PDWAA 237

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INTERNATIONAL INDUSTRIAL MARKET RESEARCH

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ABSTRACT

"Industrial market research is a neglected tool which chemical engineers can utilize to select economically sound projects, both international and domestic, and to help spot potential losers. Author will illustrate basic market research principles by means of examples from project experience in such developing countries as Morocco, Syria, Tunisia, Indonesia, Malaysia, Sri Lanka, Colombia, Bolivia, Panama, Rwanda and Uganda. Long-range market forecasts, resulting from such research, are an essential input to valid feasibility studies."

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NOTICE

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INTRODUCTION

New product development is approached by many chemical engineers from a purely technical orientation, with little reference to marketability. Yet, the "first law" of marketing could be stated. "Sell what people want to buy, and not what happens to interest you." With experience we soon learn that the world no longer beats a path to the door of the better mousetrap inventor, but rather the mousetrap market should first be defined -- including the attributes of a needed and saleable product -- then a competitive product and marketing plan developed accordingly. This is one aspect of market research.

Marketing Research has been defined as "The systematic and objective search for an analysis of information relevant to the identification and solution of any problem in the field of marketing." (Green & Tull, Research for Marketing Decisions, Prentice-Hall). It has also been characterized as "The application of the scientific method to marketing." As we will observe presently, there is a well-established communication system between the seller and his market. Often, however, there is a deficiency in the "feedback loop". Marketing research may be said to "organize" these communications from buyer back to seller, adding an analysis of problems and supplying a suitable strategy for meeting the problems relating to the marketing of industrial goods and services.

There is no question that market research has proved its worth to industrialists. But, why should a chemical engineer employed by Government be concerned with this concept? Why is it relevant? Simply in that the principles of industrial market research can be utilized to help select sounder projects for assistance and to aid in eliminating those in advance which would not be a sound use of time and public funds. In the author's own experience, he has found these principles to be highly useful in developing, assessing, auditing, and trouble-shooting projects around the world related to the foreign aid program of the U.S. Government.

A BRIEF HISTORY

Market research on consumer buying dates to the Old Testament, while industrial market and marketing research have a much shorter history. Merchant families of Fugger and Rothschild prospered in part because their far-flung organizations enabled them to get more information before their competitors could. Even the children of Israel sent interviewers out to sample the market and produce of Canaan.

Lavoisier, the noted French Chemist, estimated the number of acres under cultivation, and the number of horses, cattle, sheep and pigs being raised. A century later, the equally famous French mathematician La Place introduced the sampling error concept, one of the first significant steps to increasing precision in surveys. An early example of marketing research in the United States was in 1903, when the Studebaker Brothers researched the market for the horseless carriage. By 1917, two prominent companies -- U.S. Rubber and Swift & Co. -- had founded marketing research departments. Two years later the first text book on marketing research principles was published, and by 1934 the world's largest private market research firm (A.C. Nielsen) had been founded.

It was not until after World War II, however, that marketing research really took off. This is illustrated in Exhibit A, where the growth of in-house market research departments for U.S. companies is plotted.

As to who does marketing research, Exhibit B shows that a range of organizations value this management information technique. Most larger manufacturers conduct their own research, supplemented by special consultant studies and syndicated data services on a subscription basis. Industrial products expenditures are several times larger than consumer product purchases, yet industrial market research investigations are far less in number and funding than for consumer products. Even so, as the number of manufacturing companies continues to grow -- including those of developing nations -- there is an increasing awareness of industrial market research and its benefits.

EXHIBIT A

Growth of U.S. Market Research Departments

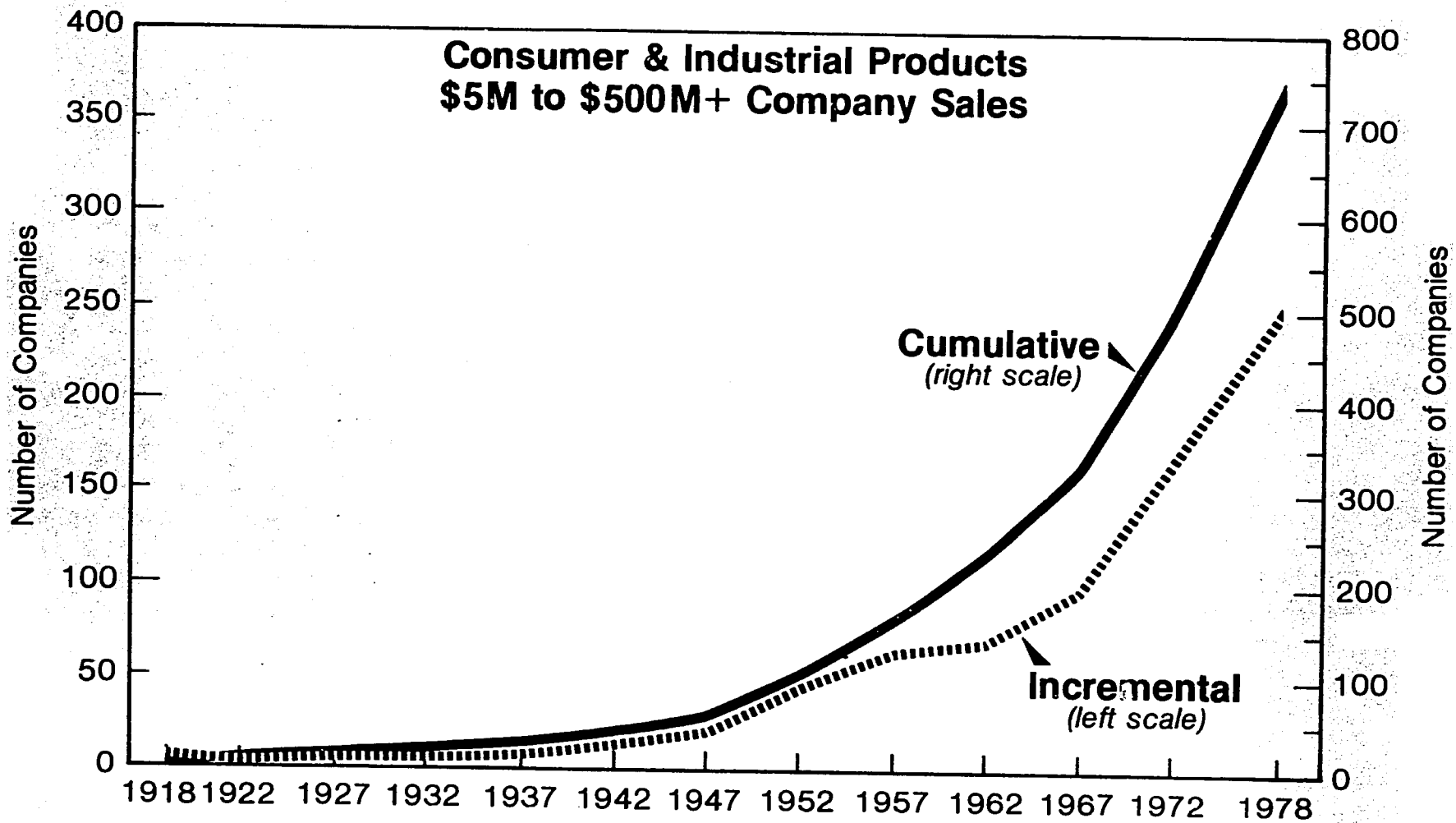

EXHIBIT B
Organizations Conducting Market Research

Manufacturers
Wholesalers and Retailers
Government Agencies - Federal and State
Advertising Agencies and Publishers
Trade Associations
Chambers of Commerce
Financial Organizations
Transportation Companies
Marketing Research Agencies
- Consulting Firms
- *Syndicated Data Services*
- Full-Service Firms

We shall now examine three of the very important principles of market research, illustrating them with examples from the author's experience in developing countries as well as the U.S. industrial technical marketplace.

As may be seen from Exhibit C, these particular areas of concern comprise only a portion of the total sphere of activity for the market research and development practitioner. However, they will serve to give insight into this valuable tool for chemical industry decision-makers.

EXHIBIT C
Market Research Applications

Secondary Data Collection
Primary Data Collection
* Market Segmentation
* Channels of Distribution
* Competitor Analysis
Pricing & Trade Margin
Long-Range Forecast
—Total Market Demand
—Capturable Market
—Market Share
Profitability & Return-on Investment
New Product Development
Test Marketing
* Foreign Marketing Research
Promotion and Advertising
Distribution Channel Management
Brand Preferance Analysis
New Venture Analysis
Marketing Strategy Formulation
Diversification Planning
Marketing Organization & Selling Methods
Mergers, Acquisitions & Joint Ventures

* Principles or practices discussed in this paper

MARKET SEGMENTATION

To begin with, we shall consider the principle or concept of Market Segmentation. This is really the starting point of a normal market research study, and is revealed in a preliminary way through Secondary Data Collection or the literature search. Any given market, whether domestic or foreign, should be subdivided or segmented as a logical starting point. We are rarely interested in estimating demand for all possible segments of a given product or service, but we must know what these are in order to decide where to concentrate our forecasting attention and marketing skills.

Since it illustrates so well several principles of industrial market research, we shall first study the case of Magnesium Oxide recovery from Tunisian magnesia brines. Then we shall use this as a baseline case, adding experiences from other countries to elaborat each market research principle chosen for discussion.

In 1980, the Tunisian Government and a prominent U.S. engineerin firm proposed to the U.S. Government that it fund an engineering feasibility study on a magnesium oxide plant in Southern Tunisia. A rich source of magnesia brines and a current high price for premium quality material made this appear as an attractive means to stimulat export of U.S. equipment and services. To check the advisability of this assistance, a pre-feasibility study was undertaken by the autho during early 1981, using the methodology of in-depth interviewing of magnesium oxide manufacturers in the U.S. and Europe, together with American equipment and engineering suppliers and the International Iron and Steel Institute (representing the principal user industry). As a starting point, it was first determined (Exhibit D) that the magnesium oxide market consists of two major segments according to product classes, namely, dead-burned or refractory grade (known as Periclase) and light-burned or caustic (chemical) grade materials.

Subsegments for dead-burned or refractory grade material include principally the steel and cement industries, while subsegments for caustic grades include a whole host of products, from cattle feeds to welding rods to SO_2 scrubbing. For the dead-burned grade, cement is relatively insignificant as a market segment, since only approximately 0.5 pound MgO per ton cement is required, compared to 4 1/2 to 6 1/2 pounds MgO per ingot ton of steel. Furthermore,

EXHIBIT D
Magnesium Oxide
(Tunisia)

A. Refractory Grade
(dead-burned or Periclase)

1. Steel industry
2. Cement industry
3. Other uses

B. Caustic Grade
(light-burned)

1. Cattle feeds
2. Fertilizers
3. Fuel additives
4. Synthetic wallboard
5. Pulp and paper whitener
6. Flooring cement
7. Neoprene additive
8. Soil Conditioners
9. Welding rods
10. Heating elements
11. SO_2 scrubbing

almost any grade of Periclase will do, since cement furnaces operate at lower temperatures than steel, and high-grade material is unnecessary. This leaves only one market segment of real significance in the Periclase market, namely steel. With a severe, worldwide recession in the steel industry this market segment has had serious problems.

Then, how about the caustic or chemical grades as a viable market segment? Unfortunately, for the prospective new magnesium oxide producer, this is traditionally an "odd lot" business, characterized by critical quality control problems (cattle feeds), competition from waste materials, oversupply of product from established manufacturers and only 10% of the market commanding premium prices up to $1,000 per ton (i.e., 80 to 90% sells typically for only $40 per ton for cattle feed, fertilizers and flooring cement). Even the most intriguing use, for SO_2 scrubbing, suffers from unfavorable economics compared to ordinary limestone and the market is limited to some five utilities located in heavy metropolitan areas where land is severely limited and by-product gypsum cannot be tolerated. In short, only the market segment defined as refractory steel use can be considered viable for a new producer of Periclase from sea water.

A further important segmentation of the Periclase or refractory-grade magnesium oxide market, is according to product quality. As illustrated in Exhibit E, at least four purity grades are recognized, ranging from a very high MgO content, with a high CaO/SiO_2 ratio and a low boron content, down to a "maintenance" grade with low MgO content and relatively high impurities. A high MgO content preferably 98% or better is desirable to take advantage of the theoretical melting point of magnesium oxide in excess of 2000°C. Secondly a high CaO/SiO_2 ratio, approximating the composition of dicalcium silicate ($2CaO.SiO_2$), is desired to avoid the formation of lower melting point silicates (1000° - 1500°C). Again, the presence of Boron Oxide is detrimental since it acts as a "flux" to facilitate such low-melting point formation. Other bad actors are aluminum oxide and iron oxide.

If we next examine the principal products on the market, according to their purity levels, a logical market segmentation will be quickly discerned. Exhibit F shows six classes, instead of four, classified from the ultra high purity 99.2% MgO of the Dead Sea Periclase Ltd. material from Israel to the lowest class containing as little as 88.3% MgO. You will note that the important CaO/SiO_2 ratio, which should be 2 or better for highest grade materials, is equaled or exceeded in Classes I through III. Likewise, lowest boron content is to be found in these same grades. Obviously, then, these will command the higher prices. Class II is the standard grade for high hot-strength brick manufacture, while Class III is for pitch or tar-bonded brick, and not a high hot-strength brick. Class IV is still lower quality, being used in the common Mag-chrome grade for

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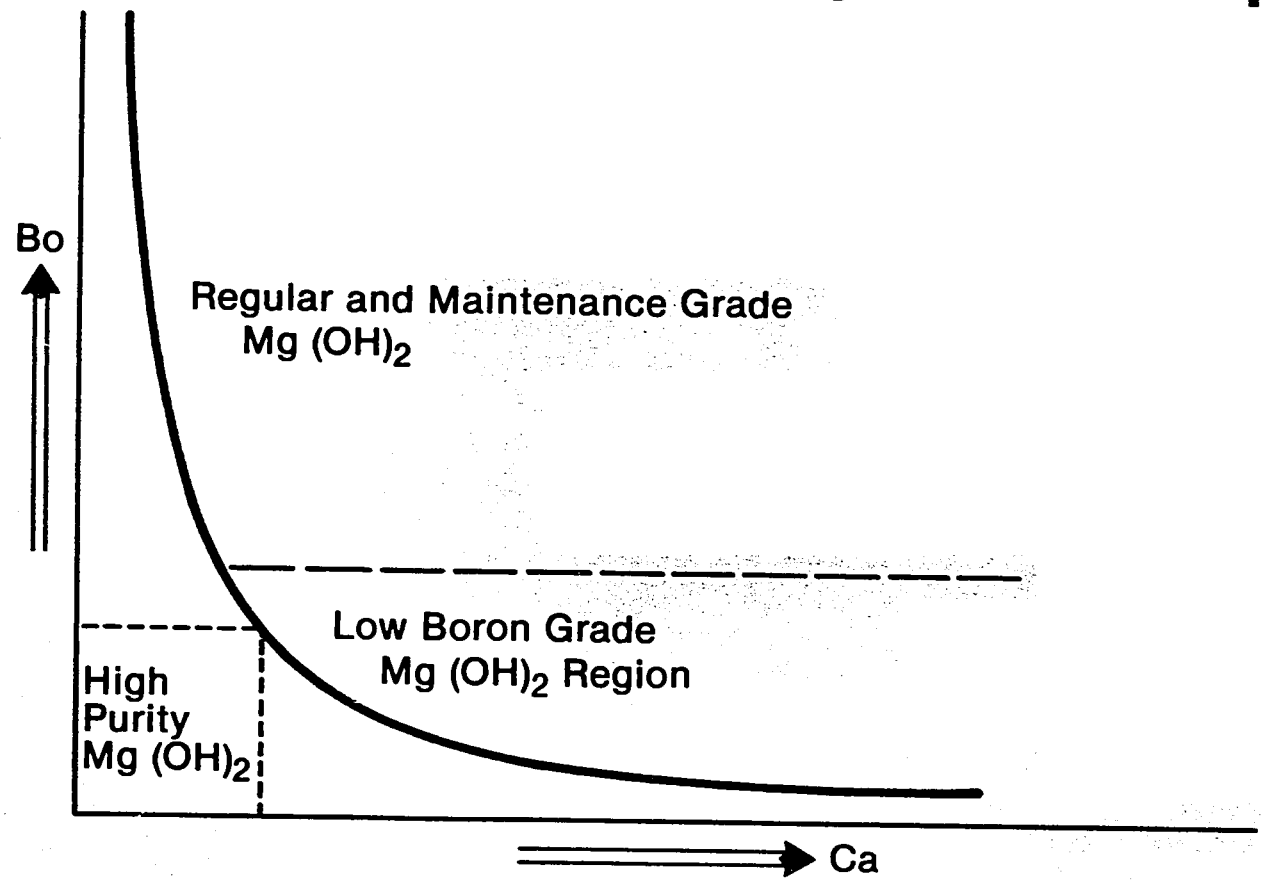
EXHIBIT E

Periclase Grades vs. Purity Relationships



Grade	MgO	CaO	SiO_2	B_2O_3
High-Purity	99.5%	0.4%	0.1%	Less than 0.1%
Regular	98-99	Less than 1.0%	Less than 1.0%	Less than 0.2%
Low Boron	96-97	Less than 3.0%	Less than 1.0%	Less than 0.5%
Maintenance	94-95	Less than 3.0%	Less than 1.0%	0.2-0.4%

EXHIBIT F

Chemical Analyses and Pricing of Commercial Periclase Products

	MgO	CaO/SiO_2 Range	Ratio Average	B_2O_3	Comments	Typical Producers
Class I Ultra High Purity	98.0-99.2%	9.2-2.3	4.3	0.01-0.23%	Premium Grade brick	Dead Sea Periclase Ltd. Ube Chemical Industries Asaki Kaiser Industrias Penoles
Class II Regular	96.3-96.8%	8.3-3.0	4.7	0.002-0.05%	High hot-strength brick	Martin Marietta Harbison Walker Cogema/Sardamaz Premier Periclase
Class III Low Boror	96.5-98.6%	4.9-1.2	2.9	0.06-0.6%	Carbon-bond brick (not high hot-strength)	A.P. Green Basic Ube Asaki
Class IV	96.5-98.3%	1.3-0.8	1.0	0.05-0.5%		Steetley Martin Marietta Harbison Walker Ube Sirma
Class V	86.0-95.0%	2.3-1.0	1.5	0.008-0.01%	Silica brick replacement	Fimisco (Greece)
Class VI Maintenance	88.3-96.0%	1.9-0.25	0.56	0.07-0.5%	Low-spec uses (e.g., gunnite)	Steetley Harbison-Walker Magnesita S.A. Continental Metals

cement, glass and open-hearth steel manufacture. Still lower grades may be used for gunnite application, wherein low-spec materials can be sprayed into a hot steel furnace to reinforce linings, without even shutting down for re-bricking.

Relative demand and pricing for these various grades is shown schemcatically in Exhibit G, where the market for Class I ultra-pure material is seen to be high priced but very small in volume -- merely the tip of the iceberg which is the total market. In other words, the market segment proposed for capture by Tunisians turns out to be much smaller than expected. This baseline case will be discussed further below. First, however, we will mention other examples of Marget Segmentation.

In 1978 the world's largest supplier of strategic cobalt metal, Zaire, suffered two civil wars and complete disruption of cobalt operations. The U.S. superalloy industry is the world's largest user of cobalt, and this metal is almost indispendable for jet aircraft engine manufacture. Consequently, the U.S. Government has actively examined various cobalt supplies. Accordingly, a mission was led by author to Morocco to investigate existing mining of a relatively pure cobalt mineral and the prospects of exploration and development of additional potential deposits.

In this case, Exhibit H identifies several markets, most importantly to the 31.7% market segment identified as for transportation and aircraft. From the standpoint of this particular project, none of the remaining segments were relevant. After this investigation of the supply side of the cobalt question, a market research study was conducted by author to identify the U.S. demand for cobalt, and the possibility of U.S. aid to exploration companies interested in pursuing Moroccan cobalt development.

Still another illustration of defining the market segments before undertaking in-depth market research is the manufacture of rubber gloves in Malaysia. Author was a United Nations Team Leader in that country. This Team was responsible to help identify prospective manufactured products from a wealth of natural raw materials, especially rubber, and to elaborate these into pre-investment feasibility studies. Knowing the problems of export marketing research, especially in a foreign environment remote from major export markets, author strongly recommended for investigation the relatively simple third category of rubber gloves in Exhibit I. Even this limitation in the market segments to be researched proved to be a major undertaking. Again, this illustrates that only selected market segments may become of interest to the market researcher.

EXHIBIT G

Refractory Price vs. Volume Relationship

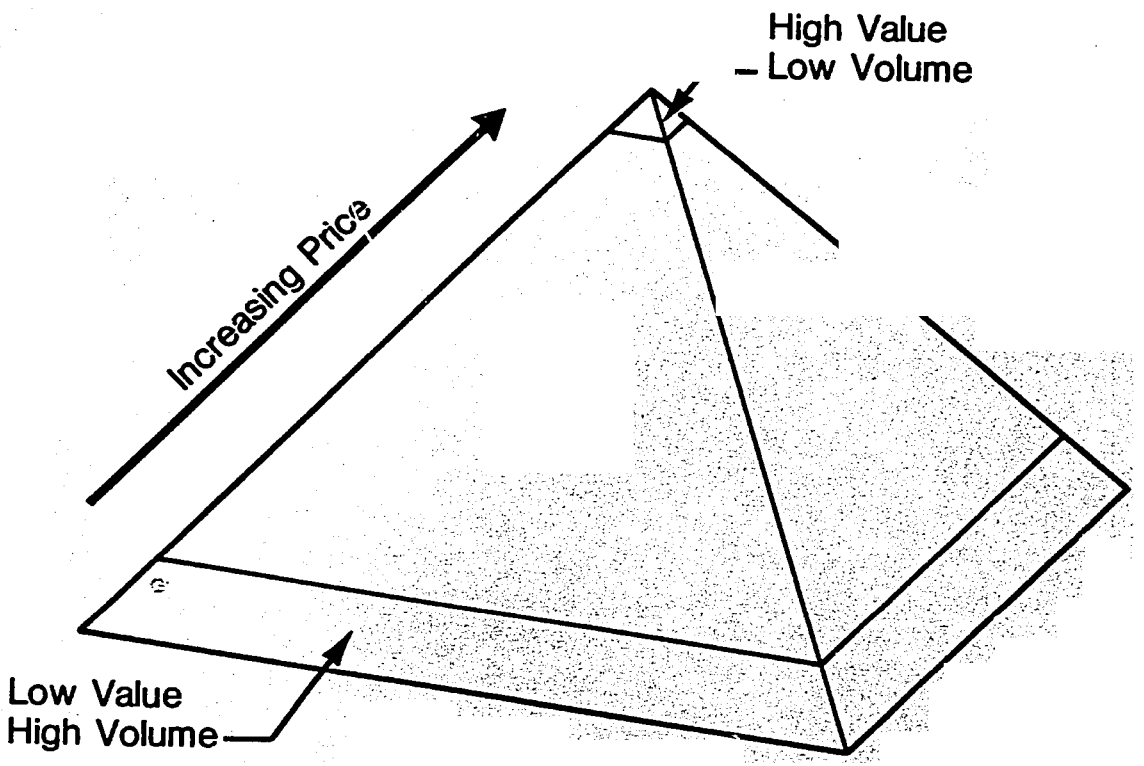


EXHIBIT H

U.S. Cobalt Demand

Classified by Industries

(Thousand Tons, 1979)

Metal		
Transportation/Aircraft	5,980	31.7%
Electrical	4,094	21.8
Machine tools	1,878	10.0
Construction machinery	1,665	8.9
Other	251	1.3
Total metal	13,868	73.7%
Non-metal		
Paints	2,115	11.2%
Chemicals	1,664	8.9
Ceramics and glass	1,158	6.2
Total non-metal	4,837	26.3%
Total Metal and Non-metal	18,805	100.0%

EXHIBIT I

Malaysia; Rubber Products

A. "High-rubber content, non-black rubbers"

- Pharmacuetical closures
- Rubberbands
- Fruit jar seals
- Packing rings
- Bathing caps
- Pacifiers
- Car floor mats
- Bicycle tires

(etc.)

B. Rubberized Fabrics

- Raincoats
- Table cloths
- Hospital sheets
- Industrial aprons
- Tents

(etc.)

C. Rubber Gloves

- Surgical
- Industrial
- Household

A final word about market segmentation concerns its use as a strategic tool in choosing segments of a total market which concentrate resources and efforts. Each market segment may need a different marketing, promotion and selling approach or strategy. This approach also allows the market researcher to identify gaps for new product opportunities. Thus, the marketing-oriented chemical engineer can become involved in new product development much earlier than at the laboratory and pilot plant stage, to the benefit of his employer and his personal development as a professional and manager.

CHANNELS OF DISTRIBUTION

What is a "channel of distribution"? This is an important marketing term which can be used in two ways. First, it refers to the routes over which the manufacturing company's products and selling messsages move to consumers. Secondly, it is like a flow sheet of middlemen or selling organizations between the manufacturer and ultimate consumer.

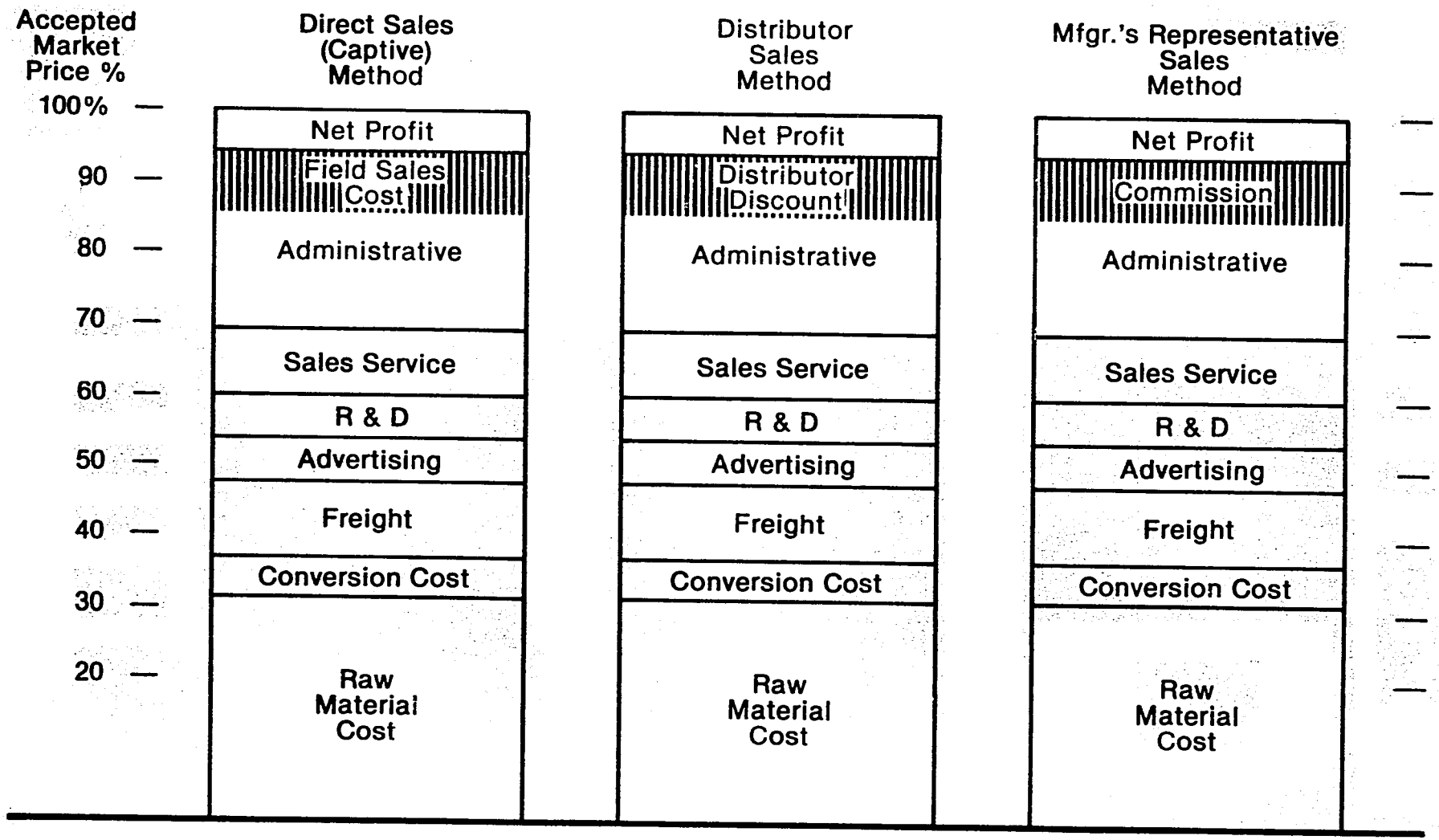
Analagous to the chemical plant flow sheet, these channels are not pre-ordained. Just as there may be more than one combination of processing steps possible in reaching a given chemical end product, so there is more than one possible way to reach a given set of customers with a certain product or service.

The term "middlemen" is actually a rather lazy word, and is equivalent to somebody labeling your particular technology as a "black box". In actual fact, one or more of such organizations as brokers, manufacturers' representatives, dealers, distributors, mill supply houses, jobbers, wholesalers and freight forwarding agents may be involved in moving and selling your company's products. We may greatly simplify these various marketing middlemen into three basic types, illustrated by Exhibit J.

Direct selling is illustrated typically by Avon in the cosmetics industry or Amway in the household products market. Infrequently, a chemical manufacturer may elect to do his own warehousing and field selling on this basis, but this is not the general rule. More often, depending upon several factors, he will choose a wholesaler who buys his goods outright and resells them as a distributor in selected geographical regions. Alternatively, our manufacturer may choose to distribute his product through a manufacturer's representative, who normally does not take title to the goods and collects a commission (rather than a distributor discount) for his knowledge and services.

A manufacturer's representative generally grosses about 15 per cent from his sales, and the manufacturer does not have to pay this before the sale is actually made. Likewise, the distributor may also gross 15 per cent, but part of this profit will commonly come from the spread or margin between receiving carload lots and breaking

EXHIBIT J
Traditional Marketing Options



them down into higher-priced less-than-carload lots. It is plain, however, that a good distributor or manufacturer's representative will earn his salt. Not only does he have specialized knowledge of particular markets, but he may serve a role in product planning, in educating retailers, in serving as a small manufacturer's entire sales force or a retailer's purchasing agent. To use the chemistry analogy, he serves as a catalyst in the buying and reselling process for a wide variety of chemical products and related equipment.

Additional lessons may be learned from Exhibit J. An elementary principle of marketing is that the costs associated with the various steps between manufacture of a product and its purchase plus receipt at the customer's warehouse are inescapable. The manufacturer cannot avoid them by deciding to sell directly, without the help of middlemen. Furthermore, a corollary to this principle is that approximately 50 percent of the price which the customer pays is for marketing functions, for a large majority of products. This may be seen readily from Exhibit J, where the sum of freight, advertising, sales service, administration and either commission, distributor discount or direct field sales cost approximates 50 per cent. Only after these costs are paid is a net profit realized, in any case.

To illustrate the channels of distribution chart -- and there are no "typical" examples -- we may consider the channels for a common commodity found in every chemical plant, welder's gloves. Such gloves may be imported from China, Korea, Thailand, Taiwan or Brazil. Exhibit K shows how they are then made available to welding companies, large metal fabricators (like General Motors) or construction companies (like Fluor or Chicago Bride & Iron Works) or to ship repair yards like Bath Iron Works. This chart illlustrates how an end user can order directly from a foreign manufacturer or importer, and how more than one route is possible using conventional middlemen. There are perhaps 20 large welding distributors in the United States, marketing some 5 million pairs of gloves per year. One of these is actually a chemical company, Linde Air Products, which also operates a welding requirements manufacturing and wholesale service, marketing imported welders gloves to large factories and certain other welding distributors.

To illustrate further how complex such distribution channels can become, we may examine briefly the distribution channel flow charts for the tea trade in the United Kingdom and U.S. (Exhibit L) and the citrus juice trade (Exhibit M). While these are not from the chemical industry directly, they do show such refinements as consignment wholesaling (where title does not pass until goods are sold), the role of consumer cooperatives and the important marketing tool of the commodity auction, all of which may apply to the chemical industry.

EXHIBIT K

Welding Glove Distribution

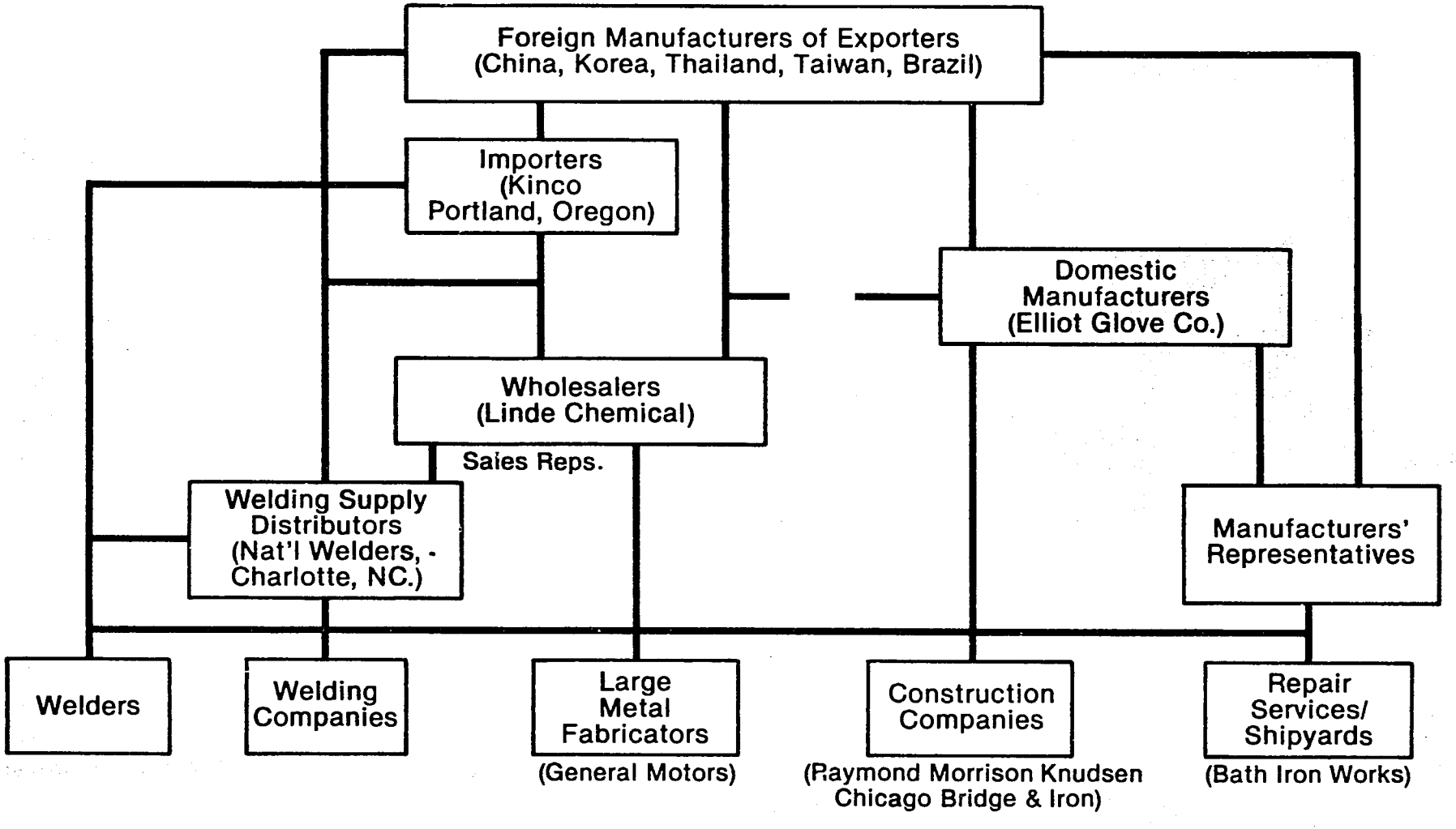
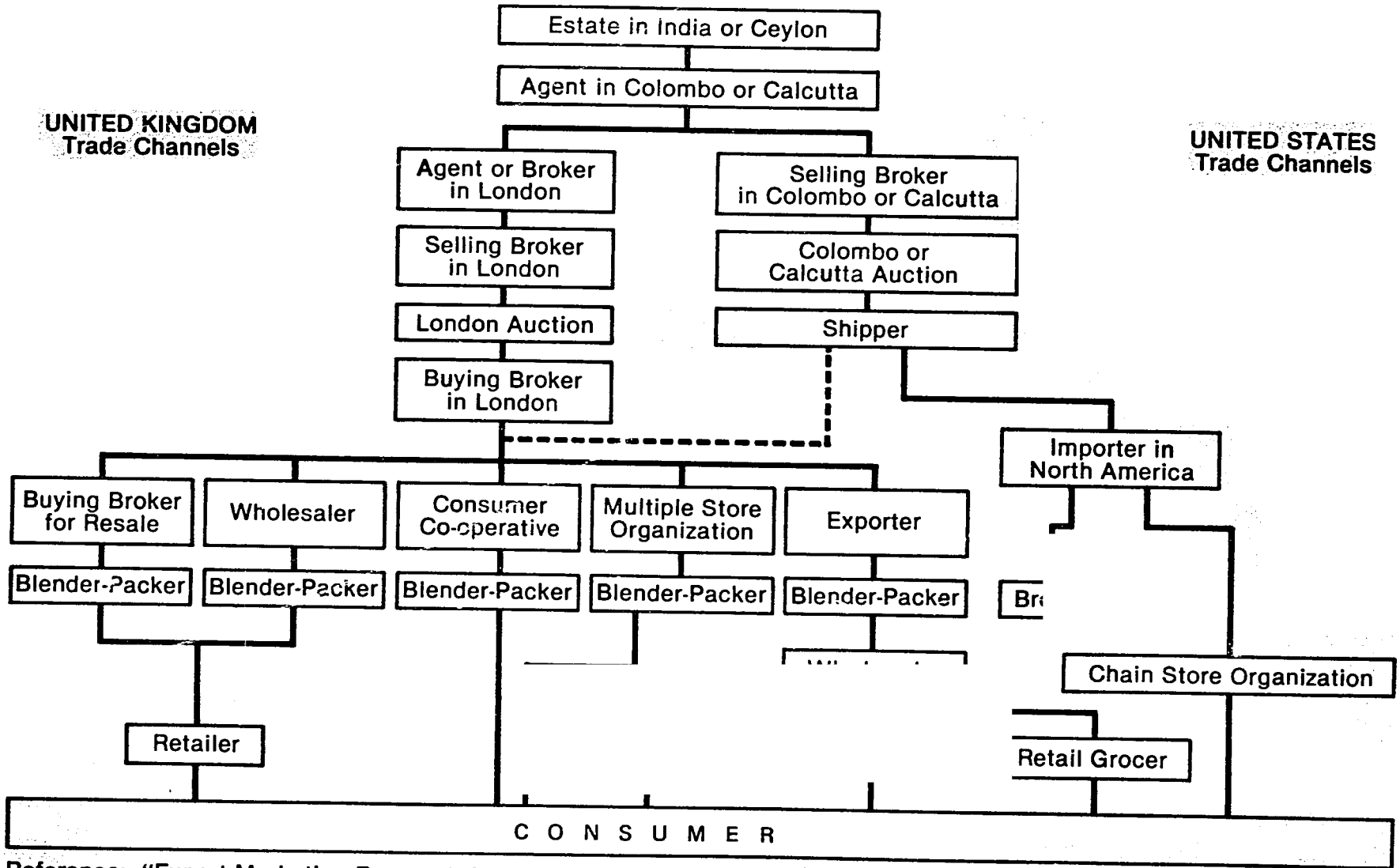


EXHIBIT L

Distribution Channels in the Tea Trade

(United Kingdom and United States)

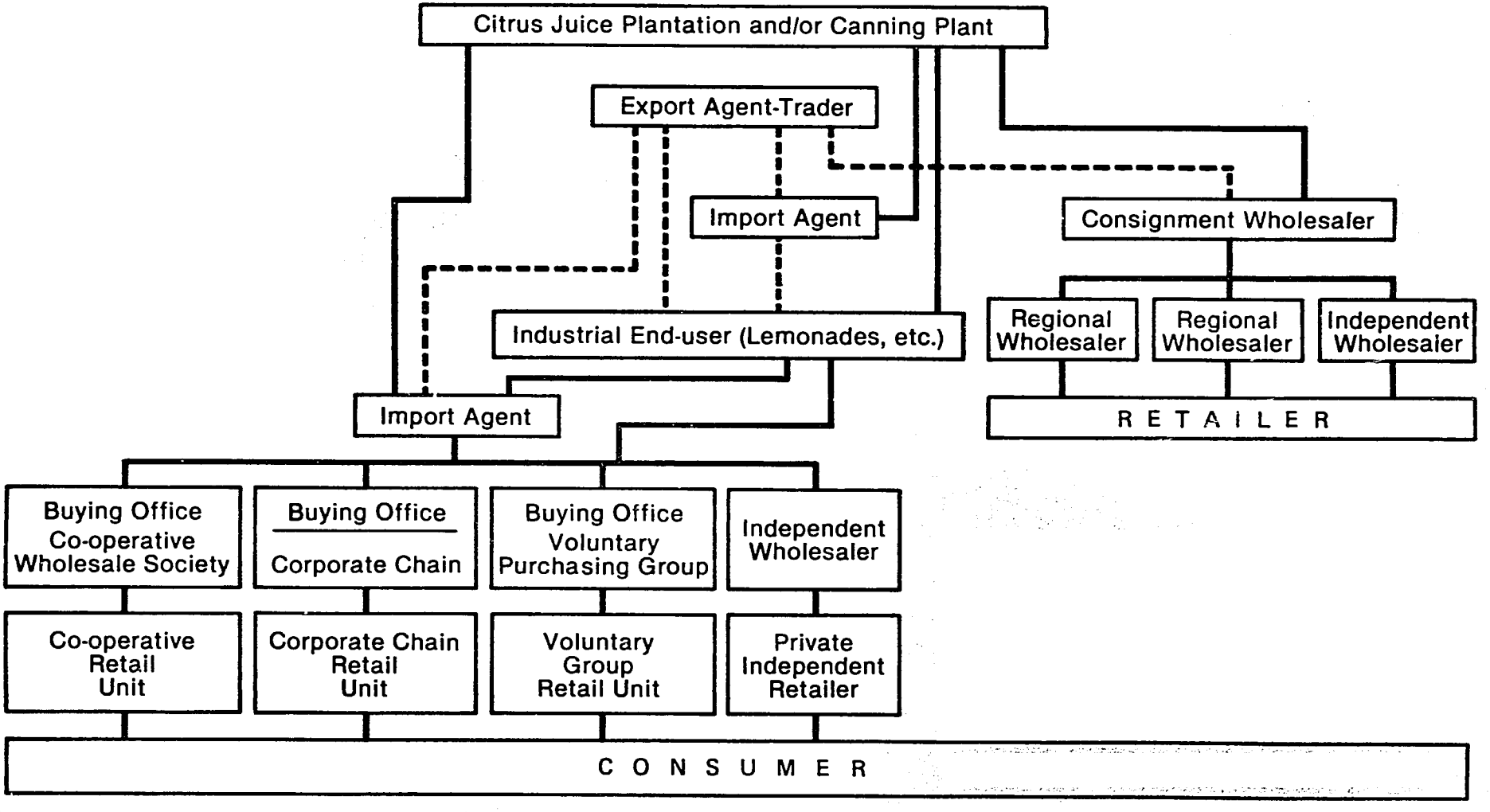


Reference: "Export Marketing Research for Developing Countries", GATT International Trade Centre, Geneva, 1967.

---- Alternative Flows

EXHIBIT M

Distribution Channels in the Citrus Juice



Reference: "Export Marketing Research for Developing Countries", GATT International Trade Centre, Ceneva, 1967.

---Alternative Flows

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Designing of these channels and channel management can become a competitive tool, and create profitable employment for a certain number of marketing-oriented professionals. Using a systems approach, a distribution channel may be designed starting with basic customer requirements (discussed under market segmentation) and working backwards to determine the fewest possible middlemen with which the company can work in satisfying the projected demands of its chosen market. Preferably, this market should first be defined and quantified with a working knowledge of industrial marketing research techniques.

To be sure, most channels of distribution have evolved over a long period of time for each industry or product class, but this does not by any means eliminate the possibility of innovation. One author has described industrial distribution and industrial marketin research as like "uncharted desert land" but "exceedingly fertile."

A young engineer interested in expanding his horizons beyond his technical discipline into management, might be well advised to trace the varied channels of distribution for his company's products. In the author's experience, a World War II ship captain required his engineering officers to submit a complete flow sheet of the ship's piping systems before their first shore leave! Needless to say, this is a way of learning fast. Of course, the aspiring management professional may require a longer-range viewpoint than one night ashore.

COMPETITOR ANALYSIS

We may define the Sales Potential or Sales Forecast for a given class of products as the share of industry Total Market Potential which a company expects to capture during a specified period under a proposed marketing plan or program. Such a value can be estimated, using the methodology of industrial market research. Before you can estimate this figure with any realism, however, someone must make an intelligent assessment of a company's competitive strength in the market in question.

Competitor analysis is not limited to merely domestic trade nor is the technique useful merely in the private sector. On the international scene, the assessment of competitive strengths can be highly significant.

Taking our baseline case of refractory Magnesium Oxide from Tunisian brines, we find that at least 33 non-Communist firms are already in either the sea water magnesia extraction or the magnesite mining business (Exhibit N). To assume that the market for a new entrant in the world magnesium oxide market would be 1/33, or about 3%, could be extremely misleading. Here the concept of Market Segmentation, already discussed, comes into play. If we examine the competitors in the same top quality class -- and Tunisia proposed to produce a product of Class I purity over 98% MgO and minimum impurities -- we find six other competitors ranking in this Ultra High Purity classification. Even with the refinement of Market Segmentation, the assumption of 1 share out of 7 competitors (including Tunisia), would be decidedly dangerous. This is where competitive analysis comes into importance.

To illustrate, Billiton International Metals B.V., was seen as a formidable competitor. As shown in Exhibit O, this firm sits astride one of the largest gas and oil fields in the North Sea and 80% of West Europe's industrial market lies within 500 kilometers (300 miles). Add to this an intensive research and development program in refractories since 1975, an existing refractory product line to the brick industry, extensive pilot testing with latest U.S. and Austrian equipment, a production plant of first-rate equipment and Dutch Shell financial backing. Considering the sizeable advantage

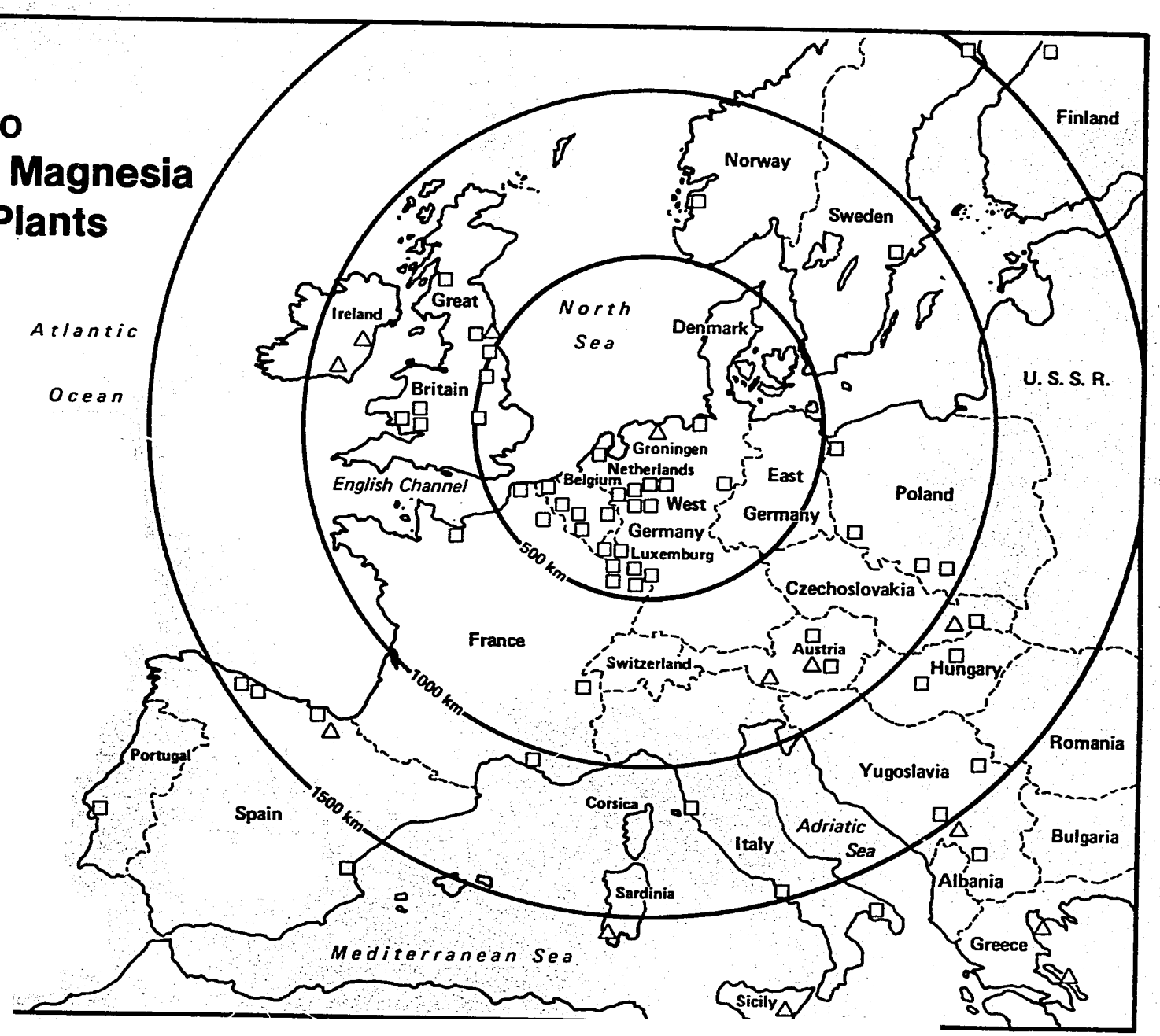
Exhibit N

WORLD CAPACITY FOR DEADBURNED MAGNESITE PRODUCTION BY PRODUCER

1978 ('000 M.T.)

Country	Typical Producers	Total
Austria	Veitscher Magnesitwerke AG OEAMAG	550
Eire	Quigley Magnesite Co.	70
Greece	Financial Mining Industrial & Shipping Corp. (Scalistirit) Grecian Magnesite Co.	610
Italy	Sardamag SpA Sirma	180
Spain	Magnesitas Navarras SA	110
U.K.	Steetley Minerals	230
Canada	Dresser Industries Canada	60
U.S.A.	Basic Inc. (Port St. Joe) Harbison-Walker (Cape May) Kaiser Refractories Martin Marietta (Manistee)	810
Japan	Ube Chemical Industries Ltd. Asahi Chemical Industry Co.	715
Czechosolvakia	Slovenska Magnesitove Zavody	250
U.S.S.R.		1,500
Yugoslavia	Magnoshrom	200
Mexico	Quimica de Mar S.A.	90
Brazil	Magnesita SA Ceramica de Guaralhos	210
Israel	Dead Sea Periclase Ltd.	50
China		400
India	Dalmia Magnesite Corp. Almora Magnesite Lte.	99
Turkey		200
North Korea		700
	TOTAL	6,534

EXHIBIT O
Crude Steel and Magnesia Production Plants
Europe



Legend:
- □ Steel Production Plant
- △ Magnesia Production Plant

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in fuel cos alone over Tunisia (energy accounts for 50% of MgO Periclase costs), it was estimated that Tunisia could compete only in Italy and Spain, with Billiton controlling most of the West European market. Even Italy was seen to be in question, with the long-established presence of COGEMA and SARDAMAG in the nearby Greek Islands offering high-grade magnesite.

In the competive analysis of the world magnesium oxide market, the presence of international cartels was soon discovered. Exhibit P illustrates the important effect of such integrated cartels on the sale of this product to the steel industry. This may be considered as a simplified channel of distribution chart. As may be seen, an interlocking group of magnesium oxide manufacturers, of intermediate brickmakers and of end user steel firms -- in 8 European countries -- control the flow and use of this product among themselves. In other words, when investigation reveals this kind of built-in competition, the "warning flag" is clearly flying for a potential new venture.

In a quite different situation, the equivalent of a competitor analysis was the key to understanding U.S. interests in a problem related to phosphoric acid manufactured in Indonesia. Here, again, the objective of market research analysis was to distinguish between a good or bad project, from the standpoint of public interest. In this case, a request for U.S. assistance to finance a pilot plant led to an investigation not only of technology but of "who's who" in the competitive field. It was found that there were, indeed, three U.S. companies or organizations in the upstream feasibility study competition (Exhibit Q). However, for the much larger down-stream implementation or construction job, there was not a single U.S. company being considered in the competition (Exhibit R). Was this fair, when funds were being sought to finance the desired pilot plant? We did not think so. But there were more problems. A U.S. architect-engineer firm wishing to compete in this case was forced to contend with a preselected process which favored Japanese hemi-hydrate technology. Further, project loan funds were not available in the U.S. without Government of Indonesia guarantees. At least four of the companies listed in Exhibt R were able to secure funding through their respective governments, without such guarantees.

In other words, a competitor analysis in this case was sufficient to warn against U.S. investment except on possible terms more favorable to U.S. contractors, and to alert such contractors to this situation. In the end, SPIE-Batignolles of France won this implementation contract, with engineering support from Simon Carves of Australia, despite the fact that one U.S. listed firm (Exhibit Q) had previously enjoyed this role. In this case, a competitive analysis saved an unwise investment of government funds.

EXHIBIT P

Integrated Cartels in Marketing Magnesium Oxide

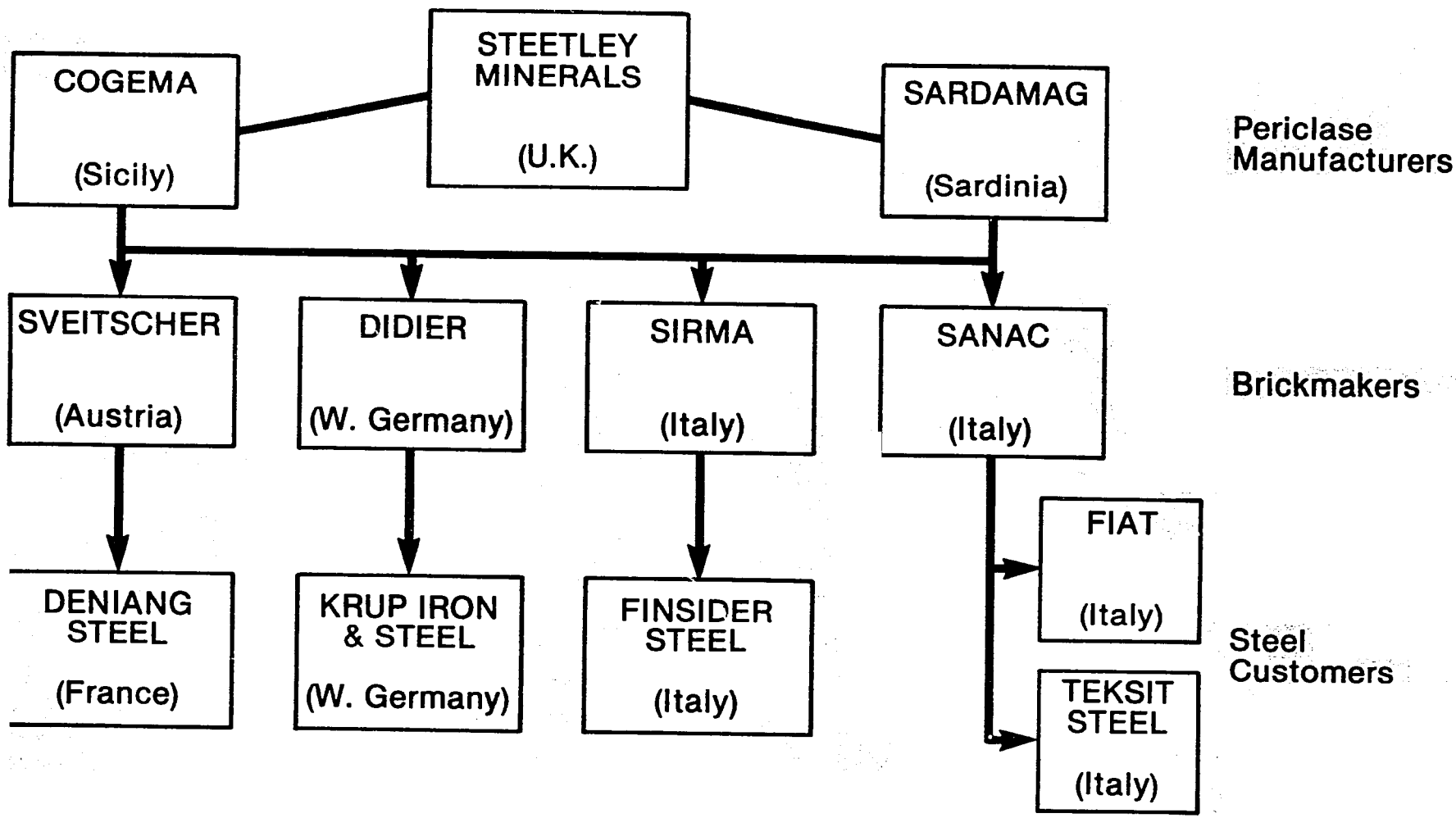

EXHIBIT Q

Indonesia Consultant Candidates

(Phosphoric Acid Study)

1. PEC Engineering	Paris, France
2. U.S. Company "A"	U.S.A.
3. U.S. Company "B"	U.S.A.
4. Nissan Chemical Industries	Tokyo, Japan
5. A.B.R. Engineering	Belgium
6. U.S. Company "C"	U.S.A.
7. Simon Carves	Australia

EXHIBIT R

Prospective Downstream Contractors

(Indonesia Phosphoric Acid)

1. SPIE — Batignolles (Old TSP Plant) ..... France
2. Heurtey Industries ..... France
3. Mitsubishi & Nissan & Hitachi (Consortium) ..... Japan
4. Lurgi ..... W. Germany
5. UHDE + Hoechst ..... W. Germany
6. Coppee Rust ..... Belgium
7. ADAIBRA ..... Spain

CONCLUSION

By way of conclusion, we can logically ask how have some of these projects discussed actually come out? One of the rules-of-thumb for the long-range planning professional is not to stay around for ten years, and have to account for his or her forecasts! Before this concluding note, we should be sure to repeat that this treatment of market research principles and practice has necessarily left much unsaid. An earlier slide, Exhibit C, reminds us that there are several additional arrows in the market researchers quiver, and that we have touched on just three or four of these.

So, how did these projects finally end up? Recently fresh information has been received which indicates the outcome of two of these projects, namely our baseline case of proposed magnesium oxide refractories from Tunisia, and secondly the rubber gloves case from Malaysia.

In the Tunisia case, where an unequivocal negative recommendation was made, prices of Israeli premium-grade, hard-burned magnesium oxide have slipped drastically, from $500 - $550 per ton down to only $400 per ton. This figure is below the projected cost of Tunisian production 2 1/2 years ago. Two major U.S. production plants have recently left this business, and a third is expected to do likewise. In the case of Europe, we learn that Steetley (Exhibit P) has given up its involvement with SARDAMAG, a major Greek magnesite operator. There is industry speculation that SARDAMAG may in turn be closed down completely within a few months. The Irish firm Premier Periclase continues to run at only 50% to 60% of capacity, and the biggest competitive threat from Billiton Metals of the Netherlands has been deflated by a major world recession and the price cutting from Isreal. In the meantime, a factor not foreseen, the devaluation of the Mexican Peso has placed Industrias Peñoles in the position of selling magnesium oxide 30% to 35% cheaper than anyone in the world.

Under these conditions, Tunisia would have stood little or no chance for success, and a negative market research finding saved both that country and the U.S. Government from sponsoring a sure loser. What about Malaysia?

X

During a recent trip to New York, I visited the Malaysian Export Trade Centre and was very pleased to note the following quotation in the U.S. World Journal, Vol. IX, No. 11, 1983: "Today Malaysia is the world's leading exporter of rubber gloves."

Certainly author's small contribution was only at the beginning of this ten year success story, but the point is hopefully evident: Sound market research -- both foreign and domestic -- can result in maximizing rewards from sound ventures, or minimizing involvement in unsound ventures. In either case, the potential sponsor is the beneficiary.