,942	102,795	115,737
14 Terneuzen & Axel	59,969	13,917	73,886
15 Vlissingen	6,474	2,446	8,920
16 Other distr. NL	10,705	55,453	66,158

Appendix II - Part A (continued)

1960

Port	Imports	Exports	Total
1 Amsterdam	785,815	362,527	1,148,342
2 Rotterdam	2,806,833	4,098,181	6,905,014
3 IJmuiden & Velsen	91,002	273,304	364,306
4 Zaandam	3,374	4,789	8,163
5 Schiedam	5,316	283	5,599
6 Vlaardingen	21,337	95,856	117,193
7 Maassluis	12,629	37,149	49,778
8 Hoek van Holland	7,744	48,888	56,633
9 Dordrecht	147,855	28,618	176,473
10 Zwijndrecht	6,204	204	6,408
11 Delfzijl	95,019	52,422	147,441
12 Groningen	7,689	718	8,407
13 Harlingen	4,852	97,708	102,560
14 Terneuzen & Axel	68,519	46,752	115,271
15 Vlissingen	33,066	2,719	35,785
16 Other distr. NL	25,238	70,252	95,490

Appendix II - Part A (continued)

1965

Port	Imports	Exports	Total
1 Amsterdam	1,038,626	944,075	1,982,701
2 Rotterdam	2,801,265	6,933,241	9,734,506
3 IJmuiden & Velsen	52,107	230,319	282,426
4 Zaandam	2,058	10,102	12,160
5 Schiedam	5,199	1,760	6,959
6 Vlaardingen	87,168	43,799	130,967
7 Maassluis	26,763	56,889	83,652
8 Hoek van Holland	9,727	49,759	59,486
9 Dordrecht	203,418	77,858	281,276
10 Zwijndrecht	3,545	1,013	4,558
11 Delfzijl	54,928	100,384	155,312
12 Groningen	2,645	41,380	44,025
13 Harlingen	19,836	72,590	92,426
14 Terneuzen	273,141	50,443	323,584
15 Vlissingen	121,218	3,824	125,042
16 Other distr. NL	37,070	136,327	173,397

Appendix II - Part A (continued)

1970

	Port	Imports	Exports	Total
1	Amsterdam	669,970	2,598,472	3,268,442
2	Rotterdam	5,453,139	11,912,711	17,365,850
3	IJmuiden & Velsen	116,258	296,252	412,510
4	Zaandam	5,739	16,461	22,203
5	Schiedam	31,055	5,576	36,631
6	Vlaardingen	233,593	135,489	369,082
7	Maassluis	35,703	49,381	85,084
8	Hoek van Holland	17,296	35,518	52,814
9	Dordrecht	586,043	48,754	634,797
10	Zwijndrecht	5,132	7,659	12,791
11	Delfzijl	39,896	111,761	151,657
12	Groningen	3,473	11,175	14,648
13	Harlingen	27,084	28,226	55,310
14	Terneuzen	234,413	180,398	414,811
15	Vlissingen	15,158	4,432	19,590
16	Other distr. NL	n.a.	n.a.	n.a.
17	Scheveningen	72,297	110,088	182,385

Appendix II - Part A (continued)

1975

Port	Imports	Exports	Total
1 Amsterdam	629,693	1,624,755	2,254,449
2 Rotterdam	6,127,379	17,300,561	23,427,940
3 IJmuiden & Velsen	37,322	609,559	646,881
4 Zaandam	3,535	45,611	49,146
5 Schiedam	848	1,484	2,332
6 Vlaardingen	151,067	399,683	550,750
7 Maassluis	31,111	84,272	115,383
8 Hoek van Holland	832,603	79,145	911,748
9 Dordrecht	606,690	55,723	662,413
10 Zwijndrecht	22,425	35,740	58,165
11 Delfzijl	74,603	220,225	294,828
12 Groningen	6,013	34,523	40,536
13 Harlingen	4,334	16,312	20,646
14 Terneuzen & Axel	250,332	216,732	467,064
15 Vlissingen	885,171	524,847	1,410,018
16 Other distr. NL	-	-	-
17 Scheveningen	248,794	235,200	483,994

Figures calculated from:

Maandstatistiek van de Zeevaart en van het Havenverkeer,

('s-Gravenhage, 1955, 1960, 1965, 1970, 1975).

APPENDIX II

Part B

Commodity trades between the Dutch ports and the United Kingdom per port
1955-1975 (five-yearly figures, 1,000 kg.)

1955

Port	Group	Import	Export	Total
1 Amsterdam	0	15,118	79,139	94,254
	1	24,075	149,251	173,326
	2	270,264	39,768	310,032
	3	39,058	2,557	41,615
	4	287	1,486	1,773
	5	25,960	9,598	35,558
	6	159,393	1,859	161,252
	7	0	1,198	1,198
	8	45,137	45,626	90,763
	9	85,858	83,424	169,282
	Total	665,150	413,906	1,079,056
2 Rotterdam	0	25,746	273,744	299,490
	1	92,674	380,258	472,932
	2	540,866	4,639,079	5,179,945
	3	760,369	1,582,214	2,345,583
	4	21,540	4,532	26,072
	5	119,637	70,564	190,201
	6	47,465	65,121	112,586
	7	0	0	0
	8	40,389	57,678	98,067
	9	113,259	399,484	512,743
	Total	1,761,945	7,472,674	9,234,619

1955

Appendix II Part B continued

Port	Group	Import	Export	Total	
3 IJmuiden and Velsen	2	35,446	0	35,446	
	4	627	6,409	7,036	
	5	4,178	146,933	151,111	
	8	2,362	0	2,362	
	9	0	3,093	3,093	
	Total		42,613	156,435	199,048
4 Zaandam	8	0	3,854	3,854	
	Total	0	3,854	3,854	
5 Schiedam	9	643	8,433	9,076	
	Total	643	8,433	9,076	
6 Vlaardingen	0	0	212	212	
	1	5,740	32,179	37,979	
	2	25,707	2,509	28,297	
	3	11,366	0	11,366	
	4	0	4,911	4,911	
	6	3,979	2,687	6,666	
	8	1,184	761	1,945	
	9	1,366	5,866	7,232	
			49,342	49,125	98,467
	7 Maassluis	0	0	44,836	44,836
9		3,110	0	3,110	
Total		3,110	44,836	47,946	

1955

Appendix II Part B continued

Port	Group	Import	Export	Total
8 Hoek van Holland	0	0	16,726	16,726
	1	587	7,229	7,816
	9	5,530	46,611	52,141
	Total	6,117	67,566	73,683
9 Dordrecht	0	0	725	725
	1	0	3,643	3,643
	2	2,961	0	2,961
	3	1,571	0	1,571
	4	16,081	0	16,081
	5	0	245	245
	6	31,442	509	31,951
	8	3,696	1,953	5,649
	9	2,804	228	3,032
			58,555	7,303
10 Zwijndrecht	1	7,407	405	7,812
	5	2,628	0	2,628
	Total	10,035	405	10,440
11 Delfzijl	1	5,287	0	5,287
	2	16,543	0	16,543
	4	0	14,695	14,695
	8	9,818	16,317	26,135
	9	0	62,417	62,417
	Total	31,648	93,429	125,077

1955

Appendix II Part B continued

Port	Group	Import	Export	Total
12 Groningen	0	253	0	253
	1	493	0	498
	8	695	1,879	2,574
	Total	1,446	1,879	3,325
13 Harlingen	0	0	16,632	16,632
	1	82	23,370	23,452
	2	10,886	0	10,886
	4	0	1,070	1,070
	8	314	9,694	10,008
	9	0	48,302	48,302
	Total	11,282	99,068	110,350
14 Terneuzen and Axel	0	396	2,079	2,475
	2	35,875	0	35,875
	4	5,286	0	5,286
	5	147	0	147
	6	17,692	0	17,692
	7	0	7,357	7,357
	8	102	4,465	4,567
	Total	59,498	13,901	73,399
15 Vlissingen	0	0	960	960
	1	0	1,288	1,288
	9	6,019	29,386	35,405
	Total	6,019	31,634	37,653

1960

Appendix II Part B continued

Port	Group	Import	Export	Total
1 Amsterdam	0	16,949	47,943	64,892
	1	24,716	163,441	188,157
	2	228,521	326	288,847
	3	102,379	20,919	123,298
	4	3,497	7,163	10,660
	5	44,908	8,428	53,336
	6	194,292	3,389	197,681
	7	0	0	0
	8	44,985	33,067	78,052
	9	142,155	61,508	203,663
	Total	802,402	346,184	1,148,586
2 Rotterdam	0	143,123	382,472	525,944
	1	75,266	230,023	305,289
	2	641,118	2,682	643,800
	3	1,231,871	2,892,961	4,124,832
	4	18,587	14,613	33,200
	5	212,174	90,007	302,181
	6	216,381	63,297	279,678
	7	0	20,825	20,825
	8	136,018	122,689	258,707
	9	147,698	172,038	319,736
	Total	2,822,236	3,991,607	6,813,843

1960

Appendix II Part B continued

Port	Group	Import	Export	Total
3 IJmuiden and Velsen	1	1,868	218	2,086
	2	24,169	0	24,169
	4	0	2,887	2,887
	5	14,236	186,409	200,645
	6	46,005	0	46,005
	8	661	0	661
	9	3,133	16,006	19,139
	Total	90,072	205,520	295,592
4 Zaandam	1	0	3,767	3,767
	4	1,200	0	1,200
	5	519	0	519
	8	493	0	493
	9	1,089	0	1,089
	Total	3,301	3,767	7,068
5 Schiedam	9	5,203	50	5,253
	Total	5,203	50	5,253
6 Vlaardingen	0	0	3,472	3,472
	1	9,054	37,649	46,703
	2	264	0	264
	3	274	0	274
	4	482	0	482
	5	1,187	2,226	3,413
	6	0	1,512	1,512
	7	4,972	22,260	27,232
	8	3,951	216	4,167
	9	1,027	0	1,027
	Total	21,211	67,335	88,546

1960

Appendix II Part B continued

Port	Group	Import	Export	Total
7 Maassluis	0	5,134	34,648	39,782
	1	100	0	100
	9	6,789	748	7,537
	Total	12,023	35,396	47,419
8 Hoek van Holland	0	0	19,668	19,668
	1	919	8,619	9,538
	9	3,240	10,111	13,351
	Total	4,159	38,398	42,557
9 Dordrecht	0	1,022	2,695	3,717
	1	0	3,108	3,108
	2	74,293	0	74,293
	3	2,121	275	2,396
	6	39,225	6,287	45,512
	8	27,945	13,269	41,214
	9	2,247	192	2,439
	Total	146,853	25,326	172,679
	10 Zwijndrecht	1	1,204	0
5		4,999	0	4,999
Total		6,203	0	6,203
11 Delfzijl	0	56,284	0	56,284
	1	107	1,584	1,691
	2	36,075	0	36,075
	6	0	140	140
	7	0	599	599
	8	2,152	3,291	5,443
	9	0	46,018	46,018
	Total	94,618	51,632	146,250

1960

Appendix II Part B continued

Port	Group	Import	Export	Total
12 Groningen	0	6,244	0	6,244
	1	1,088	250	1,338
	5	0	341	341
	Total	7,332	591	7,923
13 Harlingen	0	0	2,393	2,393
	1	0	20,099	20,099
	2	1,455	0	1,455
	5	177	0	177
	8	96	24,693	24,789
	9	2,383	45,029	47,412
	Total	4,111	92,214	96,325
14 Terneuzen and Axel	0	512	0	512
	2	18,064	0	18,064
	3	0	753	753
	4	0	27,112	27,112
	6	49,319	0	49,319
	7	0	8,381	8,381
	Total	67,895	36,246	104,141
15 Vlissingen	3	30,071	0	30,071
	4	208	0	208
	5	693	0	693
	6	0	475	475
	9	990	1,046	2,036
	Total	31,962	1,521	33,483

1965

Appendix II Part B continued

Port	Group	Import	Export	Total
1 Amsterdam	0	19,023	534,549	553,572
	1	40,215	124,079	164,294
	2	304,361	61	304,422
	3	70,829	243,069	313,898
	4	3,154	121,341	124,495
	5	24,447	3,506	27,953
	6	150,865	8,064	158,929
	7	740	19,264	20,004
	8	62,684	35,339	98,023
	9	137,317	48,306	185,623
	Total	813,635	1,137,578	1,951,213
2 Rotterdam	0	81,382	698,582	779,964
	1	97,272	238,099	335,371
	2	457,512	7,102	464,614
	3	1,137,292	4,914,943	6,052,235
	4	109,046	191,564	300,610
	5	166,440	71,821	238,261
	6	265,215	91,950	357,165
	7	4,291	188,652	192,943
	8	195,703	273,113	468,816
	9	253,302	166,143	419,445
	Total	2,767,455	6,841,969	9,609,424

1965

Appendix II Part B continued

Port	Group	Import	Export	Total
3 IJmuiden and Velsen	1	634	0	634
	2	18,547	0	18,547
	4	0	1,212	1,212
	5	4,196	143,961	148,157
	6	16,801	0	16,801
	7	0	51,988	51,988
	9	11,604	141	11,745
	Total	51,782	197,302	249,084
4 Zaandam	0	1,323	2,629	3,952
	1	0	3,404	3,404
	8	0	653	653
	9	300	0	300
	Total	1,623	6,686	8,309
5 Schiedam	9	4,855	1,550	6,405
	Total	4,855	1,550	6,405
6 Vlaardingen	0	1,113	6,186	6,299
	1	515	11,736	12,251
	2	13,148	0	13,148
	3	4,476	1,325	5,801
	4	52,733	0	52,733
	5	0	10,242	10,242
	6	0	421	421
	7	0	2,742	2,742
	8	12,178	299	12,477
	9	1,056	690	1,746
	Total	85,219	33,641	118,860

1965

Appendix II Part B continued

Port	Group	Import	Export	Total
7 Maassluis	0	26,143	54,977	80,977
	Total	26,143	54,977	80,977
8 Hoek van Holland	0	0	21,392	21,392
	1	0	6,614	6,614
	5	902	0	902
	9	3,247	15,272	18,519
	Total	4,149	43,278	47,427
9 Dordrecht	0	0	3,634	3,634
	2	104,791	0	104,791
	3	4,511	26,062	30,573
	4	6,247	0	6,247
	5	2,566	1,371	3,937
	6	1,205	0	1,205
	8	36,301	46,331	82,632
	9	1,223	0	1,223
	Total	156,844	77,398	234,242
	10 Zwijndrecht	0	1,169	0
5		2,119	380	2,499
Total		3,288	380	3,668
11 Delfzijl	0	863	17,379	18,242
	2	7,086	0	7,086
	3	0	28,988	28,988
	6	1,976	796	2,772
	8	6,571	4,988	11,559
	9	2,744	31,167	33,911
	Total	19,240	83,318	102,558

1965

Appendix II Part B continued

Port	Group	Import	Export	Total
12 Groningen	0	959	22,090	23,049
	1	0	4,117	4,117
	2	1,677	0	1,677
	8	0	265	265
	Total	2,636	26,472	29,108
13 Harlingen	0	1,510	2,393	3,903
	1	0	13,720	13,720
	2	8,648	0	8,648
	5	220	0	220
	6	562	0	562
	8	0	14,438	14,438
	9	4,537	33,939	38,476
	Total	15,477	64,490	79,967
14 Terneuzen and Axel	0	1,341	25,701	27,042
	2	177,462	52,984	230,446
	4	0	807	807
	6	37,689	0	37,689
	7	2,021	17,986	20,007
	8	0	5,178	5,178
	Total	218,513	102,656	316,619
15 Vlissingen	0	869	1,307	2,176
	3	110,421	1,547	111,968
	4	8,899	0	8,899
	9	254	0	254
	Total	120,443	2,854	123,297

1970

Appendix II Part B continued

Port	Group	Import	Export	Total
1 Amsterdam	0	19,527	746,321	765,848
	1	36,460	140,975	177,435
	2	148,340	13,856	162,196
	3	91,685	399,950	491,635
	4	6,769	1,150,835	1,157,604
	5	29,602	6,080	35,682
	6	132,118	9,009	141,128
	7	762	0	762
	8	68,146	21,843	89,989
	9	128,780	81,178	209,958
	Total	662,189	2,570,047	3,232,236
2 Rotterdam	0	98,107	1,049,624	1,147,731
	1	166,223	429,576	595,799
	2	198,352	8,549	206,901
	3	1,391,831	10,453,628	11,845,459
	4	76,634	872,337	948,971
	5	278,658	133,533	410,191
	6	2,162,254	276,134	2,438,388
	7	1,523	250,171	251,694
	8	695,724	1,006,342	1,702,066
	9	388,775	417,121	805,896
	Total	5,458,081	14,897,015	20,353,096

1970

Appendix II part B continued

Port	Group	Import	Export	Total
3 IJmuiden and Velsen	0	321	0	321
	1	9,226	112	9,338
	2	290	0	290
	4	663	0	663
	5	7,986	271,125	279,111
	6	80,716	1,615	82,331
	7	8,627	14,755	23,382
	9	8,178	834	9,012
	Total		116,007	288,441
4 Zaandam	0	0	805	805
	1	3,248	4,083	7,331
	8	1,410	10,418	11,828
	9	0	1,150	1,150
	Total		4,658	16,456
5 Schiedam	6	29,958	0	29,958
	9	0	3,638	3,638
	Total		3,638	33,596
6 Vlaardingen	0	2,311	2,004	4,315
	1	3,552	43,723	47,275
	2	86,382	11,614	97,996
	3	302	2,478	2,780
	4	26,276	37,199	63,475
	5	20,882	11,989	32,871
	6	82,787	2,275	85,062
	7	0	5,018	5,018
	8	8,423	9,354	17,777
	9	724	94	818
	Total		231,639	125,748

1970

Appendix II Part B continued

Port	Group	Import	Export	Total
7 Maassluis	0	0	36,389	36,389
	1	5,203	6,465	11,668
	2	340	0	340
	5	224	659	883
	6	1,768	0	1,768
	8	2,383	234	2,617
	9	13,814	734	14,548
	Total	23,732	44,481	68,213
8 Hoek van Holland	0	96	25,473	25,569
	1	0	1,202	1,202
	8	888	317	1,205
	9	8,272	1,980	10,252
	Total	9,256	28,972	38,228
9 Dordrecht	0	0	2,743	2,743
	1	5,496	1,366	6,862
	2	125,398	0	125,398
	3	1,652	17,126	18,778
	4	13,191	0	13,191
	5	2,972	219	3,191
	6	315,992	7,921	323,913
	8	110,947	19,549	130,496
	9	2,208	2,333	4,541
	Total	577,856	51,257	629,113

1970

Appendix II Part B continued

Port	Group	Import	Export	Total
10 Zwijndrecht	0	2,247	1,041	3,288
	1	0	2,175	2,157
	2	608	0	608
	5	1,888	122	2,010
	8	56	0	56
	9	0	4,115	4,115
	Total		4,799	7,453
11 Delfzijl	0	6,508	6,904	13,412
	1	1,972	12,130	14,102
	2	7,620	0	7,620
	6	1,950	1,343	3,293
	8	12,593	70,711	83,304
	9	5,943	20,601	26,544
	Total		36,586	111,689
12 Groningen	0	2,540	5,297	7,837
	1	0	4,036	4,036
	2	822	0	822
	9	0	1,780	1,780
	Total		3,362	11,113
13 Harlingen	0	1,244	1,651	2,895
	1	8,833	4,456	13,289
	2	8,956	0	8,956
	5	1,244	125	1,369
	8	0	10,025	10,025
	9	2,477	9,745	12,222
	Total		22,754	26,002

1970

Appendix II Part B continued

Port	Group	Import	Export	Total
14 Terneuzen and Axel	0	2,642	72,641	75,283
	1	0	6,957	6,957
	2	66,359	0	66,359
	3	6,433	5,916	12,349
	4	6,617	0	6,617
	5	0	102	102
	6	130,722	3,288	134,010
	7	0	50,106	50,106
	8	20,833	36,106	56,939
	9	0	1,281	1,281
		233,606	176,397	410,003
15 Vlissingen	0	0	2,442	2,442
	2	5,507	0	5,507
	3	5,202	0	5,202
	4	140	0	140
	6	2,136	0	2,136
	8	1,046	0	1,046
	Total	14,031	2,442	16,473
17 Scheveningen	0	11,997	33,395	45,392
	1	8,488	49,126	57,614
	3	207	0	207
	4	89	0	89
	5	3,547	1,160	4,707
	6	237	7,170	7,407
	8	4,377	4,172	8,549
	9	36,866	8,807	45,673
	Total	65,808	103,830	169,638

1975

Appendix II Part B continued

Port	Group	Import	Export	Total
1 Amsterdam	0	70,319	646,425	716,744
	1	6,629	134,602	131,231
	2	140,656	475,552	616,208
	3	277,009	124,222	401,231
	4	3,127	156,898	160,025
	5	11,093	7,379	18,472
	6	33,244	35,998	69,242
	7	127	3,367	3,494
	8	18,345	8,168	26,513
	9	50,614	33,828	84,442
	Total	611,163	1,616,439	2,227,602
2 Rotterdam	0	333,961	1,947,710	2,281,671
	1	464,297	951,798	1,416,095
	2	232,580	554,477	787,057
	3	2,571,152	11,231,726	13,802,878
	4	270,212	379,344	649,556
	5	302,785	342,341	645,126
	6	462,985	292,026	755,011
	7	61,454	103,457	164,911
	8	842,710	386,213	1,728,923
	9	587,574	597,051	1,184,625
	Total	6,129,710	17,286,143	23,415,853

1975

Appendix II Part B continued

Port	Group	Import	Export	Total
3 IJmuiden and Velsen	0	4,498	13	4,511
	1	5,131	480	5,611
	3	0	52	52
	5	868	543,616	544,484
	6	24,221	12,675	36,896
	7	0	23,990	23,990
	8	0	7,552	7,552
	9	783	1,440	2,223
	Total		35,501	589,818
4 Zaandam (now Zaanstad)	0	2,285	0	2,285
	1	0	1,687	1,687
	6	0	23,067	23,067
	8	0	20,546	20,546
	Total		2,285	45,300
5 Schiedam	1	0	622	622
	9	355	220	575
	Total		355	842
6 Vlaardingen	0	4,179	2,050	6,229
	1	12,950	85,707	98,657
	2	75,520	176,149	251,669
	3	4,515	2,037	6,552
	4	30,944	13,674	44,618
	5	1,825	88,902	90,737
	6	10,625	7,300	17,925
	7	3,261	7,592	10,853
	8	3,895	2,741	6,636
	9	1,266	1,222	2,488
	Total		148,990	387,374

1975

Appendix II Part B continued

Port	Group	Import	Export	Total
7 Maassluis	0	0	8,299	8,299
	1	5,880	43,984	49,864
	5	1,552	10,861	12,413
	6	422	2,876	3,298
	8	4,082	3,823	7,905
	9	4,226	4,268	8,494
	Total		16,162	74,111
8 Hoek van Holland	0	105	39,849	39,954
	1	591	1,411	2,002
	6	799,526	0	799,526
	8	1,746	2,266	4,012
	9	16,040	25,663	41,703
	Total		818,008	69,189
9 Dordrecht	0	5,886	9,222	15,108
	1	3,409	1,953	5,362
	2	50,934	0	50,934
	3	15,226	2,532	17,758
	4	17,168	3,539	20,707
	5	1,870	446	2,316
	6	314,342	5,580	319,922
	7	16,343	571	16,914
	8	175,088	16,403	191,491
	9	4,124	11,740	15,864
	Total		604,390	51,986

1975

Appendix II Part B continued

Port	Group	Import	Export	Total
10 Zwijndrecht	0	3,027	9,020	12,047
	1	20	25,242	25,262
	5	2,635	983	3,618
	6	3,491	0	3,491
	8	8,336	0	8,336
	9	4,227	0	4,227
	Total	21,736	35,245	56,981
11 Delfzijl	0	11,805	21,134	32,939
	1	603	1,574	2,177
	2	12,821	0	12,821
	4	14,533	0	14,533
	5	350	103,895	104,245
	6	17,888	3,956	21,844
	7	0	1,682	1,682
	8	11,350	77,876	89,226
	9	3,313	8,597	11,910
	Total	72,663	218,714	291,377
12 Groningen	0	2,906	7,419	10,325
	1	0	26,024	26,024
	6	2,365	0	2,365
	8	0	1,057	1,057
	9	223	0	223
	Total	5,494	34,500	39,994

1975

Appendix II Part B continued

Port	Group	Import	Export	Total
13 Harlingen	1	907	957	1,864
	8	0	4,296	4,296
	9	1,567	8,426	9,993
	Total	2,474	13,679	16,153
14 Terneuzen and Axel	0	18,559	15,810	34,369
	1	0	2,669	2,669
	2	167,667	3,131	170,798
	3	1,719	22,912	24,631
	4	4,501	0	4,501
	5	296	0	296
	6	46,699	0	46,699
	7	0	69,908	69,908
	8	10,349	101,101	111,450
	Total	249,790	215,531	465,321
15 Vlissingen	0	6,564	32,903	39,467
	1	7,945	5,958	13,903
	2	14,759	1,425	16,184
	3	8,180	393,066	401,246
	4	3,625	742	4,367
	5	18,544	23,885	42,429
	6	739,850	27,926	767,776
	8	28,098	4,699	32,797
	9	48,809	25,332	74,141
	Total	876,374	515,936	1,392,310

1975

Appendix II Part B continued

Port	Group	Import	Export	Total	
16 Scheveningen	0	15,365	85,536	100,901	
	1	53,116	95,868	148,984	
	3	1,673	0	1,673	
	4	12,101	154	12,255	
	5	40,274	9,840	50,114	
	6	12,738	1,861	14,599	
	8	31,800	7,659	39,459	
	9	69,338	28,802	98,140	
	Total		236,405	229,720	466,125

END 1975

Figures calculated from:

Maandstatistiek van de Zeevaart en van het Havenverkeer,

('s-Gravenhage, 1955, 1960, 1965, 1970, 1975).

APPENDIX III

Liner Services between the Port of Rotterdam and the United Kingdom,
1956 to 1975.

Name of Line	Destination(s)	Dates in which operating	Comments
Albion Line	London	1956	
Ancon Line	Liverpool/Manchester	1955-62	
Argo Reederei	Hull/Grimsby/Goole	1956	Ceased sailings to U.K. in 1956.
Assoc. Humber Lines	Hull/Goole	1956-71	No Hull sailings 1959-60. Goole sailings ceased 1965.
Assoc. Portugal Lines	Dover	1972-75	Conventional ships.
Bacat Line	Hull/Goole/River ports	1975	Barge system
Bacoro Line	London/Chatham/Kings Lynn/Boston	1960-66	Kings Lynn from 1963
Batavier Line	London/Rochester/Grimsby Aberdeen/Boston/Middlesbrough	1956-60 1966-72	Between 1960 and 1966 continued as Bacoro Line. Grimsby ceased 1966.
Batt Line	Middlesbrough	1969-71	Joint venture by Muller/Batavier
Bell Line	Middlesbrough/Newport	1967-75	Containers. From Newport 1971
Bohmer Lines	London/Liverpool/Hull/Glasgow	1958	
Bristol Steam Navigation Co.	Plymouth/Bristol/Swansea Newport/Cardiff	1956-69	Cardiff sailings ceased 1968.
British/Continental Steamship Co.	Liverpool/Manchester Garston/Ellesmere Port	1956-65	From 1965 continued as Holland/Mersey Line. Runcorn 1964.
Bugsier Reederei	Bristol/Avonmouth/Newport/ Cardiff/Swansea/Barry/ Port Talbot	1970-72	

Name of Line	Destination(s)	Dates in which operating	Comments
Cawoods Containers Ltd.	Belfast	1971-75	Containers.
Channel Seaways	Southend	1968	Later Starintex.
Cornelder Line	London	1956-60	From 1960 continued as Bacoro Line.
Crescent Line	Rochester/Whitstable	1968-75	From Whistable 1975.
Dammers Line	Liverpool/Belfast	1958-75	Conventional.
European Unit Routes Ltd.	Tilbury	1968-75	Containers.
Everard Lines	Felixstowe	1967-70	
J. Fischer & Sons	Felixstowe	1958-67	Ferry Services.
General Steam Navigation Co.	London/Southampton Ipswich	1956-72	London sailings ceased 1968, and Southampton 1969.
Gibson-Rankine Line	Leith/Grangemouth Dundee	1956-72	
Great Yarmouth Shipping Co.	Great Yarmouth/Norwich Lowestoft/Ipswich Felixstowe	1956-68	Sailings to Ipswich 1958-60. From Felixstowe 1959.
Holland-Ierland Line	Belfast	1956-75	Conventional and container.
Holland-Ipswich Line	Ipswich	1975	
Holland-Mersey Line	Liverpool/Manchester Garston/Ellesmere Port Runcorn	1965-69	In the last year of sailings only to Liverpool.
Hollandsche Stoomboot Maatschappij	Liverpool/Goole	1965-72	Sailings to Liverpool from 1970-72 only.
Link Line	Newcastle	1963-72	Containers
Liverpool/Scottish Shipping Line	Rochester	1967	Continued as Crescent Line.
Lowestoft Line	Lowestoft	1965-72	
Macvan Containers	Leith/Glasgow	1972-75	Containers
Mercandia-Med Line	Rochester	1975	

Name of Line	Destination(s)	Dates in which operating	Comments
Metric Line	Liverpool/Runcorn Manchester/London Felixstowe	1963-75	Containers and units. From London 1964, from Felixstowe 1974.
Muller and Co.	Aberdeen/Boston/Kings Lynn/London/Middles- brough/Chatham	1956-65	London, Chatham, Boston ceased 1962. Kings Lynn ceased 1963. From 1965 continued as Batavier Line.
Norfolk Line	Great Yarmouth	1963-65	
North Sea Ferries	Hull	1966-75	Roll-on/roll-off.
North Sea Line	London	1956	
Oriel Line	London	1967-69	
Regents Line	London	1956	
Rotterdam/Cardiff Line	Cardiff/Newport	1957-58	
Rotterdam/Chatham Line	Chatham	1959	From 1960 continued as Bacoro Line
Rotterdam/Ipswich Line	Ipswich	1959-75	Conventional and roll-on/roll-off.
Rotterdam/London Line	London	1956-59	From 1960 continued as Bacoro Line.
Sea/Land Service	Felixstowe/Grange- mouth	1971-75	Containers
Sealord Shipping Co.	Great Yarmouth	1968	Roll-on/roll-off.
Smith/Van Ommeren General Steam Nav. Co.	London	1956-67	Continued as Sealord for 1968.
S.S.M. Lines	Leith/Grangemouth Glasgow/Kings Lynn Boston/Rochester Grimsby/Goole	1956-75	Conventional and container. From Rochester 1959, Grimsby 1963, Goole 1965.
Sutcliffe Line	Grimsby	1956-62	
Thames Line	London	1956-75	Conventional
Tor Line	Immingham	1972-75	Container and roll-on/ roll-off.

Name of Line	Destination(s)	Dates in which operating	Comments
Transport Ferry Service (Atlantic Steam Nav.Co.)	Tilbury/Felixstowe	1960-75	From Felixstowe 1966.
Trias Ferry Service	Felixstowe	1972-75	
Tyne-Tees Steamship Co.	Newcastle/Sunderland	1956-75	Conventional
United States Line	Liverpool/Greenock Felixstowe	1972-75	Container. From Felixstowe 1975.
Walford Lines	London	1956-63	Continued from 1963 as Metric Line.
Yorkshire Line	Hull/Goole	1956-60	
Zaan-London Line	London	1956-75	Conventional

BIBLIOGRAPHY

- Aarens, F.L., 'De Rijn, het Westduitse Industriegebied en de Nederlandse Zeehavens', Tijdschrift voor Economische en Sociale Geografie, 41 (1950), pp. 71-88
- Abert, J.G., Economic Policy and planning in the Netherlands 1950-1965 (New Haven, Connecticut, 1969)
- Alexandersson, G., and Norström, G., World Shipping, an Economic Geography of Ports and Seaborne Trade (New York, 1963)
- Amsterdam Gemeentebld, Havennota 1969, Bijlage F (Amsterdam, 1969)
- Anthony, V., Britain's Overseas Trade (London, 1971)
- Bax, J., 'Sharp increase in cargo and freight transport between Britain and Rotterdam', Rotterdam Europoort Delta, 3 (1976), pp. 18-20.
- Beaver, S.H., 'Ships and shipping, the geographical consequences of technological progress', Geography, 52 (1967) pp. 133-156
- Berggren, H., 'Maatschappij Zeeland reorganiseert terminal in Hoek van Holland', Rotterdam Europoort Delta, 5 (1977), pp. 8-9
- Berggren, H., 'Norsky, a new ro/ro ship for North Sea Ferries', Rotterdam Europoort Delta, 2 (1978), p. 20
- Bergh, S.E., 'Infrastructure planning: force behind Port of Rotterdam's growth', Civil Engineering, 41 (1971), pp. 79-82
- Bergstra, J.T., 'Recente ontwikkeling in het Rijnmond gebied', Koninklijk Nederlands Aardrijkskunde Genootschap Tijdschrift, 83 (1966), pp. 416-423
- Beukers, J.A., 'De industrie in het havengebied', in Rotterdam Europoort 1945-1970, ed. by G.E. van Walsum (Rotterdam, 1972), pp. 247-261.

- Bird, J., Seaports and Seaport Terminals (London, 1971)
- Bird, J., 'Traffic flows to and from British Seaports',
Geography, 54 (1969), pp. 284-302
- Blonk, W.A.G., 'Die seehaffen in den Niederlanden und in Belgien', in
Handbuch der Europäische Seehafen bank IV/V, ed. by
H. Sameman (Hamburg, 1974)
- Board of trade Journal 1968 (London, 1955) pp. 149-150
- Boerman, W.E., 'The need for special examination of particular aspects
of port geography', Tijdschrift voor Economische en
Sociale Geografie, 42 (1951), pp. 347-349
- Boyd, L., Britain's search for a role (Glasgow, 1975)
- Britton, J.N.H., The ports of Victoria (Melbourne, 1964)
- Britton, J.N.H., 'The external relations of seaports: some new consider-
ations', Tijdschrift voor Economische en Sociale
Geografie, 56 (1965), pp. 109-112
- Cambier, R., 'De haven van Ghent', Tijdschrift voor Economische en
Sociale Geografie, 43 (1952) pp. 189-203
- Carter, R.E., 'A comparative analysis of United States ports and their
traffic characteristics', Economic Geography, 38 (1962),
pp. 162-175
- Centraal Bureau voor de Statistiek, Maandstatistiek van de zeevaart en
en van het havenverkeer ('s-Gravenhage, 1956-1969),
continued as Statistiek van het internationale zeehaven-
vervoer ('s-Gravenhage, 1970-1975)
- Centraal Bureau voor de Statistiek, Maandstatistiek van Verkeer en Vervoer
('s-Gravenhage, 1956-1975)
- Centraal Planbureau, De Nederlandse Economie in 1980 ('s-Gravenhage, 1976)
- Clark, C., British trade in the Common Market (London, 1962)

- Couper, A.D., The Geography of Sea Transport (London, 1972)
- Desbarats, J.M., 'A geographical analysis of the Clyde's forelands',
Tijdschrift voor Economische en Sociale Geografie,
62 (1971), pp. 249-263
- De Boer, J., De vervoerscheppende en de vervoerschuivende functie
van het Eemshaven project op de havens Delfzijl en
Emden (University of Groningen, 1972)
- De Bruin, M.G., Rotterdam/Europoort als schakel naar de toekomst
(Rotterdam, 1970)
- De Vries, J., The Netherlands Economy in the Twentieth Century
(Assen, 1978)
- Dienst der havens en handelrichting Amsterdam, Tien Jaar Expansie
1950-1960 (Amsterdam, 1960)
- Drijgers, G., 'De economisch-geografische functies van de Vlissingse
haven, enige daaruit voortvloeiende relaties en effecten'
(unpublished dissertation, University of Nijmegen, 1972)
- Dudley Stamp, A Commercial Geography (London, 1973)
- Economic Intelligence Unit, Britain and Europe (London, 1957)
- Economisch en Technologisch Instituut voor Noord-Holland, Haven en voor-
haven - een economische analyse van de ontwikkeling in
en rond de Amsterdamse haven tot 1976 (Amsterdam, 1976)
- Economisch en Technologisch Instituut voor Zuid-Holland, De Scheveningse
haven - een studie van de ontwikkeling tendenties
(Rotterdam, 1968)
- EFTA trade, report on overseas trade, The effects of EFTA on the economies
of member states (London, 1967)
- Florence, P. Sargant, 'The technique of industrial location', The
Architectural Review, 93 (1943), pp. 59-60
- Freeman, Fox, Wilbur Smith and associates, Land use and Transportation
Study (Rotterdam, 1969)

- Frondeville, B.de, 'Port growth policies abroad', Water Spectrum,
3 (1971/2), pp. 1-8
- Gemeentelijk Havenbedrijf Amsterdam, Havenstatistieken (Amsterdam, 1977)
- Geraerts, H., and Wegenwijs, F., 'Het Industrialisatie proces in Midden
Zeeland' (unpublished dissertation, Technische Hogeschool Eindhoven, 1976)
- Goss, R.O., 'The turnaround of cargo liners and its effect upon
sea transport costs', Journal of Transport Economics
and Policy, 1 (1967) pp. 75-89
- Goss, R.O., 'Towards an economic appraisal of port investments',
Journal of Transport Economics and Policy, 1 (1967)
pp. 249-272
- Groenendijk, J.G., Havenformatie Delfzijl - de plaats van de haven in
de functionele structuur van de gemeente Delfzijl
(University of Utrecht, 1967)
- Groenendijk, J.G., and De Smidt, M., 'De havenformatie als facet van
de functionele structuur (toelichting aan een
vergelijkende analyse van Delfzijl en Harlingen)',
Bulletin Geografisch Instituut Utrecht, 5 (1967) pp. 77-99
- Grotewald, A., 'Some aspects of the geography of international trade',
Economic Geography, 37 (1961), pp. 309-319
- Hagenaar, J.M.C., 'Port development in the European Economic Community'
Water Spectrum, 5 (1973), pp. 27-35
- Hagenaar, J.M.C., 'De economische consequenties van de ontwikkeling in
de scheepsbouw voor de havens', Vierde Benelux haven-
studiedagen, (1966), pp. 8-19
- Harris, E.R., The greater delta region (Rotterdam, 1968)
- Hartog, F., 'Als de overloop stukt', Twaalfde Benelux havenstudie-
dagen, (1978), pp. 23-28

- Havenbedrijf der gemeente Rotterdam, Seaborne goods traffic between Rotterdam and the United Kingdom (Rotterdam, 1975)
- Haver, J., van der Knaap, G., and De Smidt, M., 'Changes in the industrial geography of the Netherlands during the sixties', Tijdschrift voor Economische en Sociale Geografie, 62 (1971), pp. 139-157
- Hilling, D., 'The evolution of a port system: the case of Ghana', Geography, 62 (1977), pp. 97-105
- Hilling, D., 'Port development and economic growth: The case of Ghana' in Seaports and Development in Tropical Africa, ed. by B.S. Hoyle and D. Hilling (London, 1970), pp. 127-145
- Hirschmann, A.O., National Power and the Structure of Foreign Trade (California, 1945)
- Hoefman, H.M., 'Het Botlekgebied' (unpublished dissertation, University of Rotterdam, 1971)
- Hoekveld, J.B., 'De economisch-geografische basis van de haven van Delfzijl', Tijdschrift voor Economische en Sociale Geografie, 50 (1959), pp. 72-78
- Hoekveld, J.B., 'Over onze beide grote havens', Geografisch Tijdschrift, 18 (1965), pp. 1-23
- Hoogendijk, J., Ontwikkeling van Vlaardingen van 1814-1913 met statistisch overzicht (Vlaardingen, 1913)
- Hurd, A., Ports of the World (London, 1955)
- Ibucon N.V., Amsterdam port areas - current potential and future scope within the Netherlands (Amsterdam, 1970)
- Jürgensen, H., 'The regional impact of port investments and its consideration in port investment policy' in The Future of the European Ports, Volume 1, ed. by R. Regul (Bruges, 1970), pp. 576-601

- Kamer van Koophandel en Fabrieken voor Rotterdam, Een prognose van de Nederlandse behoefte aan zeehavenareaal in 1980 (Rotterdam, 1968)
- Kamer van Koophandel en Fabrieken voor Rotterdam, Scheepvaart verbindingen ter Zee van en naar Rotterdam (Rotterdam, 1956-1975)
- Kasbergen, L., 'Het Nederlandse Zeehavenbeleid', Tijdschrift voor Vervoerswetenschap, 1 (1967), pp. 16-41
- Kenyon, J.B., 'Elements in inter-port competition in the United States', Economic Geography, 46 (1970), pp. 1-24
- Kieft, M.C., 'De Veranderende Functie van de Zeehaven', (Zesde Benelux havenstudiedagen, (1969), pp. 7-14
- Krietemeyer, J.H., 'Ontwikkeling in de scheepsbouw', Vierde Benelux havenstudiedagen, (1966), pp. 60-79
- Kruijtbosch, E.D.J., 'De betekenis van havens uit nationaal en internationaal gezichtspunt gezien', Zesde Benelux havenstudiedagen, (1969), pp. 15-23
- Kuiler, H.C., Achtergrond van de Tweede Vervoersrevolutie (Breda, 1971)
- Kuiler, H.C., 'De Haven in de Tweede Verkeersrevolutie', Rotterdam Europoort Delta, 3 (1970), pp. 1-6
- Kuiler, H.C., 'De plaats van Nederland in West Europa, met name in het E.E.G. gebied', (Kamer van Koophandel en Fabrieken voor Midden en Noord Zeeland te Middelburg, 1966)
- Kuiler, H.C., 'De Stoomvaart Maatschappij Zeeland in de Colven der Maatschappelijke Ontwikkeling', in Honderd jaar Engelandvaart, ed. by P.W. Klein and J.R. Bruijn (Bussum, 1975), pp. 125-165
- Kuiler, H.C., 'Deltahavens - polen in een krachtveld', Tijdschrift voor Vervoerswetenschap, 1 (1967), pp. 312-325

- Kuiler, H.C., 'Een Deltahaven complex geheel in een complex regio',
Tijdschrift voor Vervoerswetenschap, 7 (1973), pp. 5-23
- Kuiler, H.C., 'Verschuiving in General Cargo Le Havre - Hamburg range',
Economisch Dagblad, 27 January 1977, number 446
- Kuiler, H.C., 'Vervoersstromen tussen de continentale E.G. landen
en het Verenigd Koninkrijk', Maandstatistiek van Verkeer
en Vervoer, (May 1974), pp. 190-206
- Kuiler, H.C., 'Vervoersstromen tussen Nederland en het Verenigd
Koninkrijk', Maandstatistiek van Verkeer en Vervoer,
(May 1973), pp. 201-208
- Küster, G., 'De Tweede Scheepsvaartrevolutie en de Haven van
Antwerpen', Aardrijkskunde/Geografie, 21 (1969), pp. 73-81
- Lange, G.C., 'De sleutels van het Delta gebied', Vierde Benelux
havenstudiedagen, (1966), pp. 25-33
- Larkins, L.B.S., Netherlands. Overseas Economic Surveys (London, 1949)
- Lawrence, P., International sea transport - the years ahead
(Massachusetts, 1972)
- Lucas, P., Botlek I (Rotterdam, 1968)
- Lucas, P., Botlek II (Rotterdam, 1968)
- Lucas, P., Europoort (Rotterdam, 1968)
- Meyer, F.V., United Kingdom trade with Europe (London, 1957)
- Ministerie van Verkeer en Waterstaat, T.P. 2,000 ('s-Gravenhage, 1970)
- Molenaar, H.J., Snelheids keuze voor tramp en lijn schepen (Rotterdam,
1966)
- Monnikhof-van Driel, J.O., 'Een analyse van de wijzigingen in het globale
ruimtelijke patroon van het reizigersvervoer tussen
Groot Brittannië en het Europese continent over de
periode 1870-1970' (unpublished dissertation, University
of Rotterdam, 1975)

- Morgan, F.W., 'Observations on the study of hinterlands in Europe',
Tijdschrift voor Economische en Sociale Geografie,
42 (1951), pp. 366-373
- Morgan, F.W., Ports and Harbours (London, 1958)
- National Institute of Economic and Social Research, The United Kingdom
Economy (London, 1976)
- National Ports Council, Digest of Port Statistics (London, 1969, 1970)
- Nederlands Vervoerswetenschappelijk Instituut, De economische betekenis
van het vervoer (Rotterdam, 1969)
- Nederlands Vervoerswetenschappelijk Instituut, De economische betekenis
van het vervoer in E.E.G. landen en een drietal EFTA
landen (Rotterdam, 1967)
- Nederlands Vervoerswetenschappelijk Instituut, De havengebieden van
Amsterdam, Antwerpen, Gent en Rotterdam (Rotterdam, 1965)
- North Sea Ferries, 'Rotterdam in het verkeer tussen Vasteland en Verenigd
Koninkrijk', Rotterdam Europort Delta, 1 (1974), pp. 25-32
- O.E.C.D. Economic Survey of the Netherlands (Paris, 1970)
- Ogundana, B., 'Patterns and problems of seaport evolution in Nigeria',
in Seaports and Development in Tropical Africa, ed. by
B.S. Hoyle and D. Hilling (London, 1970), pp. 166-182
- Oldewage, P., Die Nord Seehäfen in E.W.G. Raum (Basel, 1963)
- Openbaar Lichaam Rijnmond, Rijnmond in de delta. Beoordeling der economische
ontwikkelingsmogelijkheden van het Rijnmondgebied
(Rotterdam, 1969)
- Oram, P., and Baker, C., The Efficient Port (Oxford, 1971)
- Ottens, H.F., 'De Internationale Goederen Uitwisseling Over Zee', in
Aspecten van Europa - sociale en geografische beschouwing
over bevolking en bedrijvigheid, ed. by J. Jansen, (Bussum,
1978)
- Overlegorgaan Zeehavenontwikkeling Zuid-West Nederland, Verkenning van
enkele aspecten van de ontwikkelingsmogelijkheden voor
zeehavens in het deltagebied (Middelburg, 1969)

- Patten, D.J., 'General cargo hinterlands of New York, Philadelphia, Baltimore and New Orleans', Annals of the Association of American Geographers, 48 (1928), pp. 436-455
- Patten, D.J. 'Some recent literature on ports', Annals of the Association of American Geographers, 47 (1957), pp. 193-196
- Pieters, L.J., 'A hundred years of sea communication between England and the Netherlands', Journal of Transport History, 6 (1973/4), pp. 210-221
- Pinder, D., The Netherlands (Southampton, 1976)
- Posthuma, F., 'Port modernization: The lessons of Rotterdam' Progress, 52 (1968), pp. 143-151
- Provinciale Planologische Dienst te Groningen, Eemshaven 1964 (Groningen, 1964)
- Provinciale Planologische Dienst te Groningen, Eemshaven 1967 (Groningen, 1967)
- Reuchlin, H., 'De Grote Handelsvaart', in Rotterdam Europort 1945-1970, ed. by G.E. van Walsum (Rotterdam, 1972), pp. 191-221
- Rimmer, P.J., 'Patterns and portents: A study of changes in the status of New Zealand ports in the country's overseas trade', Proceedings of the fourth New Zealand Geography Conference, Dunedin, 1964. (Otago, 1965)
- Rimmer, P.J., 'Recent changes in the status of seaports in the New Zealand coastal trade', Economic Geography, 43 (1967), pp. 231-243
- Rimmer, P.J., 'The problems of comparing and classifying seaports', The Professional Geographer, 18 (1966), pp. 83-91
- Rijks Planologische Dienst, Zeehavennota: het beleid van de Rijks-overheid ('s-Gravenhage, 1966)
- Rijks Planologische Dienst, De behoefte aan zeehavenareaal in 1980 ('s-Gravenhage, 1966)

- Rijksdienst van het Nationale Plan, De overslag in de zeehavens in 1980 ('s-Gravenhage, 1963)
- Rodgers, A., 'The port of Genoa - external and internal relations', Annals of the Association of American Geographers, 48 (1958), pp. 319-351
- Roelen, A.F., 'De ontwikkeling van Delfzijl', Geografisch Tijdschrift, 13 (1960), pp. 159-167
- Ruiter, R., 'Seaport development in the Netherlands', in The Future of European Ports, Volume 1, ed. by R. Regul, (Bruges, 1970), pp. 432-451
- Sargent, A.J., Seaports and Hinterlands (London, 1938)
- Schaffer, N.M., The Competitive Position of the Port of Durban (Evanston, Illinois, 1965)
- Schamp, E.W., 'Die Häfen Nordwesteuropas', Geographische Rundschau, 21 (1969), pp. 489-491
- Scheepvaart Vereniging Zuid, Memorandum inzake capaciteit Rotterdamse Havens (Rotterdam, 1976)
- Schmitt, E., Deutschland, Band I (Hamburg, 1970)
- Schraver, R., Rotterdam - de poort van Europa (Rotterdam, 1946)
- Schut, T., 'Enige aspecten van achterland afbakening, in het bijzonder met betrekking tot zeehavens' (unpublished dissertation, University of Rotterdam, 1973)
- Scottish Council and Verenigde Bedrijven Bredero N.V., Oceanspan II, a Study of Port and Industrial Development in Western Europe (Edinburgh, 1971)
- Seifriz, D., 'Interimverslag namens de commissie voor het vervoer van het gemeenschappelijk zeehavenvervoerbeleid', European Parliamentary Document, 140 (1967/8)
- Smith, R.H.T., 'Concepts and methods in commodity flow analysis', Economic Geography, 46 (1970), pp. 404-416

- Sneller, Z.W., De Geschiedenis van de Steenkolenhandel van Rotterdam
(Groningen, 1946)
- Sociografisch Bureau der Gemeente Zaandam, Een Eeuw Zaandam 1870-1970
(Zaandam, 1949)
- Städlmann, H., 'Die natürlichen Voraussetzungen für die Entwicklung
des britischen Seeverkehrs' (unpublished dissertation,
University of Vienna, 1952)
- Stichting Economisch-Technologische Ontwikkeling, De Scheveningse
haven - een studie van de ontwikkelings tendenties
(Rotterdam, 1966)
- Svensen, S., 'A note on port statistics', Tijdschrift voor Economische
en Sociale Geografie, 42 (1951), pp. 354-359
- Takel, R.E., Industrial Port Development (Bristol, 1974)
- Tanneq M.F., and Williams, A.F., 'Port development and National
Planning Strategy - the implications of the Portbury
decision', Journal of Transport Economics and Policy,
1 (1967), pp. 315-324
- Theel, G., The World Shipping Scene (Munich, 1963)
- Udink, B.J., 'Rotterdam 1960', Tijdschrift voor Economische en
Sociale Geografie, 51 (1960), pp. 103-108
- Ullman, E.L., 'Mapping the world's ocean trade - a research proposal',
Professional Geographer, 1 (1949), pp. 19-22
- Vaandrager, G.M., 'Roll-on/Roll-off Vervoer' (unpublished dissertation,
University of Rotterdam, 1978)
- Vahrenhorst, W.E., 'Der Strassengütertransport von und zu dem Rotter-
damer Hafengebiet mit einer besonderen Betrachtung der
Warte- und Umschlagzeiten' (doctoral dissertation,
University of Rotterdam, 1971)
- Van Den Burg, G., Containerization: a Modern Transport System (London, 1969)

- Van Son, N., 'De Haven van Harlingen' (unpublished dissertation, University of Utrecht, 1964)
- Van Leeuwen, C.G., 'Ontwikkelings-tendenzen in de Rotterdamse haven' Verkeer, 5 (1962), pp. 71-85
- Verburg, M.C., Nederland in de Europese Ruimte (Amsterdam, 1966)
- Verhoeff, J.M., 'Haveneconomie: een vak apart', Intermediair, 11 (1975), pp. 13-25
- Verhoeff, J.M., 'Zeehavenconcurrentie: een analyse van de aard dezer concurrentie' (unpublished paper, University of Rotterdam, 1978)
- Vleugels, R.L.M., 'The economic impact of ports and the regions they serve and the role of industrial development', International Association of Ports and Harbours, Melbourne Conference, (Melbourne, 1969)
- Vleugels, R.L.M., 'Port Economy in the European Economic Community', Chartered Institute of Transport Journal, 35 (1973), pp. 108-115
- Walsh, A., and Paxton, J., Trade in the Common Market Countries (London, 1965)
- Walsh, A., and Paxton, J., Trade and Industrial Resources of the Common Market and EFTA Countries (London, 1970)
- Weigend, G.G., 'The problem of hinterland and foreland as illustrated by the port of Hamburg', Economic Geography, 32 (1956), pp. 1-16
- Weigend, G.G., 'Some elements in the study of port geography', Geographical Review, 48 (1958), pp. 185-200
- Weigend, G.G., 'Stages in the development of the ports of Rotterdam and Antwerp', Geoforum, 13 (1973), pp. 5-15

- Wever, E., 'Pernis - Botlek - Europort, (un complexe à base de pétrole)', Tijdschrift voor Economische en Sociale Geografie, 57 (1966), pp. 131-140
- Wever, E., 'Seaports and Physical Planning in the Netherlands', Tijdschrift voor Economische en Sociale Geografie, 65 (1974), pp. 4-11
- Winkelmans, W., 'De Moderne Havenindustrialisatie' (doctoral dissertation, Brugge, 1971)
- Winkelmans, W., 'De zeescheepvaart behoefte van in de haven gevestigde olie en chemische bedrijven', Tijdschrift voor Vervoerwetenschap, 7 (1973), pp. 24-30
- Winsemius, J., 'The Dutch industrial development since the war', Tijdschrift voor Economische en Sociale Geografie, 54 (1963), pp. 52-59
- Zelinsky, W., 'A method of measuring change in the distribution of manufacturing activity in the United States, 1939-47' Economic Geography, 34 (1958), pp. 95-126

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SEAPORTS OF THE NETHERLANDS AS RECORDED BY THE C.B.S. 1955-1975

- seaports
- main roads
- == waterways

- 1 The New Waterway ports
- 2 The North Sea Canal ports
- 3 The northern ports
- 4 The Schelde ports

