THE PHOTOCHEMICAL INDUSTRY : HISTORICAL ESSAYS IN BUSINESS STRATEGY AND INTERNATIONALIZATION

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ABSTRACT

The photochemical industry produces materials sensitive to light, thereby making possible satisfaction of the world's craving for photographic images. It was among the first industries to extend its markets and operations abroad, irrespective of individual countries in which its member firms had their origins. This extension began at the dawn of the twentieth century, during an epoch well before most member firms had diversified their product lines. The experience of this industry thus provides a relatively pure field for inquiry into some issues that are central to understanding of business internationalization.

This thesis reconstructs the internationalizatioon of six surviving photochemical producers from a strategic perspective. This perspective suggests that the carrying out of strategic intents leads to certainty in the incurrence of volume independent costs. The asymmetry between certainty of cost incurrence and uncertainty of revenue generation is reduced by the restraint or elimination of intra-industry competition and by the search for markets wherever they can be found or developed. Internationalization of this industry is thus seen to have been largely a market seeking phenomenon.

The nature of markets, of knowledge, of strategy and their interrelationships are analyzed to establish linkages between the experience of this industry and certain ideas that have been advanced by international business scholars. These include the notions of cultural distance, demand similarities in international trade, cost advantages of managerial hierarchies over markets, oligopolistic reaction, internalization, and the role of differentiation in goods markets imperfections.

The choice between retention and externalization of rights inhering in prior ownership is introduced in exploring the advantages enjoyed by managerial hierarchies over alternative institutions for executing transactions across national frontiers. Strategic considerations, which is to say concern with outcomes over the long run, are seen to militate in favor of retention.

On the cost side, it is suggested that international application of the markets vs. hierarchies model subsumes choices between perfect and highly imperfect market mechanisms on the one hand and on the other, between externalization of product resale rights and their retention by the manufacturer. Retention is a necessary condition for appropriating the benefit of large scale economies that can arise in performance of the marketing function.

Successful differentiation efforts are seen to have a psychological basis that transcends cultural barriers although it is not completely universal. This contributes to the development of an oligopolistic industry structure that operates globally except where national markets have already been preempted.

Technical knowledge is retained by its original owner when externalization of the rights to its exploitation is seen to diminish the owner's long-term revenue potential.

It is argued that strategic interest prompts internationalizing firms to retain resale and knowledge exploitation rights because of the disparity in time and resources required between the shrinking of cultural distance and the acquisition of technical knowledge.

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Chapter I

Introduction

The contemporary world is hardly conceivable without photography. Pictures, images and information conveyed by photochemical means are pervasive if not ubiquitous in daily life. The industry catering to the world's insatiable appetite for such images exploits the physical phenomenon that certain salts containing silver turn dark when exposed to light. Although this phenomenon had been known since early in the seventeenth century, the technologies required to exploit it commercially were not developed until the nineteenth century. That century and its successor spawned a host of enterprises dedicated to the production of photosensitive materials. Few of these survived, and the photochemical industry eventually became highly concentrated. It is now dominated by some half dozen companies which sell their output on a more or less global scale.

The objective of the following historical essays is to describe the circumstances under which the surviving companies came to internationalize their business or, in one instance, failed to do so. The enterprise histories covered are those of :

Agfa from its beginnings in 1867 to 1964.

Gevaert from its beginnings in 1890 to 1964.

Agfa-Gevaert from its *de facto* merger in 1964 to the present.

Ilford from its beginnings in 1879 to the present.

Konishiroku from its beginnings in 1873 to the present.

Fuji from its antecedents in 1919 to the present.

Eastman Kodak from its beginnings in 1880 to 1932.

These companies, which today generate the preponderant majority of the industry's output, had their origins respectively in Germany, Belgium, England, Japan and the U.S. As the above dates suggest, the extension of their markets and operations to foreign countries can be traced back to the dawn of the twentieth century in a majority of cases. This occurred well before most of them had diversified their product lines beyond those serving chemically based photography. The industry was thus one of the first to become involved internationally and thereby provides a relatively uncluttered field for inquiry into the internationalization of business, irrespective of country of origin.

The above dates also indicate a long time span rich in changes in the business environments in which these companies operated and in events, decisions and developments within the individual firms. The reaching of the stated objective is thus a formidable task. Even if it were possible to chronicle all the events bearing on the subject at hand, to do so would contribute little to understanding of the subject. Some organizing framework is needed if sense is to be made of a maze of undifferentiated facts. The main purpose of this introduction is to develop that framework. This will be done by defining historical relevance, business strategy, internationalization and the relationship between these last two concepts.

The chapter also describes the principal strategic commitments that characterize the photochemical industry and are believed to have led to its internationalization. It further alerts the reader to some limitations arising from the nature of the research conducted upon the conclusions that can be drawn. Finally, it outlines the structure of the entire thesis.

Historical Relevance

In the words of the Talmudic metaphor used by Bronowski in his explanation of how the search for knowledge is conducted, we must put a fence around the subject of inquiry, temporarily ignoring our intuitive notion that every event in the universe is somehow connected with every other event. Some facts must be considered as relevant and others as irrelevant.[1] The standard of what constitutes relevance for the present purpose is guided by the philosophy of history expounded by Carr in What is History ? Carr's point of view represents a reaction to those held by nineteenth century historians from Ranke to Acton. Their work was guided by the notion that the historian's obligation is fulfilled by a recital of pure facts that tell exactly what happened. Carr expresses his reaction by stating that "the belief in a hard core of historical facts existing objectively and independently of the interpretation of the historian is a preposterous fallacy." [2] Fact and interpretation are seen to be nearly inseparable. The discovery of new facts modifies prior interpretation which in turn influences what further facts are to be sought. This is not to suggest that history is merely what historians say it is or that all possible interpretations are equally valid.

To circumvent the possible ambiguities that may arise from this view of history, Carr distinguishes between historical facts and ordinary facts about the past. In his mind, an ordinary fact becomes a historical fact when the interpretation in support of which the ordinary fact is cited becomes accepted as valid or significant. Interpretation thus guides what facts are selected for presentation.[3] The meaning of these abstractions can be illustrated by reviewing two nearly contemporaneous

events in the history of the Eastman Kodak Company.

Event 1. In 1898, George Eastman went to London to float the shares of a new company to be known as Kodak Ltd. The purpose of this new British corporation was to acquire the business and property of all then existing Eastman Kodak corporate entities. These included the Eastman Kodak Company, a New York corporation formed in 1892 but with antecedents going back to a single proprietorship founded by George Eastman in 1880. They also included the Eastman Photographic Materials Co. Ltd., a nine year old British manufacturing and sales subsidiary, and recently formed sales subsidiaries in France and Germany.[4]

Event 2. Within six months of the formation of Kodak Ltd., the company opened a retail sales branch in Brussels, the Belgian capital.[5]

The formation of Kodak Ltd. represents the formal dedomiciliation of a major enterprise. As such, it may be an interesting fact, even an astounding and extraordinary fact. But it is not, in the present context, considered a historical fact in Carr's sense of the term.

On the other hand, the opening of a Brussels retail store, a fact deliberately chosen here for its apparently utter triviality to emphasize the contrast, is treated as a historical fact rather than as an ordinary fact about the past.

Why is the opening of a retail store in a foreign country a historical fact while the selection by the same company of a foreign country as the domicile for its parent is not ? The distinction inheres in the strategic substance of the two events. Within a year of the the formation of Kodak Ltd., its host country became embroiled in the Second South African War (1899 - 1902). To finance the required military

expenditures, the British Parliament increased the rate of direct taxation from 8 Pence per Pound to 1 Shilling and 3 Pence per Pound over the three year period.[6] Although the 6.2 percent rate of taxation seems, by the standards of a later day, to have been quite modest, the base to which the rate was applied under wartime pressure to increase government revenue had ominous implications for Eastman Kodak. This base was the company's world-wide earnings of which the largest part by far was generated in the U.S., the company's original home country. In 1900, Eastman wrote to his New York legal counsel :

> Altogether we shall be subjected to an excessive taxation of about $100,000 which we ought to avoid. The only way to do it as far as I can see at present would be to reorganize under the laws of some friendly state and transfer the whole business, foreign and domestic, to a new company, keeping such local foreign companies as may be necessary to carry on the business advantageously...[7]

The result was the 1901 formation of the present Eastman Kodak Company (of New Jersey), a corporation that acts both as an operating entity conducting the company's business in the U.S. and as the parent of its foreign subsidiaries.[8]

Following the formation of the New Jersey company, Kodak Ltd. assumed a more modest, though hardly negligible, role in Eastman Kodak's international operations, and this role is described in the chapter devoted to the company's internationalization. The present point is that the formation of Kodak Ltd. as the world-wide parent had no impact whatever on the long-term business fortunes of Eastman Kodak.* By contrast, the opening of the Brussels store was one step in the implementation of a global market development strategy. It was a step

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* In fact, the company protested the imposition of British income tax on earnings generated outside the U.K., and a British court eventually ruled in the company's favor.[9]

that Eastman Kodak was to repeat more than 200 times in as many cities around the world during its founder's lifetime. More important than the consistency of the company's behavior in this respect is that this behavior was guided by an articulated policy the purpose of which was to overcome the limitations of a primitive, and in some places non-existent, distribution system for a novel consumer product.

The formation of Kodak Ltd. can thus be categorized as an interesting but ordinary fact while the opening of the Brussels store is nominated, as Carr would put it, for membership in the club of historical facts. Whether this nomination will be seconded and accepted depends on the extent to which readers of these essays accept the interpretation herein offered as being valid and/or significant. As the title assigned to these essays suggests and the foregoing discussion adumbrates, the interpretation serving as their organizing principle rests on two pillars, the concepts of business strategy and of internationalization.

Business Strategy

The literature of management offers many definitions of strategy and little agreement as to what the word really means. Despite the widespread disagreements, some examples of which are cited below, the definitions can be classified along two dimensions. The first of these involves statements of what a thing is, while the second involves descriptions of the distinguishing characteristics of the thing being defined. These are obviously related but can usefully be separated for expository purposes.

Along the first of these dimensions, the definitions fall into

two fundamentally different and perhaps incompatible taxonomic categories. These categories can be conceptualized by means of an analogy drawn from the field of photography itself. A photograph captures a scene at a moment in time. When a series of photographs of such scenes is strung together and shown at well defined intervals, the human eye is fooled into the perception that it is seeing motion. The individual photographs constituting what is called a motion picture are not seen simultaneously but in sequence. Projection of the sequence necessarily occurs over time. The story told by a movie thus unfolds over time. An individual photograph, on the other hand, can reveal something only about the particular instant at which it was taken.

Many, if not indeed most, strategy definitions are movie analogues. Some representative examples of the genre follow. In a classic contribution to the literature of management, Chandler defines strategy as "the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out those goals." [10] The key nouns here - determination, adoption and allocation - all connote action of some sort. Somebody is doing something, even if it is something as intangible as making a decision.

What is implicit in Chandler's definition is made explicit by Andrews when he states that "corporate strategy is an organization process, in many ways inseparable from the structure, behavior and culture of the company in which it takes place." [11] The key word here is process, something that usually occurs over time.

These movie analogues can be contrasted with snapshot analogues. Tregoe and Zimmerman, for example, define strategy as "the framework which

guides those choices that determine the nature and direction of an organization." [12] The image used is revealing. A framework does not move; there is at least a strong presumption that it will stand up long enough to withstand scrutiny.

Quinn's definition falls into the same snapshot category when he states that "a strategy is a pattern or plan that integrates an organization's major goals, policies, and action sequences into a cohesive whole." [13] (Emphases by Quinn.) A plan can have meaning only with reference to a point in time. There may be many such points, and they may be separated by relatively long intervals. The same plan may exist at each of the points in a long interval; the individual points are nevertheless discrete. On the other hand, a plan may change at some point. To the extent it does, it represents a different strategy.

The following definition by Andrews is recited at some length for two reasons. It contains elements that will subsequently be drawn upon as useful, and it throws into sharpest relief the essential difference between the two principal views of strategy.

> Corporate strategy is the pattern of decisions in a company that determines and reveals its objectives and purposes or goals, produces the principal policies and plans for achieving those goals and defines the range of businesses the company is to pursue, the kind of economic and human organization it intends to be, and the nature of the economic and noneconomic contribution it intends to make to its shareholders, employees, customers and communities. In an organization of any size or diversity, "corporate strategy" usually applies to the whole enterprise, while "business strategy," less comprehensive, defines the choice of product or service and market of individual businesses within the firm. Business strategy, that is, is the determination of how a company will compete in a given business and position itself among its competitors. Corporate strategy defines the businesses in which a company will compete, preferably in a way that focuses resources to convert distinctive competence into competitive advantage. Both are outcomes of a continuous process of strategic management...[14]

Now, we can choose to attend the cinema or to stay home and look at old photographs. The attempt to do both simultaneously is likely to produce unnecessary confusion. To avoid it, a choice should be made between strategy as process and strategy as the outcome of a process.

The point of view adopted in the following essays is that the conduct of management follows a sequence that begins with a process best described as the formulation of strategy. The outcome of this process is an intent to pursue one course of action rather than another. The carrying out of this intent, best described as strategy execution, is another process. The nature of what is intended constitutes strategy, and the concept is meaningful only at a point separating the two processes.

As strategy is one kind of intent, all intents do not necessarily constitute strategies. To differentiate strategic intents from other kinds, it may be useful to consider the second of the above mentioned definitional dimensions and identify the distinguishing characteristics of strategy. Some of these have already been given; others will be added. The aim here is to synthesize from all of them a definition that will be useful in the present context.

All the definitions cited thus far share, though with varying degrees of clarity, the idea that strategy is directed toward important ends. Tregoe and Zimmerman perhaps do it most succinctly in summoning the ability to guide those choices that will determine where an organization goes. The use of qualifying adjectives, such as "major" by Quinn and "principal" by Andrews, points to the same concern with importance.

Broad objects call for general predicates; narrower objects require more restricted ones. To Tregoe and Zimmerman, a distinguishing characteristic of strategy is that it guides choices; for Andrews, it

defines choices. The choices that guide do so to determine the nature and direction of an enterprise. The choices that define do so with respect to the range of businesses to be pursued and to products, services and markets. The distinction between guiding and defining will be ignored since the object of one can easily be subsumed within that of the other. Both are acceptable if the aim is to identify those characteristics that distinguish intents constituting strategy from those that do not.

The distinction made by Andrews between corporate and business strategy, while useful in the study of large contemporary corporations, can also be largely ignored for the present purpose. Given a sufficiently broad conception of involvement with photography, the corporate interests and business interests of the photochemical enterprises were essentially the same during the periods covered in this study. Exceptions, of which the early Agfa is the most prominent example, are noted where appropriate in individual chapters. In general, however, the notions of how these companies competed and allocated resources to convert distinctive competence into competitive advantage during their early decades apply equally well to given companies and the businesses they pursued.

The intents constituting strategy have other distinguishing characteristics. Henderson suggests one of these in the following terms : "Strategy cannot be changed very often. It is, by definition, the essentially irretrievable commitment of resources." [15] If the conceptualization of strategy being developed here has merit, it may be more accurate to state that the intent embodied in a strategy will, when carried out, require the irretrievable commitment of resources. This subtle difference will not be labored further here lest we lose the main point which is that strategy is concerned with the long run.

Robinson addresses substantially the same point, though more incisively, when he defines a strategy as "a policy choice that, once having been made, tends to be institutionalized and thereby resists change in the short run." [16] The change resistant institutionalization that follows from the making of strategic choices will be assigned a key role in the following model of what drove photochemical enterprises to internationalize their operations.

Although the next definition appears on the surface to say much the same thing as the previous one, it includes one idea that makes an essential addition to the list of distinguishing characteristics. In a later work, Robinson modifies his earlier statement by defining strategy as "an element in a consciously devised overall plan of corporate development that, that once made and implemented, is difficult (ie., costly) to change in the short run." [17] The crucial additional idea here is that strategy is consciously devised. Much the same idea is apparent in Henderson's thinking when he states :

> A business should be regarded as a system in equilibrium. An effective strategy is a predetermined sequence for the allocation of resources in such fashion that the equilibrium will be shifted to a more favorable relationship.[18]

The important idea here is that of a predetermined sequence. This is characteristic of strategy whether or not it turns out to be effective.

It may be noted as an aside that while strategy is consciously devised, the strategist formulating it may thereby be acting out psychological drives that never rise to the surface of consciousness. A given strategy may also be one manifestation of sweeping social and economic changes or a response thereto. The strategist may not be completely aware that such changes are occurring. Neither of these considerations invalidates the idea that strategy is consciously devised.

There is one more distinguishing characteristic to be brought into this developing definition of strategy. This is hinted at by Henderson in his idea of shifting to a more favorable relationship. It is insinuated by use of the phrase "defendable position" in Porter's description of competitive strategy as "taking offensive or defensive actions to create a defendable position in an industry..." [19] It is implicit in several of the above cited definitions. To make it explicit, it may prove useful to draw on the work of an earlier student of management. In his exposition of "The Theory of Opportunism," Barnard wrote :

> If we take any system, or set of conditions, or conglomeration of circumstances existing at any given time, we recognize that it consists of elements, or parts, or factors, which together make up the whole system, set of conditions, or circumstances. Now, if we approach this system or set of circumstances, with a view to the accomplishment of a purpose (and only when we so approach it), the elements or parts become distinguished into two classes : those which if absent or changed would accomplish the desired purpose, provided the others remain unchanged; and these others. The first kind are often called limiting factors, the second, complementary factors. Moreover, when we concentrate our attention upon a <u>restricted</u> or subsidiary system or set of circumstances, we often find, on the basis of previous experience or knowledge, that the circumstances fail to satisfy the requirements of purpose because they lack an additional element or elements, that is elements which are known to exist in the <u>larger</u> environment. These are likewise limiting factors.
>
> The limiting (strategic) factor is the one whose control, in the right form, at the right place and time, will establish a new system or set of conditions...
>
> Where the crucial element or part present or absent is a thing or physical element or compound or ingredient it is convenient to call it a "limiting" factor; but when personal or organizational action is the crucial element, <u>as it ultimately is in all purposive effort</u>, the word "strategic is preferable.[20]

The idea to be drawn out of this line of thought and adapted to the present purpose is the pivotal nature of that which is strategic. An intent is strategic when its successful execution is indispensable to the long run prosperity, perhaps even the survival, of the organization.

To summarize, strategy is an intent or collection of intents to pursue certain courses of action and to avoid others. Among the important distinguishing characteristics of of these intents are that :

1. Their purpose is to make more certain the long run fortunes and survival of an enterprise in an environment that may be and often is competitive.
2. They guide the choice of businesses to enter or exit, of products znd services offered, of markets to be sought, of ways of competing or avoiding competition.
3. The choices tend to become institutionalized.

The institutionalization of strategic choices warrants further comment. This may illuminate why strategy as intent and strategy as process are sometimes confused. The view has been adopted above that strategy formulation precedes the carrying out of strategy in a sequence. So far, such a sequence may be viewed as linear. It may occur, however, that the successful execution of one or more institutionalized elements of a given strategy creates conditions in the firm's environment that stimulate the need to formulate other, additional strategic intents. The sequence of formulation and execution is therefore repeated, and the pattern of repetitions may appear to become circular. It becomes easy for the observer to confound the circular repetition of processes with the essence of strategy and thereby to conclude that strategy is a process.

Internationalization and its Linkage to Strategy

The concept of internationalization is far less elusive. It is the extension of business activities across national frontiers. In the photochemical industry, those activities are largely confined to trade in tangible goods. Such trade is primarily in consumable products and to a lesser extent in raw or intermediate materials. Other business functions and relationships have been extended across national borders by the companies in this industry, and these will be noted where appropriate. However, for reasons to be discussed, the international involvement of the members of this industry fundamentally takes the form of exporting.

As photosensitive materials are consumed rather quickly and repeatedly, internationalization in this instance implies recurring export and related marketing activities.

In view of these circumstances, strategy and internationalization can be linked by the following proposition which serves as the unifying theme for these essays. All the usual qualifications apply with respect to models as highly idealized representations which, because they are idealized, must discard a great deal of detail.

As suggested above, it is in the very nature of certain strategic intents that to carry them out requires the institutionalization of business functions. The performance of such institutionalized functions involves the incurrence of costs that are quite independent of the physical volume of what is produced and sold. These volume independent costs are conventionally labeled as fixed in the literature of economics and accounting, although this is something of a misnomer.

These costs have in common another characteristic related to but different from their volume independent behavior. This is that once the strategic intent to incur them has been formed, they are virtually certain to be incurred. By contrast, the variable margin required to absorb these costs is far from certain. The dispersion around an expected value is far greater for revenues than for these costs. This disparity in degrees of uncertainty has little appeal to those responsible for the welfare of the enterprise. It is the source of powerful motivational drives to do whatever can be done to reduce the uncertainty of revenue generation. These drives express themselves in one or the other or both of two forms. One is to restrain or eliminate competition by every means available. The other is to seek and develop markets wherever they can be found. This search for markets sooner or later spills across national frontiers. Internationalization is thus seen as a market seeking response to the need for recovery of certain fixed costs that arose from strategic commitments.

When market search extends to other countries, the searcher encounters numerous difficulties, inconveniences and complexities, all of which lead to the perception of a new set of uncertainties. Until this perception becomes modified by experience, the risk that is thought to arise out of conducting business in a foreign environment is typically shifted to someone to whom that environment is not foreign. This is achieved by selling the product to an independent foreign distributor. Later, as the foreign environment comes to seem less strange and signals that it has the potential for significant market development, a new round of institutional commitments is made in the form of permanent sales and distribution establishments owned and operated by the manufacturer. The original image of repeated strategy formulation and execution takes on

another dimension by being extended from circular to spiral form.

The foregoing discussion attempts to identify a chain of causes and effects. This is not to suggest that the sequence of events is inevitable. The view adopted here differs from that of Porter who, for example, begins his booklength treatise on strategy with the assertion that every firm competing in an industry has a competitive strategy.[21] The contrasting position taken here is that all firms exhibit patterns of behavior. Such patterns may be followed more or less consistently by a given firm, and the particular combination of elements making up that pattern may characterize the behavior of that firm so as to differentiate it from others. When such behavior is the result of having been thought out and deliberately decided, it can be described as the carrying out of strategy. This distinguishes such behavior from mere habit. It is easy to confound habit with the execution of strategy because both involve repetition. The distinction is made here to emphasize the point that the prosperity of the firm depends less on its habitual behavior than on a deliberated way of dealing with its business environment.

Once the train of causes and effects is set in motion, it does not necessarily move in only one direction. The perception that significant market potential exists abroad can lead to further institutionalized commitments at home. Nevertheless, the present attempt is to identify how the spiral got started.

Strategic Commitments of Photochemical Producers

Various attempts have been made by students of the subject to describe the substance of strategy in a generalized way. Porter, for example, discusses three generic business strategies under the headings of leadership in cost minimization, product differentiation and concentration on market segments.[22] Andrews gives a brief taxonomy of low-growth and forced-growth strategies.[23] Both would agree that it is exceedingly difficult to generalize strategy. Any given company strategy is in most respects a unique combination of intents that develop in a unique business environment and represent a unique response to the challenges posed by that environment. This uniqueness strongly influenced the presentation of the substance of this thesis in historical essay form.

Such difficulties notwithstanding, there are several characteristics that distinguish the most successful photochemical enterprises. These characteristics are the result of carrying out of strategic intents and are noted here for that reason.

The production of photosensitive materials has over time become highly capital intensive. Vast complexes of factories, production machinery and ancillary equipment are used to make photographic film and paper. Fewer than a dozen such complexes operating around the clock are capable of satisfying the entire world's demand for their output. Master rolls of paper or plastic are run in widths of several meters under coating heads at speeds exceeding 100 meters per minute. A modern color film receives ten or more coats of chemical compounds including the silver halides which make it sensitive to light. Each of the layers is exceedingly thin, its thickness being measured in microns, and tolerance

for deviation from standard width is quite low. Ambient temperature, humidity and air purity are stringently controlled. Once the light sensitive compounds enter the process, it must be conducted in virtually total darkness.

The input of human labor to such a production function is of necessity limited, and its cost is a miniscule portion of the total product cost. The small amount of human labor incorporated in the final product is nevertheless absolutely crucial and represents a perfect example of the institutionalization of business functions. The design, improvement and maintenance of such complex production facilities requires the work of highly trained and skilled technicians and engineers. Such people are relatively scarce, and the service they perform is not hired by the production lot. Their presence at the scene is more or less permanent, and the cost of the service they perform will be incurred irrespective of the volume of production within rather broad limits.

The output, which is measurable in millions of square meters per year, is cut up and packaged into relatively tiny units. A 24 exposure roll of 35mm film covers a little more than 200 square centimeters; the disk format film introduced by Eastman Kodak in the early 1980s includes about 11 square centimeters of negative per packaged unit. As it is the intent to bring such products within the means of the great mass of consumers, prices are quite low. The cost of the vast manufacturing complexes in which such products are made can be recovered only from the production of many years. The decision to construct such facilities takes on a strategic character.

In narrow economic terms, the objective of these capital intensive production functions is to minimize both total costs and unit

output costs. When the production process is characterized by large quantities of materials being transformed at high speed, the detection of defects becomes very costly if it is delayed until the process is complete. The detection of conditions causing defects and the adjustment of these conditions therefore also became automated at every step in the process. The decision to manufacture at high speeds thus led to an even greater intensification of capital use.

Minimization of unit costs is achieved by spreading the relatively large component of fixed costs, in the main depreciation, over as many output units as possible. The declining unit costs characteristic of scale economies in manufacturing eventually became a distinguishing feature of the photochemical industry.

In a somewhat broader sense, the use of capital intensive manufacturing processes in this industry has other strategic objectives. Among these is uniformity in physical makeup of the output. This makes possible a predictable consistency of performance in actual use. The user takes this consistency on faith when the product is purchased.

Successful producers develop this faith over time and by several means. Perception of the need to develop it sets in motion a train of other institutionalized strategic commitments among which is scientific research and development. It is virtually certain that a photochemical enterprise that fails to undertake the effort to reduce its understanding of the relevant physical and chemical phenomena to scientific law will sooner or later fall by the wayside. There has always been a sufficient number of competitors forging technical progress in this industry to assure this result. But the mere undertaking of the effort by no means assures success. There are few activities the outcome of which is less

predictable. The development of a new photosensitive product can easily consume a decade. Once the decision is made to institutionalize research and development, the costs to be incurred in conducting it are quite certain, and the independence of such cost incurrence from sales revenue is constrained only by short-term profit considerations.

Photosensitive materials are used in a variety of applications. They can serve as intermediate or ancillary products in some other product, process or service. These can be broadly categorized as commercial applications. All other uses for which the photographic picture serves as the end product are categorized as consumer uses.

Where the materials are intended for consumer use, the business behavior of producers is characterized by high marketing intensity. The most visible manifestation of this intensity is pervasive advertising. The strategic significance of advertising requires a little elaboration. On its face, a given advertising campaign would appear to be the quintessential example of a tactical maneuver. It is short in duration, and the decision to refrain from repeating it can be made at any time. The photochemical industry nevertheless advertises with predictable regularity. In a word, the function becomes institutionalized. As it does, the managerial discretion to refrain from advertising becomes increasingly hypothetical. Firms become committed to continued advertising and are willing to stake their long term prosperity on its effectiveness. The strategic objective of continued advertising by the members of this industry is to build long term brand loyalty. The basis for this loyalty is the predictable performance of the product in actual use, something that, as mentioned above, the purchaser necessarily takes on faith.

The same function is performed by the ubiquitous display of company trademarks wherever photographic products are advertised and sold. Although the cost of trademark registration and protection is relatively minor, photographic companies go to great lengths to protect their trademarks from improper or unauthorized use. The ostensible purpose of trademarks is to differentiate the products offered by a given producer from those put out by competitors. But the underlying motive is always to reduce to whatever extent possible consumer perceptions of the product's performance risk.

It is notable that the above characteristics correspond closely to those identified in a number of empirical studies that sought to identify the distinguishing characteristics of industries showing large propensities for internationalizing their operations. These studies have been summarized by Vernon[24] and Caves[25] among others.

Qualifications and Research Issues

The foregoing description of strategic commitments characterizes the photochemical industry as it has come to be in the twentieth century. The central proposition offered above is that internationalization is a market seeking consequence of the carrying out of these commitments. The following essays will show that in several instances the search for markets abroad began during the late nineteenth century, before such strategic commitments came to characterize the industry. These early foreign market explorations were, however, for the most part quite modest and can be attributed to the entrepreneurial initiative of the industry's pioneers. It can even be argued that the early search for foreign markets

and the early adoption of characteristic strategies had a common source in the entrepreneurial makeup of some of the industry's founders. This argument will not be pursued since few facts supporting it came to light in the research.

The following chapters recount a number of events the significance of which is open to question in light of the offered interpretation. Some of these are presented simply to minimize disjointedness in presentation. The inclusion of others is prompted by considerations of completeness. What is offered here is an interpretation of the internationalization of an industry. Other interpretations are certainly conceivable, and history does not, in any event, unfold according to formula. If readers are to form their own judgments about the general validity of this interpretation, they are entitled to as complete a recital of the facts as the availability of raw data makes feasible. This is notwithstanding that the researcher has used his own judgment in excluding some events on the ground that they had no role in the recurring international activities of given firms.

The use of judgment was critical throughout the research conducted in preparing this thesis. Before the judgmental discrimination between historical fact and ordinary fact can be made, it is necessary to ascertain that a given set of data constitute a fact at all. In many instances, this was not self-evident and required qualitative use of the quantitative concept of probability. The search for facts was conducted, wherever possible, by inspection and evaluation of primary source documents. Such documents are rare, incomplete and sometimes inaccessible. Enterprises do not conduct their affairs or leave behind records of their doings for the convenience of later historians. Any

given document cannot be accepted at face value when other documents give incompatible or contradictory indications. This situation, which was encountered on a number of occasions, prompted a search for independent corroborating evidence. If and as such coroboration was found, the subjective probability that the researcher had a factual basis for the reconstruction of events was perceived to have increased. These probabilities can never be quantified in a meaningful way, but at some point they will have grown to an extent that warrants the reconstruction of data as facts.

A danger in this approach is that the researcher will fail to identify a potentially significant fact because the evidence no longer exists. This is a risk that must be assumed if anything is to be reported at all. It can never be eliminated, but it may be reduced by placing limited reliance on secondary sources. This had to be done to some extent in the present work, and its merit is diminished in direct proportion thereto. The first end-note following each chapter of Part II. identifies the major sources used in the research for that chapter.

The problem of data search and evaluation was particularly acute with respect to reconstruction of business strategies. With the exception of George Eastman, who nearly always indicated throughout his voluminous business correspondence what he was about to do and why, the leaders of photochemical enterprises rarely articulated their strategies as such. The analytical task in writing these company histories thus was to tease the strategic substance out of such data as were unearthed. Often this can only be surmised from the observed behavior of companies, and the rigor of the distinction between behavior as habit and as carrying out of strategic intent must sometimes be relaxed.

Structure

Part II. comprises the histories of the individual enterprises named earlier in this introduction. It is appropriate to note at this point that several other participants in this industry have been excluded. This omission is due mainly to lack of researchable data. Among those excluded are :

3M Company, (formerly Minnesota Mining & Manufacturing Co.), a diversified multinational enterprise that, in a sharp departure from its own traditions, bought its way into the photographic industry by the acquisition during the early 1960s of several minor manufacturers; it operates as a private label film supplier to chains of photographic specialty and general merchandise retailers.

E.I. DuPont de Nemours & Co., a large multinational chemical enterprise that has been involved in photosensitive materials for at least six decades but only in certain medical and industrial application niches.

Polaroid Corporation, an enterprise that since 1948 has occupied a special niche in the industry by offering instantly developing photographs; the photosensitive materials used in this product were for more than two decades manufactured by other firms which included Eastman Kodak, DuPont, and Agfa-Gevaert. The internationalization of Polaroid began in the early 1960s and had essentially taken its present form by the time the company

internalized the manufacture of photosensitive materials in the mid-1970s.[26]

It is considered unlikely that omission of these companies would materially affect the conclusions to be drawn from this study. Those conclusions are discussed in Part III. which relates the findings, the above described model and several strands of relevant theoretical work. Much of that theoretical work draws on concepts that have been developed by the discipline of economics. Several of these concepts have already been mentioned or used without being named as such, e.g., economies of scale, oligopolistic industry structure, product differentiation, etc. It is thought best, however, to postpone a detailed discussion of how these concepts relate to the subject at hand until the evidence has been examined.

Notes and References

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Finance Act, 1900, Ch. 7, Pt. IV, 63 Victoria;
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21 Porter, Competitive Strategy, p. xiii.

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23 Andrews, ...Corporate Strategy, pp. 28-31.

24 Raymond Vernon, Sovereignty at Bay, The Multinational Spread of U.S. Enterprises, New York : Basic Books, 1971, pp.11-16.

25 Richard E. Caves, Multinational Enterprise and Economic Analysis, Cambridge : Cambridge University Press, 1982, supra.

26 The lack of source documents and the author's own role in the company's internationalization would subject a Polaroid chapter in this thesis to the criticism that it represents autobiography rather than scholarly research.

Chapter II

Agfa [1]

Introduction and Background

If a major theme of this thesis is the internationalization of the photochemical industry, we might well transpose subject and object in contemplating the early history of Agfa. This company was a mature, internationalized dye manufacturer before it became a significant participant in the photographic industry. Its two founders shared a cosmopolitan outlook which had been acquired by virtue of social background, education and early work experience. The company was formed by Carl Alexander von Martius and Paul Mendelssohn-Bartholdy. Von Martius was the son of a well known scientist who had been a travel companion of Alexander von Humboldt. Trained as a chemist, the son had worked for a time in the English dye industry after studying in London. Mendelssohn-Bartholdy belonged to a family whose reputation had extended beyond Germany for several generations. He was a great-grandson of the philosopher Moses Mendelssohn, grandson of the international banker Abraham, son of the musical composer Felix. He too was a chemist and had apprenticed in the Leipzig branch of a company based in Manchester.[2]

The two men met and in 1867 formed an enterprise dedicated to the then young field of synthesizing aniline dyes. Starting with the production of intermediate chemical products, they soon saw better business opportunity in forward integration to the actual making of dyes.

This required physical expansion. In 1873, the company was incorporated as Actiengesellschaft für Anilinfabrikation, and it purchased the Berlin factory and business of a Dr. Jordan. This plant, established in 1850, had been chartered in 1863 to make aniline dyes for which even then there were good markets as far away as East Asia.[3]

The business prospered. By 1877, it was possible to pay a six percent dividend on a capital base of 1.02 million marks. The growth of the firm is revealed by periodic increases in its outstanding share capital. An indication of this is provided by the following data : [4]

Year	Marks
1877	1,020,000
1882	1,800,000
1884	2,600,000
1890	3,000,000
1895	5,000,000

By the turn of the century, the company was operating branch factories in Moscow, St.Fons (France) and Libau (Austria). The motivation for the erection of such foreign branch plants is familiar to the student of early international business. This was the need to get behind high tariff barriers and other impediments to trade. In France, for example, one of these obstructions was that the protection given to the holder of a locally registered patent would remain in force only if the product covered by the patent were made locally. Commercial exploitation in France of a patented product was thus dependent on local manufacture.[5]

A report to the company's supervisory board for the year 1901 indicates that Agfa was then exporting prodigious quantities of dyes and

intermediate products to Shanghai, Tientsin, Canton, Hong Kong, Japan, the Straits Settlements (Singapore), India and the U.S. from its German factories. Products were shipped to the Far East on consignment and sold by agents. A branch in New York directed the work of sales offices in Chicago, Charlotte, Cincinnati, Boston and Philadelphia. A company sales representative was posted in Bombay to scan the specific needs of the Indian market. Patent and trademark infringement litigation was conducted by the company in Italy and the U.S. that year.[6]

Agfa was thus a fairly sophisticated international enterprise by the time of its entry into photography. When one of its chemists discovered a new photographic developer in 1888, the company took immediate steps to have the discovery patented in four foreign countries as well as in Germany.[7]

While the company prospered, it was not alone. There were others, and some of them prospered even more. The 1860s had brought forth most of the subsequently important participants in the German coal tar dye industry. An indication of Agfa's relative standing among incorporated companies in its industry is provided by the following 1902 data : [8]

Total Long Term Capital Employed
(in marks)

Farbwerke vorm. Meister, Lucius & Brüning	51,811,687
Badische Anilin- und Sodafabrik	35,752,875
Farbenfabriken vorm. Fiedr. Bayer & Co.	28,059,884
Aktiengesellschaft für Anilinfabrikation	17,933,505
Chemische Fabriken vorm. Weiler ter Meer	7,481,000
Farbwerke Mühlheim vorm. A.Leonhardt & Co .	3,591,202

Competition in this industry was fierce during the 1880s and 1890s, sometimes driving prices below production costs. This led the management of Agfa to pursue two strategic objectives. One was to try to restrain competition; the other was diversification. Both of these

pursuits evolved in the mind and under the direction of Franz Oppenheim, the company's chief executive during the years Agfa came to full flower as a photographic enterprise.

Oppenheim realized that playing in the same league as the giants of the German dye industry was dangerous and potentially fatal for Agfa. He therefore kept his mind open to other opportunities. Photography turned out to be one of these. In a modern industrial sense, it was a new field in 1888. The discovery of a photographic chemical was completely incidental to the company's business at the time. Its discoverer was a dye chemist with an amateur interest in photography. This developer was commercialized on a modest scale. Organizational lethargy had to be overcome to get the developer produced at all. Exclusive German distribution rights were given to a former Agfa chemist who had set himself up as a photographic dealer in Frankfurt am Main.[9] Even with such a modest beginning, some quantities of the product were exported to America where a company representative tried to sell it.[10]

The product enjoyed small commercial success, partially because it yellowed certain plates when a given solution was used repeatedly in the development process. Nevertheless, its discoverer kept up the pressure for further research and development work on photographic chemicals. Without making a major commitment, Oppenheim was supportive to the extent of permitting the establishment of a photographic department in the company. By 1891, it had synthesized a new developer. This was given the name Rodinal, and it enjoyed broad and long lived commercial acceptance. This success emboldened the company to introduce dry plates in 1894. In the first year of the new century, such plates were being made with special hardening of the emulsion so as to be usable in the

tropical climates to which they were being exported.[11]

While the company had by 1900 gained a modest foothold in the German photographic industry, it was one among many. Germany had 44 dry plate manufacturers at the turn of the century.[12]

Toward World Class Status

The seed which eventually blossomed to make Agfa the biggest producer of photosensitized materials in Europe had nevertheless already been planted. Starting in 1894, the same year it first made saleable dry plates, the company started coating emulsions on flat sheets of celluloid. The next decade and a half was a period marked by many disappointments as the company's chemists and engineers struggled to master the relationships among time, temperature, humidity, air purity, celluloid and light sensitive emulsions. Several times films were put on the market only to have to be withdrawn. Latent images would disappear, nitrocellulose would decompose, emulsions would interact chemically with the safety paper in which films were rolled, and similar childhood diseases, characteristic of almost any new and ill understood technology, frustrated the photographic department's progress.

In the meantime, the department made do with what it had to offer. The report to the supervisory board for the year 1902 mentions that the photographic department's propaganda in foreign markets must have been successful since the entire increase in the department's sales was represented by exports. A 25,000 copy edition of the department's handbook had been distributed to the German trade the previous year. A French translation of this book, entitled Agfa-Guide, had come out in

1902; Italian, Swedish, Danish, Russian and English editions were ready for publication in 1903. The profits generated by sales of existing photographic products were easily eaten up by the research and development costs of films. The goal had, however, become clearly defined by 1903. That year's report to the supervisory board stated :

> An experimental facility was launched and numerous trials undertaken for the rational production of the film base. Production of an endless film band should be achieved by this facility. Should we succeed in this, we would be able to make cinematographic films, for which a profitable market should exist, and above all, we should be able to lower significantly the production costs of our films; this is because, until now, we have found coating faults wherever the film support lies over the small space between two adjoining glass plates on which the support rests, giving rise to very considerable waste in production.[13]

The profitable market mentioned in this report did not exist in Germany. The impetus for Agfa's painful and costly cinefilm product development efforts came from abroad. A German industry dedicated to the exposure of negative cinefilm and the development and copying of positive film destined for theatrical exhibition did not, for all practical purposes, exist prior to 1910. [14] Such industries had sprung up, beginning about 1895, in America, France, Italy and Denmark. Virtually the sole supplier of unexposed film to these cinema industries was the Eastman Kodak Company.[15] There were marginal producers of photosensitive materials, like the brothers Lumière in Lyon, who tried to supply these industries with film. But the quality of their product was not up to the technical standard set by Kodak.[16] And the demand was insatiable.

Potential customers for unexposed film were not limited to the cinema studios in Paris, Rome, Turin and Copenhagen. The economic functions of people and companies during these infant years of the cinema

were not sharply defined and differentiated. People looked for opportunities wherever they were to be found. One such potential customer for positive film was the firm of the brothers Pathé in Paris. They had developed a strong position in the theater exhibition end of the business. They saw the potential in backward integration to the production of multiple copies of positive cinefilm. They wanted to build a factory for this purpose in Paris. Lacking intimate knowledge of the technical aspects of such a venture, however, they needed outside help. In 1905, they made contact with Paul Singer, a partner in the firm acting as Agfa's distributor in France. Singer went to Berlin to propose what would in a later day become known as a turnkey plus technical knowhow project. Agfa would construct a film factory for Pathé in France and make available its process technology for film making. Oppenheimer articulated a key policy decision in rejecting this proposal. He decided that if Agfa were to become involved with large scale manufacture of raw film at all, it would do so only if manufacturing were under Agfa management.[17] The conditional nature of this decision is to be noted; we are not yet at a point where we can speak of a strategic decision. The latter was, however, soon to be taken.

The Pathé reaction to Oppenheim's refusal was that they were prepared to enter into a long term agreement under which Agfa would supply positive film to them. Similar readiness was expressed by the European studios, potential customers for negative film. The American studios were growing at a prodigious rate during the first decade of the century. The European studios had a well founded fear of a film supply cutoff from the single source in Rochester. They also resented what George Eastman subsequently called his Paris manager's "dictatorial and brusque"

treatment of the studios.[18] French studios like Eclair and Lux, and Italian studios like Ambrosio, Itala and Cines worked closely with Agfa during this period in trying out the experimental product and in cooperative attempts to solve many technical problems. In 1906, a pilot plant was successfully started in Berlin, and the foreign studios were sufficiently satisfied with its output to pressure Agfa into a fundamental decision. This was whether or not to go into large scale production.[19]

A brief parenthetical discussion of the issues involved in this decision may be useful here. The scale of what was proposed was unprecedented for Agfa. The planned annual output capacity under consideration was ten million linear meters of film. [20] In comparable area of photosensitized materials, this was more than double what the company had achieved in coating glass plates. The work to be done was, moreover, quite different from what Agfa had experienced up to that point. It comprised not only the making of emulsions and coating them on a base; these are common to plates and film. Rather, it included the making of the film base itself. Apart from this backward integration, the raw materials from which the base was made were still changing. This was because the highly flammable nature of cellulose nitrate had brought the suitability of this material into question, both in manufacturing and in use in public theaters. This problem was eventually solved by the use of cellulose acetate, but this material behaves very differently from the nitrate in actual use. Coating was to be done by continuous process, something which was virtually impossible to achieve with glass because of the very nature of this material. All of the foregoing factors made for high uncertainty and high cost. The plants to be built were to cost four million marks.

A management contemplating such an expenditure looks for some assurance that there will be profitable long term markets for the output. Such assurance existed, at least for the short term, in the willingness of foreign customers to enter into supply contracts. Obligations are, of course, assumed by both parties to a contract. Agfa was neither the first nor the last photographic manufacturer to learn that what works in a research laboratory and even in a pilot production plant does not necessarily work under conditions of large scale production. Seemingly assured sales can evaporate. Despite the professed willingness of Charles Pathé to be supplied by Agfa, his firm did build its own factory. As the events of the next decade were to show, the ultimate chaos in international relations represented by world war can make a mockery of assured markets for a producer completely dependent on foreign customers for sales. Finally, it was required, in the Berlin of 1906, either to have far sighted vision or to be amenable to the discernment of associates to appreciate the potential of the cinema as something more than a passing fad. Oppenheim himself is reported never to have entered a cinema before 1926.

Oppenheim later said that it was the most difficult decision of his career.[21] The decision was made to go, and it led to Agfa becoming the largest manufacturer of photosensitized materials in Europe. The film manufacturing complex took several years to design and build. It went into production in 1909. Because of the by then already intolerably high concentration of industrial air pollution in Berlin, the plants were built in Wolfen, where Agfa already had a dye works. This choice of location, about 120 kilometers southwest of Berlin, was four decades later to have profound implications for the company's very existence, not to mention its

international history.

The facility was inadequate to meet demand almost from inception. Continued growth of the foreign cinema industry and the gradual emergence of German studios after 1910 required almost continuous expansion of the complex during the next four years. By the end of 1913, the company was producing cinefilm at an annual rate of 30 million linear meters. 1913 sales of such films exceeded nine million marks, which represented 65 percent of the company's photographic business. To keep the significance of this business in perspective, sales of all photographic products represented one fourth of total Agfa sales that year.[22]

Such success could not, of course, fail to draw the attention of Eastman Kodak. A series of meetings between Agfa and Eastman Kodak senior managements took place in Paris and Berlin during the 1912-1913 period. These meetings produced an agreement dividing world markets for cinefilm between the two companies. According to Leubner, Agfa agreed to refrain from entering the U.S. cinefilm market. All other markets were to receive 60 percent of their film from Kodak and 40 percent from Agfa. For all practical purposes, all other markets meant France, Italy and Denmark. That Kodak agreed to exclude Agfa from the U.S. is open to question. The contemporary correspondence of George Eastman indicates he was well aware that such restraint of trade in the U.S. was illegal. But the division of European markets is documented in Eastman's own correspondence.[23]

1914 - 1925

World War I caused a dramatic change in the nationality of Agfa's photographic markets. Major foreign markets were cut off

overnight. The company became a much more conventional uninational enterprise than it had been before. The domestic market, and in particular the German government, picked up the slack. Agfa production capacity was strained by the demand for entertainment films to maintain the morale of troops and the civilian population. This demand could be filled by the rapidly developing German cinema studio industry. By 1916, the company had gained enough experience in the large scale production of cinefilm to bring out a negative roll film for use in still cameras. Such film had largely been imported before the war. With a total supply cutoff after entry of the U.S. into the war, Germany was desperate for a local supply source. Such films were used extensively in aerial reconaissance by the German army.[24]

By 1918, scientific research as the basis for new or improved products had long been embedded in the company's chemical operations. A further step toward the institutionalization of research and development in the photographic section came to be seen as a vital necessity in 1920. New laboratories were set up in Wolfen; Berlin was seen to be simply too far removed from actual production.[25]

The research effort bore fruit in a variety of new or better products introduced by Agfa in the early postwar years. These included panchromatic dry plates, portrait films, reversal cinefilms, sensitized printing and reproduction plates, dental x-ray films, and color screen plates.[26] The research efforts required to bring out these products were costly; so was the expansion of production facilities necessitated by these new products. These products were not just new . Their introduction reflects a considerable broadening of the product palette offered by the company. To cover the inevitable escalation of costs which

accompanies such expansion, markets had to be sought, including those beyond the borders of Germany. This was by no means easy. The war left a residue of unresolved international economic problems and of ill will against Germany. This took many forms. Among these were trade barriers. The British Tariff of 1922 is an example. This tariff explicitly singled out products of German origin, including photographic materials, and raised the import tariffs on these to 33.3 percent ad valorem.[27] Agfa thus had to go far afield to such regions as the Far East to generate export sales. The effort to do so effectively led to the establishment of a number of foreign branches. This in turn required working capital and was seen by the management as being the immediate cause of bringing the company to the edge of insolvency during the hyperinflation of 1923. The minutes of a management board meeting held that year are sufficiently instructive to warrant translation at this point :

> Privy Councillor Oppenheim described the present unfavorable financial position and ascertained that we are approaching the borderline of possibility for the continued maintenance of our activities. A credit of 300,000 Dutch guilders and 25,000 pounds Sterling has been secured through the Mendelssohn banking house. This should enable us to meet our obligations for about two more weeks. An even more thrifty housekeeping than heretofore is therefore required of all departments. The main cause undoubtedly lies in the recent expansion of our exports; moreover, it lies in the circumstance that in many cases we have tried to stand on our own feet in our foreign business by establishing our own offices and warehouses. As our export business has, by such means, achieved a greater radius of action, significantly larger amounts of money have had to be tied up in large foreign warehouses (for example, in Japan with Y. 4 million in insured value, of which, however, Y. 300,000 were destroyed by the earthquake) and in floating goods. For these, not only production costs but substantial amounts for freight and customs duties (for example, 33.3 percent in Japan) have been incurred; but compensating sales proceeds have not in the meantime as yet flowed into the company.[28]

The company's fortunes were soon to change.

Division III of IG Farbenindustrie AG

Attempts to restrain competition within the German chemical industry were nearly as old as the industry itself. A patent dispute over a dye called Congo Red had led Agfa and Bayer to seek an accommodation with each other as early as 1876. This took the form of a pooling of patents covering this and four other dyes; it also included the fixing of prices on these dyes for the remaining lives of the patents. Agfa and Bayer joined six other German producers and one English dye manufacturer in the Alizarin Convention of 1881. This cartel divided markets and allocated sales quotas to the participants and set price floors for alizarin dyes. Other efforts, similar in nature, emerged with the passage of time. In 1905, the German Interior Ministry identified some 46 cartels in the chemical industry.[29]

Such cartel arrangements inevitably broke down sooner or later. Top executives of the leading firms had come to feel early in the new century that stronger measures were required if the competition among them were to be kept from becoming ruinous. Except for Bayer's Carl Duisberg, none were willing to give up their independence of action. A middle course was taken in 1905. Prodded by a 56 page Duisberg memorandum urging the complete consolidation of the entire industry, the six largest dye makers formed two groups.[30] Each of these constituted an Interessengemeinschaft. (Hereafter, this term, which translates roughly into Community of Interests, will be abbreviated as IG.) One of these, the Dreibund IG, included Agfa, Bayer and BASF. It operated through a pooling of profits generated by the invention, manufacture and sale of dyes. Agfa and Bayer were thus free each to go its own way in

photography. A further step was taken in 1916 when the eight largest companies formed an IG to be operated along similar lines.[31] Duisberg finally had his way in 1925 when IG Farbenindustrie AG was formed. (Hereafter, this will be abbreviated as IG Farben.) This was a full merger into one corporate entity of all German chemical companies of any consequence. This led to a total reorganization of what was now one of the largest firms in the world. A modern divisionalized structure with numerous central staff commissions emerged. Agfa became Division III. Its product responsibilities included, in addition to artificial fibers, all photographic products. Agfa thereby inherited responsibility for its own former film, plate and photographic chemical operations, Bayer's photographic chemical, paper and film business, and the Rietzschel camera works which had earlier been acquired by Bayer.[32] Shortly after the merger, IG Farben acquired the business and assets of Saska GmbH, a Munich based maker of photofinishing equipment. This acquisition was turned over to Agfa to integrate into its operations.[33]

Agfa thus quickly became, for the first time in its history, a fully integrated photographic manufacturer, capable of offering a complete product palette. All of its goods were soon sold under the Agfa brand and trademarks. This began in Germany and soon spread to other countries excepting the U.S. where other developments were to unfold.

Agfa's advertising during these years reflects an emerging business strategy made possible by the new situation. The principal slogan it used was Alles aus einer Hand (Everything from one Source).[34] The slogan is unambiguous in meaning, but it has a twofold significance to be more fully discussed below.

In 1930, Agfa brought out a simple box camera and sold 44,000

units. The following year, 160,000 units were sold.[35] To generate some extra sales of this model, Agfa ran a special promotion in 1932. The camera was offered to the public at the virtually unheard of retail price of four marks.[36] The promotion led to sales of more than two million Agfa box cameras.[37]

It is in the very nature of consumer product promotions that they be short lived. The Agfa box promotion could have been stopped at some reasonable point in time. It was continued well beyond its initially planned term and ran for more than a year. Agfa management had begun to think in strategic terms. After observing Eastman Kodak behavior over a generation, Agfa executives had come to appreciate that the profit potential in amateur photography inhered in repetitive sales of consumable sensitized materials. They had come to see that an effective way to realize this potential was to invest in whatever was required to make it possible for the sensitized materials to be sold. In this instance, the requirement was fulfilled by putting a camera in the consumer's hands; the investment took the forms of giving up profit on the sale of the camera and of massive advertising to support distribution of the cameras to the ultimate users. The sale of two million cameras resulted in a significant increase in the sale and use of Agfa films and papers during a period in which economic activity seemed to be heading toward a nearly complete standstill.[38]

The strategic significance of the box camera promotion, and in connection with this, that of the above mentioned advertising slogan, can now be discussed. Agfa remained a full line manufacturer of photographic products. But the box promotion marks a turning point. From this point on, a much greater emphasis was placed on the popularization of

photography and on making Agfa a supplier of consumer products. In its appeal to the general public, the slogan conveyed an assurance of quality, reliability and completeness of service. It drove the public into the arms of the photographic specialty retailers. This helped strengthen the company's dominant position in the distribution system of its home country. The dealers constituting this distribution channel were cultivated assiduously by Agfa. By appealing to them with this slogan, Agfa was able to achieve new scale economies in marketing. A sales call on a dealer had the potential of generating sales of cameras, accessories, darkroom equipment, chemicals, plates, films and paper.

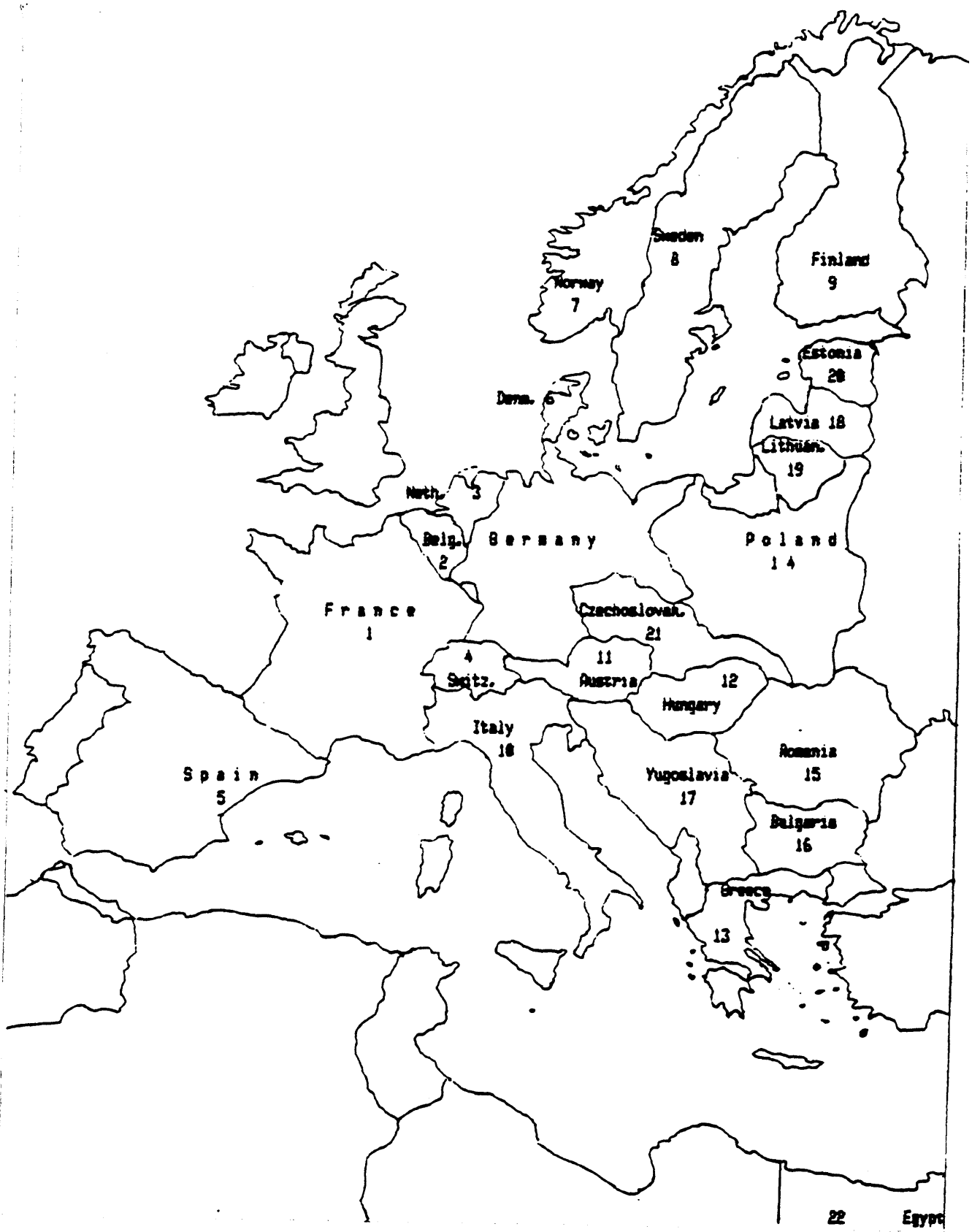
Although the box camera was exported, the present research has uncovered no instance of export of the promotion or of foreign adaptation of the basic promotional idea. The 1932 box camera promotion thus appears to have been a purely German event. It was, nevertheless, meaningful for this chronicle of Agfa's international development. The promotion started an expansion of unit volume of consumable sensitized products. This helped the company to achieve scale economies that were quite useful in all of its selling efforts, including those in foreign countries. It is to be recalled that this occurred during a period of nearly chaotic international economic relations. The ability to manufacture at low cost was a critical requirement for any company seriously interested in export markets.

The international expansion of Agfa's business during the interwar period fits the conventional pattern and can thus be recited briefly. The company was, with one notable exception to be discussed below, a uninational manufacturer with export markets. At first, products were exported to independent distributors. When and where the perceived

market potential appeared sufficiently large to justify the establishment of a sales branch or a partially or wholly owned sales and distribution subsidiary, this was done. This latter course had, by 1933, been followed in the countries shown on the map following this page.[39] These countries all belonged to the Europe-Near East sales territory, one of two into which the world outside Germany was organized by the company's sales management. The other was known as the Overseas territory; this included the British Isles as well as the more distant countries. At the outbreak of the next world war, Agfa was exporting to some 70 countries throughout the world. Among those which were considered important were India, China, Indochina, Japan, Dutch East Indies, Straits Settlements, South Africa, and Australia.[40]

In some instances, Agfa took a middle course between working exclusively through a subsidiary or a distributor in a given country. One or more Agfa employees worked within the organization of an independent distributor. Their work, after training and indoctrination in Berlin, was to bring to the distributor the full range of Agfa's technical and marketing expertise.[41,42]

I6 Farben - Agfa European Sales Subsidiaries as of 1933, In Order of Formation



Agfa - Ansco

The U.S. has thus far been prominent by its absence from this account of Agfa's postwar international history. This country was the host for Agfa's only pre-World War II foreign direct manufacturing investment in the photographic industry. The proximate stimulus for this investment was the traditional frustration in penetrating a protected foreign market. The Fordney - McCumber Tariff Act of 1922 imposed an import duty on film at the rate of .4 cents per linear foot of 35mm film.[43]

In an effort to preserve its traditional hegemony over its American market, Eastman Kodak had progressively lowered the price of its cinefilm from a postwar high of 2.5 cents per linear foot to one cent. Given the prevailing U.S. import duty, this was a price with which no foreign film could profitably compete.[44]

The situation was similar for amateur photographic products. Apart from the high import tariff, Agfa's U.S. activities remained modest because of a self reference bias in its distribution policy. Such success as Agfa was enjoying in Europe was based on its growing control over and reliance on specialized photographic retailers. This policy was not readily exportable to a market where George Eastman had shown the prescience to popularize his products by distributing them through drug stores and other frequently visited retail outlets.

The fundamental resources and skills needed by Agfa to conduct an effective U.S. business were lacking. As it happened, however, there was an American company which had at least the nucleus of what Agfa

needed. This was the Ansco company.

The antecedents of Ansco can be traced back to well before the appearance of photography. The J.M.L. & W.H. Scovill Co. had been involved in the manufacture of small hardware items since its 1802 founding.[45] It had gone into production of the silvered plates used by daguerreotypists within months of Daguerre's 1839 demonstration of his process in Paris. Edward Anthony had in 1842 opened a New York store to supply daguerreotypists. Both firms became importers of European photographic materials; both became significant participants in American photographic industry and commerce during the nineteenth century. Both had run out of energy and leadership by the end of the century. They merged in 1901 to form the Anthony and Scovill Company. Six years later, the company name and trademarks were changed to Ansco.[46] This appears to have been the limit of the company's strategic thinking. In 1914, the courts ruled for Ansco in a patent infringement suit it had brought against Eastman Kodak. As the case involved the patent for the process and use of the celluloid film base which constituted the core of the radical change in photography that had started in 1889, the court's judgment might well have changed the subsequent history of the industry.[47] But Ansco accepted a $5 million out of court settlement from Eastman and proceeded to dissipate over 40 percent of this to pay a dividend to its common stockholders and to retire two preferred stock and bond issues.[48] In 1922, Ansco directors brought in Horace Webber Davis, a professional revitalizer of sick companies, to do what could be done with the company. He did what he could, but he saw clearly what was lacking.

Davis approached IG Farben in terms that were later paraphrased

by the editors of Fortune as : "We need money and technicians. You need sales in the U.S. market. You have the money and technicians. We have a factory within the U.S. borders. Let us pool our possessions and meet our necessities." [49] The approach was hardly subtle. To make sure, however, that his German negotiating partners did not miss the point, Davis had Ansco file a dumping complaint against Agfa with the U.S. government just before the negotiations began.[50]

The Agfa Ansco Photo Products Company was organized as a new corporation in late 1927, capitalized at $7,350,000 of which 60 percent was subscribed by IG Farben. (This was subsequently raised to 93 percent.)[51] The products were marketed under the Ansco brand, and in acknowledgement of the political sensitivities of the era, every effort was made to maintain an American face toward the public. The marketing functions and general administration were headed by American executives. The board of directors remained prominently American. Production, all technical support functions and finance were headed by Germans. A new film factory was built, and the paper and camera plants in Binghamton, New York were extensively modernized, all according to engineering plans drawn up in Wolfen. A veritable flood of German engineers and technicians streamed into Binghamton. This did not always result in perfectly harmonious relations with their American colleagues. The quality of Ansco products nevertheless soon began to show remarkable improvement. Academy Awards were earned in 1936 and 1937 for new infra-red and high speed films. By 1935, the company had begun to generate reasonable profits.[52]

The Ansco acquisition became involved with some of the other corporate purposes of IG Farben. A gasoline synthesization project had drained IG Farben's financial resources. One of the means used to

replenish the corporate treasury was an agreement with Standard Oil Company (New Jersey). Under this 1928 agreement, a new American company, Standard - I.G.Company was formed; ownership was split, Standard Oil holding 80 percent and IG Farben the rest. Farben turned over to this new company world patent rights, excepting Germany itself, to the Bergius-Bosch hydrogenation process. The consideration paid to Farben was two percent of Standard Oil's common stock, then valued at $35 million.[53] This amount was subject to German income tax, an expense which Hermann Schmitz, the company's chief financial executive, was desperate to avoid. He therefore caused a number of IG Farben subsidiaries to be formed. These were to act as holding companies. Among these were the American I.G. Chemical Company which came to hold the IG Farben equity in Agfa Ansco Company and in the General Aniline Works. The parent holding the stock of American I.G. Chemical Company was organized in Switzerland in 1929 as the Internationale Gesellschaft für Chemische Unternehmungen, subsequently called I.G. Chemie. Several IG Farben controlled Dutch companies also became involved in the share control of American I.G. Chemical Company by way of the latter's 1929 issuance of convertible debentures.[54] As the second World War approached, other efforts were made to camouflage the real German ownership of American I.G. Chemical Company. In 1939, its name was changed to General Aniline and Film Corporation (hereafter GAF).[55]

In the end, none of these moves were effective. Within days of American entry into the second World War, the U.S. Department of Justice initiated a congressional amendment to the 1917 Trading With The Enemy Act. This amendment, the main aim of which was to legalize government seizure of GAF, empowered the U.S. to cut through the corporate veil of

nominal ownership of enemy assets by entities in Switzerland and other neutral countries. GAF was seized early in 1942 by U.S. Treasury Department agents and put under the control of the Alien Property Custodian.[56] Following more than two decades of litigation and political maneuvering, GAF shares were eventually sold to the public in 1965 for $329 million.

1945 - 1963

In the perspective of subsequent events, the loss of Ansco was trivial. Agfa lost virtually the entire basis for its business with the collapse of the Third Reich. The European economy lay in ruins, as did that of much of Asia and other parts of the world in 1945. The company's paper facilities in Leverkusen were slightly damaged. Its Munich camera works were one third completely destroyed and two thirds severely damaged. Many of the company's key chemists were either dead or scattered over the rest of the world.[57] Agfa's chief executive was soon to be indicted as a war criminal at Nürnberg.

The American army briefly occupied Wolfen. During its occupation, visitors representing competitor firms based in Allied countries came to get and received Agfa's emulsion formulas. These firms included Dupont (U.S.), Ilford (U.K.), Kodak Ltd. (U.K.), Guilleminot (France) and, for a final ironic touch, Ansco (U.S.); Russians, Czechs, and even Chinese visitors arrived to get what they could.[59] The Allied powers appropriated all Agfa patents and freed them for common use. As a result, details of the Agfacolor process became known to Tellko (Switzerland; later acquired by Ciba), Ferrania (Italy; later acquired by

3M), and Gevaert (Belgium; later to merge with Agfa).[60] In monochrome photography, the Kosiowsky effect became public knowledge. This had been the 1935 discovery by an Agfa chemist that film sensitivity could be significantly increased by the addition of minute amounts of gold to the emulsions.[61]

The American occupation lasted two months. Troops of the Soviet Union took its place in June 1945. Under the subsequent regime of the Sowjetische Militäradministration in Deutschland (Soviet Military Administration in Germany), the Wolfen works were expropriated in 1947 and nationalized as Soviet property in Germany. Although the German Democratic Republic effectively came into existence as a separate nation in 1949, the Soviet Union waited until the end of 1953 to turn formal ownership of the Wolfen works over to the new state.[62]

There was, in short, little reason to believe in the mid-1940s that Agfa would ever again be a significant name in the photographic industry. Agfa had, however, not quite lost everything. Among its remaining assets, intangible though they may have been, were its reputation and the determination of a handful of executives not to yield to the disaster which had befallen their enterprise and their country.

There were others who saw potential for Agfa in a reconstructed Europe. Approaches were made by Gevaert, Tellko, and by the Union Bank of Switzerland. The bank's client is not identified, but it is not wildly implausible that the bank was speaking for CIBA, the Basel based chemical giant. (CIBA later acquired Tellko, Lumière and Ilford to establish itself in the photographic business.) Nothing came of these approaches. Agfa began to reconstruct itself in the western occupation zone of Germany. Two Agfa companies were formed, each a subsidiary of Bayer AG; Bayer was

reconstituted as one of three major companies to emerge from the breakup of IG Farben. The two Agfa subsidiaries were subsequently combined into one. The Munich-based Agfa subsidiary made cameras. The other Agfa subsidiary was established in Leverkusen to make photochemical products. The choice of Leverkusen, a city north of Cologne, was influenced by two major considerations. One was that Leverkusen was the principal site of Bayer's chemical manufacturing operations. Secondly, Agfa photographic paper coating operations had been centered in Leverkusen before the war.

The decade starting in 1945 constitutes a hiatus in the international history of Agfa. The Munich works did make Ansco branded cameras as a contract manufacturer for GAF, the company's former U.S. affiliate, during this period.[64] But similar activity on the photochemical side was out of the question. The first attempts to coat film in Leverkusen were made on machinery designed to coat paper. That did not work very well. The tension to be maintained for coating paper and film base varies significantly with the material. [65] It took until 1950 to construct and install new film machinery in Leverkusen.[66] By then, the 1948 currency reform, which had the effect, among others, of institutionalizing East and West Germany as separate economic zones and eventually as separate political entities, had made its contribution in stimulating what came to be called the Wirtschaftswunder, the extraordinary post-war recovery of the West German economy. [67] The Leverkusen management had its hands full keeping up with rapidly growing domestic demand during this decade. Therein lies a chapter in the history of international business relations which may be unique in its details but which throws some light on the importance of intangible assets in the conduct of international commerce in photographic goods.

The name Actiengesellschaft für Anilinfabrikation does not fall trippingly from the tongue even in its native language. The letters A-G-F-A thus began to appear in the company's trademarks with the introduction of its first gelatin dry plates in 1894. The photographic historian, Stenger, ventures that this may have been the first use of an acronym for such purposes in Germany. The Agfa trademark was first registered in 1897, and by the turn of the century it had become prominent in the identification of the company and its products.[68]

Despite a certain amount of dismantlement during the American and Russian occupations, the Wolfen film factory was able to resume production soon after the cessation of hostilities.[69] It was able, though operating as expropriated Soviet property under Soviet direction, to supply substantial quantities of Agfa branded films to customers of Agfa Leverkusen. When ownership of the factory was transferred from the Soviet Union to the German Democratic Republic, it took the name VEB Filmfabrik Agfa Wolfen.[70]

As Leverkusen gradually built up its film production capacity and became able to satisfy its domestic market during the 1950s, an increasing share of Wolfen production sought outlets in third country markets. This led to a vigorous dispute over which of the two entities had the right to use the Agfa name in trademarks and product branding in international markets. In the preamble to an agreement executed in 1956, both sides declared themselves to be the rightful owners of all Agfa trademarks. A key clause in this agreement specified that as from 1957 the products of both factories would be exported to one exclusive distributor in each third country market. Such distributors were to be appointed, in principle, based on continuation of prior representation

arrangements in each country in which either of the two contracting parties had registered the trademarks.[71]

This clause gave a decided advantage to Leverkusen. Both of the German republics had been formed at about the same time starting in 1949. But the Federal Republic had been somewhat quicker in establishing diplomatic, consular and commercial relationships with other countries. Agfa Leverkusen had thus been able to reregister its trademarks in many more countries and, from a market perspective, in more important countries than had Wolfen. Among potentially major export markets, Italy, Japan and Sweden, for example, had simply ignored trademark registration applications from enterprises in the German Democatic Republic.[72] Agfa Leverkusen was by this time becoming quite active in reestablishing its sales subsidiaries in those European countries that represented major market potential. The 1956 agreement thus effectively empowered it to call the tune as to which factory was to supply which markets with what products.

The 1956 agreement was amended two years later. In this amendment, Leverkusen effectively relinquished its trademark rights in most countries of Eastern Europe. Wolfen relinquished its rights in other nations adhering to the Madrid Agreement. Several long lists specifying countries in which Registered User, Permitted User and Co-User agreements were to be executed were included in this amendment.[73]

The basic reconstruction of the West German Agfa was essentially complete by 1958. Given that its production capacity was sufficient to supply both domestic and export markets, the disadvantages to Wolfen of the arrangements became more evident with each passing year. By 1965, 40 percent of Wolfen's production was being exported; this represented 14

percent of the entire East German chemical industry's exports.[74] The prospect of gradual diminishment of the foreign exchange earned by such an important export was seen to be a serious matter for the East German economy. A reconstructed West German Agfa, capable of filling export demand with superior products and enjoying better access to export markets by virtue of its international trademark control, made such a prospect quite real to the East German authorities.

The postwar Agfa trademark episode finally ended in the 1960s. The East German enterprise assumed the new name of Volkseigener Betrieb Filmfabrik Wolfen and became the headquarters of the Fotochemisches Kombinat DDR.[75] Its products were branded and sold under the ORWO trademark.[76] In a final agreement, executed in 1967, Agfa-Gevaert AG paid a substantial sum to Wolfen in consideration for exclusive use of the Agfa trademark in all countries except the German Democratic Republic where registration of the mark "Agfa Wolfen" was to be cancelled.[77]

In summary, the early postwar activity of Agfa outside its home country was largely confined to reestablishing its trademark rights, its good name and, gradually, its international sales network.[78] As the redevelopment of the company's export business proceeded to gather steam, it began to run into trade barriers which, though traditional in form and mechanism, reflected the new political realities of the period. Despite the greatest initial reluctance expressed by its senior management, Agfa began, where necessary and justified by perceived future market potential, to invest in small foreign manufacturing facilities.[79]

The New India Industries Ltd. began production of simple roll film cameras in Baroda (India) under Agfa technical direction in 1960. Agfa took a one fourth share in the capital of the company, the rest

remaining in the hands of the Ghia family, local industrialists who had hitherto been active in textile manufacture. Construction of a photographic paper plant in Mulund (India) was begun in 1961 by this company, and production commenced in 1963, again with technical knowhow provided by Agfa.[80,81]

The firm Domingos Bove e Irmao had been founded as a trading company in Sao Paulo (Brazil) in 1936. In 1958, it was incorporated as Industria Fotoquimica Bove S.A. and began manufacture of photographic papers. Agfa took a majority interest in the new corporation and provided the necessary technical knowhow. [82] (The Bove factory ceased operations in 1974. By then, it was believed that the Brazilian market could be supplied more efficiently from Argentina by a subsidiary described elsewhere in this thesis.)

Société Nouvelle As de Trèfle S.à.r.l. had begun operations near Avignon (France) in 1936. An Agfa investment in a portion of the share capital of this company was made in 1953. The purpose was to begin coating of Agfa document copy papers in France. This investment was increased to a controlling interest six years later. (This operation was closed down in 1964 because a separate French production facility could no longer be justified for this product in light of the gradual abolition of trade barriers among European Economic Community member countries.)[83]

There is a consistent pattern in these foreign direct investments in manufacturing facilities made by Agfa up to 1964. All were market seeking in their motivation. Very likely none of them would have been made had it not been for a variety of trade impediments.[84] All meant involvement with a more or less established local enterprise. All involved continued equity participation by host country investors. The

basis for control that Agfa was able to exercise in these situations rested in the first instance not on equity but on its mastery of the required manufacturing technology.

Epilogue

Throughout its first century, Agfa had, as a German enterprise, enjoyed the fortunes and suffered the misfortunes of the nation which is its domicile. After 1945, the company came to flower again, mainly in domestic soil. This was largely a function of an international relations drama played out on a much broader stage during the quarter century beginning in 1939. Agfa's resurrection from the ashes of 1945 to world class status must remain a remarkable achievement. Its ability to regain that status within two decades was conditioned by several factors. Among these were the financial, administrative and research support of Bayer AG. In the aftermath of the breakup of IG Farben, Agfa had become a wholly owned subsidiary of Bayer; the latter had quickly regained a place among the giant chemical enterprises of the world. Bayer's own store of knowledge of dye chemistry, which had accumulated over a century, was by no means the least significant of assets at Agfa's disposal. Perhaps the key strategic element in Agfa's revival was that it was able to rebuild a distinctive competence in color photography during the 1950s. This was a period in which this new technological wave was building up to a crest. The chemistry underlying color photography is subtle and the coating technology complex. The shift to color photography constituted a change as profound in its way as the change from dry plates to roll film had been half a century earlier. As a result, the barriers to entry into the

photochemical industry had become intellectual far more than financial.

The field in which Agfa chose to apply its technical competence was amateur photography. This represented a continuation of policies that had developed two decades earlier. It formed, for the time, an effective basis for its business. Amateurs gradually shifted to color photography as increases in their incomes made this more feasible. Contemporaneous with the shift to color photography, momentous changes were occurring in consumer marketing. Among these were the distribution of photographic goods through mass retailing outlets, a proliferation of retailers' house brands, growing sophistication on the part of Eastman Kodak in product differentiation, and the awesome intrusion of television as an advertising medium. Agfa management, fully occupied with the reconstruction of its production capacity, was slow to appreciate the implications and significance of these changes. When the appreciation came, it was late enough to carry with it the realization that the failure to adapt to these changes earlier constituted a genuine source of long term weakness. This was especially significant for an enterprise that was ready once again, at least in a technical sense, to play a larger role in the international arena. The weakness was considered serious enough to call for a more dramatic solution than was possible by evolutionary means alone. This solution involved the fusion with Gevaert and is described in a later chapter of this thesis.

Notes and References

1 The documents and source materials on which this chapter is based are in the corporate archives of Bayer AG and the library of the Agfa-Gevaert Foto-Historama, both in the city of Leverkusen in the Federal Republic of Germany.

Unpublished materials in the Bayer Archiv are hereafter identified by "BA:..." followed by a document number where this has been assigned by Bayer archivists.

Many of such original source materials as survived the destruction of World War II were, as of this writing, in the German Democratic Republic and inaccessible to western scholars. Because of this, large reliance had to be placed on materials that are available in the Federal Republic of Germany. Noteworthy among the latter is an unpublished manuscript exceeding 1,500 pages and variously entitled "Geschichte der AGFA Berlin - Wolfen Vols.Ia and Ib" and "Geschichte der AGFA Aktiengesellschaft in Leverkusen 1854-1958 Vols.IIa, IIb and III". The latter is followed by "Geschichte der AGFA Aktiengesellschaft in Leverkusen 1959-1964 Vol. IV". It is difficult to classify these works as either strictly primary or secondary sources; they have elements of both. They are collections of reports, individual memoirs, statistical data, photographs, etc., woven together in narrative form by a score of collaborators under the editorial leadership of Adolf Leubner for the period up to 1959 and Heinz Berger for the period 1959 - 1964. References to these works are hereafter cited as "Leubner et al. Vol...." and "Berger et al. Vol.IV," as appropriate.

2 "Daten zur Entwicklung der Fotoindustrie", unpublished chronology, Volkswirtschaftliche Abteilung, Agfa-Gevaert AG, ca. 1975, p. 5. Hereafter cited as "Daten zur Entwicklung...".

3 Leubner et al. Vol.Ia, p. 25.

4 Ibid., p. 31.

5 Carl Duisberg, "Denkschrift über die Vereinigung der deutschen Farbenfabriken," 1904, reproduced in Carl Duisberg, Abhandlungen, Vorträge und Reden aus den Jahren 1882-1921, Berlin: Verlag Chemie, 1923, p. 351. Hereafter cited as "Duisberg 1904 Denkschrift...".

It is to be noted that Duisberg was discussing the German chemical industry in general in this memorandum, not only Agfa. But it seems highly plausible that these impediments to international trade provided the motivation for Agfa's foreign direct investments in manufacturing.

6 BA: 5/E a.16, "An den Aufsichtsrath der Actiengesellschaft für Anilin-Fabrikation, Berlin, April 1902."

7 Leubner et al. Vol.Ia, p. 61.

8 Duisberg 1904 Denkschrift..., p. 346.

9 Erich Stenger, 100 Jahre Photographie und die Agfa, 1839-1939, Munich: Verlag Knorr & Hirth, 1939, p. 24. Hereafter cited as "Stenger, 100 Jahre Photographie...".

10 Leubner et al.Vol.Ia, p. 62.

11 Ibid., pp. 72, 76.

12 "Daten zur Entwicklung...", p. 14.

13 BA: 5/E a.24, "An den Aufsichtsrath der Actien-gesellschaft für Anilin-Fabrikation, Berlin, April 1904."

14 Siegfried Kracauer, From Caligari to Hitler, Princeton, NJ: Princeton University Press, 1947, p. 15;

Oskar Kalbus, Vom Werden deutscher Filmkunst, Altona-Behrenfeld, Germany: Cigaretten-Bilderdienst, 1935, pp. 12-14.

15 "...We estimate that we make and supply 90% of all the moving picture film used in the world...". Letter, George Eastman to George C. Davis, Assistant Appraiser of the Port of Chicago, 11 May 1909, Eastman - Butterfield Collection, University of Rochester Archives. See Note 1 of Eastman Kodak chapter for further description.

16 Terry Ramsaye, A Million and One Nights, New York: Simon & Shuster, 1926, p. 530.

17 Leubner et al. Vol.Ia, p. 87.

18 Letter, George Eastman to William S. Gifford, 17 May 1911, Eastman - Butterfield Collection, University of Rochester Archives.

19 Leubner et al. Vol.Ia, pp. 92-95.

20 BA: 5/E a.24, "An den Aufsichtsrath der Actiengesellschaft für Anilin-Fabrikation, Berlin, April 1914."

21 Leubner et al. Vol.Ia, pp. 95-96.

22 See note 20 above.

23 Leubner et al. Vol.Ia, pp. 132-133.

Letters, George Eastman to : Carl Duisberg, 21 April 1910;
J. J. Kennedy, 19 May 1913;
Walter S. Hubbell, 1 May 1924;
Eastman - Butterfield Collection, University of Rochester Archives.

24 P. Brand, "Photographische Erzeugnisse", in Beiträge zur hundertjährigen Firmengeschichte 1863-1963, Leverkusen, Federal Republic of Germany: Bayer AG, ca.1964, p. 29. Hereafter cited as "Beiträge..."

25 Leubner et al. Vol.Ia, p. 155.

In the struggle to overcome a host of technical difficulties, a saying among Agfa photographic chemists during the early 1920s was : "We shall be able to enjoy true serenity only if and when everything here is as it is at Eastman."

26 Stenger, 100 Jahre Photographie..., passim.

27 Customs Tariff of the United Kingdom, 1922.

28 "Vorstandssitzung vom 15. Oktober 1923", reproduced in Leubner et al. Vol.Ia, p. 182.

29 John Joseph Beer, The Emergence of the German Dye Industry, Urbana,IL: University of Illinois Press, 1959, pp. 117-122.

30 Duisberg 1904 Denkschrift.

31 BA: 5/E a.59, "Interessengemeinschaftsverträge, 1904, 1916."

32 Fritz ter Meer, Die I.G., Ihre Entstehung, Entwicklung und Bedeutung, (apparent reprint of a section of a larger work), p. 783.

33 "Daten zur Entwicklung...," p. 28.

34 Leubner et al. Vol.Ib, p. 397.

35 P. Brand, Beiträge..., pp. 183-184.

36 Use of the qualifying adverb is necessitated by the appearance on the market of very cheap cameras at the turn of the century. Among these were Eastman Kodak's Brownie which retailed for $1 in 1900 and Konishi Honten's first Cherry Portable model which was introduced in 1903 at a retail price of Y. 2.30. Adjustment of these prices for changes in national price indices and exchange rates would have made the prices of these cameras the equivalent of less than 5 German marks in 1932.

Letter, George Eastman to George Davison, 4 September 1900, Eastman - Butterfield Collection, University of Rochester Archives;

Japanese Historical Cameras Screening Committee, "A History of Japanese Cameras," Camerart, July 1976, p. 24;

Moon H. Lee, Purchasing Power Parity, New York: Marcel Dekker Inc., 1976, Appendices.

37 Leubner et al. Vo.IIa, pp. 132, 350.

[38] Ibid., p. 135

[39] Leubner et al. Vol.Ib, p. 420.

It is to be emphasized that this list is not complete. It does not include any countries which were part of Agfa's Overseas sales territory. The company had organized a U.S. subsidiary soon after World War I and one in Japan in 1921.

[40] Ibid., pp. 430-431.

[41] Ibid., p. 428.

[42] The author of this thesis can confirm from personal experience that such an arrangement between two companies dealing with each other at arm's length and the managements of which may have entirely different and often conflicting long term objectives and strategies is often an uneasy one. But it can be made to work for the benefit of both parties in the short run.

[43] Tariff Act of 1922. U.S. Statutes at Large. Vol. XLII. Part I. Chap. 356. Par. 1,453.

[44] Leubner et al. Vol.IIb, p. 370.

[45] Agfa Ansco, 1842-1942, 100 Years of American Photography, n.p.: General Aniline & Film Corporation, 1942;

Theodore F. Marburg, "Management Problems and Procedures of a Manufacturing Enterprise, 1802-1852; a Case Study of the Origins of the Scovill Manufacturing Company," unpublished Ph.D. dissertation, Clark University, 1945, pp. 245-251.

[46] Reese V. Jenkins, Images and Enterprise, Baltimore: Johns Hopkins University Press, 1975, passim.

[47] Goodwin Film & Camera Co. v. Eastman Kodak Co., Vol. 207 Federal Reporter, pp. 351-362; Vol. 213 Federal Reporter, pp. 231-240.

[48] Moody's Analysis of Investments, New York: Moody's Investors Service, 1919, p. 1,721.

[49] "Inevitable Competitor," Fortune,Vol. 5, May 1932, p. 59.

[50] Leubner et al. Vol.IIb, p. 370.

[51] Moody's Manual of Investments, New York: Moody's Investors Service, 1928, p. 2,664; 1941, p. 2,892.

52 Leubner et al., Vol.IIb, pp. 375-393.

Fritz Wentzel, Memoirs of a Photochemist, edited by Louis Walton Sipley, Philadelphia : American Museum of Photography, 1960, pp. 103-106.

53 U.S., Congress, Senate, "Investigation on the National Defense Program, Part II", Hearings Before a Special Committee Investigating the National Defense Program, 77th Cong., 2nd Sess., 1942, cited by Joseph Borkin in The Crime and Punishment of I.G.Farben, New York: The Free Press, 1978, pp. 44-51. Herereafter, the Borkin work is cited as "Borkin, Crime and Punishment..."

54 Borkin, Crime and Punishment..., pp. 183-184.

55 Moody's Manual of Investments, New York: Moody's Investors Service, 1941, p. 2,892.

56 Borkin, Crime and Punishment..., p. 198.

57 P. Brand, Beiträge..., p. 187.

58 Fritz Gajewski and most of the other IG Farben top management were acquitted. New York Times, 30 July 1948.

59 Leubner et al. Vol.IIa, pp. 95-98.

60 Leubner et al. Vol.Ib, p. 287.

Imprecise indications in other secondary sources suggest that the gold effect had also been independently discovered during the 1930s by Eastman Kodak and Ilford scientists.

61 Janis Schmelzer and Eberhard Stein, Geschichte des VEB Filmfabrik Wolfen, Berlin (East): Verlag Tribüne, 1969, p. 104. Hereafter cited as "Schmelzer & Stein..."

62 Ibid., pp. 107, 116, 194.

63 Leubner et al. Vol.IIa, p. 112.

64 BA: 5/E 37, 38, Correspondence between Agfa and Ansco, 1950s.

65 Interview with Dr. Heinz Berger, Cologne, Federal Republic of Germany, 16 June 1983. Hereafter cited as "Berger interview".

66 P. Brand, Beiträge..., pp. 188-189.

67 Richard J. Barnet, "Annals of Diplomacy", The New Yorker, 10 October 1983, pp. 74-82.

68 Stenger, 100 Jahre Photographie..., pp. 20-25.

69 Schmelzer & Stein..., pp. 108-113.

70 Contract dated 19 April 1956 among Deutscher Innen- und Aussenhandel Chemie, VEB Filmfabrik AGFA Wolfen, and Agfa Aktiengesellschaft für Photofabrikation, Leverkusen.

71 Ibid.

72 Schmelzer & Stein..., p. 248.

73 Contract dated 10 October 1958 among Agfa AG, Deutscher Innen- und Aussenhandel Chemie, and VEB Filmfabrik AGFA Wolfen.

74 Schmelzer & Stein..., p. 247.

75 The Kombinat includes, in addition to the Wolfen works, the Berlin-Köpenick factory (expropriated from Kodak AG), ORWO-Export-Import (the Kombinat's own foreign trade organization), VEB Fotopapierwerk Dresden, VEB Gelatinewerk Calbe, and VEB Magnetbandfabrik Dessau. ORWO, brochure, 1981.

76 The name is the result of combining the first syllables of the words Original Wolfen.

77 Contract dated 13 June 1967 between Agfa-Gevaert AG and VEB Filmfabrik Wolfen.

78 Berger interview.

79 BA: 5/E 23, Minutes of Agfa Management Board meetings, 1953-1957.

80 Berger et al. Vol.IV, pp. 196-198;

"Daten zur Entwicklung...," pp. 37, 47, 51.

81 The main import substitution objective of the Indian government was, however, frustrated. India is quite possibly the world's largest national consumer of cinefilm. The reluctance of any of the world's leading photochemical manufacturers to share their strategic core technologies and the rigorous conditions imposed by the Indian government on foreign investors stood in the way of fruitful collaboration. An indigenous public sector enterprise, Hindustan Photo Films Manufacturing Co. Ltd., went into production of cinefilm in 1967 with limited technical help from Bauchet & Cie., a small French firm. See Berger et al. Vol.IV, p. 198;

Praba Mahajan, "HPF: No photo finish this", Business India, 3 - 16 January 1983, pp. 70-80.

82 "Daten zur Entwicklung...," pp. 33, 43.

[83] Berger et al. Vol.IV, p. 195;

"Daten zur Entwicklung...," pp. 23, 49.

Correspondence with Hendrik Le Page, August 1984.

[84] The original six members of the European Communities had barely begun to dismantle their internal trade barriers by 1962. Agfa's French investments can thus safely be covered by this generalization.

Chapter III

Gevaert [1]

Introduction and Background to Founding of Company

Perhaps no single photochemical enterprise more clearly supports the market seeking internationalization thesis than that founded by Lieven Gevaert. Three quarters of a century elapsed between the company's spare origins in an Antwerp photographer's studio and the juncture of its destiny with that of Agfa. During this interval, Gevaert grew into one of the half dozen largest enterprises in what had become a highly concentrated world industry. To its 1964 fusion with Agfa, Gevaert brought a sales and service network extending to 122 countries and three minor manufacturing subsidiaries in countries outside its Belgian home base. Nearly twenty years later, the phrase "our traditional export mentality" remained firmly embedded in the company's internal culture. The roots of this tradition run deep and can be traced back to the very origins of the company.

Lieven Gevaert was apprenticed to several Belgian photographers during his adolescence. His mother, who had been widowed when he was three years old, established a photographic studio in 1883. How long this venture lasted is not known. In 1889, when Gevaert was twenty-one, he felt ready to establish himself as an independent portrait photographer in his home city of Antwerp. His shop prospered sufficiently to survive, but the pace was slow and left time to experiment with a variety of photographic printing materials and techniques. For a time, he made a

commercial specialty out of printing photographs on ceramics and porcelain. He also experimented with various papers and chemical preparations. These experiments led to a product he called Calciumpapier. The name originates from the layer of calcium chloride which was spread on the paper before the coat of silver chloride was applied. This gave a reddish brown tint to the eventual print and was considered an attractive feature.[2] The quality of the prints made possible by this paper was perceived to be quite superior to that achieved by his professional colleagues in Antwerp. These were soon satisfied to buy their papers from Gevaert.[3] The basis for a larger enterprise had begun to emerge.

In 1894, Gevaert gathered six local investors to form the Commanditaire Vennootschap op Aandelen L.Gevaert & Cie. The immediate purpose of this company was the production of photographic papers on a commercial scale.

Foreign Raw Material Supply

Gevaert's initial market was confined to the 36 professional photographers who by 1892 had established themselves in Antwerp.[4] But his business was grounded in international trade from the beginning. The raw materials for the product that eventually becomes a photographic print are paper and chemicals. The latter are suspended in a binding agent of some sort. One of the binding agents which came into general use in the nineteenth century was egg white; hence the name albumen papers for those in which this medium was used. The employment of albumen, however, created an economic problem for those who used it on an industrial scale. This is what to do with the yolks. Physical disposal was wasteful and

costly. German albumen users had solved this problem by selling the unwanted by-product to local tanneries.[5] As this outlet was not practical for Gevaert, he used collodion as his binding agent. Collodion, a solution of cotton in ether, had been well known as a binding agent used in the sensitization of glass plates since the middle of the century. This and other chemicals were bought from Schering, a producer of pharmaceuticals and fine chemicals in Berlin.[6]

The chemical makeup of the raw paper which eventually becomes a photographic print is critical to the appearance of the picture. It must be free of any metalic traces which react chemically with the silver salts in the emulsion. As paper making depended on flowing water during the nineteenth century, the metalic content of the streams where paper mills were established greatly influenced whether the output was suitable for photographic use. It was thus in part the accidents of geology which largely determined that such continental European mills would be located in France and Germany. Among the first paper suppliers to Gevaert were the Buntpapierfabrik Gustaf & Heinrich Beneke in Löbau (Saxony) and J.B. Weber in Offenbach a.M. (Hesse) These were soon followed by the mills with the greatest renown for the purity of their papers, namely Steinbach & Cie. in Malmédy (Rhenish Prussia before 1919) and Blanchet Frères & Kléber in Rives (near Grenoble, France).[7] These two firms formed a cartel in 1898 by organizing the General Paper Company and appointing it to be their exclusive selling agent.[8] When prices for the output of these mills effectively doubled overnight, Gevaert lost little time in seeking alternate sources of supply. This search led him to the then recently founded firm of Felix Schoeller Jr. which was operating a mill in Burg Gretch (near Osnabrück, Westphalia). Schoeller began to deliver

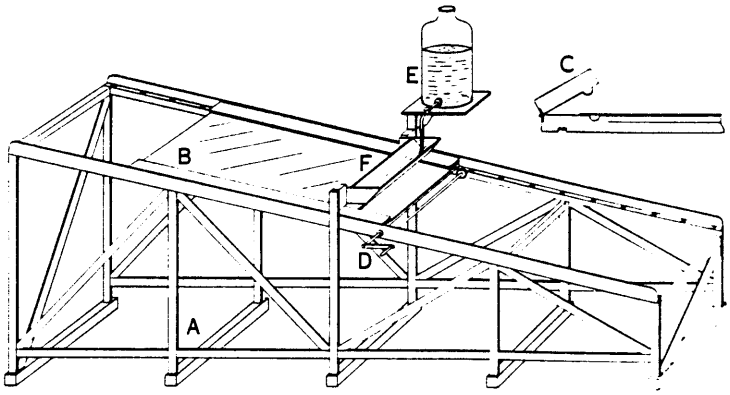
paper to Gevaert within a year.[9] Other German paper suppliers during the early period included Trapp & Münch and the Vereinigte Fabriken Photographischer Papiere, a consortium of firms headquartered in Dresden.[10]

The Gevaert business was thus rooted, at least on the raw material supply side, in international business relationships from its beginnings. The conduct of these relationships by Lieven Gevaert, whose mother tongue was Dutch, was facilitated by his having taught himself German, French and English during his apprenticeship years.[11] This linguistic knowledge was acquired to enable him to supplement his practical understanding of photographic processes by study of the professional publications which were flourishing in the 1880s.

Toward Continuous Process Production

From a production point of view, several conditions had to be satisfied if Gevaert were to have an economic basis for an industrial enterprise in photographic papers. First, the paper had to be sensitized by means somewhat more efficient than was possible by each photographer doing his own. In addition, the emulsion had to be spread over its base completely and with uniformity in thickness. These conditions led to a search for mechanical aids. By 1891, he was coating paper with the help of a mechanism of his own design and construction. This mechanism - it can scarcely be called a machine - was primitive indeed compared even to the succeeding machinery which quickly made it obsolete. But it adumbrates much that is to be found in subsequent coating technology. It is reproduced here from a company publication.[12]

The first emulsifying machine invented by L. Gevaert.



The machine consists of a wooden framework (A) on which rests a glass frame (B) covered with a sheet of baryta paper. The paper is fastened to the frame by two hinged clips worked by the interlocking shaft of a crank (D). Above the machine a flask (E) discharges the emulsion through a rubber tube into a tank (F) from which a strip of chamois leather emerges. This strip is in contact with the paper which it covers with a film of emulsion. A second frame is slid against the first so that the emulsifying can be carried on without interruption from one sheet to another.

This mechanical aid made possible the coating of 2.5 square meters of paper per hour.[13] By 1894, a somewhat larger mechanism had increased the output to 17.5 square meters per hour. Within a year, a semi-automatic machine brought this to 54 square meters per hour. A gas driven, 2 horsepower machine, imported from Germany in 1898, made possible the continuous coating of 66cm wide stock rolled in lengths of up to 100 meters. By the time the company had moved to its present facilities in Mortsel on the outskirts of Antwerp in 1905, a 150 horsepower steam engine was drawing paper under the coating head at up to 4 meters per minute, realizing a production output of 158 square meters per hour.[14]

Explosive growth in productivity accompanied the absolute increase in output. A few key figures survive from the period. Gevaert production of sensitized papers grew as follows : [15]

Year	Square Meters (approx.)
1895	10,000
1900	50,000
1905	1,200,000
1910	2,000,000
1913	3,200,000

Roosens has researched the 1910 paper sales data of several prominent manufacturers.[16] These are here translated to a common numeraire in which Gevaert sales are indexed at 100 :

Eastman Kodak	431
Gevaert	100
Ansco	71
Bayer	14

Foreign Sales

The fast growth of the Gevaert company into a force to be reckoned with in world photographic circles would have been inconceivable had its marketing efforts remained confined to its home country. Lieven Gevaert took to the road during the first year of his company's existence, and he was soon followed by some of his closest associates. The radius of the circle they covered lengthened quickly and soon extended beyond the borders of Belgium. In a year spanning the period 1895-1896, expenses incurred in travel to The Netherlands, Germany, France and Switzerland amounted to Fr. 4,787. In relation to the company's initial issued capital of Fr. 20,000, this was a considerable sum. Soon after the reimbursement of each travel expense, the books began to show sales to and accounts receivable from customers in the places visited. At the end of 1895, there were customers in the following foreign places :

France : Bienne, Lyon, Dijon, Lille, Calais, Boulogne, Reims, Colombes, Paris, Bordeaux, Nancy, and Besancon.

Germany : Frankfurt a.M., Schweinfurt, Aachen, Roermond, Würzburg, Cologne, Strassburg (then under German control), Coblenz, Nürnberg, Wiesbaden, Berlin, Karlsruhe, Mühlheim, Mannheim, and Munich.

Netherlands : Groningen, Eindhoven, Amsterdam, the Hague, Leiden, Leeuwarden, Nijmegen, Utrecht, Dordrecht, Arnhem, Rotterdam, Dordrecht, Haarlem, and Delft.

Switzerland : Zürich, Basel, Luzern, Lausanne, and Geneva.

Others : Milan, Luxembourg, Lisbon, Porto.

The mere listing of these cities does not reveal a key fact which requires emphasis. The number of customers, and the value of product sold to them, in the business capitals of the foreign countries were minimal. Paris, Berlin, Amsterdam, Milan - cities in which competition from other manufacturers might have been expected to be fiercest - were largely avoided. Gevaert sales policy was directed to the provincial cities.

By the end of 1895, the bookkeeper had begun to find it useful to classify the receivables by country. The Fr. 43,000 owed were classified as follows :[17]

Belgium	47%
Netherlands	28
France	12
Switzerland	6
Germany	4
Others	3
Total	100%

Payment and collection of foreign drafts were handled for the firm by the Antwerp banking house of Jos. Waterkeyn & John Aulit who were also among the financial backers of the young venture.

Early Foreign Sales Establishments

The logistics of physical distribution of products across national frontiers on what was essentially a retail basis of operation must soon have become a burden. A branch distribution depot in Paris began to be organized in 1895 and was in operation the following year. To express its commercial hopes and intentions, the company temporarily gave itself a new trade name to accompany this move : Franco-Belgische Maatschappij voor het vervaardigen van fotografische papieren, L.Gevaert & Cie. (Franco-Belgian Company for the Production of Photographic Papers L.Gevaert & Co.) [18] How long this name was used is not known, but the Paris branch depot survived and was the antecedent of a wholly owned French sales subsidiary that was incorporated in 1913. [19]

The pattern of market penetration that had worked in France was followed in several other countries with large populations. This pattern consisted in local market prospecting and establishment of contacts with photographers, the beginning of sales, the setting up of branch warehouses, and when the volume of sales had grown sufficiently to support them, the incorporation of wholly owned sales subsidiaries. Depots were started in Vienna and Berlin in 1901; the latter was incorporated as a G.m.b.H. in 1908. The year 1906 saw the establishment of depots in Milan (incorporated in 1913) and Moscow. A depot was started in London in 1908, and this was incorporated shortly thereafter.[20]

The choice of country in this early pattern of penetration appears to have been dictated largely by assessment of market potential as measured by population size. After one year of Gevaert selling effort, The Netherlands represented by far the largest single foreign market for

the company. This is hardly surprising in view of its geographic and cultural propinquity. But the Dutch neighbor was a small country. Establishment of a Netherlands Gevaert sales depot did not take place until 1914, and it was not incorporated until nine years later.[21]

The company's sales were not for long confined to European markets; nor did they in all instances result from its own direct selling efforts. Shortly after the turn of the century, the Defender Photo Supply Co. of Rochester, New York requested and got exclusive U.S.A. distribution rights for Gevaert products.[22] A Defender Vice-President who had negotiated the agreement was prominent among the dignitaries who sat for portraits with Lieven Gevaert in 1905. The occasion was a celebration of the opening of the new Gevaert factory and company headquarters in Mortsel. The initial contract between Gevaert and Defender ran until the end of 1907. [23] Whether or not it was renewed is not known; but it is likely that a few years later the World War I transatlantic shipping disruptions and German occupation of Belgium would have closed the American market to Gevaert for some time in any event. Gevaert formed its own North American sales subsidiary in 1920. [24]

Other parts of the western hemisphere did not escape the company's attention. Sales agency-depots were organized in Buenos Aires in 1913 and in Rio de Janeiro one year later. Although the dates remain uncertain, depots were also set up in Montevideo (Uruguay) and Valparaiso (Chile) about this time.[25]

On the eve of the First World War, then, the Gevaert company was already trading on a broad international scale. The company's 1913 sales were close to Fr. 10 million, of which some 96 percent was exported.[26]

Strategic Issues During First Quarter Century

Although the company kept operating throughout the German occupation of Belgium, the 1914-1918 period represents a hiatus in its development. It may, therefore, well serve at this point to supplement what has already been reported so as to provide a basis for a critical interpretation of what, seen in strategic terms, took place during the company's early years. Much that occurred during those years set the tone and pattern for what was to come in the succeeding five decades.

A fact of the greatest strategic significance is that the Gevaert enterprise concentrated its entire industrial activity on paper coating for nearly two decades. This occurred during a period in which opportunities for profitable sensitizing of other photographic base materials were abundant, obvious, and quite probably within Gevaert technical competence to exploit.[27] A review of the company's actions and policies during this period may provide some clues to an understanding of its product strategy.

The start in paper is understandable in view of the modest financial resources initially available to Gevaert. Paper is simply a much less costly material than glass to tie up in working capital. Furthermore, the virtually unsolicited arrival of initial orders signified a great deal more than aesthetic satisfaction with Gevaert's paper. It was a sign of the times. During the 1890s, demand for the photographic image was growing to an extent that required multifaceted change. This included change in the way photography was practiced and commerce in its goods conducted; it included change in the technology underlying the production which fed this commerce.

Egg whites represented a technological blind alley from which photography had to be diverted. The separation of whites from yolks had obvious physical efficiency limitations. What is less obvious is that the photographer had to do his own sensitizing shortly before printing when he used albumenized paper. The product had a very short shelf life. The move to collodion and other binding agents was thus a change as profound in paper coating as the move from wet collodion to gelatin dry plates had been in negative materials a decade earlier. In this, and in other technical aspects, Gevaert was by no means a first mover. The substitution of collodion for albumen has been traced back to J.B. Obernetter in Munich in 1867.[28] George Eastman had first used machinery to coat paper in 1884.[29] The search for mechanical aids for this purpose in Germany during the 1880s had been sufficiently extensive to support the 1890 foundation of the Radebeuler Machinenfabrik August Koebig G.m.b.H. to supply such equipment.[30]

That which sets Lieven Gevaert apart from most of his contemporaries was his ability to combine these elements of change into a coherent strategic bundle that responded to the unarticulated imperatives of an international market.

Once started in paper, the enterprise soon had enough to do to absorb all the energies of its handful of employees. Gevaert did not rest on the laurels won by his Calciumpapier. After 1893, hardly a year went by that did not see the introduction of some new Gevaert product. These papers, emulsified with a variety of silver halogens and in a variety of binding agents, were developed to meet some market need, whether anticipated or actual, and whether aesthetic or technical. At the aesthetic level, papers came out with a variety of surfaces ranging from

mat to high gloss, from fine grain to raw. While colorprint photography awaited a future technology, Gevaert put out papers capable of being printed in monochrome tints of blue, sepia, green, violet and rose. Gevaert kept close enough to his market to sense that a growing segment of it consisted of amateurs who preferred to do their own developing and printing. For them, papers were made which obviated the need for the expensive gold and platinum baths which yielded such superb results for professionals. Papers were brought out which were more sensitive, thereby freeing the photographer from restricted lighting conditions. As is almost inevitable when a field requiring some technical background becomes more popular and the process falls into less expert hands, the resulting photographs sometimes became less than completely satisfactory. Gevaert invented papers on which acceptable prints could be made even when the negatives had poor contrast.

To take nothing away from Lieven Gevaert's ingenuity and inventiveness, it is to be noted here that he worked near the technical frontiers of photography of his the time but rarely crossed those frontiers to break really new ground. Precedents for early Gevaert product and process developments can be found elsewhere in Europe and America. Gevaert's contribution to the development of the photographic industry was entrepreneurial more than it was technical. In judging when the time was right to adapt innovations and bring them to market, his intuitions were generally sound.

There are several key patterns running through the early Gevaert history of product development and commercialization. First is that products were developed to satisfy a market need. (Lest this statement be taken as a superfluous platitude, it may be appropriate to point out that

the history of photography is replete with inventors whose first priority and purpose lay in the sheer overcoming of some technical obstacle, without regard to marketability.) Secondly, no paper which was superior to an earlier product in some respect was introduced before the commercial potential of the predecessor had been fully exploited. Finally, product development was sequential rather than proliferative although many varieties of paper were introduced. No paper was introduced without thorough testing of the variety of conditions under which it might be used. The sequence of steps required to invent, develop and test a new product is necessarily time consuming when limited resources are devoted to it. Gevaert hired his first university trained chemist in 1898; while others joined him in subsequent years, a decade elapsed before a central Gevaert research laboratory was formally instituted.[31]

The testing of new products before commercialization was of a piece with the entire Gevaert product policy. While he moved rapidly to put his production on an industrial basis, he maintained an essentially craftsman's attitude toward his product. An absolutely uncompromising policy with respect to selling only the highest quality product possible characterized the Gevaert business from the start. Long before modern statistics had integrated the insights of probability theory to put statistical quality control on a scientific basis, Gevaert sampled from production batches and rejected a batch if the sample were found wanting.[32] A policy of quality leadership became one of Gevaert's sources of competitive advantage. Such sources were a condition for survival and growth since Gevaert was hardly the sole participant in the field. Industrial scale preparation of photographic papers had been going on for decades when Gevaert entered the business. Paul Eduard Liesegang

had begun to succeed with albumen papers in Germany in 1860. [33] Trapp & Münch, whose main business was the milling of paper, began albumenizing in 1862. [34] A dozen photographic paper manufacturers were operating in Germany alone by 1890, and this number had grown to 28 at the turn of the century.[35]

Gevaert did little advertising in its early years. In 1900, Fr. 8,000 was spent for advertising.[36] Gevaert did not, however, rely entirely on word of mouth by satisfied customers to spread the word that its papers were a premium product. Gevaert papers were submitted to the judgment of experts at a number of international expositions. First prizes were carried off at Liège in 1905, Milan in 1906, and Turin in 1911. At the Brussels Fair in 1910, Gevaert papers were classified as "without competition." [37] These symbols of recognition and achievement, while a legitimate source of pride to members of the company in contemplating its history and traditions, are less than completely persuasive. We do not know against whose products the company was competing at these exhibitions. A more convincing, though also more grim, indicator of the esteem in which the quality of Gevaert papers was held is provided by Wentzel. He relates in his memoirs that Gevaert was able to keep operating under German occupation from 1914 to 1918 because the hard gradation of its Ridax paper could not be matched by any German manufacturer. Hard gradation was needed to print details from the fuzzy negatives obtained in aerial photography. The German military forces were a large customer during this period.[38]

The other aspects of the company's operations during this period show a conservatism which tolerated no nonsense. Few expenses were incurred which did not promise a quick return in higher sales, lower costs

or improved products. The sales policy was one of maintaining direct, close and frequent contact with customers and treating them as always being right even when they were not. The early books of the company show many entries for reclamatory allowances and adjustments.[39] As the sensitivity of papers increased with the introduction of new materials, Gevaert sales activity took on a stronger educational and service orientation. Customers had to be taught to adjust their exposure times to the new products.

The development of products intended to satisfy the needs of amateurs required no change in distribution channels. As this branch of photography began to grow in continental Europe, people who had been professional photographers gradually became retailers of photographic products. Recognition of the amateur market's significance was nevertheless expressed by an action the strategic importance of which increases whenever sales to ultimate users are not direct but through intermediary distribution channels. The company registered its first Belgian trademark in 1909; international trademark registration began the next year.[40]

The conservatism of the company's operations was matched by its financing. Debt was avoided entirely for the first ten years. When the first bonded debt obligation was issued for Fr. 300,000 in 1907, the shareholders' equity had grown to Fr. 840,676, and the net earnings exceeded Fr. 250,000. A second bond issue came out in 1912; this one amounted to Fr. 700,000, and by this time the shareholders' equity was close to Fr. 2.9 million, and net earnings exceeded Fr. 800,000.[41]

The foregoing portrait is that of a cautious, conservative management. But the story is somewhat more complex. The real nature of

Lieven Gevaert's attitude toward dealing with uncertainty is revealed by the contrast between the company's industrialization and its international expansion. The slow, steady, deliberate, methodical, patterened entry into foreign markets reflects caution in facing the unknown and in learning to deal with it over time. No such caution is apparent in the company's rapid movement from one coating technology to the next. Every new machine certainly represented some risk of either not working at all or of compromising the product quality on which the company had staked its existence. Yet, Gevaert and his associates had gained enough experience to be able to assess the probability of success in this domain with far more confidence than they could with respect to making good in foreign markets. Lieven Gevaert was thus not simply a risk averse conservative, but there were severe limits to his willingness to expose himself to risks involving multiple unknowns at any given time. He rarely took a step into the unknown without having a solid base on which he could fall back should anything go wrong.

Photography was going through a very gradual technological transition from plates to film during the three decades starting in 1890. Despite great technical strides by Eastman Kodak, the eventual outcome was not yet by any means obvious to everyone. The field had become fairly crowded with plate makers in England and Germany. The contemporaneous, and largely unsuccessful, initial struggles of Agfa and Bayer in Germany and Lumière in France to produce marketable film were surely known to Gevaert. It was not for a man who had based his company's survival on a reputation for quality leaderahip to place that reputation at risk until the new technology was more completely understood if not mastered.

But Gevaert's ambition to expand into other photosensitive

materials had burned from the beginning. As early as 1896, Gevaert had informed his investors of his intent to manufacture photographic plates. With his characteristic caution, he had arranged for an unidentified producer to make the plates to order under Gevaert supervision. The plates were to be branded as Gevaert products. This arrangement, he said, will "permit me to appreciate the investment yield of this new branch before impairing our own production." [42] Nothing came of this plan. The subject was not mentioned again until 1910 when construction of the first facilities dedicated to the manufacture of dry plates and cinefilm was begun after two years of experimentation.[43] The first Gevaert plates were marketed in 1912. [44] Volume production of cinefilm was achieved in 1913 when 11 million linear meters of 35mm film were produced.[45]

World War I put a stop to film expansion. This was a matter of raw material supply availability. Belgium, along with England, had developed a plate glass industry during the nineteenth century. The purity of its output had made it a premier supplier in photographic commerce. The nitrocellulose base used in film coating, by contrast, was bought by Gevaert from the Deutsche Celluloid Fabrik, Eilenburg, and the Celluloid Company of Newark, New Jersey, sources which became unreliable or impossible under wartime conditions.[46]

The war made several major national markets temporarily or permanently inaccessible to Gevaert. The company tried to compensate for this loss by turning its selling efforts to neutral countries. Among these were The Netherlands, the Scandinavian countries and Switzerland.[47]

The Interwar Period

The cessation of hostilities enabled the company to resume building on the foundation which had been set in place by 1914. Cinefilm production was resumed. Roll film and flat sheet film were introduced in 1923. The company participated fully in the explosive growth of photography during the 1920s. The use of advertising and budgets became visible during this period. Research and development became institutionalized as an indispensable element in the company's strategic mix. Wherever photography went in its technical development, Gevaert followed, rarely far behind. X-ray films were brought out in 1929, sound cinefilm a year later, and cinefilms for amateur use within two years after that event. By 1928, the company built a cellulose plant to lessen its dependence on foreign suppliers for this critical base material.[48]

A certain financial sophistication to be found in firms operating on an international scale became more evident during this period. A letter from the company to a Basel intermediary, written in 1926 to support an application to the Swiss federal bank for the opening of a commercial credit, lists accounts receivable denominated in a variety of national currencies. Among these were Dutch florins, Argentine pesos, Brazilian milreis, Danish, Norwegian and Swedish crowns, German and Finnish marks, English pounds, Italian lires, Spanish pesetas, French and Swiss francs, and Uruguyan piastres; customers in the Baltic States, Austria and Portugal had been billed in U.S. dollars, as had the company's U.S. affiliate.[49] Just when multi-currency invoicing began is not known. The possibility exists that this practice went back to the first export sales made by the company. Memorandum entries showing translations

of amounts invoiced to foreign customers show up in the earliest accounting journals of the company.[50] This would have been consistent with the policy of making life as convenient as possible for customers. A provision for foreign exchange losses showed up for the first time in the balance sheet at the end of 1914, the first war year.[51]

Gevaert continued the expansion of its international sales and distribution network throughout the interwar period. Some of the prewar affiliates had, for unknown reasons, fallen by the wayside since 1914, but other relationships were substituted. By 1927, the American subsidiary had branches in Canada and Mexico; the Vienna subsidiary was responsible for branches in Hungary, Czechoslovakia, Bulgaria, and Romania. Agents and independent distributors represented the company in 26 countries. That year, the company dispatched an experienced traveler to study on site the feasibility of appointing new representatives or of establishing direct trade relations in "China, the Japanese Empire including Korea and Formosa, Kwantung, Sakhalin, the Mariana, Caroline and Marshall Islands, the Kingdom of Siam and its dependencies, the Straits Settlements, Hong Kong, Oceania, Macao, Indo-China, Cochin, Tonkin, Annan, Cambodia, Laos, and Eastern Siberia." [52] Three years later, exclusive distributors had been appointed in Palestine, Ceylon, South China, North China, Japan, Indo-China, Manchuria, Cuba, Dutch Guyana, Venezuela, Colombia, Mozambique, Lowanda, and Albania.[53] In its booklet describing the company, published for distribution at the 1939 New York World's Fair, Gevaert listed representations in 74 countries and dependencies; nine of these were Gevaert subsidiaries.[54] Two were tied to the Gevaert family through marriage of Lieven Gevaert's daughter. Several of the wholly owned affiliates were held through an intermediary holding company

registered in Luxembourg.

An undated manuscript, the content of which suggests that it was written late in 1939, describes the Gevaert sales organization of the time. It is translated here in its entirety, not only for the light it throws on the Gevaert company but because it reflects what, with minor variations in detail, can be described as the standard practice of the entire international photographic industry during the twentieth century. (This is confirmed by Bäuerle [55], by Kobayashi [56] and by the present author's work experience during the 1960s and 1970s.)

Brief Overview of the Sales Organization of the Gevaert Firm

The Gevaert firm makes 'articles which, provided with their own brands and trademarks, are offered for sale to the public in all countries of the world and should be held in stock everywhere';

This applies to the principal products of its manufacture, that is to say, photosensitive products in current use. (Special products made by the Gevaert firm are not treated in the present overview.)

It is then to the sales of these articles that the sales organization is necessarily adapted. This organization is thus different from that of an industry which, for example, :

supplies unfinished products to other industrial enterprises,

makes articles which are delivered in neutral form, that is to say, without trademarks, and sold for the most part in large quantities in public commodity exchanges,

produces articles which are not sold to the public but solely to a restricted number of buyers, transmitting large orders at a time, orders which absorb over the months the production of the factory (army, navy, railroads, etc.),
etc.

Factory Sales Organization

At the head of this (organization) we find the Sales Manager. He is assisted by the Sales Services, direct and

auxilliary. The direct sales services comprise geographically divided departments :

1) Belgium and Belgian Congo
2) Central and Western Europe
3) Southern Europe and North Africa
4) Eastern Europe and Asia Minor
5) Great Britain and North America
6) Central and South America
7) Asia and Africa (other than North Africa and the Congo)

Each of these departments is headed by a Department Chief, who is backed up by an assistant and an adequate team of employees.

The following auxilliary services are functioning :

1) A 'Pricing' and 'Conditions of Sale' Department, which is headed by a Section Chief and which has as its mission the setting of sales prices and conditions of sale in the different countries, the control of these two matters, and the relations among producers under international conventions.

2) A Stenographic Department charged with the stenographic work of all the other services.

3) An Advertising Department which occupies itself with all the problems of advertising in Belgium and abroad.

4) An Editorial Department which occupies itself with the publication of publicity articles, usage guides, manuals, etc.

5) A Budget Department which lends help in the establishment of annual budgets, fixed year by year for each country separately, and which, in the course of the year exercises a severe control over budget performance.

6) A Finance Department and an Insurance Department, directed by a Section Chief. The function of each of these departments is indicated sufficiently by its name.

Sales Organization Outside the Factory

a) Belgium

In Belgium, sales are made in great part via wholesalers, and sometimes also, directly to a limited number of large retailers. The wholesalers directly supply professional photographers and retailers of lesser importance. The retailers sell to the public. Sales in Belgium are directed by a general representative, assisted by 7 traveling salesmen, who regularly visit the entire clientele, divided into geographic sectors. They also, and even particularly, visit the professional photographers, despite the fact that these receive their supplies from wholesalers.

b) Abroad

Abroad, the firm has founded its own affiliates in the principal countries. To these it has entrusted a sales monopoly for its products. This type of affiliate exists in Holland, Italy, France, Spain, Great Britain, Canada, the United States of America, Brazil and Argentina.

In other countries which are important from the point of view of consumption of photosensitive products, the Gevaert firm has appointed distributors, that is to say, agents who are exclusively at the service of the firm and who sell Gevaert products, be it, due to juridicial or fiscal motives, in their own name and for their own account, or be it, at the same time in the name and for the account of the company. The remuneration of this type of agent consists of a commission based on the realized sales turnover. Some of these agents cannot afford the expenses of selling, which fall to the charge of the firm; their responsibility is limited to that of the commission agent, to efficient distribution within the availability of stocks, and to the minute execution of fixed expense budgets. Others among these agents can absorb either the total or a portion of the selling expenses (personnel, rent, etc.), and for this category of agents, as is well understood, the commisssion percentage is proportionally higher, Agents of this type have been appointed by the firm in Denmark, Sweden, Finland, Poland, Czechoslovakia, Switzerland, Bulgaria, Greece, etc.

In the countries of lesser importance, or there where fiscal legislation renders it preferable, the Gevaert firm has entrusted the sale of its products to independent monopolists. The monopolists of this type are independent commercial firms, which buy and sell Gevaert products in their own name and for their own account. Exclusive distributors of this type exist in Norway, Hungary, Romania, Yugoslavia, Turkey, and in all other overseas countries not mentioned above.

In the countries with protective customs tariffs, the Gevaert firm has erected its own factories or concluded agreements for the production of Gevaert products with existing enterprises already in place; this is the case for France, Spain, and the United States of North America.

All the sales organizations in the different foreign countries are visited regularly by inspectors; it is thus that one inspector has been appointed for each of the following territories :

Central and Western Europe
Southern Europe
Eastern Europe
Asia Minor and North Africa
Asia and (the south of) Africa
Central America and South America

England and North America are visited by special delegates or by members of management. [57]

Manufacturing Abroad

Gevaert's first venture into foreign manufacturing was the result of a mixture of personal relations, marketing strategy and macroeconomic phenomena. The mixture was complex and perhaps somewhat idiosyncratic. Spain had during the 1920s increased its customs tariff to a level considered among the highest in Europe. By 1928, the tariff on sensitized film imported from Belgium, which enjoyed Most Favored Nation status, was imposed at the rate of 5.8375 pesetas per kilogram; for sensitized paper, it was 11.675 pesetas per kilogram.[58] It is difficult to describe this duty rate as protectionist; there was little to protect. A modest local paper sensitizing industry had sprung up after 1914 as a result of supply difficulties precipitated by the war. All the participants in this local industry, under pressure of the rapid postwar technical development in other countries, had consolidated into one firm, Industria Fotoquimica A. y R. Garriga, S. en C. Among the principals of this company were Rafael Garriga Roca and Higinio Negra Vive; the first had responsibility for general direction of the business and technical direction of the factory in Barcelona; the latter served as Commercial Director. The plant had technical difficulties in the proper drying of its papers after sensitization.

Garriga decided to seek help from abroad. In 1926, he met Hendrik Kuijpers at a convention of European photographic manufacturers in Germany. Kuijpers was Lieven Gevaert's first employee and closest business associate throughout their careers. At the time of the meeting, Kuijpers was serving as General Technical Director of the Gevaert firm.

Gevaert was at the time represented in Spain by an independent distributor, D. Eduardo Tey, who had expressed the intention of retiring. As the Garriga and Gevaert firms explored their mutual business interests over the next two years, a very close relationship developed between Rafael Garriga Roca and Charlotte Kuijpers, the daughter of Hendrik Kuijpers. This culminated in an engagement to marry. The wedding was first scheduled to take place in 1928 and to coincide with the merger of the two firms.

The marriage had to be postponed because of an accident sustained by Garriga, incapacitating him for two years. During his convalescence, Higinio Negra Vive ran the Barcelona plant and assumed responsibility for general direction of the business. Despite the marriage postponement, the fusion of the two firms went on as planned in 1928. The Garriga enterprise was incorporated as Industria Fotoquimica Nacional S.A. (Infonal), and the Gevaert company took a 75 percent equity participation, paying in over Fr. 2 million.

The state of the world economy which Gevaert faced after Rafael Garriga Roca resumed his duties as General Manager of Infonal in 1930 was clearly quite different from that which had prevailed earlier. The long sought technical assistance from Mortsel was too slow in coming in to suit Higinio Negra Vive; substantial policy disagreements between Garriga and Negra arose during the next two years. In the latter's view, the weight of Gevaert emphasis had shifted away from development of the Barcelona plant and toward use of the Infonal organization to distribute Belgian manufactured materials in Spain. Negra resigned in 1932 and began to lay plans for the foundation of his own company. In 1936, he sold his shares in Infonal and founded the forerunner of the present Negra Industrial S.A.

As a final and perhaps ironic touch, the new Negra operation, slow in getting started owing to the Spanish Civil War, sought out and received technical and commercial assistance from the local Agfa subsidiary in distributing its products in Spain.[59]

The Gevaert company sustained a severe setback during the global economic crisis of the early 1930s. Sales began to drop off after a 1930 peak estimated at Fr. 264 million and decreased by nearly one fourth over the next four years. A new sales record was not achieved until 1936.[60] As an indication of the essentially fixed cost structure of this industry, Gevaert profits during the five years starting in 1930 fell by 79 percent.[61]

It is hardly possible to read a Gevaert annual report covering this era without being exposed to a lengthy recital of the full panoply of trade hindrances characteristic of the time : protectionist import tariffs, import quotas and other restrictions, suspensions of international payments and currency inconvertibilities, competitive devaluations, League of Nations sanctions against Italy, civil war in Spain, German autarky; this was the fate of an enterprise dependent almost entirely on exports from a domestic manufacturing base during a decade in which the conduct of international economic relations often appeared to be heading toward anarchy.

Under these circumstances, and given the by now excessive production capacity of his company, it is perhaps understandable that Lieven Gevaert was in no mood to initiate further foreign adventures during these years.[62]

In addition, his world outlook and sense of social responsibility undoubtedly influenced his entire business strategy. He

was born and raised in a poor and barely industrialized Flanders in 1868.[63] The region had not escaped the ravages of an economic depression which lasted for the better part of three decades at the end of the nineteenth century.[64] Throughout his career, Lieven Gevaert expressed a concern for the physical and spiritual degradation that accompanies poverty. He believed that one of the necessary conditions for the social uplift of his provincial countrymen lay in industrial development. As soon as he felt that his business was on a solid enough footing, he began to give concrete expression to these concerns. At his initiative, a mutual aid society was formed in 1905; this society was a vehicle for funding pensions, life insurance and health insurance for Gevaert employees. In 1910, the company started evening courses for its employees. Gevaert started an employee Works Council in 1913, many decades before this became a statutory requirement throughout western Europe. A relief fund for inadequately protected widows and orphans of Gevaert workers was set up in 1920. An informal profit participation scheme was set up in 1900; it was institutionalized on a company wide basis in 1921.[65] Lieven Gevaert would not have denied the charge that some of his schemes were somewhat paternalistic. Among the objectives of his employee relations program was the bonding of his workers into a sense of belonging to an extended family. His humanistic impulses were genuine, and a major factor motivating his expansion of the firm was concern for the social welfare of his Mortsel workers.

We can submit that a chief executive motivated by such considerations will not lightly entertain the idea of a direct foreign manufacturing investment or the licensing of unrelated foreign manufacturers. In this light, the investment in Infonal must be

considered as a tactical exception within a larger strategic pattern. It was thus not until after the death of Lieven Gevaert in 1935 that the company moved to establish production behind trade barriers that had been erected by the governments in two of its potentially most important markets, France and Germany.

France had dealt with the economic crisis of the early 1930s in the nationalistic fashion characteristic of the time. The import tariff had been raised to levels at which the duty represented one third of the retail price for sensitized papers and ten percent for film. In addition, quantitative limits on importation of sensitized goods had been imposed.[66]

A new Gevaert subsidiary, L'Industrie Photographique S.A., was formed in France, and a paper and film factory was built at Pont-à-Marcq near Lille.[67] (That factory has continued in operation to the present day and is now an integrated unit of the Agfa-Gevaert global production system, producing two types of specialty papers for the entire world.)

In Germany, an accommodation to the political realities of the day was made. The company entered into a joint venture itself with Voigtländer, the oldest name in the commerce of photography. Voigtländer activity in the making of precision instruments antedates photography itself by nearly a century. Since 1840, when it had introduced the world's first photographic lens designed on the basis of mathematical calculations, Voigtländer had developed a reputation as one of the premier makers of high quality lenses and cameras.[68] Its shares had come under the control of Schering in 1923.[69] This German manufacturer of pharmaceuticals and fine chemicals, with which Gevaert had had a business relationship since its own beginnings, had wanted to keep at least a

toehold in photography, pending this industry's development.

The 1935 joint venture, called Voigtländer-Gevaert G.m.b.H., involved a 51-49 percent split of the share ownership. Although Gevaert had the smaller of these shares, it was given the responsibility for management of the factory. This was an abandoned textile mill that was converted to production of paper, plates, and films in the Spindlersfeld section of Berlin.[70] The German marketing organization of Gevaert was absorbed by that of Voigtländer which took over distribution within Germany of the Spindlersfeld factory's output and retained distribution of Voigtländer's own cameras and other optical goods. (The venture had a short life. The Spindlersfeld factory was expropriated and dismantled by Soviet occupation forces in 1945. A business relationship between the two partners was, however, kept alive until 1964. Until then, the global Gevaert sales network was used to distribute Voigtländer cameras outside Germany. Gevaert products were distributed in Germany by Voigtländer until 1957; for the next seven years, German distribution of certain Gevaert products was handled by a joint venture described below.)[71]

Gevaert's American sales subsidiary had been organized in 1920. By 1939, the Gevaert Company of America Inc. was operating sales offices in New York, Boston, Chicago, Philadelphia and Los Angeles. Its former branch in Canada had become incorporated, and Gevaert (Canada) Ltd. had offices in Montreal, Toronto and Winnipeg.[72] As the approach of a major war became evident in 1939, Gevaert anticipated the cutoff of its Western Hemisphere markets from their normal supply source. It bought an abandoned textile mill in Williamstown, Massachusetts and converted it to a paper and film coating plant. Production began in 1941 but never achieved scale economies or Gevaert quality standards. (The plant was

closed in 1948 and was eventually sold to Remington Rand Corporation which had earlier been licensed by Gevaert to coat a special paper for document copying applications.)[73]

1939 - 1963

Although a 1943 Allied air bombardment seriously damaged parts of the Mortsel factories and killed some 50 employees, the Second World War did not nearly affect the company 's operations as seriously as it did those of major European competitors such as Agfa. The German occupation officer under whose supervision the Mortsel factories were placed had been an executive of the Voigtländer company in civilian life. Given the relationship of the two companies, it can be presumed that he exercised his control in the Gevaert company's best interests to the extent this was possible under wartime conditions. German demands for aero-films were defied; existing stocks were destroyed, and new production was not undertaken.[74] In view of the German occupation of Belgium, Gevaert Ltd. in London was seized as enemy property by the British government. The subsidiary was, however, permitted to operate more or less normally under its own management and became a kind of wartime headquarters in exile for Gevaert subsidiaries in allied and neutral countries. When its Belgian supplies of sensitized materials were exhausted, some replacements were furnished by Ilford Ltd.[75]

The international economic dislocations caused by the war did not stop with the cessation of hostilities. The inconvertibility of Sterling, in particular, stimulated negotiation between Gevaert and Courtaulds Ltd. to form a joint venture for the manufacture of film base

at Norwich.[76] The British government did not allow this venture to get started, however, and as the postwar economic recovery went into high gear, the Gevaert company began a major expansion of its Belgian production facilities.

During the first postwar decade, a new emphasis in Gevaert product development became more manifest. This was an increasing concentration on the development and commercialization of photosensitive materials for use by other than amateurs. Among these were office document copying, industrial x-ray photography, professional cinematography, reprography and other graphic arts applications, and a variety of materials used in scientific and technical work.[77] This emphasis has implications which are wider than can be subsumed under the heading of product strategy. These products are characterized by high volume usage, making possible the rapid achievement of production scale economies. They further enable the producer to maintain direct sales and service contact with relatively few customers. And they obviate the need for much of the costly selling activities necessary for the development and maintenance of market position for a mass consumer product.

The foregoing summary of Gevaert postwar direction should serve as background to understanding of the company's further international development. In that development, much Gevaert management time and attention was devoted to Germany. Belgium's large industrial neighbor to the east had represented a problem and an opportunity for a generation. Prior to 1914, Germany had become Gevaert's biggest foreign market. As an aftermath of World War I, the German border had effectively been closed to Gevaert products until a German-Belgian trade accord was signed in 1925.[78] The company did not for long enjoy the benefits of this

agreement. The economic crisis of 1930, soon followed by the autarkic policies of the Nazi government, again brought Gevaert exports to Germany to a virtual standstill. The joint venture with Voigtländer did not survive the Second World War. As the reconstruction of the German economy brought unprecedented prosperity to that country, opportunity again beckoned. The next Gevaert move, though short lived, is significant for our story. This is because it reflects management thinking of the time and, seen in retrospect, it represents an adumbration of the dramatic developments that were to come.

In 1956, Gevaert executed two agreements with Zeiss Ikon AG in what had become the Federal Republic of Germany. Zeiss was an old and highly respected name in photography. Following the loss of the principal Zeiss factories in what had become the German Democratic Republic, Zeiss had acquired a number of West German photographic producers and had merged them into Zeiss Ikon AG. Among these was Voigtländer which had been bought from Schering AG.[79]

The first of the two Gevaert-Zeiss agreements called for the creation of a new, jointly owned German company, Gevaert Technik Vertriebsgesellschaft m.b.H., the function of which was to be the sale and distribution of all Gevaert professional and industrial user products in the Federal Republic. Under the second agreement, Gevaert was to supply its range of amateur use materials to be marketed in Germany under Zeiss brand names.[80]

The commercial myopia of the second agreement was not long in making itself obvious. Zeiss enjoyed a reputation for technical excellence in optical precision instruments. This reputation was the primary cause for the failure of the Gevaert-Zeiss arrangement to bear

fruit. Distribution of Zeiss products was limited to several hundred German prestigious photo retailers. No large scale commercial success was possible for Gevaert's amateur products in Germany under such circumstances. By 1958, discussions between Gevaert and Agfa were under way to explore other possibilities.[81] These discussions eventually culminated in the fusion of Agfa and Gevaert described in the next chapter.

Following the formation of the Latin American Free Trade Association in 1960, Gevaert acquired a newly reincorporated Argentine firm, Fabricacion Industrial Fotografica Argentina S.A., successor to an S.A.R.L. of the same name (hereafter FIFA). FIFA had a factory near Buenos Aires, and its initial mission under Gevaert direction was the production of monochrome films and papers. FIFA eventually became the center of gravity of the company's manufacturing operations in Latin America.[82]

Epiloque

During the seven decades following the founding of the Gevaert company, technological and economic developments in the world photochemical industry did not permit the survival of many manufacturers. Gevaert's rise to eminence during this period constitutes prima facie evidence of sound management. The quintessential characteristic of that management was conservatism. Although the company was among its industry's pioneers in the internationalization of markets, its international development was essentially arrested at the export stage. In the development of new products and processes, the company rarely led

the way, thereby sparing itself much of the pain and cost to which first movers are subject. In retrospect, the timing of its entry into product markets and production technologies seems nothing less than exquisite. Except for its rather late entry into an already mature dry plate market, it usually began to ride a new wave of product and process technology and market readiness before that wave crested. It knew, moreover, when to exit or abandon a field.[83] The company's history is a persuasive demonstration that an intelligent follower strategy can pay handsome long term dividends. Gevaert conservatism may thus be said to have served the company well. It was under no duress to give up its corporate independence in 1964. Sales and earnings had reached record levels; during the three years preceding the merger, the return on stockholders' equity had averaged 15.7 percent.[84]

The conservatism which served Gevaert so well for so long eventually became a source of weakness for the long run. It had, during its founder's lifetime, enabled the company to assemble an effective mix of business strategies. Because it had worked, it became implanted in the company's culture. Under such circumstances, a management's propensity to confound form and substance, attitude and strategy, becomes nearly irresistible. It becomes prisoner of a mindset that gradually becomes less appropriate as new technologies and new ways of conducting business emerge on the world scene.

The historian's task of reconstructing the past so that it has coherence for the present is difficult enough without assuming the added burden of speculating on what might have been. But several cases in point insinuate.

1.) During the early 1930s, a Japanese company approached

Gevaert for technical assistance. The request was turned down by Gevaert. Within a generation, Fuji Photo Film Co. Ltd. developed into the second largest enterprise in the photochemical industry.[85]

2.) Gevaert was one of the companies approached by Chester Carlson to support development of his electrostatic copying invention. That idea was rejected by Gevaert. It was eventually taken up by what is now the Xerox Corporation.[86]

These two cases have more in common than Gevaert rejection. Fuji and Xerox subsequently formed one of the most successful international joint ventures of modern times to exploit the process. The experience suggests that the issue goes well beyond adaptation of new technology. A marketing policy that does not develop beyond seeing outlets for domestic production in export markets will eventually blind management to new business opportunities and challenges that emerge in other countries. This proposition is supported by another case in point.

3.) In America, Polaroid Corporation developed a new branch of the photographic industry during the 1950s. The technical foundation of this branch was a process that had first been discovered by a Gevaert engineer.[87] The adaptation of this process to a consumer product, the original basis of Polaroid success, was perhaps a phenomenon that would have succeeded commercially only in the U.S. at the time. The instant gratification provided by the Polaroid system came at a high cost to the consumer. The retail price of the first Polaroid camera alone came to nearly $100. This was a sum not likely to be spent by many consumers for such a novelty in the war-torn economies outside the U.S.

Sectors of Gevaert's domain were clearly being invaded by products and processes in the hands of competitors more nimble, more

aggressive and less inhibited by their own traditions than the Gevaert of the late 1950s. During this period, conventional photography was moving toward greater use of color. This was particularly evident in the amateur sector. Despite the company's obvious success in the professional and industrial user fields, Gevaert management saw that its weakness, compared to Kodak and Agfa, in color technology and the amateur sector represented a danger for the long term. This had much to do with leading Gevaert to seek a common solution with Agfa.

Notes and References

1 Much of the history of the Gevaert company traced in this chapter is based on documents and source materials in two separate archives. These are :

A) Agfa - Gevaert Historisch Archief. Provinciaal Museum voor Fotografie. Antwerp, Belgium. (Subsequent to the research for this thesis, the author was informed that it was foreseen that this collection might be returned to Agfa - Gevaert in Mortsel, Belgium.) Citations of materials in this collection are hereafter identified by the abbreviation AGHA : D...; numerals following the letter D identify the box number in which the materials are stored; numerals, if any, following this box number indicate that the individual item has been catalogued as a separate document within that box; this has not been done for all of the documents.

B) Bedrijfsarchief Gevaert Photo-Produkten N.V. This collection is maintained by Agfa-Gevaert N.V. at their facilities in Mortsel, Belgium. Citations of materials in this collection are hereafter identified by the abbreviation GPP :... .

Research into the above archival materials was supplemented by a series of interviews with senior executives of Agfa-Gevaert N.V. during June 1983.

2 Laurent Roosens, "De ontwikkeling van de foto-en filmindustrie in de provincie Antwerpen", manuscript, ca. 1981, p. 27. (Subsequently published under the title "De foto-en filmindustrie" in Industrielle Revoluties in de Provincie Antwerpen, edited by Roland Baetens, Antwerp: Standaard-Scriptoria, 1984.) Hereafter cited as Roosens, "De ontwikkeling..."; page references are to original manuscript.

3 Carlo Gevaert, "L'Industrie Photographique en Belgique", in Extrait des Informations Economiques No. 6, Bulletin bimensuel du Ministère des Affaires Economiques, 15 Mars 1943, p. 157.

4 Roosens, "De ontwikkeling...," p. 2.

5 Willy Kühn, Die Photographische Industrie Deutschlands, Schweidnitz, Germany: Verlag Berthold Köhn & Co., 1929, p. 60. Hereafter cited as Kühn, Die Photographische Industrie....

6 GPP : General Ledger and General Journal, 1894-1901.

Among the earliest and most frequent remittances recorded in these books are those made in payment of Schering invoices.

These are the only surviving early account books of the company .

7 Roosens, "De ontwikkeling...," pp. 23-24.

8 Kühn, Die Photographische Industrie..., pp. 63-64.

It is appropriate to note in this context that George Eastman negotiated exclusive purchasing rights for North America from the combine within a short time of its formation. See United States v. Eastman Kodak Co. et al., Vol. 226 Fed. Rep., p. 71.

9 Exchange of correspondence, Felix Schoeller Jr. AG and Agfa-Gevaert N.V., 1979.

10 GPP : L.Gevaert & Cie. 1894 General Journal.

11 AGHA : Gevaert Post, 1954, n.p., (A company periodical published for its employees.)

12 GPP : 1953 Annual Report, (English version), p. 15.

13 AGHA : D40. "De productie van lichtgevoelig materiaal in Belgie," anonymous manuscript, ca. 1947, n.p.

14 Roosens, "De ontwikkeling...," p. 26.

15 Computed by the author from data published by A. Pil in "De N.V. Gevaert Photo-Produkten", Voor Iederen, Vol. 1 No. 3, 15 Nov. 1922 - 15 Jan. 1923, pp. 120-128; The result of this computation for 1913 closely accords with data reported by Roosens in "De ontwikkeling..."

16 Roosens, "De ontwikkeling...," p. 35.

17 GPP : L.Gevaert & Cie. 1894-1896 General Journal and General Ledger.

18 Lieven Gevaert, de mens en zijn werk, Leuven, Belgium: Davidsfonds, 1955, p. 90. Anonymous book length work, apparently sponsored by the company in celebration of its 60th anniversary.
Hereafter cited as Lieven Gevaert, de mens....

19 AGHA : D40. "Feestschrift voor een Wereldfirma bij haar 35 jaar bestaan," anonymous manuscript, ca. 1929.

20 AGHA : D40B - 17, "Inlichtingen uit Jaarverslagen en Balansen."

21 AGHA : D40B., Letter to the parent company from N.V. Handelsonderneming Gevaert, 'a Gravenhage, 5 April 1949.

22 Lieven Gevaert, de mens..., pp. 92-93.

It may be noted here that Defender was a struggling producer of photosensitive materials. Defender never acquired the physical, financial or intellectual resources required to compete effectively against its giant neighbor in Rochester. It was eventually acquired by E.I. DuPont de Nemours & Company.

23 Letter George Eastman to George Davison, 27 July 1907, Eastman - Butterfield Collection, University of Rochester Archives. See Note [1] of Eastman Kodak chapter for further description.

24 Lieven Gevaert, de mens..., p. 264

25 AGHA : D40, "Feestschrift...," (see Note [19] above).

26 GPP : 1913 Annual Report shows unconsolidated sales of Fr. 9,636,387.

AGHA : D40 - 16, "Note relative a l'activité et au développement de la société en Commandite par actions L.Gevaert & Co.," anonymous manuscript, ca. 1919, gives a round number of Fr. 10.5 million, presumably a consolidated figure.

27 A report of the 12 July 1892 meeting of the Brussels chapter of the Belgian Photographers' Association describes a factory capable of daily production of "more than 2,000 dozen plates sized 13 x 18 cm. Hardly started up, it has already produced 1,300 dozen per day.... Despite frequently defective output, it will realize a net profit of up to Fr. 1,800 per day." Bulletin de l'Association Belge de Photographie, Vol. 20, 1893, p. 71.

28 Fritz Wentzel, Memoirs of a Photochemist, edited by Louis Walton Sipley, Philadelphia: American Museum of Photography, 1960, p. 69. Hereafter cited as Wentzel, Memoirs....

29 Reese V. Jenkins, Images and Enterprise, Baltimore: Johns Hopkins University Press, 1975, pp. 82-83.

30 Wentzel, Memoirs..., p. 65.

31 Roosens, "De ontwikkeling...," pp. 37-38.

32 Interview with Laurent Roosens, Mortsel, Belgium, 1 June 1983. Dr. Roosens is one of many employees representing multiple generation association with the company . The information reported here was transmitted to him by his late father who spent his career in the company and served as its Commercial Director.

33 "Daten zur Entwicklung der Fotoindustrie", unpublished chronology, Volkswirtschaftliche Abteilung, Agfa-Gevaert AG, Leverkusen, Federal Republic of Germany, ca. 1975, p. 3. Hereafter cited as "Daten zur Entwicklung..."

34 Kühn, Die Photographische Industrie..., p. 61.

35 "Daten zur Entwicklung...," pp. 10, 14.

36 GPP : General Ledger, 1900.

37 Lieven Gevaert, de mens..., pp. 263-264

38 Wentzel, Memoirs..., p. 84.

39 GPP : General Journal, 1894-1901.

40 Tribunal de Commerce, Antwerp, Trademark Registration No. 2418;

Registre International des Marques No. 8792, Bureau International de la Propriété Industrielle, Service de l'Enregistrement des Marques, Berne, under the Madrid Agreement of 1891.

41 GPP : Annual Reports, 1907 and 1912.

42 GPP : Annual Report, 1895-6.

43 GPP : Annual Report, 1909.

44 Roosens, "De ontwikkeling...," p. 36.

The company's annual report for 1915 indicates, however, that commercialization of plates did not begin until that year.

45 AGHA : D40 - 16, "Note relative...," (See Note 26 above.)

46 Roosens, "De ontwikkeling...," p. 36.

47 AGHA : D40B - 17, "Inlichtingen...S," (See Note 20 above.)

48 AGHA : D40, "De productie...," (See Note 13 above.)

49 AGHA : D40A, Company letter to E. Hunin, Basel, 25 Sep. 1926.

50 GPP : General Journals, 1894-1901.

51 GPP : Annual Report, 1914.

52 AGHA : D40A, Letter from company to Société Nationale de Crédit à l'Industrie, Bruxelles, 5 May 1927.

53 AGHA : D40A, Letter dated 10 April 1930 to same bank cited in Note 52.

54 AGHA : D40 - 6, Gevaert Exhibition in the Belgian Pavilion at the New York World's Fair, 1939, New York: The Gevaert Company of America Inc., 1939. Hereafter cited as Gevaert Exhibition...

55 Ernst Bäuerle, "Absatzorganization eines Unternehmens der photochemischen Industrie", doctoral dissertation, Technische Hochschule München, Forchheim, Germany: Buchdruckerei Otto Mauser, 1938. pp. 186-190.

56 Setsutaro Kobayashi, Watakushi No Rireki Sho, Tokyo: Nihon Keizai Shinbusha, 1977, p. 95f.

57 AGHA : D23 - 9, "Bref apercu sur l'Organization de Vente de la firme Gevaert", anonymous manuscript, ca. 1939

58 Edicion oficial de los Aranceles de Aduana para la Peninsula e Islas Baleares, Real Orden de 25 Octubre de 1927;

Gaceta de Madrid de 30 Junio 1928.

59 Wentzel, Memoirs..., p. 95.

Jaime Roig Pujol, "La Produccion Fotografica en Espana", unpublished manuscript from the Garriga family archives supplied by Enrique Garriga;

Correspondence between the author and Esteban Negra Valls, 1984;

"Protokoll über die 5. Vorstandssitzung der AGFA Aktiengesellschaft für Photofabrikation, Leverkusen, 20 Jan. 1954."

60 The company stopped disclosing its sales figures after 1927; data used here have been estimated from a series of crude graphs published in the 1953 Annual Report.

61 GPP : Annual Reports, 1930-1935.

The reported earnings have been adjusted to remove the effect of a Fr. 3.7 million exchange gain realized on retirement of a Fr. 52.2 million debt that had been issued in 1930 and denominated in Sterling. All other data are necessarily somewhat arbitrary. Amortization of depreciable assets was still subject to management discretion to a far greater extent than to consistently applied accounting principles during this era.

62 GPP : Annual Reports, 1927-1929.

Gevaert had spent Fr. 60 million in facility expansion during the three years which ended the 1920s.

63 The term 'industrialized' is used here in its modern sense of machine driven production equipment. It thus excludes the Flemish textile weaving activities which had flourished since the Middle Ages.

64 Jan St. Lewinski, L'Evolution Industrielle de la Belgique, Brussels: Instituts Solvay, Université Libre, 1911, pp. 39-43, 102-105.

65 Roosens, "De ontwikkeling...," pp. 8-9;

AGHA : D13 - 15, "Van Huisnijverheid tot Wereldindustrie", company brochure, ca. 1954.

66 Bernard Engrand, L'Industrie Photographique en France, Paris: Editions Domat-Montchrestien F. Loviton, 1934, pp. 150-160.

67 GPP : Annual Report, 1935;

AGHA : D40A -16, Moniteur Belge, 20 May 1936.

68 GHA : D40A, L'Objectif, No.28, n.d. but ca. 1960.

69 Hans Holländer, Geschichte der Schering Aktiengesellschaft, n.p.: Schering AG, n.d. but post-1952.

70 GPP : Annual Report, 1935;

AGHA : D40B - 17, "Inlichtingen ...," (See Note 20 above.)

71 Interviews with Hendrik Le Page, Mortsel, Belgium, June 1983;

Correspondence with Hendrik Le Page, August 1984.

72 AGHA : D40 - 6, Gevaert Exhibition....

73 Interviews with Hendrik Le Page, Mortsel, Belgium, June 1983;

North Adams (Mass.) Transcript, 23 September 1939;
25 September 1939;
5 December 1940;
7 May 1941;
6 November 1945;
19 November 1948;
11 June 1953;
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Berkshire Eagle (Pittsfield, Mass.), 4 November 1940;
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R.R.R. Brooks, ed., Williamstown, The First Two Hundred Years 1753 - 1953 and Twenty Years Later 1953 - 1973, Williamstown, Mass.: Williamstown Historical Commission, 1974.

74 AGHA : D40, "Devoirs Patriotiques", anonymous manuscript, ca. 1945

75 Michael Wilsdon, "Gevaert - The Story of an Industry," Perspective, Vol I, February 1960, pp. 5-19.

76 GPP : Annual Reports, 1946-1947.

Statist (London), 31 May 1947.

77 GPP : Annual Reports, 1946-1955.

78 GPP : Annual Report, 1925.

79 "Daten zur Entwicklung...," p. 44.

80 GPP : Annual Reports, 1956-1957;

Interviews with Hendrik Le Page, Mortsel, Belgium, June 1983.

81 Interviews with Hendrik Le Page, Mortsel, Belgium, June 1983.

82 "Daten zur Entwicklung...," pp. 33, 43;

Correspondence from Hendrik Le Page, August 1984.

83 In 1903, the company sold off its photographic card business to a German company. In 1913, it had abandoned a research program in color photography. In the first instance, the business had not lived up to expectations; in the second, it was recognized that the effort was premature. GPP : Annual Reports, 1901-1913 and 1962-1964.

84 GPP : Annual Reports, 1962-1964.

85 Saburo Ohashi, ed. Sogyo 25 Nen No Ayumi, Private printing, Fuji Photo Film Co. Ltd., 1960, p. 35.

86 Interview with Andre Van der Auweraer, Mortsel, Belgium, 24 June 1983.

87 Laurent Roosens et al., eds., Vier decennia beeldoverdracht door diffusie, Mijlpalen in de fotografie, Deurne-Antwerp, Belgium: Sterckshof Provinciaal Museum voor Kunstambachten, 1978, p. 13.

Chapter IV

Agfa-Gevaert [1]

Historical Background

Discussions by top executives of Agfa and Gevaert, seeking a closer modus vivendi between the two enterprises, began in 1958. [2] It was not the first time the paths of the two companies had crossed in such efforts. A meeting had taken place as early as 1913. This conference, which involved representatives of Agfa, Gevaert, Kodak and Pathé, attempted to reach an understanding on cinefilm prices and on ways to prevent the film studios from playing off one manufacturer against another. This meeting had failed to produce an agreement. Gevaert had refused to go along with whatever had been proposed.[3]

A similar effort did result in an agreement in 1924. A convention involving Gevaert and the leading German producers, soon thereafter joined by French and English interests, agreed on a system of price regulation and production restraints. The leading national producer in each country established the price level for its domestic market. Foreign competitors had to accommodate to this level.[4] This arrangement lasted until World War II.

At the conclusion of that war, a Gevaert executive had approached Agfa with the suggestion that the two companies merge. The purpose was to reconstruct a European photographic industry capable of competing against Kodak. The merged enterprise was to be known by the Gevaert name. Agfa refused to consider this proposal.[5]

During the war, Gevaert had for a time made Agfapan film to Agfa's order. After a fire in Agfa's reconstructed Leverkusen plant had temporarily disrupted production there in the 1950s, Gevaert supplied celluloid base and 35mm film to the German company. Trade in intermediate and final products went on between the two companies during the postwar reconstruction whenever the production facilities of one had been inadequate to meet the then rapidly growing demand.[6]

Shortly before the outbreak of World War II, researchers at both companies had, independently and within the same year, discovered and patented the principles of diffusion transfer reversal. This process involves the migration of silver salts from negative to positive image layers when both are immersed in a developer and brought into contact with each other. The rapid formation of the positive image by this process considerably shortens the traditional sequence of developing, fixing, washing and drying needed to make a photographic print.[7] This process eventually served as one of the bases for a system of instant photography introduced by Polaroid Corporation.[8] Both of the European companies, however, chose document copying as the field of application to exploit the discovery commercially during the early postwar period. Executives of both companies met periodically during the 1950s to discuss ways and means of exploiting the process to mutual advantage. In the marketplace, however, lower level employees of both companies competed vigorously and as if no such discussions were taking place.[9] The formation of the European Economic Community in 1957 would, in any event, have inhibited continuation of such top management discussions. The Rome Treaty establishing this Community prohibits such anti-competitive collusion by companies within member countries.

In 1956, Gevaert acquired exclusive European distribution rights for the products of Pako, a Minneapolis-based manufacturer of photographic development and printing equipment.[10] Gevaert sales of this equipment to German photofinishing laboratories was perceived by Agfa as an indirect but potentially serious competitive move. It threatened the traditional hegemony of the specialty retailers over the service of developing, enlarging and printing of photographs for consumers. The performance of this service had long been a source of profitable revenue both for the retailers and for Agfa. The specialty retailers had for a generation been the foundation stone of Agfa marketing policy for consumer products. They constituted the major outlet for Agfa photographic papers and chemicals. The scale economies made possible by a Pako machine could only be achieved by a unit volume greater than that enjoyed by many dealers. This stimulated the development of a number of independent photofinishing laboratories operating on a wholesale basis. Agfa retaliated by introducing smaller equipment of its own design and manufacture after having mounted an unsuccessful public relations campaign cautioning against loss of the creative element in photofinishing.[11]

Merger Decision

These and other skirmishes involving two companies that knew each other well were the immediate stimuli prompting the search for a more comprehensive basis for cooperatioon. There also were larger considerations. These included the visible integration movement in the photographic and other industries, the fear of diminishing competitive power resulting from falling behind in technical development, the ever

growing technical strength and market presence of Eastman Kodak and the relative weaknesses of Agfa in professional markets and of Gevaert in amateur markets. A committee of senior executives representing both companies was appointed to study the matter in 1958. [12] Over the next three years, the members of this committee persuaded themselves and their principals that :

1) Production and research costs in both companies were rising more rapidly than sales revenues.
2) Global competition in the industry was becoming more intense.
3) Product rationalization and production cost economies could be achieved through joint effort.
4) Marketing costs were unnecessarily high due to the competition between the two firms, and these costs could be reduced.

The restraint of trade provisions of the aforementioned Rome Treaty influenced these deliberations. These provisions prohibit practices that inhibit competition among companies, but they do not prohibit mergers as such. By 1961, Agfa and Gevaert managements had concluded that the best solution lay in a complete fusion of the two enterprises.[13]

Commentary on Decision and Additional Background

These retrospective rationales, though not implausible, call for somewhat closer scrutiny. The two firms had long histories, traditions and individual company cultures. The respective managements had their own ambitions and fears. There was no duress impelling them to join their fates. The propensity to perpetuate their individual activities did not

die with the decision to merge. It may therefore be appropriate to reexamine what the two stood to gain in the long run by joining forces.

It has been estimated that 70 percent of Agfa's production during the early 1960s was devoted to amateur or mass market pleasure consumption. The same approximate percentage of Gevaert's output went into a variety of technical, professional and business use markets.[14] This was not fortuitous but the result of strategic choice. As related in an earlier chapter, photography was at this time undergoing a fundamental technological change. This was the move to color. This made itself especially evident in the amateur sector. It had already become clear by 1960 that no participant with ambitions to maintain a significant position in the industry had a chance of surviving for the long run without mastery of photographic color technology. Gevaert had introduced a Gevacolor film in 1949, using the prewar Agfa patents which had been appropriated by the Allied powers at the end of the war. The dyes were not stable, however, and the product never reached a level of technical development that made it competitive or that was up to the level on which the Gevaert reputation for quality had rested throughout its history. Gevaert had not been willing to undertake the substantial risks of the research and development efforts needed to keep pace with Agfa and Eastman Kodak in color photography; nor had Gevaert been willing to engage these two companies in the bruising and costly, albeit oligopolistic, competition in the consumer marketplace.

An alliance with Agfa thus promised to give the Gevaert organization access to a technology which it could have acquired on its own only at very high cost. It created an improved chance of more solid penetration of the German market with products in which Gevaert's

competence was distinctive. This was an opportunity that had eluded Gevaert for fifty years. It is not clear in retrospect that Gevaert could not eventually have done this on its own, given the development of the European Communities. But the use of the Agfa sales organization in its domestic market must, on balance, be considered to have been an advantage.

Sales of Agfa professional products had been largely confined to its domestic market during the postwar period. Access to the palette of Gevaert technical and professional products gave Agfa an improved basis for reentry into the markets of the larger industrially developed countries. Such reentry with only its amateur products into the U.S. and Japan, for example, would have been suicidal, given the presence of Eastman Kodak and Fuji on their respective home grounds.

An analysis of available 1963 sales data suggests that not more than 40 percent of the combined sales of $300 million was subject to direct competition between the two companies. Some portion of this would soon have fallen away in any event. Haloid Xerox had put its Model 914 electrostatic copying machine on the market in 1960. Within two years, it had formed joint ventures with the Rank Organization in the U.K. and Fuji Photo Film Ltd. in Japan to exploit the electrostatic copying process in Europe and the Far East.[15] 1964 imports by Germany of Rank-Xerox copiers amounted to DM 47 million.[16] The days of diffusion transfer based document copying, the process which had been the immediate source of contention bringing Agfa and Gevaert together, were clearly numbered, although the process subsequently found other commercial and industrial applications.

The complementarity of the two companies' product lines was mirrored in their foreign operations. Manufacturing operations abroad during the early 1960s were as follows :

Agfa [17]

France : Société Nouvelle As de Trèfle, S.à.r.l.; 52 percent Bayer owned; document copy papers and photographic chemicals.
Fabrique d'Horlogerie La Vedette, S.A.; 50.2 percent Agfa owned; camera shutters and cameras.

Brazil : Industria Fotoquimica Bove, S.A.; 79.9 percent Agfa owned; papers.

India : The New India Industries Ltd.; 25.7 percent Agfa owned; cameras and papers.

Gevaert [18]

Argentina : Fabricacion Industrial Fotografica Argentina, S.A. (FIFA); 99 percent Gevaert owned; monochrome films and papers, document copy papers.

France : Gevaert France, S.A.; 100 percent Gevaert owned; monochrome films and papers.

Spain : Industria Fotoquimica Nacional, S.A. (Infonal); 100 percent Gevaert owned; document copy and other monochrome papers.

Perutz [19]

(The affair becomes somewhat more complex. This is due to the presence of Perutz interests which, as related below, had been acquired by Bayer. For the point to be made here, this interest is merely listed.)

Spain : Manufacturas Fotograficas Espanolas, S.A. (MAFE); 28.4 percent Perutz owned; x-ray, cine and amateur films.

Each of the above listed foreign direct investments had been market seeking in motivation. Most of them had been made to cicumvent some national barrier to international trade. This fact and the nature of the products made in the various locations suggest that the opportunities

for achieving greater production scale economies abroad through rationalization were minimal at the time and for the foreseeable future.

The combined international sales and distribution network of the two companies extended to 144 countries.[20] The Gevaert network was, reflecting the company's traditional export policy, perhaps somewhat more highly developed; it extended over 122 countries including wholly owned subsidiaries in sixteen.[21] In at least ten countries, mainly in Latin America, Agfa was represented by departments of its Bayer parent's sales organization. Sales subsidiaries under direct Agfa management were operating in seventeen countries. The number of countries in which both Agfa and Gevaert were operating sales subsidiaries amounted to seven; some distribution functions may also have been performed by wholly owned photofinishing laboratories that had been established by Agfa in several countries where Gevaert had its own selling subsidiaries.[22]

The above facts strongly suggest that it was possible and quite likely to have overestimated the potential for a more secure future prosperity simply through elimination of duplicate costs. There appears to have been more overlapping of activity in the international marketing function than in manufacturing and research before the merger. Such economies of scale as could be achieved through joint effort would in the long run benefit the merged enterprise only if the products manufactured under these conditions could find outlets. It can thus be said in retrospect that the potential for expansion of international scope may have had a significance that has previously been underestimated.

Small and Large Mergers

The decision to merge having been reached in 1961, it took three more years to develop a suitable form. In the eyes of the two senior managements, substantial barriers stood in the way of using traditional means to achieve this end. Such traditional means might, for example, have involved the takeover of one company by the other. This was rejected because it would have adversely affected management and employee morale in whichever company had been taken over. Harmonization of legal systems within the European Communities had made no progress toward permitting the formation of one European corporate entity the validity and rights of which would be recognized by all member nations. A classical merger would, under these circumstances, have required the formation of one new corporate entity in one particular nation. Apart from the national sensitivities of stockholders of the two merging companies, such a move might have had unfortunate fiscal consequences for one or the other or both groups of shareholders.[23]

The legal forms adopted and the rationales given for their adoption have been reported at length elsewhere and are summarized here only for the sake of completeness.[24] The participating entities, Agfa AG and Gevaert Photo-Produkten N.V., turned themselves into holding companies. Two operating companies were formed, Agfa-Gevaert AG in Germany and Gevaert-Agfa N.V. in Belgium. (The name chosen for the Belgian operating company undoubtedly represented an appeasement of Gevaert stockholders and employees at the time. In 1970, six years after the merger, the Belgian operating company's name was changed, for the sake of commercial uniformity, to Agfa-Gevaert N.V.) The two holding companies

each held 50 percent of the shares of each of the two operating companies. These came under joint general management direction through boards of directors with common members except for the labor representatives on the supervisory board of Agfa-Gevaert AG required by the German co-determination law.[25] Fixed assets originally owned by the holding companies were leased to the operating companies. Patents, trademarks, other assets and employees were simply transferred to the operating companies. Future investments in various assets were intended to be made by the operating companies for their own account. Net profits of the operating companies were, when distributed, to be shared equally by the holding companies.

As two new entities emerged rather than one, and as the identities of the merging firms were not lost so much as combined, the arrangement might more accurately be described as a de facto merger. It is, however, referred to herein simply as a merger. This is both for the sake of brevity and in recognition that Agfa-Gevaert in fact became a single operating enterprise irrespective of the legal mechanisms chosen. The selection of these mechanisms was guided by the most punctilious regard for national sensitivities and company traditions on both sides. The result was a legal fusion of two national companies with international orientations and embryonic multinational characteristics into a transnational enterprise.[26] It should be pointed out here that execution of the marriage certificate is a necessary but not sufficient condition for a functioning marriage. After the legal formalities were completed, the work of integrating the operations of the two companies remained to be done.

These integrating efforts were complicated by factors that were

part of the entire package design. In what might be called the folk terminology used within the German company, the fusion of Agfa and Gevaert became known as "the large merger" and "the big solution." It was immediately preceded by "the small merger" or "the little solution." The latter meant the absorption by Agfa of seven smaller German photographic manufacturers. These firms were :

Perutz-Photowerke G.m.b.H. and its wholly owned subsidiary,
CAWO Photochemische Fabrik G.m.b.H. *

Mimosa G.m.b.H. *

Leonar-werke AG. *

Chemische Fabrik Vaihingen/Enz G.m.b.H. **

Gelatine-Fabrik Koepff & Söhne G.m.b.H. **

Otto Schlund G.m.b.H. **

* Makers of branded photographic products, to be viewed as Agfa competitors within their limited spheres and the acquisition of which represented horizontal integration.

** Manufacturers the acquisition of which represented vertical integration.

Agfa's parent company, Bayer, had prior to 1964 acquired partial or complete equity interests in these seven firms, but they had been treated as portfolio investments. As part the so-called little solution, these companies were completely absorbed into the Agfa organization. Although each of these seven firms was, with the exception of Perutz, of moderate significance, the small merger had the effect of considerably enlarging Agfa and putting it on a more equal footing with Gevaert.[27] In

an operational sense, the timing of the small merger could have been more propitious. Rationalization of product mix, production, marketing and distribution had to be achieved simultaneously with the integration of these functions with Gevaert.

The small merger had international repercussions of its own, thus adding to the complexities of the large merger. The Perutz firm had existed since before 1880 and had begun making dry plates in 1882. [28] Although Perutz had survived mainly as a uninational business, it had achieved modest export distribution by the 1930s. [29] By the time of the small merger, Perutz had its own sales subsidiaries operating in Austria and Italy.[30] In 1949, Perutz had also gained a foothold in Spain by organizing, with local equity participation, a joint venture for the production of monochrome amateur, cine and x-ray films. This venture took the name MAFE. (See above.)[31] The marketing and general management functions of MAFE had to be integrated with those of Gevaert's Infonal subsidiary and with the Spanish marketing operations of Agfa and Gevaert.

The integration and coordination of operations in Belgium and Germany proceeded without abnormal difficulties. The Belgian operating company took on responsibility for technical and professional products. The German operating company did the same for amateur products. This eliminated competition in the market place between the two former companies. But this concentration of effort merely reinforced the major emphases which the two companies had given their product lines before the merger. There thus was not too much duplicate production and management to eliminate.

Integration of overlapping foreign operations was, by contrast, somewhat more difficult. Perhaps the most complex situation, that in

Spain described above, was successfully resolved within two years. In some other countries, where there had been what were now overlapping subsidiaries and/or independent distributors, the effort took much longer. The elimination of competing products was easier to achieve than the appointment of managers in subsidiaries abroad. Where there had been two subsidiaries in a foreign country, there would now be one. In such countries, a number of functional and general management positions had to be eliminated. Less difficult, but not entirely free of problems, was the elimination of duplicate distributorships in many countries.

The one country in which legal obstruction to the combining of several subsidiaries into one might have been expected did not raise any barriers. There is no record of the U.S. Department of Justice intervening to stop the merger. Any attempt to explain this lack of action on the part of U.S. anti-trust law enforcers is pure speculation. But it is not wildly implausible that they might have welcomed the merger. This is because of the overwhelmingly dominant market position that Eastman Kodak enjoyed in the U.S. market for photographic products at the time. Any additional strength accruing to Agfa-Gevaert as a result of its merger might well have been interpreted as a factor creating the possibility for more effective competition in the U.S. market rather than less.

The work of integrating Agfa-Gevaert into a unified world-wide enterprise was done during a period in which the company participated in an explosive growth in the global business opportunities offered by photography and related imaging technologies.[32] This eventually led to a new company structure in 1979. This structure comprised four operating divisions, each with its own research, production and sales functions and

global profit responsibilitiy. The four product families for which operating divisions were established comprised Amateur Photo, Technical Photographic Products, Office Systems, and Magnetic Tape. A centralized Regional Sales Coordination staff function was established as part of this structure. The group was by this time operating around the world through 22 national sales subsidiaries and 145 independent foreign distributors. Exports represented 70 percent of the Agfa-Gevaert group's sales at the end of the 1970s. [33]

Post-Merger Strategic Issues

Despite enormous revenue growth, the post-merger profit performance of Agfa-Gevaert has been lackluster. During the fifteen years following the merger, net earnings reported by the operating companies averaged less than one percent of worldwide sales and never rose above 2.4 percent after 1965. [34] These can hardly be the results envisioned by the merger's architects. Some examination of what occurred during the post-merger period is in order.

Let it be stated at the outset that the problems underlying Agfa-Gevaert's poor profit performance do not appear to be related in any way to the transnational nature of the merged enterprise. There was not a trace of national bias among the many of senior and middle management executives who were interviewed, both formally and informally, in the course of the present research. To the extent that the disagreements which are inevitable in any large organization may arise, they reflect the viewpoints of executives as individuals, not as representatives of a given national culture.

Any conflicts that could have arisen because of the binational ownership of Agfa-Gevaert were removed at the source. By 1979, the operating companies needed a large infusion of additional share capital. This was subscribed in its entirety by Bayer AG, thereby giving Bayer a 60 percent equity interest in both operating companies. Two years later, in connection with a further increase in the share capital of the operating companies, all of which was again paid in by Bayer, the latter acquired the minority interest still held by Gevaert Photo-Produkten N.V., the Belgian holding company. As a result, Bayer is now the sole owner of Agfa-Gevaert. Bayer is a German company, though some of its shares may well be held by people and institutions outside Germany. The senior management of Agfa-Gevaert remains binational. The chief executive at this writing is a Belgian. This is a fact that no one would expect if the German parent were under the influence of any national bias.

There is, furthermore, no evidence that the labor participation in the highest councils of management required by German law is causing any unusual problems. It can be presumed that the labor representatives on the supervisory board of the German operating company were not elated by the decision to close the company's Munich camera works permanently. (See below.) But they accepted the decision, though it led to the dismissal of several thousand workers.

Certain macroeconomic forces did affect the profits reported by Agfa-Gevaert. These forces included the general turmoil in the world economy beginning in the late 1960s, an inflation in raw material costs far exceeding the increase in the general price level, and the relative strength of the Belgian franc and the Deutschmark during the 1970s. As Belgium and Germany are the main manufacturing and administrative bases of

the company, a heavy preponderance of costs incurred is necessarily denominated in these currencies. This was a source of competitive disadvantage the results of which are reflected in the reported earnings.

Macroeconomic forces do not, however, provide a complete explanation. There were other forces at work. A critical review of what Agfa-Gevaert chose to disclose and emphasize in public, and what it chose not to reveal or to deemphasize, leads to some tentative conclusions. This review suggests that the company pursued a highly successful strategy in its professional and technical product markets. A key element in this strategy is what might be called a systems approach. This involves selling a mechanism engineered to provide a certain type of photographic image. The mechanism is designed, in its optical, electronic and mechanical aspects, so as to make it necessary to use the same manufacturer's photosensitive materials. Once the customer decides to use a given system, he must consume certain photosensitive materials for some time to come. Even when the consumable materials of a competing manufacturer can be substituted, the customer often buys those made and supplied by the equipment manufacturer. The after-sale service provided by the manufacturer generates a certain customer loyalty. This approach more or less assures the manufacturer of a steady stream of sales revenue as materials are consumed and have to be replaced by the customer. Variations of this approach had been exploited brilliantly for years by Eastman Kodak and Polaroid in the amateur photographic sector. Agfa-Gevaert prospered in adapting this strategy to its industrial user markets.

The same review suggests that the handsome profits generated by its industrial user business were being drained away by Agfa-Gevaert's

participation in the amateur photographic sector. In this sector, the company had become the prisoner of its own historic business strategy and, in a larger sense, of Agfa's locational history. Compared to its competitors, the company moved slowly and with some difficulty to extricate itself from its nearly exclusive reliance on photographic specialty retailers for the distribution of its products to the consuming public. Had it not unfolded as gradually as it did over a twenty year period, the development of a variety of mass retailing outlets as significant distribution channels for photographic products in continental Europe, particularly in the German Federal Republic, might well be termed a revolution. Agfa-Gevaert gradually came to grips with this revolution by such means as using the Perutz brand name to move its films at substantially lower prices through German mass merchandise outlets. Such moves came late in Germany and had little hope of succeeding in international markets, where the Perutz name had little meaning.

The area within which the company had room for strategic maneuver was severely circumscribed by the location of its amateur product manufacturing base in Germany. Despite whatever success it achieved in product cost reduction, the company and its pricing policy had become captive to its own cost structure. In the heady expansionary atmosphere of the postwar reconstruction, Agfa's administrative bureaucracy had become not only very large but too deeply entrenched to be uprooted save by the most dramatic means. Such means, for example, were resorted to in 1982, when a management decision to terminate production of amateur cameras was made. This meant the permanent closure of camera manufacturing facilities in Munich and an eight year old satellite camera factory in Portugal. This was was described as "imperative to safeguard

the existence of the company".[35]

A similar decision with respect to amateur use photosensitive material, which is produced in Leverkusen, is most unlikely. Leverkusen, a town north of Cologne in North Rhine-Westphalia, is the site of :

1. Corporate headquarters for Bayer AG, Agfa-Gevaert's parent company.
2. The principal chemical manufacturing works of Bayer AG.
3. Administrative headquarters for all Agfa-Gevaert operations within the Federal Republic of Germany.
4. The principal Agfa-Gevaert research, development and manufacturing works for amateur use photosensitive materials.

Except for retail and service businesses serving the Leverkusen community, Bayer and Agfa-Gevaert are the sole employers of consequence. There is a highly developed top management sense of social responsibility for the maintenance of employment where there are no alternative opportunities. German institutional employment arrangements do not, in any event, encourage employee mobility. Bayer is a highly profitable enterprise; it has a deeply embedded corporate bureaucracy of its own; it also has an established policy of employee benefits the lavishness of which goes well beyond world standards. The range of benefits offered is necessarily common to Bayer and Agfa-Gevaert employees in Leverkusen. Bayer may be able to afford them; Agfa-Gevaert cannot. Given all the foregoing factors, it is difficult to foresee management decisions either to terminate the company's activities in amateur photosensitive materials completely or to scale down its excessive administrative overhead costs. Were such decisions to be taken, the impact on the Leverkusen economy and

on Bayer employee morale would be severe. As long as the excessive costs continue to be incurred at their recent levels, prices charged by the company for amateur films and papers will remain high compared to the prices of Japanese competitors whose overheads are more commensurate with their sales volumes. The present pattern of Agfa-Gevaert operations in amateur photographic materials is thus a holding action, maintained while normal employee attrition and retirements take their effect.

Contemporaneous with this holding action in the amateur photographic sector, Agfa-Gevaert has gradually been developing a strategic reorientation to its business. Like every other major participant in the photographic industry, it has been searching for sensible ways to combine its distinctive competence in photochemistry with the emerging electronic technologies to satisfy the world's appetite for image information. A major step in this search was taken in 1981 with the $78 million acquisition of a 69 percent interest in Compugraphic Corporation.[36] At the time of acquisition, Massachusetts-based Compugraphic held a dominant position in the market for computerized phototypesetting equipment used by smaller circulation newspapers and in-house corporate publications. Consolidation of Compugraphic sales represented the lion's share of the 1982 sales increase reported by Agfa-Gevaert that year and raised the share of the group's global sales represented by foreign countries to 78 percent.[37] How this and related developments will eventually affect the company remains to be told by future historians. But it is clear that Agfa-Gevaert's continued development as a participant in world business had taken a new direction.

Notes and References

[1] Sources used to develop this chapter are the same as those used for the individual Agfa and Gevaert chapters. The reader is referred to Note [1] following each of those chapters for more descriptive detail.

[2] Interviews with Hendrik Le Page, Mortsel, Belgium, June 1983. Hereafter cited as "Le Page interviews."

[3] Adolf Leubner et al., eds., "Geschichte der AGFA Berlin-Wolfen Vol. Ia", unpublished two volume manuscript, Leverkusen, Federal Republic of Germany, Agfa-Gevaert Foto-Historama, p. 134. Hereafter, this work and its three volume companion, "Geschichte der AGFA Aktiengesellschaft in Leverkusen 1854-1958 Vols. IIa, IIb, and III" are cited as "Leubner et al. Vol....".

[4] L.J. Heens, "Industrie en Handel der Belgische Foto-Produkten," Licht en Schaduw, serialized June 1936 to January 1937, no pagination;

Bernard Engrand, L'Industrie Photographique en France, Paris: Editions Domat-Montchrestien F.Loviton, 1934, pp. 140-141.

[5] Leubner et al. Vol. IIa, p. 112.

[6] Le Page interviews.

[7] Laurent Roosens et al., eds. Vier decennia beeldoverdracht door diffusie. Mijlpalen in de fotografie, Deurne-Antwerp, Belgium: Stercxshof Provinciaal Museum voor Kunstambachten, 1978, p. 13.

[8] Interview with André Van der Auweraer, Mortsel, Belgium, 24 June 1983.

The use of this process by Polaroid led to protracted negotiations which culminated in an exchange of licenses between Polaroid and Gevaert in 1956 and between Polaroid and Agfa in 1958.

[9] Le Page interviews.

[10] "50 Jahre Pako : das automatische Fotolabor", Gevaert Press Service release, ca. 1960.

[11] Le Page interviews.

[12] Ibid.

13 Heinz Berger et al., eds., "Geschichte der Agfa Aktiengesellschaft in Leverkusen 1959-1964 Vol. IV.", unpublished manuscript, Leverkusen, Federal Republic of Germany, Agfa-Gevaert Foto-Historama, pp. 166-168. Hereafter cited as "Berger et al. Vol. IV".

14 Ibid., p. 167.

These estimates are necessarily somewhat arbitrary. There are photographic products that serve the needs of amateur and professional users equally well, and it is certainly difficult to predict who the ultimate user of any given unit of production will be.

15 "Daten zur Entwicklung der Fotoindustrie", unpublished chronology, Volkswirtschaftliche Abteilung, Agfa-Gevaert AG, ca. 1975, pp. 48, 50. Hereafter cited as "Daten zur Entwicklung..."

16 Berger et al. Vol. IV, p. 127.

17 Ibid., p. 196.

18 Gevaert Photo-Produkten 1963 Annual Report;

Correspondence with Hendrik Le Page, August 1984

19 Berger et al. Vol. IV, p. 196;

Agfa-Gevaert 1964-5 Annual Report.

20 Ibid.

21 Gevaert Photo-Produkten 1963 Annual Report.

22 Berger et al. Vol. IV, p. 196.

23 Hendrik Le Page, "The Agfa-Gevaert Merger", Industrial Integration in Europe, London: Federal Trust for Education and Research, 1968, pp. 9-13;

Agfa-Gevaert 1964-5 Annual Report.

24 See Paul Morton Goldberg, "The Evolution of Transnational Companies in Europe", unpublished Ph.D. dissertation, Alfred P. Sloan School of Management, Massachusetts Institute of Technology, 1971, pp. 134-156.

25 Correspondence with Hendrik Le Page, August 1984.

26 In the hope of maintaining clarity of exposition, Robinson's terminology is used here. See Richard D. Robinson, International Business Management, 2nd Ed., Hinsdale, IL: Dryden Press, 1978, pp. 642-677 for definitions of international, multinational and transnational.

27 Berger et al. Vol. IV, p. 164;

Agfa-Gevaert 1964-5 Annual Report;

Correspondence with Hendrik Le Page, August 1984.

28 "Daten zur Entwicklung...," pp. 7-8.

29 Ernst Bäuerle, "Absatzorganization eines Unternehmens der photochemischen Industrie", doctoral dissertation, Technische Hochschule München, Forcheim, Germany: Buchdruckerei Otto Mauser, 1938, pp. 186-190.

30 Berger et al. Vol. IV, p. 192.

31 "Daten zur Entwicklung...," pp. 39-40.

32 The worldwide inflation and exchange rate changes which occurred during the fifteen years following the merger make any serial financial data not more than the very roughest of growth indicators. The following data are to be seen in light of this qualification.

(in Millions of U.S.$)

	1964-5	1979
Sales	$ 319	$ 2,026
Stockholders' Equity	99	349
Research Expense	17	149
Personnel Expense	83	681
No. of Employees	29,552	32,059

Source : Agfa-Gevaert 1964-5 and 1979 Annual Reports.

33 Agfa-Gevaert 1979 Annual Report.

34 Agfa-Gevaert Annual Reports, 1964-5 to 1979.

The group has never disclosed its consolidated earnings. It is, however, unlikely that the earnings of the group's subsidiaries outside Belgium and Germany would significantly alter the stated conclusions.

35 Agfa-Gevaert 1982 Annual Report.

36 Agfa-Gevaert 1981 Annual Report.

37 Agfa-Gevaert 1982 Annual Report.

Chapter V

Ilford [1]

Introduction and Early History

In 1976, a British bi-monthly, The Photographic Journal, published a short historical essay entitled "Plates, Ilford, England." Its author, George Jones, a retired Managing Director and historian of the Ilford company, states in this article that the words in its title were a cable address known throughout the world from 1900 until the arrival of telex.[2]

As of the writing of this thesis, Ilford is among the most minor of minor league players in its industry. Its continued existence is tolerated by its Swiss based parent for only one reason. This is that Ciba-Geigy A.G., with an eye on much larger corporate interests, wants to avoid, to whatever extent possible, being cast in the role of the nasty multinational which takes over local enterprises, exploits them and then shuts them down when they have outlived their usefulness.[3] The small toehold in color photography which the Ilford Group manages to maintain with the products branded as Ilford Cibachrome depends on technical assistance provided by Konishiroku.[4]

Analysis of such fragmentary evidence as still exists suggests that the title of the Jones article has a significance that goes well beyond what its author intended to convey. The Ilford case is a classic example of the business-technological mind-set identified by Jenkins. This mind-set is characterized by a commitment to a given technology and

way of conducting business. It becomes oblivious to the possibilities and later to the imperatives of new ways.[5] The company was started in 1879 by Alfred H. Harman as a cottage industry dedicated to the manufacture of gelatin dry plates in the village of Ilford, east of London.[6] Harman took up the sensitizing of papers in 1884, but the reputation of his firm rested on the excellence of its plates.[7] A small indicator of public acceptance of this product is given by an 1887 survey of member usage undertaken by the Camera Club Journal. Its report showed the following data : [8]

Ilford	312
Eastman	223
Cadett	187
Wratten & Wainwright	79

Once firmly established in the coating of glass plates, Harman became committed to this photographic medium. A film was brought to his attention in 1892. B.J. Edwards, a local plate maker later acquired by Ilford, had made a film coating machine. Harman inspected the machine and decided against going into films.[9] Three years later, the company did purchase the business and goodwill of Austin Edwards, a son of B.J. Edwards and, perhaps somewhat more significantly, a maker of both plates and films. These films were, however, coated on flat sheets of celluloid. They were sold as plates at prices which were 50 to 100 percent higher than glass plates.[10] These flat films appear to have been coated manually, a process that was not destined to be competitive with Kodak.[11] The film did not sell well and was phased out in 1896. [12] The company was approached by owners of several small roll film manufacturers looking for buyers in 1899, 1900, 1902 and 1903. These offers were all rejected.[13] When the company finally decided to enter the field in 1912, it engaged two Germans to undertake the necessary

engineering work. They were asked to leave the country as undesirable aliens after August 1914. It was 1922 before Ilford was able to introduce a roll film in commercial quantities.[14] Its commitment to plates remained undiminished, however. A peak daily production rate of 45,000 plates was achieved in 1933, a year not otherwise noted for the brilliance of its economic activity.[15] Ilford coated its last plates in 1975. [16]

Foreign Marketing

The above sketch of Ilford product commitment is illustrative of a broad set of management attitudes. These attitudes accepted the status quo not merely as given but as nearly immutable. Distribution of product was effected through agents and wholesalers. The company did not have its own traveling salesmen before 1923. The idea of having them was brought in by T.M. Illingworth whose company had been acquired.[17] An advertisement run by Ilford in an 1889 professional yearbook carried the following laconic footnote :

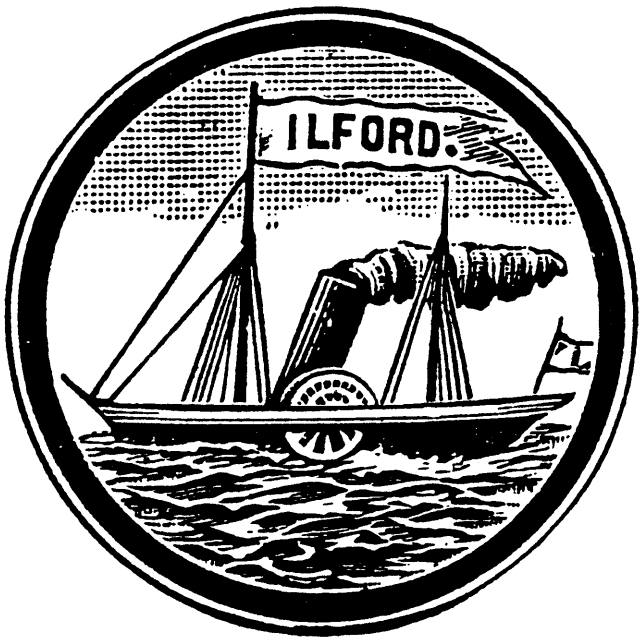
> Special Export Agent for the manufactures of this company,
>
> Mr. J. Spencer, 125 West Regent Street Glasgow.[18]

In the following year's edition of the same annual, Spencer described his functions more explicitly in a notice of his own :

> John Spencer
> 125 West Regent Street Glasgow
> (Export Only)
>
> John Spencer acts as Home Agent for many Colonial and Foreign Photographic Dealers and Wholesale Druggists, and being constantly in the market is able to offer them all the advantages of a Home Office of their own.[19]

It is likely that Spencer had an exclusive agency for Ilford exports during its first decade. The practice of appointing foreign distributors appears to have started after the 1889 appointment of John Howson as the firm's business manager. He was active in a number of functions that would in a later day be subsumed under the word marketing.[20] The first advertisement run by Ilford in a foreign country that has been uncovered in the course of the present research appeared in a German language 1902 yearbook. The names of Ilford distributors began to appear in this publication a few years later.[21]

In one sense, the product carried its own advertisement to exotic places. Ilford had adopted as its trade name that of the village where it was founded in 1886. Harman had started selling his plates under the name Britannia. A trademark incorporating that name had previously been registered by Marion & Co., Harman's first domestic wholesaler. The two firms had a falling out in 1886, and Harman was forced to change his trade style. To proclaim the Ilford name, he introduced the paddlewheel steamer trademark shown below.[22]



In the Far East, where little English was known, the Ilford product became known as the Little Ship plates.[23] Although there are no existing supporting data, it is believed that India, China and Japan were important markets for Ilford products.[24] Some supporting evidence that Japan was important is given by the history of Konishiroku, one of Ilford's importers starting in the early 1890s. [25] A reform of the Japanese import tariff in 1906 raised the duty on negative materials from 30 to 40 percent ad valorem.[26] This appears to have been a significant enough increase to prompt Edward Knobel, then Ilford's Managing Director, to sail to Japan for the purpose of negotiating a joint manufacturing venture there. The suggested arrangement involved three local photographic importers and trading houses. These were Kuwata (Osaka), Asanuma and Konishi (both Tokyo). These would supply 40 percent of the capital needed to establish a dry plate factory. Ilford would provide the remaining required capital and its technical know-how. Profits were to be split by each of the Japanese partners taking 17.5 percent and Ilford 47.5 percent.[27]

The Japanese venture was doomed before it could begin. The intense commercial rivalry among the three potential Japanese participants made any future cooperation in such a venture unlikely. In addition, Knobel's temperament may not have made him the best person to undertake a delicate negotiation with three Japanese companies. The detailed reports in the London financial press of Ilford shareholder meetings of the time suggest that Knobel was rather dictatorial in his approach to everything related to the conduct of the company's affairs. As early as 1903, his aggressively assertive personality was described as considerably diminishing the value of his technical ability to Ilford. Among the

suggestions made was that "his wings will have to be clipped before the direction of the Ilford Company can be considered healthy and satisfactory." [28] He could also be abrasive. An indication of this bent is given by his reported remarks at one such meeting :

> On the other hand, the Board itself knew nothing about the business. He ventured to ask, Had they ever seen even the outside of the factory more than twice during the last five years ? (Laughter.) Had they ever seen the price list, or did they know what articles the company manufactured ? (Laughter.) He maintained that the opinion of the directors, so far as regarded the actual trade, was not worthy of very serious consideration.[29]

At the meeting following the Ilford Booard's request for Knobel's resignation in 1907, one director was reported as stating :

> When(ever) the Board met, Mr. Knobel seemed to expect them all to be puppets and dance to his tune, and the directors had never had a proper share in the management of the concern.[30]

Precisely what Knobel told his Japanese negotiating partners and how he said it have not been recorded. But it is plausible to believe that Knobel was used to having his own way and that he was not likely to have it in a Japanese manufacturing venture involving local partners. This was as close as Ilford ever came to manufacturing abroad until modern times.

Some semblance of an export organization began to develop during the 1920s. Before then, no foreign customers had ever been visited. A somewhat more aggressive approach to selling abroad was initiated by T.M. Illingworth. The typical Ilford foreign distribution contract ran for two to three years. Distributors began to be visited on a regular basis by Ilford sales personnel at four to six month intervals. A roving area salesman for the Far East was based in Tokyo.[31]

The first Ilford foreign sales subsidiaries came into being during the early 1930s. [32] They were the product of a crisis into which

the company had stumbled with little strategic forethought. In 1903, George Eastman had made an unsuccessful attempt to acquire Ilford. A committee of Ilford stockholders had made several recommendations to the management after this attempted takeover had been rebuffed. Among its suggestions was that there be a combination of British photographic manufacturers and distributors.[33] That recommendation was duly adopted and then forgotten for a decade and a half.

Between 1917 and 1930, however, the company gradually acquired nearly every remaining British photographic manufacturer of consequence, a dozen in all. Their early account books show that several of these had a more or less lively export trade, conducted through agents and distributors in foreign countries.[34] Here and there a foreign sales branch could be found. The companies having been acquired, not much further was done with them. This practice of competitor acquisition without managerial integration may have been characteristic of British industries at the time.[35]

By the end of the 1920s, Ilford was a kind of photographic mini-conglomerate. Some sporadic efforts were made to bring these companies under common direction and control. But in the main, each went its own way. Some twenty pages of advertising were spread among five of the companies in the 1932 edition of the industry yearbook. No one would have known that these were all Ilford companies. The contrast in impact with the nineteen pages of Kodak advertising in the same publication is striking.[36]

It was the economic crisis of the 1930s which finally stimulated Ilford management to bring some order to this imbroglio. The overlapping efforts of competing foreign agencies, distributors, and sales branches

had to be rationalized. It was thus that sales subsidiaries came into being in Italy, Denmark, the Netherlands, Belgium, France and India.[37] Single distributors were appointed in other countries, mainly in Europe. Foreign sales territories were organized into three geographic groups. Two of these covered Europe and the third the rest of the world.[38]

After the second World War, several subsidiaries in small markets were not revived. Others were formed in the U.S. and in Australia. In the latter, a high tariff and import restrictions led to shipment of films and papers in bulk master rolls from England. Slitting and packaging for local consumption were done in Australia.[39] A government report issued in 1966 shows the company to have been operating sales subsidiaries in Australia, Denmark, France, India and the U.S., in addition to having a world wide distribution network during the early 1960s.[40]

Accelerating Weakness Amid Growth

Alfred Harman preferred to work in secrecy when it came to preparation and coating of emulsions. He engaged his first chemist in 1888, but his function appears to have been that of ensuring product quality rather than research, product or process development. Harman had, on an empirical basis , developed a superior product which he meant to exploit as fully as possible. The first Ilford research chemist was hired in 1898 as Harman was beginning to phase out from active management of the company. Ilford research laboratories eventually developed a number of products that gave the company a first rank reputation as a producer of highly sensitive fine grained monochrome negative materials. There is, however, little evidence that the research effort had a well defined sense

of direction.

Throughout the 1930s, the company worked on a number of additive color processes. None of these were destined to be competitive in the postwar world. The U.K. government prohibited the use of scarce resources for research into color photography during the war. Ilford was thus faced with some difficult decisions as the reconstruction began. The company knew that it had to develop an effective basis for entry into the color market. Its first decision was not to use the Agfa process though this had become freely available after the Allied powers had appropriated Agfa's patents. The reason given for this decision was that Ilford felt it lacked the technical knowledge needed to make the organic chemicals required by the process.[41] To avoid infringing the web of Kodak color patents, Ilford introduced a number of coatings and solutions that required processing of the exposed materials in special equipment and under closely controlled conditions. No one objected to the company's insistence that this be done in its own facilities when this business was in its infancy. It did require the sale of the film with processing costs included.

As this business gradually matured during the 1950s, the way it had to be conducted became an increasing irritant to those who were necessarily excluded from participation. For their own reasons, Kodak and Agfa had internalized the processing of color films. A complaint was lodged by some members of the Wholesale Photofinishers' Association with the U.K. Monopolies Commission. The report of that commission was finally issued in 1966 and recommended a reduction in the price of Kodak color films and cessation of the practice of selling them with the processing costs included.[42] The endorsement of the commission's report by the

Board of Trade the same year gave its recommendations the force of law in the U.K. Kodak duly lowered its color film prices by 20 percent. This was a level at which Ilford management felt it could not support the costs of continued technical and market development. The circumstances seem, in retrospect, to have been tailor made for the next decision taken by Ilford.

The company abandoned the field of amateur color photography as a supplier of its own branded products. Instead, it became a supplier of private label color film. Its principal customers were Boots, the largest drug store chain in Great Britain with 1,300 outlets, and Film Corporation of America (FCA). The latter, a Philadelphia photofinisher, had developed a way of getting direct access to consumers through mail order and concession counters in supermarket chains. Ilford sales to FCA swelled within a few years to a point which enabled the company to win two Queen's Awards to Industry for Export Achievement.[43] But these arrangements did not last. FCA became involved in several ventures into business activities it did not understand, including an unsuccessful gas well and general merchandise mail order operations. By 1978, FCA was insolvent. Ilford wrote off a substantial receivable from FCA and its 11 percent investment in FCA's equity which had sunk below American Stock Exchange listing standards.[44]

The company put a toe into several other waters outside Great Britain in modern times. An equity interest in Valca S.A., a Spanish manufacturer of sensitized materials, was taken in 1960. That equity was given in consideration of technical knowledge and assistance. Ilford's hope in selling this knowledge was to get access to the Spanish market and, through it, to those of South America. The Valca shares were sold in

1976 for reasons not revealed by the company's historians.[45] It is, of course, plausible that the dominating presence in Spain of Eastman Kodak and Agfa-Gevaert would have made any other photosensitive product a marginal one in that market. And, except for common language and cultural heritage, Spain offered nothing that would ease access to South American markets for photographic goods.

In 1969, Ilford became the supplier of a turnkey project in Poland. It involved the provision of designs, paper and film plants and technical know-how to the Polish government for cash.[46] Later that year, Ilford became one of the cooperating participants in a similar project in the U.S.S.R.[47]

In Germany, the company entered into a joint venture with Polychrome Corporation, an American company. The purpose of this 1967 venture was the production and sale in Germany of reprographic materials, sensitized metal plates used in the printing business.[48]

New Ownership

Although it was plain to the participants in retrospect that Ilford's postwar effort to establish a position in color photography had drained the company's financial resources, the antiquated control system it was still using in the 1950s did not make this transparent at the time. In the words of Hercock and Jones, a "classical business situation had arisen; turnover was increasing but profit was not and nobody knew why." [49]

What was clear was that the company's capitalization was inadequate in light of what is was trying to accomplish. Imperial

Chemical Industries Ltd. (ICI) provided £6.4 million in 1958. For this, it took newly issued Ilford shares, giving ICI 32 percent of Ilford's equity and effective control of the company. ICI had, ever since the freeing of Agfa's patents, been looking for a forward integration opportunity in color photography as an outlet for its dye manufacturing operations.[50]

Another multinational chemical manufacturer, one with similar motivations, came into the picture in 1963. Researchers at Ciba A.G. had developed a silver dye-bleach process of color photography. This process was similar to one that had been abandoned by Ilford in 1960 because it appeared to require a very large and long term research effort to bring up to competitive standards. Ciba had begun to act on its diversification program in 1960 - 1961 by acquiring Tellko A.G., a Swiss based manufacturer of photosensitive materials, and Lumière S.A., the oldest French producer in the business.

Ciba had not found a sufficiently high level of technical expertise in these acquired companies. It therefore approached ICI and Ilford for an exchange of technical information and help in the construction of new plants. ICI welcomed to these arrangements because its investment in Ilford was becoming a disappointment. The fundamental chemical concepts and techniques on which ICI and Ilford scientists had been working for years were not compatible. ICI began to look for a graceful way to extricate itself from its embarrassing involvement with Ilford. It made a tender offer for the remaining Ilford shares outstanding. It was understood that 40 percent of Ilford's equity would be sold immediately to Ciba. ICI sold the remainder of its investment to Ciba two years later.[51]

In 1970, Ciba merged with Geigy A.G., another Swiss based

multinational chemical producer.[52] Ilford and Geigy had known each other for nearly two decades. A British subsidiary of Geigy had been a supplier of chemicals to Ilford, and the two companies had formed Gyl Chemicals in 1952 as a joint venture to make and supply Ilford with hydroquinone, a photographic developer agent.

As a result of the foregoing events, a series of discussions about organization ensued in Basel and London. Ciba-Geigy was ready to form a group which would bring under its umbrella all of the company's worldwide photographic operations. The critical issue was who was to manage this group. The company's technical strength in color technology was by now centered in Fribourg, Switzerland. The company's senior management was headquartered in Basel. Such knowledge as Ilford possessed of the business aspects of the world photographic industry was embodied in executives in the U.K. In the end, it was decided that the group would be called the Ilford Group and responsibility for its operations would be given to Ilford management headquartered in London. This was a first for Ciba-Geigy, none of its other operating divisions or groups ever having been headquartered outside Switzerland previously.[53]

It was a decision that the senior management of Ciba-Geigy has had ample time to ponder in the interim. The decline of Ilford as a significant factor in the world's photochemical industry continued. In 1980, the company stopped production of x-ray, microfilm and graphic arts products, selling off its inventories, receivables and customer lists to Agfa-Gevaert. These segments represented about half of Ilford's sales. The group had been running up losses for several years.[54]

Epiloque

> We consider that our board as a whole exhibits a want of general business acumen and a lack of those essential qualifications so necessary for the ..... conduct of so large an undertaking. Many facts have come up in evidence indicating that the board has not moved with the times, and that more modern ideas and methods, coupled with greater businesslike push and vigour, particularly in connection with the commercial side of the undertaking, are essential for the maintenance and development of our business. Your committee consider that your board does not contain those elements of strength necessary to cope with the exceptional competition to which our trade is specially subject, our want of progress being due to this fact .....[55]

This quotation is taken from the report of the stockholders' committee which had been appointed to look into Ilford's affairs at a somewhat stormy meeting of shareholders called to consider the 1903 Eastman Kodak proposal to take over the company. The committee issued its report in August of that year. The indictment handed down then could well have been made any time during the next eight decades. The international history of Ilford is spare. This is less a cause of Ilford's decline than a symptom of the consistent failure of its management to define the company's central purpose and business objectives, its products, processes and markets, or to formulate á coherent set of policies consistent with these definitions.

Notes and References

1 The research on which this chapter is based was done by interviewing several retired directors of the company, examination of contemporary newspaper accounts and public documents, and perusal of such other secondary sources as have been published.

2 George A. Jones, "Plates, Ilford, England", The Photographic Journal, Vol. 116, November - December 1976, p. 292. Hereafter cited as Jones, "Plates..."

3 Interview with George A. Jones, retired Ilford Managing Director, London, 19 April 1983. Hereafter cited as Jones interview.

4 Interview with Philip Jenkins, retired Ilford research executive, London, 18 April 1983. Hereafter cited as Jenkins interview.

5 Reese V. Jenkins, Images and Enterprise, Baltimore: Johns Hopkins University Press, 1975, passim.

6 Robert J. Hercock and George A. Jones, Silver by the Ton, London: McGraw-Hill Book Company (UK) Limited, 1979, pp. 16 - 17. Hereafter cited as Hercock & Jones, Silver by the Ton.

7 Ibid., p. 159.

8 Jones, "Plates...," p. 293.

It may be noted here that the firms putting out Cadett and Wratten & Wainwright plates were subsequently acquired by Eastman Kodak.

9 Hercock & Jones, Silver by the Ton, p. 33.

10 Ibid., pp. 37 - 39.

11 Jones, "Plates...," p. 295.

12 Hercock & Jones, Silver by the Ton, p. 39.

13 Ibid., pp. 51, 115.

14 Ibid., p. 158.

15 Jones, "Plates...," p. 296.

16 Id.

17 Hercock & Jones, Silver by the Ton, p. 117.

18 The British Journal Photographic Almanac and Photographer's Daily Companion for 1889, p. 352.

19 The British Journal Photographic Almanac and Photographer's Daily Companion for 1890, p. 299.

20 Hercock & Jones, Silver by the Ton, pp. 19, 27, 28.

21 Eder's Jahrbuch, 1902

Although Eder worked and published in Vienna, his various publications were aimed at Germany as much as at Austria. An Ilford advertisement in the 1908 edition of his yearbook identifies R. Woliner & Cie. as the company's general distributor for Austria-Hungary and the Balkans and Romain Talbot for Germany. (Talbot, a Belgian trader in photographic goods who had established himself in Berlin, had served as Eastman Kodak distributor before that company had established its own German sales subsidiary.)

22 Hercock & Jones, Silver by the Ton, pp. 17, 122, 123.

23 Jones, "Plates...," p. 294.

24 Ibid., p. 295;

Hercock & Jones, Silver by the Ton, p. 115;

Interview with Sydney Ferris, retired Ilford Export Director, London, 22 April 1983. Hereafter cited as Ferris interview.

25 Tokio Kikushi and Takishi Kamei, eds. Shashin to tomo ni 100 nen, Tokyo: private printing by Konishiroku Photo Industry Co. Ltd., 1973, pp. 70, 71, 74, 77, 78, 90, 136.
Hereafter cited as Kikushi & Kamei, Shashin to tomo....

26 Japanese Import Tariff, 1906.

27 Kikushi & Kamei, Shashin to tomo..., p. 161;

Hercock & Jones, Silver by the Ton, p. 50.

28 Investors' Guardian (London), 3 October and 28 November 1903.

29 Financial Times (London), 26 June 1903.

30 Financial Times (London), 4 December 1907.

31 Hercock & Jones, Silver by the Ton, p. 117.

32 Carl W. Ackerman (George Eastman, Boston: Houghton Mifflin 1930, pp. 249 - 250) lists an Ilford Company as one of many competitors active in the U.S. before World War I. All Ilford executives interviewed in the course of the present research denied that the company had any establishment in the U.S. this early. The name may have been a tradestyle adopted by an American distributor of the company's products.

[33] Statist (London), 22 August 1903;

Investors' Guardian (London), 22 August 1903.

[34] General Journals and Sales Journals, Ilford subsidiaries, Library of Imperial College of Technology, London.

[35] See Leslie Hannah, "Visible and Invisible Hands in Great Britain," in Managerial Hierarchies, edited by Alfred D. Chandler Jr. and Herman Daems, Cambridge : Harvard University Press, 1980, pp. 52-60.

[36] British Journal Photographic Almanac 1932.

[37] Ferris interview;

Hercock & Jones, Silver by the Ton, p. 117.

[38] Ibid., pp. 61 - 62.

[39] Ferris interview;

Hercock & Jones, Silver by the Ton, p. 81.

[40] The (U.K.) Monopolies Commission, "A Report on the Supply and Processing of Color Film", Parliamentary Papers (House of Commons and Command), Session 18 April 1966 - 27 October 1967, Vol. XLI, London: H.M.'s Stationery Office, 1966. Hereafter cited as "U.K. Monopolies Commission Report."

[41] Hercock & Jones, Silver by the Ton, p. 79;

Jenkins interview.

It may be noted in this context that none of the companies that introduced postwar color films based on original Agfa paptents were particularly successful, either technically or commercially, with these products.

[42] U.K. Monopolies Commission Report.

It may be of interest to the student of international business that the U.K. commission's report cites as one of the precedents for its conclusions a consent decree accepted by Eastman Kodak Company in 1954 to settle a complaint brought under the provisions of the Sherman Act.

[43] Financial Times (London), 25 October 1968;

Hercock & Jones, Silver by the Ton, pp. 88 - 90.

44 Jones interview;

Moody's Industrial Manual 1970 - 1978, New York: Moody's Investors Service;

Wall Street Journal, 21 February 1978.

45 Hercock & Jones, Silver by the Ton, pp. 85, 90, 91.

46 Ibid., p. 90.

47 Id.

"Daten zur Entwicklung der Fotoindustrie", unpublished chronolgy, Volkswirtschaftliche Abteilung, Agfa-Gevaert A.G., ca. 1975, pp. 64-65.

48 Ibid., p. 62.

49 Hercock & Jones, Silver by the Ton, pp. 80 - 82;

Jones interview.

50 Hercock & Jones, Silver by the Ton, passim;

Jones interview;

Economist, 7 January 1967;

Financial Times (London), 3 January 1967.

51 Hercock & Jones, Silver by the Ton, passim;

Financial Times (London), 8 February 1968 and 10 July 1970;

New York Times, 3 January 1967.

52 Hercock & Jones, Silver by the Ton, p. 90;

Financial Times (London), 10 July 1970.

53 Hercock & Jones, Silver by the Ton, p. 90;

Jones interview.

54 Agfa-Gevaert Annual Report, 1980;

Ilford Ltd. Annual Reports, 1974 - 1980.

55 Statist (London), 22 August 1903.

Chapter VI

Konishiroku [1]

Introduction

Konishiroku Photo Industry Co. Ltd. is an old Japanese enterprise. The involvement of its antecedents with international commerce in photographic goods can be traced to 1873. It is a large enterprise. For its 1982 fiscal year, it reported sales of nearly ¥. 285 billion. (In equivalent terms, this was well over one billion U.S. dollars.) Nearly half of its revenue comes from the sale of photosensitive materials. An undisclosed, but presumed to be very large, percentage of the company's production of sensitized materials is exported to countries in the industrially developed West.

Yet, the company is hardly known as a photographic industry participant to the general public outside Japan and a handful of neighboring East Asian countries. To the extent the company is known at all to the public in the West, it is as the producer of Konica cameras.

This apparent paradox is resolved by one key fact of strategic importance. This is that Konishiroku has chosen to be a private label exporter of sensitized goods. In Japan and nearby markets, the company sells film and paper under its own Sakura brand name. In Western export markets, these products are sold by others under a variety of names. These include brands owned by other manufacturers as well as by certain retailers. The latter, in effect, perform the entire marketing function for the company's films and papers in their localities.

This method of conducting business abroad is the result of a long, albeit slowly evolving, company history. The company gradually developed from a merchant trading in imported photographic goods to a manufacturer of such goods. The pace of this evolution was slow. Mastery of the required technologies did not come easily and may possibly have absorbed all of the management's energies. There is little evidence that the company ever learned the skills necessary for successful marketing of photographic products, either in its home market or abroad. For more than six decades after the company started manufacturing in 1902, management attention was concentrated on camera production. The company did not become a reliable producer of sensitized goods until the 1930s. During the 1950s and 1960s, a number of quality lapses resulted in a serious erosion in the company's share of its domestic film market. To keep its film factories running at reasonable unit cost, Konishiroku had to turn to exports in the late 1960s.

The turn to film exports during this period coincided with several other developments inside and outside the company. Each of these developments influenced the company's policy in coming to rely on private label exports. Inside the company, a serious financial crisis in 1967 led to the replacement of the entire top management, which had been in the hands of one family for nearly a century. The new management had been involved in research and development of the company's film products for several decades and was therefore perhaps inclined to see better business prospects for these products than its predecessors.

Meanwhile, Japan had begun to liberalize film import restrictions. This liberalization bred a fear of a massive invasion of film imports from the West. This invasion never took place, but the

prospect of Kodak films taking a dominant share of the Japanese film market stimulated the search for other markets in which to sell Japanese made film. Finally, the very success of Western producers in building a truly mass market for color photography opened opportunity for the emergence of a number of private retailer brands. Lacking knowledge of how to market films in the West, Konishiroku made a virtue of necessity. It turned the marketing function over to retailers and manufactured the product for them. This chapter traces these developments.

Early Photographic Imports

The origins of photography in Japan are shrouded in the mists of time. There is little hard evidence supporting the legends which are commonly believed with respect to particular early milestones. It is, however, safe to state that photography gradually emerged as an import from the West during the twilight years of the Tokugawa Shogunate.

The social diffusion of this imported art throughout Japan began simultaneously from the bottom up and from the top down. An example of the first is provided by foreign sailors who wanted souvenir photographs of themselves and local women. These sailors came in increasing numbers as Japanese ports were opened up to European and American traders. By 1862, the demand for such souvenir photographs had become large enough to support the establishment of the first Japanese studio shop in Yokohama. The owner of this shop, Renjo Shimooka, had learned the craft from, among others, the secretary of Townsend Harris, the American Consul.[2] Photography also came to the attention of people at the very top of Japanese society. Among these was the last Tokugawa Shogun. His

enthusiasm for photography helped to spread awareness of this new art among the Japanese aristocracy. This awareness and subsequent interest continued after the Restoration. The Meiji Emperor had his portrait taken in 1873. This was a signal to government officials and wealthy people that photography had become respectable. The demand for portraits began to grow.[3]

Among the merchants who supplied medicinal drugs to the last Shogunate and the Restoration government was a drug dealer named Rokuemon Sugiura.[4] The Sugiura family interest in trade of medicinal drugs can be traced to 1859 when a store called Konishiya had been acquired. Six years later, this business was turned over to a younger brother of Rokuemon Sugiura. The latter opened a new store in what was to become the city of Tokyo. The new store was named Konishi Honten. It was quite probably through his business contacts with high government officials that Sugiura became interested in photography. By 1873, the business of Konishi Honten turned its main emphasis to dealing in photographic and lithographic supplies. The diversification from drugs was a natural one. Photography at this time was still in its wet plate stage. In wet plate photography, the negative plate is made sensitive to light by the photographer immediately before the exposure is made. The plate is literally wet with chemicals at this point; thus the name. The chemical compounds have to be supplied by someone to the photographer. In early Meiji Japan, the supplier turned out more often than not to be a drug dealer. The diversification from medicinal to photographic chemicals had many parallels in Europe at the time.[5]

The initial Konishi Honten foray into trade in photographic supplies ceased temporarily soon after its start. Two years earlier, in

1871, another drug dealer, Tokichi Asanuma, had begun to trade in photographic supplies in Tokyo. Demand for such supplies may have been growing in the early 1870s, but it was not yet large enough to support two Tokyo dealers. Competition between Asanuma and Konishi Honten was fierce and threatened to become ruinous for both. At a bathhouse meeting, where matters of business importance were discussed in those days, it was decided that Asanuma would concentrate on photographic supplies and Konishi would specialize in lithographic materials. This arrangement lasted for three years.[6] It is an early example of attempts to restrain competition in the commerce of photography. The house of Asanuma remained in the business and, as of this writing, is by far the largest photographic wholesaler in Japan. Konishi Honten returned to trade in photographic supplies in 1876, and its successors have been involved continuously in it since then.[7]

In the Japan of the early Meiji Era, there was one major difference between trade in medicine and trade in photochemicals in that the medicines were of domestic origin while photographic supplies had to be imported. The main source for the latter was England. The first importers of photographic goods in Japan were Europeans who had established themselves near the bluff overlooking Yokohama harbor. They took care of unloading the goods from European ships, clearing whatever customs formalities were required, and storing the products. They bought and sold for their own account. It can be presumed that they enjoyed a sellers' market for many years starting in the 1860s. It was to these people that dealers such as Asanuma and Sugiura came to buy their supplies.[8]

This manner of trade went on for several decades. As Japan's

relations with the West developed during the Meiji reign, knowledge of whatever importing skills were required spread among the Japanese. Asanuma was the first to break the trading pattern in photography by becoming a direct importer. Konishi Honten followed. The latter was aided by two people in making the transition to direct imports. One of these was a European trader from whom Sugiura had bought products for many years and with whom he had developed a friendly business relationship over that time. This trader decided to retire in 1893, at which time he sold his entire photographic inventory to Sugiura and helped him make contact with his European supply sources.[9]

Another person who was instrumental in establishing such contacts was William Kinnimond Burton. In its efforts to modernize Japan, the government had invited Burton, a Scotsman, to teach civil engineering in Tokyo. He received a professorial appointment at the Imperial University in 1887 and remained in Tokyo until his death twelve years later.[10] Burton had an avid amateur interest in photography and became well known to the small circle of photographic merchants in Tokyo. Burton wrote letters of introduction on behalf of Sugiura to such English manufacturers of photosensitive materials as Ilford and Marion. Once contacts and trade relations with these companies had been established, other European manufacturers soon fell into line. It was but a small step from direct import to exclusive distributorship. By the end of the nineteenth century, Konishi Honten had become the sole Japanese distributor for a number of European and American manufacturers. These included camera and lens producers as well as makers of sensitized materials. Konishi Honten gradually transformed itself from a retailer into an importing wholesaler as photography became more diffused

throughout Japan.[11]

Konishi Honten imported its first Kodak films in 1894. They did not perform well, which fact was attributed to the very high humidity prevailing in Tokyo at certain times of the year.[12] Be that as it may, the film may simply have been defective. It is known that Eastman Kodak films made in 1892-1893 performed poorly wherever they were sold.[13] The result was that Konishi Honten imports of Kodak film were not resumed until 1901.

In summary, much of Konishi's role during the first two decades of its involvement with photography was confined to that of retailer or wholesaler. Its international involvement was limited to direct import.

The Importer as Re-exporter

Among the customers who sought out Sugiura in the 1890s was Tamotsu Kashimura, a Japanese military ship chandler. Kashimura had high ambitions to extend his product lines and the geographic scope of his operations. Following the absorption of Formosa by Japan in 1895, Kashimura established a trading business on the island. Among his lines were photographic goods. These had been imported by Konishi Honten from Europe and were then reshipped to Formosa. By the turn of the century, Kashimura had extended his operations to several cities on the Chinese mainland and had established branches in Peiping and Dairen. In Tientsin, he arranged for drop-shipments of European products to his customers.[14]

The business first stimulated by Kashimura began to expand after the Russo-Japanese War. One of the results of that war was an expansion of Japanese economic activity in Asia. Among many Japanese who moved to other countries in the region were photographers. They fanned out in a

long East Asian arc that ranged from Manchuria to the Dutch East Indies. At home, they had bought supplies from Konishi Honten. Abroad, they found Kashimura's warehouses and agents. The growing volume of Kashimura's orders impressed itself on Sugiura. Several of his sons-in-law were sent to various Chinese coastal cities for market prospecting. These investigatory visits led to the appointment of authorized Konishi wholesalers and agents in these cities. This expansion into re-export markets continued for at least two decades. During the 1920s, the goods destined for re-export were kept in bonded warehouses in Kobe and Yokohama, the paperwork being handled by a branch office in Osaka. As the decade ended, some 85 percent of Konishiroku's exports comprised re-exports of goods that had been imported from Europe. One of the major suppliers was Ilford.[15] It is doubtful that Ilford's management ever knew the ultimate destination of its exports to Japan.

Early Manufacturing

In 1901, Sugiura was able to buy, at bargain prices, the parts inventory of a Japanese company that had tried and failed to manufacture cameras. Sugiura established a manufacturing arm for his company. He gave the name Rokuosha to this department of Konishi Honten. The first commercial product made by Rokuosha, introduced in 1903, was a camera called the Cherry Portable.[16] In the words of an authoritative history, "The first hand camera from Konishi Honten had a mechanism and external design identical to the Little Nipper imported by the Ueda Camera Store and Asanuma Shokai from W. Butcher & Sons, England." The Cherry Portable was a straight copy.[17] The company continued to copy cameras from the West for over three decades while it acquired the knowledge of optics and

mechanics needed to develop its own models. It produced its first camera lens in 1931, using optical glass imported from Jena in Germany.[18]

Rokuosha also tried to bring out a sensitized printing paper in 1903. This effort failed. The paper suffered from dark spotting and other defects.[19] The chemistry of photosensitive materials was not yet well enough understood. The first successful Japanese photographic papers were produced during the early 1920s by another company. Konishiroku, the name adopted by the company after its founder's death in 1921, followed with its own sensitized papers toward the close of the same decade.[20]

During the 60 year product life cycle of the photographic dry plate, from about 1880 until the start of World War II, few Japanese enterprises ever managed to acquire the knowledge of how to sensitize plates with sufficient quality and in sufficient quantity to make a commercial success of it. Konishiroku was not among those that did, though it had made efforts to do so starting in 1904. European technicians and European trained Japanese were hired, but none succeeded. The products they put out either fogged or were in other ways inferior to European and American plates.[21]

An attempt to transfer British plate making technology to Japan was made by Ilford in 1906 following an increase in the Japanese import tarrif. This attempt came to nothing. There were too many participants in a proposed joint venture which was to include Konishi, Asanuma and Kuwata, all of whom were important photographic merchants dealing in Ilford products. They were also bitter rivals. The cooperation needed for such a venture to succeed could not be achieved.[22] At about the same time, George Nelson, Dale & Co., an English producer of photographic gelatins, approached Asanuma and several other Japanese merchants with a

similar joint venture proposal. Although Sugiura was invited to join, he refused. This venture did get organized as Nihon Kanpan K.K. and started to produce a product called the Nippon Dry Plate. This product was superior to whatever Rokuosha was trying to put out at the time, but it was not as good as the Ilford product. Konishi and Ilford responded to the appearance of the Nippon Dry Plate by renaming an existing Ilford plate and slashing its price severely. The so-called Ilford Alliance Plate eventually drove the Japanese product off the market. The combination of superior quality and lower price was unbeatable. Nihon Kanpan soon disappeared from the scene.[23]

Nearly three decades of trial and error were required for Konishi to understand the basic chemistry of photosensitive emulsions. During the 1920s, it had become apparent that the base for carrying these emulsions was to be a flexible film rather than the rigid glass plates. A Sakura branded film was put on the market in 1929 by Konishiroku.[24] This was the second Japanese made film, having been preceded by Kiku, a brand introduced by Asahi Shashin Kogyo in 1928. Kiku film soon disappeared, however, for unknown reasons. Sakura thus became the sole domestically produced film in Japan for a few years, a film largely intended for amateur use. Konishiroku needed these years to perfect the product. It was beset by the same problems that had afflicted all early films. Sakura films fogged during the very hot summers of 1931 and 1933, and they had other defects as well during these early years.[25] These defects became the subject of unfavorable newspaper publicity. This fact added to the difficulty of introducing the first Konishiroku x-ray film in 1933. Although this film was technically adequate, it was difficult to wean Japanese doctors and hospital administrators away from Kodak and Agfa

medical films.[26] One major reason that Japanese photographic products of all sorts were very late in winning acceptance, both within Japan and without, was the widely held belief that such products were inferior to those produced in the West. This belief was well supported by fact for many years, but the belief did not die until long after the technical accomplishments of Japanese manufacturers had made it irrelevant. Konishiroku brought out a series of films and papers for technical, industrial and professional users during the 1930s, and these products had to be accepted after the Japanese government banished all competing imports late in the decade.

Export Efforts in the 1930s

In view of the above described circumstances, Konishiroku's modest internationalization is understandable. Such sales of its own products outside the Japanese homeland as did take place were made to neighboring countries which had, by virtue of Japan's military adventures, become part of the Empire or were within the Japanese sphere of economic influence. Many of the customers were, in fact, Japanese who had settled in these neighboring countries.

A Konishiroku export depot was established in 1935 in the city of Fukuoka on the island of Kyushu, and the sales work was done from a branch office in Osaka. A traveling representative went from Osaka to Korea once or twice a month to visit photographers and dealers, solicit orders and arrange for advertising. In 1937, a distribution depot was set up in Seoul, and this was upgraded to a sales branch in 1941. A similar pattern was followed, starting in 1939, in the city of Dairen to serve the Manchurian market. A Formosan branch was organized in 1941. Sales to

mainland China were made directly to independent trading houses in the major Eastern cities such as Peiping, Tientsin, Shanghai, and Canton.[27]

As the military regime ruling Japan in the 1930s increasingly put the economy on a war footing, Konishiroku became primarily a supplier to the country's armed forces. Despite technical progress in photosensitive materials, the company's primary product orientation was toward the development of cameras and optical equipment.

The Early Post-World War II Era

The appearance of Konishiroku as an international participant in the photosensitive materials industry is quite recent. As of this writing, it can be measured in less than two decades. Some of the circumstances that may account for this recent entry are explored in this section.

Prior to World War II, the company simply had little to offer the world outside the Japanese sphere of economic influence. Until 1935, nearly all Japanese cameras, including those made by Konishiroku, were simply copies of Western models, and their quality was not highly regarded. But after this time, technical development came rapidly. During the second half of the 1930s, certain signs of originality began to appear in Japanese cameras, and this technical development continued intensively throughout the war. The army and navy, cut off from foreign technology, sponsored considerable research and engineering to satisfy their needs for a variety of optical precision instruments.[29] The war experience taught Japan's camera industry the design technology and production skills which were to serve as its foundation in peacetime. Konishiroku was part of this industry. As the company's main camera plant

was not harmed by the war's air raids, Konishiroku was able to convert back to peacetime production of cameras as quickly as the difficult economic conditions of the immediate post-war years allowed.[30]

By 1948, the company had given part of its name to its camera line by branding them Konica.[31] The company's first post-war camera sales were a form of export made within the national territory of Japan. This was so for the entire photographic industry. Such "exports" were confined to the post exchanges of the Allied occupation forces.[32] This market received considerable impetus from the Korean War starting in 1950. Not only did the number of foreign troops in Japan escalate greatly, but many well known photo journalists passed through Japan on the way to Korea. They became acquainted with and began to use Japanese optical equipment on their assignments, and they found it superior in quality to anything produced in the West at the time.[33] The favorable publicity generated by their reports in the U.S. laid the groundwork for the development of camera export markets in the U.S. and elsewhere in the West. Konica cameras were an indirect beneficiary of this favorable publicity. A Konishiroku director made a market inspection tour of the U.S., South America and Europe in 1952. This visit led to the appointment of independent distributors to sell, promote and service Konica cameras in the U.S., Brazil and seven European countries.[34]

Encouraged by the initial success of these foreign sales, Konishiroku turned many, perhaps too many, of its resources to perfecting its camera products during the 1950s. These efforts succeeded in generating a number of technical refinements and improvements to which the Japanese Historical Cameras Screening Committee has attributed historic significance.[35] This was, however, a high risk strategy. Konica

cameras were not the only brand of Japanese cameras to invade Western markets. A score of other producers made similar moves. Several of these - among them, Nikon, Canon, Minolta and Olympus - learned much more quickly what had to be learned to do effective marketing in the U.S. This may have reflected their absolutely fierce competition among each other in Japan. Konishiroku, on the other hand, has historically tried to play the role of dignified elder statesman in its industry. This role was not suitable to conditions in which nimble and aggressive marketing was a requisite for company prosperity. The exported cameras were not cheap, being high quality precision instruments. Sales of such instruments wax and wane with the business cycle. As the U.S. economy began to slow down in the late 1950s, camera inventories began to pile up both in the U.S. and in Japan. Severe price cutting followed, and financial losses mounted for several companies. Konishiroku was among the companies sustaining large losses, and from late 1957 to 1960 the company could not pay dividends. A level of dividend payout considered meanigful by the company, 10 percent on the common stock, was not restored until 1962. [36]

Decade of Crises

The financial crisis in which Konishiroku found itself during the late 1950s cannot be viewed as having its origins solely in an unsuccessful strategy of concentrating on cameras. Among the corollaries of this concentration was a certain neglect of the photosensitive materials side of its business. This neglect had long roots. A memoir by Ryosuke Nishimura, who eventually became the company's President, is indicative of the company's management style and of its attitude toward sensitized materials :

> I joined Rokuosha in 1931 from the Osaka Industrial Testing Center. I was not ordered to do anything, and I was bored. Then Mr. Keizo Nagahama came to me and said "you better make your own advertisement here. Nobody will give you any work if you just wait." I was surprised, but I said that I would develop 16mm film, and I started. There was no assistant for me, and I had to do all the processes myself and all alone. That was how Rokuosha was operating in those days.[37]

Left to his own devices, Nishimura went on to develop a number of film products. By 1940, he had managed to synthesize a color film. This was a remarkable achievement, coming as it did without any technology transfer from the West. Commercialization of such products had to await the post-war reconstruction, however, and the attention of the company's top management was on other matters by then.

This neglect of photosensitive materials was to cost the company dearly. Indicative of this neglect was the so-called Sakura Pan F Accident. Some time in the mid-1950s, Konishiroku placed on the Japanese market a very large production run of its Sakura Pan F film. This was a panchromatic film that the company had been making for twenty years. This type of black and white film renders the relations among all the natural colors reflected by the photographed subject so that distortion is minimized. This quality is achieved by coating the film with a number of chemical layers, each of which filters certain color values. One or more of these filtering layers went bad in the mid-1950s. The result was a seriously defective product. The incident, however, went far beyond a temporary lapse in production quality control. The news that there was a defective Sakura film on the market spread rapidly. The debacle was aggravated by many months of hesitation on the part of Konishiroku's top management to recall the product. By the time this was finally done, the

company had lost an enormous amount of credibility and good will among both the Japanese public and photographic trade. The write-offs following the recall contributed to the losses reported by Konishiroku in 1957. Perhaps more important was that the company's loss of film market share in Japan became permanent following this incident.[38]

There were some other signs of a management not entirely in control in the Konishiroku of the late 1950s. The losses of the period had led to the discharge of some 500 employees, a move which precipitated a company wide strike lasting three months. Some executive changes were made following these troubles, but these changes did not get to the heart of the company's problem, which was that Konishiroku had been run as a family business for nearly a century, and no coherent business strategy had ever been formulated. The tacit assumption had been that because the company was the oldest Japanese photographic manufacturing enterprise, it must be the best. One Sugiura son or son-in-law followed the next into the company's leadership, regardless of qualification. In regal tradition, each assumed the name of Rokuemon Sugiura and added the next serial number to it. Few gave the company a sense of direction appropriate to the times, all surrounded themselves with undistinguished managers.

New Management

The company was in trouble again by the late 1960s. A second major film defect within a decade resulted in further sales erosion. By 1967, the company was reporting operating losses and again had to pass payment of its dividend.[39] This time the action taken by major creditors was somewhat stronger. The last member of the Sugiura family

was forced out of the company's presidency in 1968 and with him, his entire entourage on the board of directors. Ryosuke Nishimura, who had devoted nearly four decades to research and development of the company's film products, was named President, and he surrounded himself with a board of directors whom he considered more in tune with the demands of the day. He tried to bring about a rather thorough reorientation of the entire company. This reorientation took several forms. Noteworthy for our purposes here are the following :

1. Reorganization of the company into a functional structure. (Hitherto, the divisions responsible for optical goods and photosensitive materials had operated independently of each other. The new structure called for the heads of production, sales, research and engineering to assume company wide responsibility for their respective functions.)
2. Definition of the company's product markets to comprise x-ray films, color films, printing materials, exports, new business and optical goods in that order of priority. (See discussion below.)
3. Reversal of the flow of management decisions, which had hitherto been from the bottom up in the organization and would henceforth be from the top down. (See discussion below.)
4. Reorientation of employees to the market and its needs. (The inward looking tendency and adherence to how things had always been done were to cease. The attitude that if the company made things, the public would buy them was to be abandoned.)
5. Execution of expansion plans without increase in the number of employees. (Increased production and unit cost reduction were to

be achieved by mechanization and automation.)[40]

All five points are indicative of the kind of enterprise Konishiroku had been up to the time of these changes. Most of the points speak for themselves, but some require a little discussion. The order of product market definition is significant. Nishimura had devoted his career to the development of photosensitive materials. It is thus not surprising that he would give the highest priority to such materials in redirecting the company's product policy. No doubt the losses sustained by the company as a result of its participation in the highly competitive camera field also played a role in changing the product emphasis. The categorization of exports at the same taxonomic level as films does not, however, appear particularly rational. In the end, the particular product the company chose to export was not quite the same total product as the Sakura film and paper it sold at home but an anonymous one.

The fifth point is consistent with the second. The production of films had, by the late 1960s, become a far more highly capital intensive process than camera production had ever been.

In light of what is commonly believed in the West to constitute the essence of Japanese management style, the third point is remarkable. It raises the question, among others, of whether the Japanese management style as seen by Western eyes, is really an expression of deep seated cultural traits or a veneer that will be stripped off when adversity threatens the life of an enterprise.

The company's reorientation under Nishimura's direction must be viewed in somewhat broader context. As a consequence of Konishiroku's own mismanagement and of Fuji's far more aggressive marketing and quality emphasis, Sakura products had fallen far behind those of Fuji in sales

volume and public esteem within the Japanese market. The two local suppliers to that market were, furthermore, expecting an invasion of the Japanese market by the products of Eastman Kodak and other Western producers. Japan had effectively been closed to foreign photosensitive products since 1937 when the government had banned all photographic imports. Following World War II, local photographic producers were well protected by absolute quantity restrictions on imports and by very high import tariffs on the few products allowed into the country.

During the 1960s, these restrictions on photographic imports were gradually liberalized. The loosening of restrictions was a government response to pressures mounted by the Eastman Kodak Company and by Western governments during the Kennedy Round of tariff negotiations.[41] Japan was one of only two major photographic markets outside the command economies that was not completely dominated by the Kodak film brand. (The other market was Germany.) The fears of a Kodak invasion felt by the managements of the two Japanese film producers are thus understandable. If they were going to lose a significant share of their home market to Kodak, other markets had to be found as outlets for Japanese production.

Konishiroku management had thus decided to reorient its product policy toward greater emphasis on photosensitive materials and to seek revenue sources abroad. The management had, however, failed to develop a strategy for achieving the second of these objectives. It recognized a most serious weakness, which was that it had little marketing expertise in its domestic market and none whatever abroad. The resolution of this problem took three distinct forms. In two of these, the company in effect sold such knowledge as it had rather than pursuing traditional routes of

internationalization through product exports.

The first of these three responses was a series of turnkey projects in the centrally planned economies. The government of the Soviet Union had first approached Konishiroku for technical assistance with respect to surface treatment of optical lenses. An agreement calling for Konishiroku to provide such technological know-how had been concluded in 1966. The two parties were thus not strangers to each other.[42] The Soviets turned to Konishiroku again in 1971, this time to contract for the design and construction of a photosensitive paper coating plant. The annual production capacity of the plant was to be six million square meters. In addition to building the plant, Konishiroku was to provide know-how in the technology of manufacturing color paper. The value of the contract was reported to be ¥. 1.2 billion.[43] A second such project followed within a year. This one was in North Korea. Konishiroku was to supply plant and related technology for making the base material for films. The consideration for this was reported as ¥. 2 billion, though actual payment was made in deutschmarks.[44] An x-ray film and color film plant was built for Romania starting in 1974. The same year saw the start of negotiations for another turnkey project in the Soviet Union. This project called for the construction of a 10 million square meter annual capacity x-ray film plant. Several members of the Mitsubishi group of companies participated in this project by providing construction materials and financing.[45]

The strategic thinking, if any, supporting the company's entry into such turnkey project contracts remains obscure. Each such project is discrete. When it is complete, that is the end of it. There is no basis for a continuing business relationship in such projects. As Konishiroku

never redefined itself to become a chemical engineering supplier, it must be concluded that it took these projects on as a side-line to keep some of its excessive personnel occupied. The projects may even have been profitable for the company. But they must be regarded as a distraction from long term development of foreign markets.

The second way of exploiting Konishiroku film making knowledge abroad took the form of participation in a Brazilian production joint venture dedicated to x-ray films. Negotiations for the formation of this venture began in 1971 and required three years to complete. The other partners were a small Japanese trading company active in Brazil, the Brazilian government's development bank, and a group of private Brazilian investors. Konishiroku was to build the plant, provide know-how and 28 percent of the equity capital of US$ 2.2 million. The bank eventually sold its 28 percent of the equity to two private Brazilian firms. These were Curt, which is one of the larger Brazilian photofinishers, and 3 Irmaos, a holding company with diversified interests. The plant went into operation in 1977 in Resende which is in the state of Rio de Janeiro. Following the start-up of the plant, the enterprise was given protection by the government. Importers of x-ray films, namely Kodak, Fuji, 3M and DuPont, were given reduced import quotas by CACEX, the Brazilian government agency responsible for foreign trade. The total of these quotas represented the difference between total Brazilian market requirements and the capacity of the new plant. The plant, run by Konishiroku personnel, is known as Cia. Brasileira de Filmes Sakura Ltda. Although Konishiroku is a minority shareholder, it has effective control because the remaining shareholders are dispersed portfolio investors and because Konishiroku controls the technology.[46]

The third route by which Konishiroku internationalized following the ascendancy of Nishimura actually involved the sale of products. But these products were anonymous. Konishiroku became a supplier of films and papers to retailers and to other manufacturers. The latter imported the products in bulk master rolls, slit them and packaged them in boxes carrying their own brand names. Konishiroku was thus relieved of all costs and responsibilities associated with the function in which it was weakest, that of marketing. The conditions for the feasibility of conducting business in this fashion had been created by Kodak and Agfa over a long period in their efforts to popularize photography. This popularization had been achieved by the late 1960s; photography had finally become a truly mass consumption activity. Characteristic of this mass consumer market were cheap and easy to use cameras and a general demand for color photographs.

The characteristics of at least some of the consumers constituting such a mass market must be made explicit here. First, there is a segment somewhat less demanding in the quality expected from a photograph than that which the makers of famous brands pride themselves in supplying. There is another segment, which may overlap somewhat with the first, that is highly price conscious. It is perfectly content to forego whatever psychological assurances accompany the purchase of a renowned brand. A lower price is the quid pro quo for this sacrifice. The emergence of such market segments provided a perfect opportunity for Konishiroku. The company had neither the financial resources nor the expertise nor the confidence needed to undertake the marketing function for its sensitized materials abroad. There were, however, a number of enterprises willing to undertake the marketing function under their own

names but who lacked the ability to make color film and paper. Konishiroku chose to supply these marketers. Several illustrative examples of how this strategy was implemented follow.

The Spanish market for amateur photography had been dominated by Kodak, Agfa and Gevaert ever since there had been such a market. Nevertheless, several minor brands put out by local manufacturers had emerged in the traditionally protected Spanish market. Among these minor brands was one called Negra. This brand managed to maintain a precarious toehold while photography remained predominantly monochrome. But the coming of color photography threatened the continued existence of the Negra brand. The Negra management approached Eastman Kodak for a license to manufacture that company's Instamatic Kodapak film cartridge. It then negotiated with Konishiroku to supply the color film which would be packaged in these cartridges and in boxes carrying the Negra brand name. The result was Negra color film, which was distributed through Spanish retailers.[47]

In Germany, the European photographic market par excellence, a number of new photographic retailing channels emerged after World War II. Starting out as mail order catalog operations offering discount prices, they succeeded in carving out a niche for themselves in the market for photographic goods. Their success led to the opening of retail chains across the country, selling from the same catalogs as those used in their mail order operations. This led in turn to franchising of the name and style of operation. Product purchasing remained centralized. Typical of these operations was a company named Photo Porst with over 500 retail outlets in the Federal Republic, the overwhelming majority of these being franchisees. The reputation for quality and good value enjoyed by such a

name gave the company a large degree of both selling and buying power. Porst branded film began to be supplied by Konishiroku in 1972. Porst took care of all selling, development and printing.[48]

Similar private label supply arrangements were worked out by Konishiroku in other countries. The most important of these national markets by far is the U.S., which currently takes about half the company's film production. Konishiroku has some 30 direct U.S. customers for its sensitized products, some of which retail unexposed film and processed photographs by mail order. Others, mainly drug store and supermarket chains, perform the retailing function in face-to-face contact with consumers. The biggest customer, accounting for more than two thirds of the company's U.S. film sales, is Fotomat Corporation. The latter operates and franchises kiosks, mainly in shopping center parking lots, throughout the U.S. Unexposed film and processed photographs are sold in these kiosks which serve as free standing single purpose retail counters. By 1982, Fotomat had over 3,700 kiosk outlets, some of which are franchised to others. The processing is done in 10 Fotomat laboratories. Fotomat became financially overextended by the rapid expansion of its retail network and sustained serious operating losses during the U.S. economic recession of the early 1980s. A retrenchment began in 1983, and nearly 1,200 of the kiosks were closed during the next 18 months. The reluctance of U.S. banks to continue financing a losing operation brought Konishiroku into the picture in the role of financier, in addition to being Fotomat's most important supplier. In 1982, the Japanese company contributed US$ 13.5 million to Fotomat by the purchase of convertible debentures. Late in 1984, the two companies announced that Konishiroku would pay in an additional US$ 10 million for Fotomat common stock and

convert the 1982 debentures. These moves, when completed, will give Konishiroku a 60 percent equity in Fotomat and control over the latter's board of directors.[49] What, if anything, Konishiroku will do to exercise this new control over a foreign retailer remains to be seen.

Here and there, beginning in 1983, Konishiroku had begun to make sporadic attempts to capitalize on the reputation of its Konica cameras by advertising Konica branded films in the U.S. These efforts have not proved to be effective since there was virtually no retail distribution for Konica films. Whether the company would use its new control over a ready made distribution channel such as Fotomat to introduce its own brand remains to be told.

Conclusion

The major themes of this thesis are business strategy and internationalization in the photosensitive materials industry. In this context, the most significant facts concerning Konishiroku can be summarized briefly. It is a Japanese company. As such, it was rather late in mastering the process technology required for survival in this industry. It was even later in making an appearance with the products of this technology outside its home base. In exporting these products, it chose largely to play the anonymous role of private label supplier.

This collection of facts raises a question : Are there some plausible connecting links among these facts. The preponderance of available evidence suggests that the facts are idiosyncratic. They are not only unique to Konishiroku as an enterprise but to the company's participation in this particular industry.

As will be shown in the next chapter, Fuji, an even later

Japanese arrival, chose to use a rather different approach to internationalize its business. Moreover, Konishiroku itself does not handle other parts of its international business by the same means as it uses for sensitized materials. Konica cameras are sold by subsidiaries in the U.S. and in Germany. The German subsidiary operates a sales branch in the U.K. In efforts to ensure its corporate survival, Konishiroku has diversified into several related fields. Like several other Japanese camera producers, the company has gone into the field of plain paper electrostatic office copying equipment. Konishiroku copyers are marketed under the brand name of U-Bix. Separate Konishiroku subsidiaries domiciled in Germany, the U.K. and France sell and service U-Bix copying machines in those countries.[50]

The company's policy of private label exporting is thus confined to photographic film and paper. Such a policy may be appropriate for an enterprise that lacks the skills required for effective marketing of these products. But the policy carries with it well defined risks. It trades off the avoidance of present marketing costs for highly uncertain future revenue generating capability. In abdicating responsibility for foreign marketing, the company exposes itself to the mismanagement or bad luck of a small number of customers in addition to normal commercial risks. Given Konishiroku's limited choice of potential and actual customers in an industry dominated by branded goods, its prospects for long term prosperity in this industry do not look bright.

Notes and References

[1] The research for this chapter was done in secondary sources. For translation of Japanese materials, the help of Ms. Toshiko Yonemura is gratefully acknowledged.

[2] Paul C. Blum, Yokohama in 1862, Tokyo: The Asiatic Society of Japan, 1963, p. 36.

[3] Japanese Historical Cameras Screening Committee, "A History of Japanese Cameras", Camerart, July 1976. An English translation of this history was published by Camerart in serial form from July 1976 to May 1979. This work is hereafter cited as Camerart, (month, year); there is no pagination in the reprint used in this research.

[4] The given name has also been transliterated as Rokusaburo and as Rokubei. For the sake of consistency, the name Rokuemon is used in this chapter.

Japanese names are reported Western style in this thesis : given names first and family names second.

[5] Camerart, July 1976;

Shashin To Tomo Ni Hyaku Nen, Tokyo: Toppan Insatsu, 1973, pp. 27 - 28; it is to be noted that the work cited here is an abridged edition of a considerably longer work of the same name written to commemorate the 100th anniversary of the start in involvement with photography of the antecedents of the present Konishiroku company. The longer work was not published but printed privately in an edition of 2,000 copies. It was edited by Tokio Kikuchi and Takishi Kamei. To avoid confusion, the shorter work is hereafter cited as Tashin To Tomo... and the longer work as Kikuchi & Kamei...

[6] Kikushi & Kamei, p. 30.

[7] Camerart, July 1976.

[8] Shashin To Tomo..., pp. 28-30

[9] Kikushi & Kamei, pp. 70-72.

[10] The Institution of Civil Engineers, (London), "William Kinnimond Burton," Minutes of Proceedings, Vol. 139.

[11] Kikushi & Kamei, pp. 72-74.

[12] Ibid., pp. 77-78.

[13] George Eastman testimony, United States v. Eastman Kodak Co. et al., National Archives, Washington, D.C. See Note [1] of Eastman Kodak chapter for further description.

[14] Kikushi & Kamei, pp. 90-91.

[15] Ibid., pp. 159, 332.

[16] Shashin To Tomo..., p. 96.

[17] Camerart, November 1976.

[18] Camerart, April 1977.

[19] Shashin To Tomo..., p. 96.

[20] Camerart, January 1977.

[21] Kikushi & Kamei, p. 136.

[22] Robert J. Hercock and George A. Jones, Silver by the Ton, London: McGraw-Hill Book Company (UK), 1979, p. 50;

Kikushi & Kamei, p. 161.

[23] Ibid., pp. 162-163.

[24] Konishiroku Today and Tomorrow, company brochure, ca. 1982.

[25] Camerart, March 1977.

[26] Kikushi & Kamei, pp. 377-382.

[27] Ibid., pp. 409, 492-496.

[28] Camerart, July 1977.

[29] Herbert Martin Bernstein, "The Signigficance of the Postwar Growth of the Japanese Photographic Industry", unpublished Ph.D. dissertation, Western Reserve Universaity, 1965, pp. 25-27.

[30] Camerart, September 1977.

[31] Konishiroku Today and Tomorrow, company brochure, ca. 1982.

[32] Camerart, September 1977.

[33] Camerart, December 1977;

"35mm Nikon and Lenses Tested by Experts", New York Times, 10 December 1950;

David Douglas Duncan, "Photo Data" in This Is War !, New York: Bantam Books, 1967, n.p.

[34] Kikushi & Kamei, pp. 662-663.

35 Camerart, July, September, December 1978.

36 Kikushi & Kamei, p. 702.

37 Ibid., p. 388.

38 The details of the events described here have become obscured by the passage of time. The reported information was gathered in interviews with a dozen Japanese members of the photographic industry and trade. These included dealers, wholesalers, trade press editors and others involved in photography at the time. The reliability of such information gathered more than a quarter century after the fact is open to question. The responses received were, however, consistent.

39 Shashin To Tomo..., pp. 278-281

40 Kikushi & Kamei, pp. 797-801.

41 Japan Camera Inspection Institute, Sekay No Nihon Kamera - Yuhutsu Sangyo E No Ayumi, Tokyo: Tokyo Shabo, 1975, pp. 255-269.

42 Japan Camera Trade News, February 1966.

43 Photo Trade of Japan (overseas edition of Nippon Shashin Kyogyo Tsushin), No. 75, 1971; hereafter cited as Photo Trade of Japan.

44 Ibid., No. 81, 1972.

45 Ibid., No. 87 & No. 92, 1974.

46 Ibid., No. 76, 1971 and No. 82, 1973;

Kikushi & Kamei, pp. 812-813;

Correspondence with H. Jensen, Sao Paulo, Brazil, March 1983.

47 Author's personal knowledge from prior business experience in dealings with Negra Industrial S.A., Barcelona, Spain.

48 Photo Trade of Japan, No. 79, 1972; No. 83, 1973.

49 Photo Trade of Japan, No. 80, 1972;

Wall Street Journal, 8 January 1972 & 20 November 1984;

New York Times, 24 June 1982;

Standard & Poor's Stock Reports, 12 June 1984;

Moody's Industrial Manual, 1984, p.2,618;

Business Week, 10 December 1984.

50 Annual Securities Report, Konishiroku Photo Industry Co. Ltd. to Japan Ministry of Finance, Tokyo: Printing Office of Ministry of Finance, 1982.

Chapter VII

Fuji [1]

Introduction

Fuji Photo Film Co. Ltd. (hereafter Fuji) is the youngest of the companies studied in this thesis. In less than five decades, this Japanese company has won a world sales ranking in its industry that is second only to Eastman Kodak. For its 1983 fiscal year, Fuji reported sales of ¥. 634 billion. (in equivalent terms, this exceeded U.S.$ 2.7 billion.) It is estimated that 70 percent of the company's revenue is generated by sales of photosensitive materials. A third of its production is exported.[2] Its products are sold wordwide in those countries that have market economies. All products are exported from the company's Japanese manufacturing base. Serious internationalization of Fuji marketing efforts did not start until the 1960s. As of the early 1980s, the company's market share in every country outside Japan was as yet small. In late 1983, for example, Fuji's U.S. film market share was estimated at six percent.[3]

Fuji's senior management has had a cosmopolitan outlook since the company's beginnings. The relatively recent internationalization of the company is thus not the result of lack of desire or ambition. It is, rather, the consequence of a business strategy that assigned the highest importance to the achievement and maintenance of product quality leadership and reluctance to sell abroad until this had been achieved.

Fuji was formed by the Mitsui Group. The company's management

has always used its global scanning capability and that of the Mitsui organization to keep itself informed of technical developments in photography everywhere. Fuji entered its industry some five decades after Eastman Kodak. Fuji management knew that the company had much technical catching up to do. Relying solely on its own research and development, Fuji needed until the 1960s before it could offer to markets outside Japan photosensitive products that matched or surpassed those of its western competitors in performance, reliability and consistency. A fanatical dedication to product quality thus became one of the anchors of the company's competitive strategy. From its beginnings, Fuji has been willing to absorb short term losses in destroying large production lots that fell short of meeting its quality standards.

Fuji played a technical catch-up game for several decades. As the basic scientific concepts and relatioships underlying photosensitivity were gradually mastered, the company's management came to understand, perhaps more clearly than any of its competitors save Eastman Kodak, that the maintenance of quality and the achievement of low unit costs were the result of the same capital intensive production process. Scale economies thus became a second anchor of Fuji strategy. While it was perfecting its production processes, the company used the time to build a dominant position in its highly protected domestic market. This meant getting effective control over Japan's exceedingly complex photographic distribution system.

In pursuing these strategic goals, Fuji developed a reputation that tends to perpetuate itself as a self-fulfilling prophecy within Japan. This reputation is quite simply that it is the best. As such, it attracts the best graduates of the best universities to become the future

cadres of its scientific, engineering and management leadership.[4]

Fuji reached a stage of technical development enabling its products to compete on a world scale at a time when external pressures prompted a more intense search for markets outside Japan. Western governments pressed Japan to open its market to foreign photographic goods during the 1960s. The eventual success of these efforts was seen by Fuji as a threat to its 70 percent share of the Japanese film market. The eventual abolition of quantitative import restrictions and a significant reduction of import tariffs were interpreted as an invitation to a massive invasion of the Japanese market by Eastman Kodak products. To maintain its production scale economies, Fuji management felt compelled to increase its export efforts.[5]

There is a distinction between recognition of the need to compete abroad and the ability to do so effectively. The outlines for Fuji's strategy for achieving the latter are still emerging as of this writing. Two aspects are gradually coming into view. One is the establishment of a universally recognized and admired brand image. The other is to price products in markets outside Japan below those of its western competitors. The eventual outcome of these policies remains to be written. This chapter traces the developments covered in the foregoing introductory summary.

Early History

Although Fuji was not formed as a separate company until 1934, its origins go back to 1919. In that year, two companies significant for this history were formed. The first of these was Dainihon Celluloid,

later changed to Daicel Chemical Industries (hereafter Daicel). The parent company of the then Mitsui zaibatsu acquired some eight smaller Japanese companies and merged them into the new Daicel subsidiary. Six of these eight companies were manufacturers of celluloid. The other two were involved in artificial fibers, products using raw materials and process technologies at that time similar to those used in the manifacture of celluloid. The primary purpose of Daicel was to make and sell celluloid. In this it succeeded and soon became the largest Japanese company in its field, enjoying a domestic market share exceeding 50 percent as well as a substantial export business.[6]

Forward integration of manufacturing operations to include products using celluloid was contemplated from the start by Daicel. One of these products was photographic film. When Daicel was formed, the first Japanese made film was still nearly a decade in the future. But Mitsui's scanning had already identified the direction of technological change in photosensitive materials. The film products of Kodak, Agfa, Gevaert and Pathé were already on the market in the West, and small quantities of these had been exported to Japan. Daicel saw a major future business opportunity. Research and process engineering devoted to the production of celluloids suitable for photographic film began in 1920. Research into photosensitive emulsions began a year later.[7]

The other Japanese company formed in 1919 was Toyo Kanpan (hereafter Toyo). This became the first Japanese enterprise to succeed in putting out a photographic dry plate that was up to the quality and performance standards of those produced in the West. Toyo's facilities were badly damaged by the 1923 earthquake. Lack of capital impeded the efforts of Toyo to rebuild during the next several years. Toyo approached

Daicel for a loan that was made in 1926. The quid pro quo for the loan was the appointment of a Daicel executive as Toyo's Managing Director. A cooperative relationship in emulsion research between the two companies was also formed as a result of the loan.[8]

The research efforts of Toyo and Daicel made slow progress during the 1920s. To speed up the acquisition of needed knowledge, several approaches were made to photographic companies in the West. The purpose of these approaches was to secure the technology of film manufacture in return for joint venture participation in a Japanese plant. The first of these approaches was made to Eastman Kodak in 1924. Technicians were sent from Rochester to Japan for investigations. They concluded that the excessive humidity in Japan made film production there quite impossible. A second negotiation with Kodak took place five years later. This time Kodak offered to supply film base material to Daicel. This offer was refused because Daicel had by this time gained sufficient confidence in its own ability to make base material. Kodak then announced its intention of starting its own Japanese plant. That threat was never carried out, but it alarmed Daicel sufficiently to accelerate its own technical efforts. These were helped along by several research grants from the Japanese government. A negotiation with the management of Gevaert in 1932 also came to nothing. With every such failure to acquire outside technology, the determination of Daicel to procede on its own became stronger.[9]

By 1933, Daicel felt ready to enter the photographic film business. Partial funding for the construction of a plant was contributed by the Japanese Ministry of Commerce and Industries. The first product to be made by this plant was cinefilm. Imports of this product had by then

become a noticeable drainer of Japan's foreign exchange. Upon completion of the plant in 1934, Daicel formed Fuji Photo Film Co. Ltd. as a separate subsidiary. Many subsequent increases in Fuji common stock issues were funded by public subscription, thereby eventually making it an independent company although it has always retained close informal ties with the Mitsui interests. Fifty years after the founding of Fuji, Daicel owned less than three percent of Fuji's equity.[10]

Among the first actions by the new Fuji management was to acquire Toyo and to absorb it into its own organization.[11] The rationale for a newly formed enterprise dedicated to the manufacture of motion picture film to acquire a company in the business of making dry plates is not self-evident. Several reasons suggest themselves, although they must represent pure speculation. One is that Fuji wanted a more direct and permanent control over Toyo's emulsion making knowledge than was possible under the previous cooperative relationship. Another was that Fuji needed sales revenue to get started in business. There was market potential for Fuji film, but there were as yet no customers. Such Japanese users of cinefilm as existed were perfectly content to use Kodak, Agfa and other imported brands. Fuji's first efforts to get its product into use took the form of giving large quantities of sample film to newsreel producers with the request that they simply try it. Toyo at least had a saleable product, a sales force and a network of franchised dealers and wholesalers. Although Toyo's plates satisfied a rather different market need, they brought in some revenues while Fuji struggled to establish itself commercially. Finally, the thinking of Fuji management has from its beginnings shown itself to be long range. Cinefilm was not the only product destined to be made by Fuji. Within a

year of its foundation, the company was putting out roll film for still cameras. It is arguable that one of the motivations for the acquisition of Toyo was the same as had been that of George Eastman in acquiring a number of American and English plate producers earlier in the century. This was to put the users of an older but still competitive technolgy out of business and thus hasten the market's acceptance of the products of a newer technology.

Fuji's films gradually began to win acceptance. Within two years of the company's startup, a facilities expansion was seen to have become necessary. The nature of the expansion decision lends support to the line of thought pursued in this thesis with respect to the relationship between production scale economies and market seeking. The majority opinion among Fuji managers was that expansion should take place in small, cautious stages. This was to prevent the company from becoming overextended. Facilities expansion should, according to this view, await market development and shifts in government policy. Fuji has, however, never been run in a style that conforms to the contemporary stereotype of Japanese management. The chief executive of Fuji takes advice from his managers but makes his own decisions. The company's President at the time, Shuichi Asano, decided on a large expansion. He did so on the assumption that demand for the company's output would be there regardless of governmental policy and should be sought, if necessary, in export markets.

The expansion was financed by a common stock issue that increased the outstanding common stock equity from ¥. 3 million to ¥. 7 million. (In 1937, the yen was worth approximately one third of a U.S. dollar.[12]) The funds were used to increase cinefilm production capacity

by 75 percent, to nearly 20 million linear meters; they were also allocated to construction of facilities for production of x-ray film, still camera roll film, sensitized papers, fine chemicals and a central research laboratory.[13] The government helped to ensure the commercial success of this expansion in 1937 by placing a total embargo on the importation of all photographic products.[14]

During the five years from its first facilities expansion to the start of the war with the U.S., Fuji enjoyed vigorous commercial growth. During this period, the company opened warehouses and sales branches in such Manchurian, Korean and Chinese cities as Dairen, Seoul, Changchun, Shanghai and Tientsin. By 1941, some 20 percent of the company's production was going to such places outside the Japanese islands. In view of the military and political circumstances of the time, it is moot whether such shipments can properly be called exports. They are, however, indicators of management thinking and certainly contributed to the development of markets for the output of the expanded production facilities. Salesmen with samples of cinefilm were sent as far afield as England and Czechoslovakia during this period. But import restrictions imposed by those countries made it impossible to consumate sales there.[15]

During the immediate pre-war years, the company sent a number of technicians to Europe and the U.S. Their assignment was to scan the technological horizons of the photographic industry. Fuji bought neither the technologies found in the West nor the products made by the use of those technologies. But the discovery of what had been developed by other companies helped to define the direction of Fuji's research efforts. These efforts bore fruit in three forms. One was a rapidly proliferating

product line of films and papers with ever increasing light sensitivity. Another was continued development of faster and more efficient production processes. Finally, the company and some of its domestic suppliers became less dependent on imports of certain critical intermediate products like photographic gelatins and baryta paper.[16]

To help the sales of its amateur roll films, Fuji became a producer of still cameras in 1938. The company had, by the late 1930s, established a reputation for energetic and effective management. In its roles as the sole domestic supplier of cinefilm, as an increasingly important supplier of aerial use film to the military and as a member of the Mitsui zaibatsu, Fuji inevitably became known in high government circles. The demand of the military forces for precision optical goods stimulated a certain pressure from the government on Fuji to acquire several less well managed manufacturers of related intermediate products so as to bring them under more efficient management. The pressures of a war economy thus enabled Fuji to become an important producer of precision optical instruments during the early 1940s. [17]

Like all members of the Japanese photographic industry, Fuji became, for all practical purposes, a supplier whose entire output went to the military or other government agencies during World War II. In his autobiography, Setsutaro Kobayashi, later to become the company's President, sums up the war experience in the following terms :

> If the war was of any benefit to us, I might say the greatest gift was that the technical members of the company had the experience of producing something to the highest quality demanded without copying others, without depending on others, using the worst materials for the highest quality, and their zeal to achieve it. It was a great experience. All the present Fuji technologies are based on these experiences.[18]

American air raids on the Japanese islands during the war

prompted a search for a safer manufacturing location. A branch film plant was planned for Manchuria. Execution of this plan had gone as afar as dispatching some sixty people and several ships loaded with equipment when the war ended.[19]

Among the products of Fuji's wartime research was a color film. Immediate commercialization was out of the question under wartime conditions and even during the immediate post-war period. When the company was first allowed to resume production in late 1945, the headquarters of the American occupation confined it to manufacture of x-ray films and somewhat later to cinefilm.[20]

The Post - World War II Era

The Japanese economy gradually developed back to something approaching normal status in the five years from the end of World War II to the outbreak of the Korean War. Fuji rebuilt its damaged factories during this period and eventually resumed production of a full line of photosensitive materials.

Fuji devoted much of its energies during the first fifteen post-war years to solidifying its product and process technologies and its position in its domestic market. It did so by adopting the most modern process technologies and management techniques then available to become a low cost, high quality producer. The following are some noteworthy examples of what occurred.

Starting in 1948, Professors Motosaburo Masayuma and Toshio Kitagawa instructed Fuji management, from top executives to production engineers, on the application of probability theory to statistical quality

control. These efforts were supplemented in 1951 by no less an authority than Frederick Deming. He was invited by Fuji to supervise the development of a company wide quality control program. Over the course of several years, the principles of statistical quality control came to be applied in every production department of the company. Production line statistics became the subject of wide ranging discussions throughout the company. The objective of these discussions was what could be done to change the story being told by the statistics. These discussions resulted in almost continuous change and modernization of production equipment throughout the 1950s. [21] These efforts had begun to be recognized by 1956, the company being awarded the coveted Deming Prize that year.[22] During the same year, the International Crystallographic Society judged Fuji's x-ray film to be the best in the world among 41 entries which included Eastman Kodak.[23]

During the 1950s, Fuji undertook the development of a device that is today in the Ueno Science Museum in Tokyo. It is a precursor of the modern computer. It was installed to control ambient environmental conditions in the film production plant. It must count among the earliest uses in the industrial world of this tool for manufacturing process controls.[24]

Fuji was able to afford such innovative experiments beause the company was operating in an environment of rapid growth in the domesic market for its products. During the 1950s, Fuji sales of film and sensitized paper grew at compounded annual rates of 20 percent and 18 percent respectively. The standard of measurement on which these data are based is square meters of product. By the end of the decade, these unit measures came to 6.5 million square meters of film and 4.6 million square

meters of paper per year.[25]

Helped along by Konishiroku's somewhat more complacent attitude toward product quality, Fuji had surpassed its older rival's market share by mid-decade. At the end of the decade, Fuji's domestic film market share exceeded 62 percent.[26] It was a decade characterized by significant changes in Japanese distribution channels for photosensitive materials. As photography came into widespread use, its products entered mass distribution channels. Film could eventually be bought in almost any kind of retailing outlet. In a growing market, such outlets supplemented rather than supplanted the traditional photographic specialty dealers. Fuji was perspicacious in sensing the change and aggressive in moving its products through these new channels to widen the distribution of its films.[27] To help the company achieve this objective, it persuaded the five largest wholesalers to carry its photosensitive materials as their sole Japanese brand.[28] It was during this period that Fuji adopted the distinctive green background color used in all its product packaging and display advertising.[29]

The company marketed its first color film in 1948, but the management did not feel this product was up to the standard set by Kodak. It took a decade of additional research and development to reach this stage. In its bread and butter product, professional cinefilm, the company had to solve two related technical problems simultaneously. One was the perfection of the color process itself. The other was to change the base carrying the color layers. Under public policy pressure in the industrially developed countries, the photographic industry had finally shifted during the post-war period from the use of the highly flammable cellulose nitrate base to non-flammable cellulose triacetate for cinefilm

used in public exhibition. Fuji had to catch up with these developments before it could consider the export of such films to the West. It took most of the 1950s to bring Fuji to this stage.[30]

In summary, Fuji devoted its energies and resources during the first fifteen post-war years to establishing itself and solidifying its position as the leading domestic Japanese supplier of photosensitive materials. The major emphases were on research, development, production engineering and domestic marketing. The company was occupied with meeting the rapidly growing demand in its domestic market and was catching up to the West in technical development. In both of these efforts, it was helped by the import substitution and infant industry protection policies of the Japanese government. These policies were expressed by traditional means, such as absolute quantitative import restrictions and a 30 percent ad valorem tariff, as well as by periodic research and development grants to local industry.[31]

International Activities

Although the company's attention was mainly focused elsewhere, as described above, it was certainly aware of what was going on in the rest of the world. A veritable stream of top executives visited other countries throughout the 1950s. While most of these visits had technical investigations as their primary objective, market prospecting was not neglected. By the end of the decade, the company had appointed sole agents or exclusive distributors in some twenty countries. Most of these were in the Asia - Pacific Basin and did not represent large markets. In the West, sales of Fuji products were largely confined to its optical

equipment by distributors in the U.K., Canada, the U.S., Argentina, Venezuela and Brazil.[32] The last named among these countries in fact became host for the company's first wholly owned foreign sales subsidiary. This is discussed at greater length below. However, in mid-1958, a trade publication reported that Fuji, though by far the largest Japanese film manufacturer, had as yet made no significant export advances.[33]

Brazil would seem, on first consideration, to have been an odd choice as a market to start Fuji's first foreign sales subsidiary in 1958. Several factors must, however, be considered. Fuji has traditionally held the technical and commercial prowess of Eastman Kodak in awe. Fuji thus took care to avoid a head-on confrontation with the much larger American company in its areas of major strength. Although Kodak had organized its own Brazilian sales subsidiary in 1920, nearly four decades later Brazil still had a relatively underdeveloped general economy and photographic market. It was, however, seen as a country with enormous long term potential. And for Fuji, some of that potential was seen to be more immediate.

Brazil's population includes a small, though economically significant, minority of people whose ancestry is Japanese. This minority was estimated to number 700,00 at the time. It had concentrated its business activities in certain sectors, one of which was photography. A well known Brazilian importer and distributor of photographic goods declared at a 1959 Tokyo press conference that he had about 3,000 dealer customers and that half of these were Japanese-Brazilian.

Fuji had tried to cultivate this market since 1952, when one of its Directors, Seiki Matsumoto, had been sent to Rio de Janeiro to represent the company in a Japanese Commodities Exhibition and to

investigate local market conditions. He was followed two years later by Setsutaro Kobayashi, then the company's Sales Director. After Kobayashi's visit, Fuji sent a company sales manager to become resident in Brazil to assist the local independent distributor in promoting the company's products. After four years of residence in Brazil, he was appointed General Manager of the company's newly formed subsidiary. The immediate purpose in forming the subsidiary was to get a basis for improved control over the foreign exchange allocations by which Brazil has traditionally tried to restrain imports. This purpose was frustrated from the start of the subsidiary and has slowed Fuji's progress in Brazil significantly over the years. To help overcome this import restraint, the company eventually opened an operation in which film and paper are imported in bulk master rolls which are then slit and packaged locally.[34]

At about the same time as the formation of its Brazilian subsidiary, Fuji took its first tentative steps toward the export of sensitized materials to North America. It appointed Ideax Corporation to be its U.S. distributor for x-ray and industrial use films.[35] Though perhaps of less importance but attracting somewhat more attention was the appointment of Ehrenreich Photo Optical Industries as amateur product distributor for the U.S. and Canada. Ehrenreich had been one of the American pioneers in the importation of Japanese cameras when they first gained fame during the Korean War and had been involved in the distribution of Fuji optical products for some years. Following the pattern established in Brazil, the company established its own branch office in New York to assist and perhaps to oversee Ehrenreich's promotional efforts. One of the people eventually seconded from the company's Fukuoka branch to the New York office for five years was an

aggressive young sales manager named Minoru Ohnishi who was destined to become Fuji's President in 1980. [36]

The significance of these moves was not lost on the Japanese photographic trade press, though it was played down by Fuji. The following 1958 interchange was indicative :

> Q. : Mr. Kobayashi, it seems to me that export of Japanese film to the U.S.A. is revolutionary. Will there be no danger of causing troubles or competitions there ?
>
> A. : No, not at all. We are very friendly with Eastman Kodak....It is quite absurd to assume that our small exports might influence Kodak. They said it doesn't matter.[37]

The Kobayashi Era

Two major factors influenced Fuji policy during the 1960s. One of these was the elevation of Setsutaro Kobayashi to the company's Presidency in 1960. The company has traditionally shown an uncanny ability to put into positions of top leadership men whose special training and abilities corresponded to the most important needs of the time. Kobayashi's predecessor, Sakae Haruki, had been an engineer. Kobayashi had been involved in trade throughout his entire business career. He had begun his work in 1923 with Iwai Trading Company, exporting the celluloid products of Daicel. To help make those export efforts more effective, he was stationed in London for six years. In his memoirs, he asserts that he found English a more efficient language than Japanese for the conduct of business. When Daicel formed Fuji, he was invited to join the new company as Sales Manager. When he became Fuji's President, he had directed its marketing activities for a quarter century.[38]

Although they represent minor digressions from the main path of

this story, several developments are recited here to illustrate Kobayashi's readiness to depart from Fuji's traditional policy of technological self-reliance. In 1962, the company entered into a joint venture with Xerox Corporation to exploit that company's electrostatic copying process in the Far East. Fuji supplied manufacturing, marketing, management and just over 50 percent of the capital needed by the venture. Xerox supplied the technology through a license and the remainder of the capital. Fuji-Xerox developed into one of the most successful and lasting international joint ventures of modern times.

In 1964, Fuji became a licensee of Polychrome Corporation, an American company controlling the technology of pre-sensitized metal plates used in offset printing. During the same year, Fuji became the exclusive Far East distributor of Pako Corporation, an American producer of automated photofinishing equipment.[39] Several times during the author's business experience in the 1960s, Fuji approached Polaroid Corporation for a license to exploit that company's instant photographic processes in Japan. These approaches were, however, rebuffed, and Fuji eventually introduced its own instant system.

The memory of Kobayashi is revered in the company. He had a gift for expressing himself simply and directly, without the stilted circumlocutions characteristic of the Japanese language in formal usage. An example, appropriate to our subject, from his memoirs follows :

> My policy in selecting an agent was to look for a practical nurse rather than an academic doctor. In any market, it is not easy to bring up a product into a commercial product. Unless the distributor brings up the product as his commercial product, the sales of the product will not go well. I have always said, and still do, to the plants of the company, 'Make commercial goods, do not just make products.' Commercial goods are the kind the customers or users like to buy and appreciate. Mere products are the kind that needs a lot of explanations for selling.[40]

The second major influence on Fuji policy in the early 1960s was the beginning of serious pressure from Western governments on Japan to dismantle its barriers to the importation of a host of products, including sensitized photographic materials. In 1962, licenses to import color film were still limited to a global value of $70,000 per calendar quarter; the import tariff on this film was 30 percent ad valorem, and it was due to be raised to 40 percent in 1964, the year of the Tokyo Olympic Games.[41]

The government gave its local industry a great deal of time to adapt to the changing economic environment. It took more than two decades to eliminate import quota restrictions and to decrease the tariff to its present negligible level. But the implications of import liberalization for Fuji were perceived and expressed by its senior management with the utmost clarity from the outset. In 1962, Fuji Director Matsumoto was reported in the trade press to state :

> We are facing (sic) with trade liberalization of photographic goods; we cannot limit our economical activities within the domestic market now, but have to stand on world-wide viewpoint, and have to compete with foreign goods in a wide market.[42]

Within two years, President Kobayashi came straight to the heart of the matter in an interview :

> Q. : Has the postponement of free imports of color film been decided because domestic color film cannot meet competition ?
>
> A. : I shall say humbly that it is true to some extent. But quality of domestic color film is not inferior to Agfa, Ansco and other makers except Kodak. As to the question of international competition, production cost, beside quality, will be an important factor which is unavoidably affected by production volume. If sales of domestic color film were confined within the domestic market only, we will be unable to put out enough quantity to lower the price to meet free competition in the world market.... Quality, price and finally sales ability are the deciding factors to take part in international competition.[43]

Guided by such thinking, the company began to increase its export efforts significantly during the 1960s. Fuji announces to its employees at the start of each fiscal year a short list of major company objectives for the coming year. The raising of all the company's products to an internationally competitive level and reinforcement of export efforts became prominent in these annual proclamations during the 1960s. The same message was emphasized in Kobayashi's semi-annual letters to shareholders during this period.[44]

Such efforts required competitive products and a distribution network before they could succeed. Much of the decade was devoted to developing these. By 1964, the network had grown to 80 distributors in 60 countries. By the end of the decade, it had increased to 140 distributors in 70 countries. Kobayashi's preference for a distributor who "brings up the product as his own commercial product" was given expression by the formation of wholly owned subsidiaries in the U.S. and the Federal Republic of Germany during the 1965 - 1966 period. These subsidiaries had for some years been preceded by unincorporated branch offices. These branches had existed primarily for market study and to assist local distributors in promotion of the company's products. An indication of the company's thinking about the directions of its international expansion as the decade ended is provided by the existence of such Fuji representative offices for market study and sales promotion in Bangkok, Hong Kong, Seoul, Singapore, Taipei and Buenos Aires.[45]

To draw attention to itself outside Japan, Fuji needed a product that could serve as a company promotional vehicle in addition to whatever commercial potential the product had in its own right. This turned out to be not so much a product as an entire product system. It comprised a line

of 8mm cameras and projectors and three films suitable for amateur cinefilm users. The heart of the system was a new thin polyester film base with sprocket holes for moving the film on only one side of the film, packaged in a ready-for-use cartridge. The cartridge design and thin film base made possible a considerable miniaturization of camera and projection equipment compared to what had hitherto been available on the world market. It also enabled the user to load camera and projector without the cumbersome threading of film that had previously been necessary. It attempted to do for amateur cinematography what Eastman Kodak had done for still photography with its Instamatic system in the early 1960s.

Fuji offered use of the entire hardware system design, which became known as Single-8, to the rest of the photographic industry on a royalty free basis. A number of manufacturers accepted this offer. Not among these was Eastman Kodak which soon thereafter brought out a similar system that came to be called Super-8 and offered a slightly larger picture size. Fuji brought the Single-8 system to market in Japan so as to have it in consumers' hands for the 1964 Tokyo Olympic Games. The system was introduced in the U.S. at the New York International Photographic Exhibition in 1965 and was awarded a prize there as a major contribution to the progress of photography. A year later, Fuji made its first appearance at the biannual world photographic trade fair, Photokina, in Cologne. Single-8 was demonstrated in a 670 square meter stand, the third largest at the fair, with a flamboyance that caused a sensation. In the eyes of the trade, Fuji had arrived as a world class competitor.[46]

Having introduced Single-8 to the world and eager to extend its reputation as a high quality film producer, Fuji set about organizing a network of photofinishing laboratories in which Single-8 films, and

eventually all its color products, could be developed and printed in accordance with the company's rigorous quality standards. Some of these laboratories were wholly owned, some were run as joint ventures, and some were run by independent licensees. All were subjected to intense training and continuous quality supervision by Fuji. By the end of the 1960s, there were approximately 150 such Fuji laboratories in 28 countries.[47]

The company's insistence on maintaining its demanding quality standards may have somewhat inhibited the rapid expansion of its international business. In its 1969 fiscal year, exports represented 11 percent of its total sales, and the operating results of its three foreign subsidiaries were not yet consolidated in the company's financial statements, suggesting that their contribution to overall sales and earnings were still negligible. The company's total sales had, however, shown a sevenfold increase during the last decade, to Y. 88 billion or approximately $244 million. The 11 percent share of this represented by exports was thus not a negligible figure. The Ministry of International Trade and Industry had cited the company as making a meritorious contribution to Japan's exports.[48]

Post - 1970

Kobayashi retired from the company's presidency in 1971, but the pattern of international expansion that had been established during his tenure was maintained by his successors. The foreign distributor network was extended to exceed 200. Sales subsidiaries were formed in the U.K. and Hawaii, and the Canadian distributor was bought out. The name of the German subsidiary was changed to Fuji Photo Film (Europe) G.m.b.H. This

represented more than a nominal change. In addition to sales and distribution of Fuji products in the Federal Republic, this subsidiary coordinates marketing activities in Europe. Representative offices opened in Manila and Sydney; the one in Buenos Aires was closed. To help overcome import restrictions, the company organized local slitting and packaging operations in Indonesia and South Korea and extended those of its own Brazilian subsidiary. The Indonesian facility is operated by the company's distributor; the one in Korea is a joint venture betwen Fuji and a local paper company.[49]

As the research for this thesis was in progress, Fuji had recently announced its intention of building a film and paper plant in Tilburg, The Netherlands.[50] Whether this facility will turn out to be merely a slitting and packaging operation or something more serious remains to be seen. The announced size of the facility (200,000 square meters), the intended completion date (1987), and the planned investment (N.fl. 200 million) all suggest a somewhat more integrated manufacturing operation. The motivation for this announced investment may well reflect a heightened political sensitivity by Fuji management more than it does purely economic considerations. Transportation costs and European Community import tariffs became minor cost elements following the duty reductions of the Tokyo Round, which were completed in 1983. But there was a significant political opinion reaction to the flood of Japanese products that had been imported into Europe in recent years.

The Japanese government finally abolished all import quotas for color film in 1971. Under the pressure of this development and its imagined consequences, Fuji maintained its technical development efforts. The company chose the occasion of the 1976 Photokina fair for world

introduction of a 400 ASA negative color film, being the first company to offer a color film with such high sensitivity.[51] The other companies in the industry soon followed this lead, so that it did not prove to be a source of lasting competitive advantage. But the timing, venue and manner of introduction sent another signal to the trade, to informed consumers, to competitors, and perhaps to its own employees that Fuji had arrived at a stage of technical maturity permitting it to play a leading role in the global photographic industry.

The results of Fuji's efforts to internationalize can be summarized by its sales data. The following table tells its own story.[52]

Fiscal Year	Sales in ¥. Billions	Of Which Sales Outside Japan
1970	116.3	12.7 %
1971	129.7	14.3
1972	132.5	15.6
1973	157.7	15.3
1974	192.2	15.9
1975	218.6	21.0
1976	256.4	25.0
1977	298.4	26.6
1978	312.6	24.2
1979	358.6	26.0
1980	465.5	32.5
1981	520.1	32.4
1982	587.4	32.9

Conclusion

The world abounds in examples supporting the view that the infancy of infant industries tends to be perpetuated indefinitely when they are protected from foreign competition by local governments. The history of Fuji demonstrates, however, that this is not a necessary consequence of government protection. Fuji used the period of protection to develop itself into a vigorous and independent adult enterprise that is capable of holding its own in competing with the most sophisticated members of its industry.

In its penetration of international markets, Fuji has come a long way, using the sparest of means. A half dozen foreign sales subsidiaries operate with relatively meager budgets and rely mainly on low prices and a reputation for the technically most advanced high quality products. Such policies may work for the company's commercial, industrial and medical products. But the observer is tempted to question if the limits of effectiveness are being approached by these policies in the marketing of consumer products. Fuji has not yet succeeded in winning an important share of the large North American and European photographic consumer markets. The company's behavior in these markets during the early 1980s may reflect an emerging strategy that must be left to a later analyst to unravel. In the present, we can only describe some aspects of this behavior and speculate as to their strategic significance.

Fuji President Minoru Ohnishi recently announced that "Our goal is to build an international brand image for the Green Fuji along with the Yellow Kodak and never to damage the citadel of the American photo-making giant." [53] The intents, if any, underlying this statement are quite

inscrutable. Surely Ohnishi knows that a strong brand image is a means to an end, not an end in itself. He must also be aware that chemically based photography represents a mature technology with only low market growth potential in the economically developed countries. In a low or no growth market, any significant increase in Fuji sales of photosensitive materials outside Japan is bound to reflect itself in damaging Kodak, be it in its own citadel or elsewhere.

Thus far, what has been exposed here is consistent with the maintenance of a minor U.S. market share. What is not consistent in Fuji's behavior, given such a policy, is the 1983 expenditure of more than $5 million for the right to call Fuji the official film of record for the 1984 Summer Olympic Games in Los Angeles. No one watching the American television coverage of this event would have ever known that this expenditure had been made. Eastman Kodak blanketed the broadcasts of the games in the U.S. with over 100 commercial messages while Fuji remained virtually silent.[54]

The Olympics expenditure fits a pattern of Fuji promotional activities in the West. The company sponsors many international sports events, such as the World Cup Football Games, over which it flies a 60 meter long airship displaying its logo. It also allocates a good share of its advertising budget to giant neon signs such as those in Times Square in New York, Picadilly Circus in London and other central locations in major cities.[55]

Ohnishi has spent most of his career in marketing and can thus be presumed to understand that such advertising media are relatively ineffective in securing for their sponsor a meaningful market share for a consumer product like photographic film. The history of every successful

participant in this industry suggests that among the necessary conditions for the achievement of this objective in modern times are massive and continuous television advertising, control of the distribution channels and a dominant display presence at the retail point of purchase. Fuji learned all this long ago in its own domestic market, and it can be taken for granted that Ohnishi absorbed these lessons as applicable to Western markets during the five years he worked in America. Such means for getting large market shares are expensive. Over an extended period of time, the incurrence of the necessary costs is not compatible with a low price policy, given minimal profit objectives. The desire to avoid such costs is understandable in view of the wish to avoid a head-on collision with Kodak in that company's area of major competitive strength. The observer may thus question the ultimate purpose of Fuji's considerable brand image building efforts since they are themselves by no means free of cost.

An answer is suggested by the direction of Fuji's product development. The company has defined itself as "an integrated image information industry enterprise." [56] This broadening of its mission is not mere public relations posturing but has genuine substance. The company is moving into a number of fields in which it can usefully combine its distinctive competence in materials coating with the emerging electronic technologies. With the far sighted vision that has long characterized Fuji, the company began research into magnetic recording materials in the 1950s. That research led to the development of Japan's first broadcast quality videotapes by 1959. Over the next 25 years, Fuji developed itself into the largest Japanese producer of magnetic tapes. When Sony started the boom in consumer video cassette recorders in the

late 1970s, Fuji was positioned to exploit its knowledge of videotape technology. Recent company reports consistently point to these tapes as the fastest growing contributor to Fuji's sales and earnings. While available data are not sufficiently disaggregated to support definitive conclusions, it is quite conceivable that the sharp increase, reported above, in Fuji's foreign sales percentage starting in 1980 is attributable to exports of video cassettes.[57] Fuji may thus be content to pursue a market skimming policy with respect to photosensitive materials outside Japan while it develops foreign markets for the products of newer technologies.

In a discussion of Fuji behavior and apparent competitive strategy, a member of the Management Board of Agfa-Gevaert, an enterprise that has certainly begun to feel the presence of Fuji on its home ground, made the following observation :

> As time goes by, the photographic consumer is becoming ever more sophisticated. We cannot expect forever to keep his brand loyalty when he knows that he can buy a film that is the equal in quality to anything on the market and he can get it for 25 percent less.[58]

Although it never finds its way into print in either the company's internal or public announcements, there is a common understanding among Fuji managers. This is that if there are only two viable photographic enterprises left in the world by the end of the current century, Fuji will be one of them. The developments described in this chapter suggest that this is a plausible outcome.

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Chapter VIII

Eastman Kodak [1]

Introduction

In its Annual Report for the year 1930, published a year before its founder terminated his life by his own hand, the Eastman Kodak Company celebrated the fiftieth anniversary of George Eastman's first patent and of the enterprise he had started. In marking its then current status, the company pointed out that it was operating twelve manufacturing plants around the world. In addition to those in the U.S., these were located in Australia, Canada, England, France, Germany and Hungary. It owned or controlled companies operating 244 establishments in 170 cities of 52 countries. These were spread around the globe in the following distribution :

	Number of Establishments	Number of Cities
United States and Canada	62	43
Central and South America	12	11
Africa	28	21
Europe and Asia	126	82
Australia and New Zealand	16	13
	244	170

In the accompanying commentary, the company stated that its "policy from the beginning has been to develop markets for its products in every country of the world. This program has been followed consistently, and not only provides international service to its customers but also stabilizes the business." [2] Within a year of the publication of this report, the editors of Fortune estimated that some 25 percent of the

company's $20 million annual profit, a level that had been consistently maintained during the five years starting in 1926, was generated by its overseas operations. They estimated that Eastman Kodak accounted for 75 percent of world volume and 90 percent of world profit in its industry. In addition to its dominant U.S. position, the company was reported to be the largest photographic company in Great Britain, France, Australia, Canada and several South American countries.[3] Such global spread and depth by 1932 was unique for the photographic industry and extraordinary for any industry. Although the company was by no means the first or only enterprise to have begun internationalizing as early as the 1880s, it was certainly among the pioneers in this, as well as many other aspects of its business.

This chapter traces the important developments of the company's first half century. The events recounted here are confined to those that occurred during George Eastman's lifetime. This selection is deliberate, being to some extent influenced by the availability of primary information sources. In addition, the company's development to a position of preeminence, a position it continues to enjoy half a century after its founder's passing from the scene, should not be considered the result of pure chance. It can perhaps be best understood if seen to be largely the result of a coherent set of business strategies. The major outlines of those strategies had all been conceptualized and implemented by George Eastman. By 1932, the company was largely what it is today, despite subsequent adaptations to this or that change in the legal, social and technological environments in which it operates. Further elaboration of subsequent events is thus deemed to be not strictly necessary for an understanding of the strategic issues in the company's

internationalization.

This introduction concludes with an overview of the key developments in the company's first two decades starting in 1880. It is followed by a documented discussion of George Eastman's business strategies as they became apparent beginning in the late 1880s. The remainder of the chapter is devoted to the company's internationalization. This is divided into three sections covering respectively the two decades to 1899, the period from 1900 to World War I, and that from the war until Eastman's death. The significance of the 1899-1900 break in this context is that it identifies a turning point in the company's development. After 1900, manufacturing economies of scale became important in Eastman Kodak operations, and this had a noticeable effect on the company's international expansion. The post-war period was an era during which the company became a truly global enterprise. An appendix is devoted to some evidence supporting a brief discussion of the economies of international scope.

In the hope of maintaining minimal coherence in the presentation of a complex set of facts, all mention of Eastman hereafter in this chapter refers to George Eastman, the man. Nearly all mention of Kodak refers to the enterprise he founded; where the reference is to Kodak as the company's registered trademark or its branded products, this will be apparent from the context.

The contributions to photography made by Eastman and his company have been covered in an abundant literature. The reader is referred to the work of Ackerman and Mees for reasonably responsible treatment of the subject on a popular level, although such work is at times tainted by company inspired public relations puffery.[4,5] Taft and Jenkins treat

the matter in more scholarly depth and with greater objectivity.[6,7]

Suffice it for the present purpose to note that Eastman became interested in photography as an amateur in 1877 at the age of 23. The many inconveniences and difficulties of photography as then practiced impressed themselves on him at an early stage. He taught himself the essential knowledge through study of contemporary European photographic journals. By 1880, he had set himself up in the upstate New York city of Rochester to sensitize dry plates on a commercial scale, using a coating mechanism of his own invention. The young enterprise managed to survive two major calamities during its first two years. These disasters involved his plates losing their sensitivity. In one instance, this occurred and the problem was not discovered until after substantial quantities had been sold to photographers. Aided by financial support from Henry A. Strong and technical help from the British plate sensitizing firm of Mawson & Swan, Eastman's company overcame these adversities and became a viable enterprise devoted to sensitizing dry plates and, after 1882, photographic papers. The operation of a going concern put Eastman in position to take quick advantage of subsequent developments. Among these were Eastman's experiments with continuous coating of printing papers and the establishment of a photofinishing service.

In 1883, he began working with William H. Walker, an inventor and unsuccessful Rochester manufacturer of cameras. In 1884, the Eastman-Walker collaboration resulted in a patented photographic system that could be incorporated into existing dry plate cameras. The system comprised a paper based roll film and a roll holder. The latter was a mechanism by means of which the film could be rolled inside the camera. After exposure of the film, the sensitized gelatin layer had to be

stripped from its paper base before it could be developed and printed. Incidental to the defining characteristics of this system, but by no means unimportant to the company's future, was the idea that the film could be coated by continuous means.

Paper was not an entirely satisfactory film base. In 1886, Eastman hired Henry M. Reichenbach, a University of Rochester chemist, and started him on experiments leading to the development of a film base that combined the lightness and flexibility of paper with the transparency of glass. These experiments resulted three years later in Reichenbach's development of a celluloid film base. Eastman devised a small, hand held camera capable of using the paper based film in 1887. He called this camera the Kodak and introduced it in 1888. After the film had been exposed, it could be sent to Rochester for development and printing. The celluloid base replaced paper in Kodak cameras in 1889. These developments initiated a radical transformation of photography as it was then practiced.

Having achieved a modest initial commercial success with the Kodak camera and film system, the company was soon in serious difficulty. Several key people, including Reichenbach, left the company in 1891. They took with them their empirically acquired knowledge of film. At the same time, there were changes in certain raw material sources. As a result, Kodak emulsions underwent changes in chemical makeup that no one in the company understood at the time. The consequence was that Kodak films deteriorated badly while on dealer shelves starting in 1891. The resulting blow to the company's reputation and an economic recession set off by the financial panic of 1893 took their toll in rapidly declining Kodak camera and film sales.

Eastman dealt with the technical aspect of the problem by hiring William G. Stuber, a master emulsioneer and photographer who had perhaps the most comprehensive empirical knowledge of photosensitive emulsions of anyone of his time. Stuber improved the company's emulsions to a point where they could again be incorporated in a commercially acceptable product. He became the voice of the company's quality conscience and was eventually rewarded for his work by succeeding Eastman as the company's President. Stuber enjoyed a certain luxury of time in his efforts to improve the company's emulsions. During the critical 1892-1893 period, Kodak's total sales remained level at about $500,000 per year. The precipitous declines in film and camera sales were offset by corresponding increases in sales of sensitized papers.[8] Profits generated by the coating and sale of paper saved the company from serious financial difficulties in the mid-1890s. They provided the funds needed by Kodak to continue operating while working to extend its film shelf life to a commercially acceptable standard.

Elements of Business Strategy

More than a few enterprises, in observing Kodak's growing commercial success and analyzing its presumed causes, adopted one or more of the elements of Eastman's strategy. That which makes Kodak unique is the lucidity with which Eastman perceived the mutual interdependencies among these elements and combined them into a coherent overall business strategy. It is not possible to describe that strategy all at once through the medium of linear prose. It is therefore dissected in the following discussion for the purpose of exposition. It is to be noted,

however, that many of the elements depended on the definition and execution of the others for the success of the whole. Their effect on each other was synergistic. This assertion is the result of reflection and judgment. It cannot be proven by rigorous logic or supported by an abundance of quantitative data. It can be supported by noting that to the extent Kodak's competitors failed to incorporate one or more of these elements in their business strategies, those competitors fell short of achieving the same degree of commercial success as Kodak.

It should also be noted that Kodak's mix of strategic elements did not spring forth spontaneously. The elements developed over a 30 year period, often in reaction to an emerging threat or opportunity in the company's business environment. This observation takes nothing away from their power in establishing Kodak's long-term direction and development as an enterprise.

The place of George Eastman in the history of business enterprise is quite secure by any number of criteria. He was either a leader or major participant in several contemporaneous revolutions. Among these, we can specify the early development of continuous process manufacturing, the use of scientific research in the development of product and process technologies, the start of mass consumer marketing, pioneering in employee benefit schemes and the internationalization of business. The interpretation of history offered by this thesis suggests that he occupy a prominent place in the pantheon of master strategists. The key elements of his business strategy and the circumstances under which some of them developed are described in the following pages.

Market and Product Definition. Eastman is generally credited as the prime mover in the popularization of photography. When he

introduced the first Kodak camera and film system in 1888, photography had already been practiced for nearly half a century. During those antecedent five decades, its practice was that of a craft requiring more than ordinary skill and tolerance for a host of inconveniences. As an amateur photographer and later as a supplier to photographers, Eastman was well aware of these requirements and burdens. He made it his business to remove them. His first efforts took the form of developing a substitute for the costly, fragile, heavy, rigid glass plates in general use as the base holding photosensitive emulsions. As already noted, this was first achieved with the Eastman-Walker Roll-Holder system.[9]

Thus far, we do not as yet have market definition but merely one necessary element of it. We have the perception of a need and the invention of the means to satisfy it. But the movement toward clear articulation of the potential market accelerated swiftly after 1885. Though admired in professional circles and praised in influential media of communication as a major advance in photography, the Eastman-Walker system was in fact a commercial failure. Unit sales of the roll holders dropped from 1,334 during the year they were introduced to 568 two years later.[10] Annual sales of the paper based film never exceeded $20,000.[11] But it was a failure that stimulated a major change in the company's direction. Eastman's articulation of that change is nicely captured by his testimony given during a subsequent patent infringement trial :

> The roll-holders were made to fit cameras that were already in existence, which were being used for the exposure of glass plates. We were therefore limited in introducing our films to such of these camera owners as would accept films. They proved to be rather small in number and ....we found that in order to make a large business we would have to reach the general public and create a new class of patrons.[12]

This testimony was given in 1906 and is on that account suspect as retrospective rationalization. It nevertheless represents the clearest possible articulation of the circumstances leading to the company's entry into consumer photography. Such an articulation represents the cornerstone on which any business strategy rests. That it constitutes such a cornerstone is corroborated by Eastman's earlier words, actions and policies. A case in point is the slogan with which the first Kodak camera was presented to the public within a year of its introduction. "You Press The Button. - We Do The Rest" is far more than merely a slick piece of advertising. Boiled down by Eastman himself from reams of advertising copy submitted by the J. Walter Thompson Agency, it brilliantly conveys the policy that has guided the company's product development for nearly a century. This is that the ultimate customer is to be relieved of all technical difficulties in getting photographs.

The message conveyed in the initial advertising slogan was made far more explicit by Eastman in a letter to a dissatisfied company stockholder in 1892 when the company's commercial difficulties caused a suspension of dividend payments. In defense of his policies and the direction in which he was leading the company, Eastman drew a sharp distinction between the true photographic amateur as a picture maker and the snapshooter as a picture taker. He estimated that the picture takers outnumbered the picture makers by a ratio of 10 to 1, and he left no doubt in seeing the company's future market among the picture takers.[13] With the ultimate customer in mind, the company :

> introduced new sizes and models from time to time...The changes, as a rule, either tended to make the camera simpler or cheaper. We have always endeavored to keep out of our apparatus superfluous details that some manufacturers call talking points. The changes that we made were usually useful, or else they cheapened the construction.[14]

It can be noted in this context that Eastman's definition of his market was sufficiently specific to guide his company's product development but sufficiently broad to encompass markets geographically though not culturally remote from the U.S. A view of the market thus defined helped to pave the way for the company's early internationalization. There is in fact no evidence that Eastman had a strategy for internationalization. He simply applied his domestically developed policies abroad in this, as well as all other, categories of policy.

A critical concept guiding nearly every subsequent major product advance introduced by Kodak had been, by necessity, incorporated in the Eastman-Walker scheme of photography. Eastman's copy for the advertisement announcing its introduction read :

> Shortly after January 1st, 1885, the Eastman Dry Plate and Film Co. will introduce a new Sensitive Film which, it is believed, will prove an economical and convenient substitute for Glass Dry Plates, both for Outdoor and Studio Work.
>
> In connection with this film will be presented New and Efficient Devices for Exposing the same in Single Sheet and in the Roll, the whole forming a complete and practical system of Film Photography.[15]

The key word here is 'system.' To be useable, the roll film needed a transport mechanism within the camera. The system thus comprised a durable, the very mechanism in question, and a consumable, namely the film repeated purchases of which were to be the source of the company's enormous revenue growth. The interdependence between the components of the system represented a new combination by means of which the company was to change the commercial exploitation of photography.

Distribution. Having defined his market, Eastman set out to reach it by the most direct means feasible and to widen the channels of

distribution. In selling the output of his factories directly to retailers, he bypassed the host of jobbers, commission agents and other middlemen who either would not or could not adapt to the changing conditions of a rapidly growing and widely dispersed market for packaged consumer goods. The choice was in part dictated by the organic nature of the product. The gelatin that binds photosensitive emulsions is made from the bones and hides of cattle and other animals. This gave film its limited shelf life. Explaining his distribution policies, Eastman wrote :

> The wholesaler or jobber is a detriment to our business because a large proportion of it is in sensitized goods which are perishable.... We have therefore organized our distribution facilities so as to get the goods into the hands of the consumer as quickly as possible.[16]

In assuming the wholesaling function, Eastman also minimized a great deal of potential interference in the carrying out of his marketing policies. He dealt with entities that were, on the whole, financially weak and thus somewhat more docile in accepting his policies. This gave Kodak great power in controlling prices and other conditions of sale.

In his effort to reach the general public, Eastman was well aware that the relatively small number of photographic specialty retailers might frustrate such an effort. The number of points of sale was limited, and photographic retailers were not easily accessible. The atmosphere in many of these stores was intimidating to a consumer who had no technical knowledge of photography.

Eastman dealt with this problem in two ways. He opened or bought a string of retail shops around the world. These shops either carried Kodak products exclusively or concentrated their selling efforts on these products to an extraordinary degree. Although these shops performed normal retailing functions, their main purpose may well have

been to perform the missionary work needed to publicise the existence of the product and to make potential customers comfortable with the ease of its use.[17] More importantly perhaps, Eastman was the first to extend distribution of photographic goods to opticians, jewelers, hardware stores, stationers, druggists and other high traffic non-photographic outlets.[18]

Advertising and Publicity. Despite his somewhat reclusive personality, Eastman had a genius for exploiting the available media of communication to draw public attention to Kodak products, and he let few opportunities to exercise it slip by. Starting in the late 1880s, the company was an exhibitor at every international exposition or fair of consequence. The first Kodak camera was launched with a long article in Scientific American. Although the language of this article does not bear the marks of Eastman's characteristic writing style and may have been edited, the minute detail in which the product is described suggests a high probability that the author was Eastman himself.[19] According to Eastman's biographer, Kodak was among the first to display an illuminated billboard (Charing Cross, London), omnibus posters (Paris), and to use full page advertisements in American newspapers and magazines.[20] By the end of the century, Kodak was spending $750,000 annually for advertising in American magazines with a monthly circulation of six million. The expenditure was one third of the company's sales revenue for 1899 and thus represented a considerable commitment.[21]

Product Quality and Reputation. Within the limits permitted by the state of the art, Eastman placed heavy reliance on superior product quality as a strategic weapon. When the company fell from grace, as it did on several occasions during its first dozen years, he was literally

willing to risk its continued existence to satisfy the claims of customers who had been disappointed by spoiled products. The length of Eastman's planning horizon was expressed with his characteristic succinctness in 1887 :

> If our business was likely to be temporary and we were obliged to boom it and drop it like a new toy it would be different but the business is likely to be permanent if built on a sure foundation which foundation is <u>good goods</u>.[22]

His views on the importance of consistency in product performance were articulated in these terms :

> Now, it is not that anybody cannot make the same kind of film, but it is making film exactly the same every day, and the man that can do it must get the trade, because there is so much dependent on it.[23]

In pioneering the commercialization of roll film, Eastman was at some disadvantage in this respect. Producers who concentrated their attention on dry plates moved well ahead of Kodak in the sensitivity and chromatic fidelity of their products. It was in this area of concern that Eastman demonstrated his leadership. He had to deal simultaneously with the problems of driving his company forward to improve its products and persuading the public to be patient. He articulated his insight into this relationship as follows :

> There is always a forked road of policy. One may make a thing and make it well and consider his business as primarily a making of things. Or, one may set up an ideal and consider those things which he makes only as steps toward the ideal. The first method held no attraction for me; it is a journey with but money as a destination. I adopted the second because, with an ideal, the journey's end is never reached : there is always the experiment, the hazard of going beyond where anyone else has gone...Continuity depends on certain broad policies that are wrought out of experience. Of those, the most important is that of having an ideal and then selling an idea instead of a thing.[24]

<u>Patents and Trademarks</u>. Eastman had sought the protection of patents from the start of his enterprise. This was a matter of patenting

his inventions and those of his associates. As the large scale commercial possibilities of photography became apparent, it was inevitable that the field would attract numerous other inventors. Eastman realized that he could not possibly anticipate every development or invention. He therefore set out to buy nearly every patent he considered important. He spelled out the strategic motivation for these acquisitions in an 1890 letter :

> We have got so many patents that if we got beaten on one we could try another and it would take our competitors ten or fifteen years to break them all down. I do not believe but what our patents are strong however and that we could sustain enough of them to keep our monopoly. I would chance it any how because success means millions, where failure means only hundreds of thousands.[25]

Eight years later, the U.S. Patent Office granted a patent that had first been applied for in 1887 by Hannibal Goodwin. This patent covered the use of celluloid as a base for photographic film. Eastman had started using this material in 1889 on the basis of Kodak experiments and patents. The subsequent finding by the Patent Office that this invention had been anticipated by Goodwin might surely constitute a fundamental threat to Kodak. It prompted an interview by a Rochester newspaper. Eastman expressed his confidence in his own position in that 1898 interview :

> This company makes more than 90 percent of all the film that is manufactured in the world, and its business does not depend on any one patent or process, but it has been built up through many years of laborious experiment which has led to many inventions, all of which have been patented; and the proposition that any one man can come into the business at this late date with one patent and control it, is absurd on its face.[26]

Eastman's policy was vindicated in 1914, by which time the scale of losing had itself grown from hundreds of thousands to millions. The Goodwin patent had been bought by Anthony and Scovill (later Ansco) after

Goodwin's death. Eastman felt so confident of his position that he invited Ansco to sue Kodak for infringement of the Goodwin patent. This Ansco did, and after seven years of litigation, the court held that Kodak had indeed infringed.[27] Eastman settled the matter out of court by paying Ansco the sum of $5 million. This happened to be the amount of uncommited cash in the balance of one of Kodak's bank accounts.[28]

The Kodak trademark was first registered in 1888. [29] For nearly a century it has been brilliantly exploited as a means of differentiating the company's products from those offered by its competitors. In its early years, Kodak came to be associated in the public's mind with a unique photographic system. As a result, the company assumed a substantial risk that the very success of that system would make the Kodak name generic. Thus, the company had to introduce another slogan, "If it isn't an Eastman, it isn't a Kodak."[30]

Continuous Product Innovation. According to an unidentified secondary source, the company's ledger for 1886, the year Eastman hired Reichenbach, shows $1,302 for expenses called 'experimenting.' This is reported to have been captured in a separate account from that year forward.[31] Ten years later, Eastman had occasion to state that "...I believe in experiments as much as anyone and in fact our entire business has been founded upon them..." [32] The experiments to which he alluded were, however, ad hoc efforts to solve specific problems. They established precedents and thereby paved the way for what was to come.

Later in 1896, the strategic importance of product innovation became somewhat more clearly articulated by Eastman when he wrote :

> I have come to think that the maintenance of a lead in the apparatus trade will depend greatly on a rapid succession of changes and improvements, and with that aim in view, I propose to organize the Experimental Department in the Camera Works and

> raise it to a high degree of efficiency. If we can get out improved goods every year nobody will be able to follow us and compete with us.[33]

To be sure, he is discussing cameras here, a product in which annual model changes were relatively easy to accomplish. Progress in sensitized materials did not come with such predictable regularity. It is nevertheless apparent from the flow of Kodak film improvements during the early 1900s that similar thinking also stimulated that side of the business. Such improvements included a non-curling film and the far less flammable cellulose acetate film base.

The prospectus that had been issued in the flotation of shares of Kodak Ltd. in 1898 had included the following description :

> Special chemical and mechanical departments with a staff of skilled hands are maintained for experimental purposes in order to keep in advance of all demands for improvements in every branch of photography.[34]

The institutionalization of the innovation function for sensitized materials became definitive in 1912. In that year, Eastman engaged C.E.K. Mees, an English photochemist, to set up a central research laboratory in Rochester. The mission of this laboratory was nothing less than "the future of photography." [35] Not quite coincidently, it was also the future of the Eastman Kodak Company.

Pricing. Several of the foregoing themes came together in Eastman's views on pricing. Successful execution of the aforementioned policies depended, in his view, on Kodak's ability to control the resale price of its products. In a letter urging the legalization of resale price maintenance, he summarized the bases for his policy :

> ...Until recently there has been in this country an opportunity for the manufacturer to do business by either one of two radically different methods : The first by making the best goods possible and building up a reputation on quality; and the second by making the cheapest goods, without much regard to

> quality. The only way the first plan can be made successful is to standardize the price to the consumer and allow a fair discount to the dealer for distributing the goods. This plan has been adopted and used by the manufacturers of the best goods almost without exception but the public has always had the opportunity to buy cheaper goods sold by the other plan. This competition has kept the 'fixed price' manufacturers from charging exorbitant prices for their wares and compelled them to fix the lowest possible discount which would pay the dealer for handling the goods. So long as they were able to prevent price cutting they were able to count on the regular distribution of their goods and were thus enabled to maintain a standard quality and make it known through continuous advertising. Inability to fix the selling price of their goods will, in our opinion, drive all the manufacturers into one class, making cheap goods the standard price of which is unknown to the public...The contention that money spent for advertising is wasted is in our opinion unsound. In what other way can the public be informed as to the existence of any goods, or the qualities they possess. It is not sufficient for the benefit of the public to invent something new and file a description of it with the Patent Office. Unless it is advertised and made known to the public it might be hidden for a hundred years.[36]

This letter, to be sure, contains elements of self-serving disingenuousness. It was written in 1914, by which time Kodak had driven nearly all effective competition from the field in consumer roll film photography. It is, nevertheless, a lucid exposition of the strategic considerations driving Kodak pricing policy at the time.

Manufacturing. The first Kodak camera sold at retail for $25 and came loaded with a film roll. The consumer could have the photographs developed and a fresh roll loaded for $10. To bring such a product into widespread popular use required a considerable lowering of prices. A quantum leap in manufacturing efficiency was required to make such price reductions feasible within the constraint of maintaining handsome dividend payments, the standard by which Eastman evaluated profitability. Although he had been preoccupied with methods for achieving increased manufacturing economies since before he had even established a business enterprise, this quantum leap was not made by Kodak until the end of the nineteenth

century. The early Kodak film production process involved the pouring of nitrocellulose ingredients in liquid form on to glass topped tables. Ten of these 42 inch by 20 foot tables were placed end to end, making one surface 200 feet long. The film made on it was, of course, marked every 20 feet by the juncture of the glass tops. When the celluloid had dried, it was coated with the photosensitive emulsion by means of a hopper traveling the length of the table. When this had dried, the film was stripped from the table, slit and packaged.

In essence, this was a batch manufacturing process. This began to be replaced in 1899 by a capital intensive process of continuous flow in casting and drying the celluloid base. A pilot plant using a 21 inch wide casting drum was so successful that the company immediately doubled this width in building the first production wheel. The new casting wheel had a diameter of 15 feet and moved the material at a rate of 150 linear feet per minute.[37] Continuous casting of the film base enabled the company to turn to continuous film emulsion coating, a process it had begun to use in sensitizing papers fifteen years earlier, having quite probably been the first in the industry to do so. The change to continuous casting increased the company's film capacity by a factor of three and reduced unit labor costs by 80 percent.[38]

The promise this change held for Eastman's approach to the market was quite clear to him. As the experimental work was under way in the middle of 1899, he wrote to Strong : "...If the continuous scheme for making film works I propose to give away cameras for the benefit of the film department..." [39] The tone here is jocular but not the intent. In 1900, the company introduced the first in a long lived series of cameras called Kodak Brownie. The Brownie brought to market in 1900 carried a

retail price of one dollar.[40]

By the end of 1899, the anticipated success in transforming its method of film production enabled Kodak to reduce prices for all its consumer products by one third. Eastman was already thinking of further price reductions in the range of 15 to 20 percent for 1901 and beyond. The competitive implications were clear to Eastman. He wrote that "we will then be where the pirates can't attack." [41] The pirates he had in mind presumbly were Anthony & Scovill who were soon to start making film under the Goodwin patent.

The change was significant in other respects. It marks the passing of Kodak's manufacturing management from the hands of inspired inventors into those of university trained engineers. These people were not content to rest on their laurels once the initial problem was solved, and they soon developed their own agenda. In their continuing efforts to improve production process technologies, the company's commitment to technical change in this sphere became institutionalized.[42] In a sense, this transformed the task of the company's top management. A much later Kodak chief executive defined this as making policy choices that represent an economically feasible balance between 'technology push' and 'market pull.' [43]

The change also helped move Kodak closer to Eastman's quality ideals. The continuous machine casting of celluloid made possible a consistency of film thickness that could never have been achieved by the essentially manual methods that had been used earlier. This helped the company to exploit the extraordinary opportunity provided by the explosive growth of the cinema early in the twentieth century.

Monopolization. Much of the foregoing discussion can be subsumed under the general rubric of the search for security through exploitation of proprietary knowledge and other intangible assets. Ownership of such assets gives the owner a monopoly for their exploitation that is legitimized by law at no less a level than the Constitution of the United States.[44] Reliance on such legitimate monopolies was not, however, sufficient to give Eastman a feeling of security in the business environment he was facing. He therefore set out systematically to restrain and eliminate his competitors by means that went far beyond what American law of the time considered tolerable. The means used included, among others, the acquisition and dissolution or merger of competing manufacturers, the monopsonization of certain key raw paper supplies, the acquisition of important links in the distribution chain, and the imposition of sales terms on dealers forcing them to stock Kodak products exclusively.

Between 1895 and 1907, the company acquired 22 competing American photographic manufacturers.[45] The immediate motivation for each of these acquisitions varied from one to the next. Some were made to acquire key people, some to get control of an important patent or process technology; in some instances, the intent to eliminate competition was explicitly stated in the minutes of the company's directors' meetings.[46] Whatever the proximate motivation had been, the fact remains that soon after most of these acquisitions had been completed, the acquired entity was dissolved and its brands disappeared from the market. In a number of instances, the acquisition agreement enjoined the officers and owners of the acquired companies from future participation in the photographic industry for periods up to 20 years.[47]

As related in another chapter (see Gevaert, p. 73), the General Paper Company was formed in Brussels in 1898. The purpose of this company was to act as sales agent for a cartel involving the two European paper mills known throughout the photographic trade as the producers of the purest material suitable for sensitizing of printing-out-papers. Eastman secured the exclusive North American purchasing rights to these papers soon after the formation of this cartel. Following execution of this agreement, Kodak acquired and dissolved or merged eight American paper sensitizers. By restricting customers for these papers to buying exclusively from Kodak and making their ability to buy such papers conditional on purchase of all other Kodak products, the company achieved effective control over the North American market for printing-out-papers.[48]

In 1902, Kodak purchased Sweet, Wallach & Co., a prominent Chicago photographic retailer. In commenting on that acquisition, Eastman wrote :

> Personally I have been opposed to having any thing to do with the retail trade in this country but for strategic reasons I have lately modified these views.[49]

Although he did not spell out precisely what his strategic reasons were, they can be inferred from the record of the company's behavior. In the next ten years, Kodak acquired 15 other large American photographic retailers. By 1912, some 86 percent of the value of purchses made by these retail houses represented purchases of Kodak products.[50]

Those dealers who remained nominally independent of the company had imposed on them terms that were highly restrictive. A dealer buying from Kodak had to agree not to stock goods made by any competing manufacturer. Photographic goods were to be sold by such dealers at

prices fixed by Kodak.[51] Eastman justified this method of selling in explicit, if somewhat disingenuous, terms to his legal counsel :

> Our terms were not instituted with the idea of obtaining or maintaining a monopoly. The real object of our system is the prevention of substitution...The quickest way to attack the problem is through the dealer. We accomplish it by putting him in a position where there is no temptation, viz.: by restricting him to our goods. Under such a restriction we can spend our money for advertising with reasonable certainty that we will get the benefit of it.[52]

In combination, the foregoing policies resulted in the company enjoying a U.S. market share by 1912 of 86 percent in film cameras, 88 percent in film and 67 percent in photographic papers.[53] In his 1915 verdict summarizing why he had found the company's actions to be in violation of the Sherman Act, Judge Hazel found it difficult to avoid the conclusion that such practices were in furtherance of an intention to form an illegal monopoly and served to erect perpetual barriers to the entry of others into the business.[54]

In having been found guilty of violating the Sherman Act, Eastman's company lost a battle. But the efficacy of his general strategy, of which the violations were an integral part, was not seriously challenged. The legal appeals took nearly six years, and under the direction of Attorney General of A. Mitchell Palmer, the government and the company came to an understanding in 1921. The company withdrew its appeal to the Supreme Court and acquiesced to the most innocuous of consent decrees. The decree called for the company to divest itself of seven of its earlier acquisitions. Three of these had been camera or parts suppliers, three were dry plate producers and one sensitized papers. None was essential to the company's business. The decree enjoined the company in perpetuity from the acquisition of any competing American plant or business.[55] Kodak's hegemony remained undiminished in the U.S. and

was destined to extend to much of the rest of the world.

To conclude, any attempt to evaluate the significance of Eastman's strategies should place them in perspective of the times in which he lived. This perspective suggests that few of Kodak's innovations or of Eastman's strategic actions, viewed singly, were either unique or completely novel. The use of paper as a negative base by W.H.F. Talbot antedated Eastman's work by nearly half a century.[56] The search for a base material embodying the flexibility of paper and the transparency of glass had been adumbrated in an English patent issued in 1855. [57] Many articles and letters published in the European photographic press during the early 1880s had speculated on the use of celluloid as such a base material.[58] The Eastman-Walker Roll-Holder system was an improvement on an invention introduced by Leon Warnerke during the 1870s in England.[59] The U.S. Patent Office, and eventually a Federal court belatedly decided that the Goodwin patent had anticipated by two years Kodak's practical use of celluloid as a film base.[60] The design of the roll holder and the first Kodak camera incorporated several features that had been patented in 1881 by a North Dakota inventor named Houston and licensed to the Rochester firm.[61] Indeed, in light of the acronym, Nodak, formed by Houston from the territory of his domicile in naming his apparatus, Eastman's coining of the word Kodak must count as a most remarkable coincidence.[62] Continuous roll casting of the film base had been done by Celluloid Co. for nearly a decade by the time Kodak adopted this method.[63]

Chandler has drawn attention to the widespread contemporaneous adoption of continuous process technologies in the cigarette, match, flour, cereal and canned food industries.[64] Among the contemporary

suppliers who became their own wholesalers, for largely the same reasons as Kodak, were Swift, soon followed by the rest of the meat packing industry, United Fruit and Pabst Brewing.[65] Research based innovation became a key element in the growth strategies of General Electric, Western Electric and DuPont among many other American enterprises that could be cited.[66] It had already characterized the German dye industry for a generation when Eastman began his activities.[67] Kodak was one of 63 American enterprises listed by Chandler in achieving successful mergers during the period. The attempt to achieve industry integration through mergers was common.[68]

In the foregoing recital, there is no intent to belittle Eastman's achievements. On the contrary, the evidence is compelling that Eastman represents the archetypical example of that exceedingly rare kind of individual whose economic function Schumpeter describes as the molding and forging of new combinations.[69] By leading the means of production and distribution into new channels, opening new markets for new goods and creating a new organization of an industry, Eastman satisfied Schumpeter's criteria of what constitutes entrepreneurial leadership.[70]

The conscious, deliberate conceptualization of such new combinations before they are carried out is what the author of this thesis views to be the essence of business strategy. The remainder of this chapter and its appendix will present a considerable body of evidence suggesting that the same strategies which enabled Kodak to achieve its commercial dominance in the U.S. were also followed in other countries.

Internationalization 1879 - 1899

Following the publication in 1851 by F.S. Archer of his wet collodion plate process, this process came into widespread use by the relatively small number of photographers then practicing. The adoption of this process precluded the development of an industry catering sensitized materials to photographers. The process required that the plate be sensitized immediately before exposure. The same was true for the many varieties of albumenized printing papers then in use. At best, then, this created a basis for commerce in materials. In such a technological environment, there was no incentive for secrecy. New developments in photography were discussed quite openly. Among the major media through which such knowledge became diffused were the British Journal of Photography, which has been published continuously since 1853, and the Bulletin de la Société Francaise de Photographie, which started publication in 1855. After some initial instruction from a local photographer in Rochester, New York, Eastman learned his photography from such internationally circulating media. It was from the British Journal of Photography that Eastman first learned of the gelatin dry plate.

In view of this setting, it may hardly be surprising that Eastman's first substantive business transaction took place not in his native America but in England. He had developed a mechanism for coating dry plates, and in 1879, before he had even set himself up in business to produce plates with this mechanism, he went to London, the trip having three purposes. He wanted to get his mechanism patented in Europe. Having done so, he wanted to raise funds by selling the rights to the foreign patents. Finally, he used the opportunity to get a first-hand

impression of the state of photographic commerce in Europe. During the trip, he made a three day excursion to Paris to survey the state of photography there.

In London, he presented himself and the drawings of his coating mechanism to the editor of the British Journal of Photography. The latter saw the merit of Eastman's invention and identified the important people for Eastman to contact. With this information in hand, Eastman made the acquaintance of Hazeltine, Lake & Co., a law firm that took care of the patent filings in England, France, Germany and Belgium. He also met the directors of Mawson & Swan Ltd. who bought the English patent rights for £500. After deducting the expenses of the trip and legal fees, Eastman cleared $1,000 from this transaction.[71] This augmented the $3,000 he had managed to save from his salary earned as an assistant bookkeeper in a Rochester savings bank. Starting with this capital, he established a dry plate factory in 1880. The glass, gelatin, and nearly all chemicals had to be imported from England.[72]

Hazeltine, Lake & Co. must have found ways to publicize the existence of Eastman's patent. Among the inquiries concerning German rights to its use that the law firm received and forwarded to Eastman was one from Romain Talbot in Berlin. Talbot was a Belgian trader who had seen bigger opportunities in Germany than were available in his native land. He had established himself in Berlin as that city's most prominent merchant in photographic goods, and he kept his eyes open to new developments in the field. Talbot's 1880 inquiry began a relationship that eventually blossomed into his being appointed as Eastman's first German agent.[73]

The idea of advertising his wares was in Eastman's plans from

the start of his business. His 1880 correspondence identifies this intent. In a letter to E. & H.T. Anthony & Co., he proposed that Anthony advertise and recommend Eastman plates in consideration for an extra discount.[74] Anthony was the oldest and quite probably the largest American photographic supplies jobber at the time. As such, the house of Anthony had a widespread clientele that may have included a number of expatriate Americans. Eastman had appointed Anthony to be his first exclusive jobber. It is uncertain when Eastman's plates were first advertised in Anthony's house organ. There is a presumption that it was early in their relationship which lasted from 1880 to 1885. It is quite likely that Eastman began to receive inquiries about his product from abroad as a result of such advertising. On the occasion of the 1884 announcement of the Eastman-Walker Roll-Holder system, a Rochester newspaper wrote, perhaps with a little journalistic hyperbole, that Eastman's plates were being sent all over the world.[75]

The inquiries from abroad stimulated Eastman's thinking about advertising outside the U.S. In 1885, Eastman answered an inquiry from Chile to assure his addressee that his plates were suitable for use in warm climates.[76] Soon thereafter, he sent his own inquiry to a New York agency :

> We contemplate advertising in Spanish America. Can you give us an idea of the best publications to advertise in, and some of their rates ? [77]

The same year saw him asking a printer in Buffalo for the price of printing a booklet in Spanish.[78]

Despite such active efforts to stimulate foreign business, the available evidence suggests that, by and large, the company's early exports were largely reactive. When orders or inquiries were received,

they were filled or dealt with in some appropriate way. This casual manner of conducting foreign business is perfectly understandable for a young enterprise still struggling to master its basic technologies and to define a business strategy.

The year 1885 marks a departure from the reactive style, however. By then Eastman had something unique to offer the world, and his travels to Europe had given him an appreciation of where his potential markets might be. He sent Walker to London in the spring of 1885 with two objectives. The first was to exhibit and demonstrate the Eastman-Walker Roll-Holder system at the International Inventions Exhibition. The system was awarded several medals at this exhibition and was widely praised in the English press.[79] The favorable publicity helped to smoothe the way for success in achieving Walker's second objective. This was the opening of a wholesale distribution branch in London.[80] By September, Strong was in London to observe progress. This was such that Strong had to inform Eastman of many local dealers complaining about backorders.[81]

In photography, neither the psychological nor the cultural distance between London and Paris was very great at the time. In October of the same year, Eastman wrote to a Prof. Stebbing that it was his desire to open an agency in France and only the pending resolution of some patent matter stood in the way.[82] That matter must have been resolved within a reasonable time. By the middle of 1887, Eastman was writing to Nadar in Paris to thank him for "pushing our goods."[83] G.F.T. Nadar was perhaps the most famous French photographer of the nineteenth century. As such, he had access to the high society of Paris, the media of communication and other opinion molders. Having somehow learned of the Eastman-Walker system, he acquired it and demonstrated its use at a press conference in

1886. Under such circumstances, it was not surprising that his son, Paul Nadar, also a photographer, would become Eastman's first French agent.

At approximately the same time, Romain Talbot became Eastman's agent in Berlin. Other, though less well known, people were appointed to represent the company in various countries. In answering an 1889 inquiry from the South Australian city of Adelaide, Eastman could point out that there were agencies for the company's products in Sydney and Melbourne.[84]

Coincident with introduction of the first Kodak camera, Eastman turned his attention to direct retail distribution. The first company owned store was opened on Oxford Street in London in 1888. [85] In 1891, Strong was in Paris, looking over a store on the Place Vendome.[86] That store was opened, and a year later Eastman noted that it was doing well.[87]

The introduction of the first Kodak and the substitution of celluloid for paper in the film base led to more than the opening of a handful of retail shops abroad. By the standards of a later day, the initial market reception of the Kodak was exceedingly modest. Some 8,000 units were shipped during the year following its introduction. An 1890 Kodak advertisement in England stated that more than 12,000 units were in use throughout the world. Shipments during the 1890-1891 period numbered less than 24,000 units.[88] However modest, the early market receptivity was sufficient to encourage the inflation of Eastman's ambition. In an 1890 law suit deposition, he stated that a factory was being built in England to satisfy the rapidly growing demand for film in that country.[89]

His contemporary correspondence does not, however, support this

statement. 1888 shipments to England were invoiced at $51,000 and a year later these had grown to $57,000. [90] The construction of an English factory may thus have been based more on hope for the future than on present reality. A film factory was nevertheless built in the London suburb of Harrow, and by 1891 it was running well enough to enable Eastman to stop further shipments of film to Europe from Rochester.[91] By 1896, Harrow was turning out cinefilm, and some time during the 1890s, it began to coat papers.[92]

The Harrow plant was built as the property of Eastman Photo Materials Company Ltd., an English corporation formed in 1889 (later supplanted by Kodak Ltd.). Some 22% of this company's £150,000 capitalization was provided by English investors.[93] Five of its seven directors were outsiders and Englishmen. Walker, who was an American, served as the Managing Director until 1893. Walker's next three successors, George Dickman (1893-1898), George Davison (1898-1908) and William S. Gifford (1908-1919), were all Americans.

Once formed, the English subsidiary served as more than the corporate shell for the Harrow factory. It rapidly took on responsibility for the conduct of all aspects of Kodak's business outside the Western Hemisphere. When foreign agents and distributors were appointed, this was done in this company's name. The managers of Kodak's foreign branches were hired and fired in London. When additional foreign subsidiaries were formed, it became the parent company. It also provided a base of operations for Joseph Thatcher Clarke who for a generation was Eastman's scientific and technological scanner and negotiator in Europe. The English company thus became the flagship of Kodak's foreign fleet. This was a role it was to retain until well after World War II.

The expansion of marketing efforts to other European countries was on Eastman's mind by 1892 despite the evident difficulties his product was then experiencing. He wrote to Walker :

> If we can only make a good showing I think we ought to start companies in France, Austria and Berlin this fall or winter.[94]

The formation of such additional companies took a few more years, but this did not impede foreign distribution efforts. A second French store was opened in Nice in 1892, and at some point in the next year, Nadar was relieved of his Kodak agency to enable the company to do its own wholesaling in France. Nadar sued the English affiliate for 400,000 francs as damages for this precipitous termination. The court awarded him 40,000 francs, a trivial sum, but the experience made Eastman somewhat more cautious about the appointment of agents abroad. The Paris branch opened a second location, on the Avenue de l'Opéra, in 1896 and conducted both retail and wholesale business from there. The French branch was incorporated the next year as a wholly owned subsidiary of the English company.[95]

While Eastman was on a four month trip in Europe in 1896 to scan further business opportunities there, Strong wrote to him to express his hope that he "remain until you have all of Europe, Asia and Africa thoroughly organized for a grand push of our goods."[96] The complete organization of those three continents took some additional years, but while Eastman was in Berlin, he wrote that he was ready to repeat the Paris experiment. He arranged for the opening of a retail store at what was then the choicest location in the city, the corner of Unter den Linden and Friedrichstrasse. A wholesale operation was simultaneously started about a mile away. The German distribution operation was incorporated as

a wholly owned subsidiary of the English company the same year.[97]

Once the precedents for moving into foreign markets were established, the pattern was repeated in major cities of the world. The prospectus for the formation of the Eastman Kodak Company of New Jersey shortly after the turn of the century indicates that Kodak was then operating wholesale houses in :

London, Liverpool and Glasgow in the U.K.
Paris and Lyon in France
Berlin, Germany
Brussels, Belgium
Vienna, Austria
St.Petersburg and Moscow in Russia
Milan, Italy
Melbourne, Australia

Every one of these cities also had its separate Kodak retail shop, five such stores being operated in London at the time.[98]

The company also formed a Canadian subsidiary in 1899. Although it was described as operating a factory in Toronto, its initial operations were in fact confined to slitting and packaging. Canadian distribution was achieved by Kodak's purchase of Palmer & Craughton and the absorption of that entity's management and staff by the new subsidiary.[99]

As the nineteenth century and Kodak's first two decades drew to a close, the company had developed the embryo of an international operation. It had one factory overseas and one quasi-factory on the opposite shore of Lake Ontario. Its distribution network included an unidentified number of independent agents and distributors. Twelve foreign wholesale houses were operating under its direct control as branches or, in four instances, as subsidiaries. It was also running its own retail shops in most of the foreign cities where it had wholesale operations. The establishment of this network was based more on hopeful plans than on present reality. Two years earlier, Eastman had informed

his directors that :

> During my visit to Europe this past summer I visited most of the principal cities on the continent where the company has been endeavoring to establish its trade with a view to ascertaining what plans could be adopted to further extend the business, and it is expected that the knowledge thus gained will lend a considerable aid in further campaigns, much of the territory being at the present time practically undeveloped.[100]

International Expansion 1900 to World War I

It has been related above that as the new century dawned, the company was in the midst of a fundamental transformation of its film manufacturing methods in Rochester. There can be no clearer indication that scale economies became important in the course of this change than that the Harrow plant ceased to manufacture film as soon as the continuous process of film making was running smoothly in Rochester. Eastman said as much in frequent correspondence to Davison at the time.[101] The Harrow plant was thereafter confined to coating paper and plates. Film manufacture did not resume at Harrow until 1916. The immediate stimuli for this resumption were the transport disruptions of World War I and the imposition by the U.K. for the first time of tariffs on the importation of photographic materials in 1915. The duty rate of 5 pence per linear foot of negative cinefilm was particularly onerous. It was the equivalent of 233 percent of the market price of the film.[102]

Having established in Rochester a film manufacturing facility capable of satisfying the world's need for this product, Kodak intensified its efforts to stimulate international demand for it. In Europe, Kodak Ltd., set up wholly owned sales subsidiaries in Italy (1905), Austria (1906), Denmark and Switzerland (1910). [103]

The Western Hemisphere was territory managed by the Rochester sales organization. An export department was organized by Domingo Delgado, a Puerto Rican who had come to Kodak after working in the shipping business. He became known as being indefatigable in developing Kodak's business throughout Latin America. Traveling by foot, mule back, river boat and every conceivable kind of vehicle, he appointed Kodak agents, dealers and distributors wherever he went during the first two decades of the new century. Starting with Argentina in 1916, Delgado organized Latin American sales subsidiaries at the rate of one new company per year for the next 10 years. Having organized the Latin American sales territory, Delgado turned his attention to the Far East and spent some years in the region.[104]

Dry Plates. Despite Eastman's prodigious efforts to convert photography from dry plates to roll film, the dry plate industry kept growing during the first decade of the twentieth century. In 1900, Kodak sales of dry plates were 8 percent of its film sales; by 1910, the comparable figure had grown to 62 percent.[105] These percentages are based on data that include sales revenues of three American dry plate producers acquired by Kodak between 1902 and 1904. These were the Standard Dry Plate Co., M.A.Seed Dry Plate Co., and Stanley Dry Plate Co.[106] The Stanley acquisition fitted into Eastman's Canadian plans. While Stanley machinery was moved to Rochester, some key Stanley technicians were transferred to Toronto to teach emulsion making and coating skills to the Canadian Kodak Company. Eastman had learned that some $15,000 per year could be saved in Canadian import duties if the sensitizing were done locally.[107]

Eastman's correspondence of the period suggests that the

acquisitions of three significant U.S. plate sensitizers were not isolated incidents but part of a grander global strategy. He spelled out his ideas in 1903 with an explicitness that leaves little room for subsequent interpretation :

> Whether any agreement with the principal manufacturers as to price would benefit us depends greatly on what our main object is. Of course the one we started out with was to dominate the trade in England , just as we do here, by means of purchase or amalgamation. The 1st thing to decide is whether conditions in England are such that it will be impossible to control the trade through the small dealer; whether by amalgamation with some larger concerns we can control enough of the trade to tie up the small dealer, or whether the jobber, drawing upon the German and French manufacturers, could break up any such proposition. Another point to be considered is whether the time is ripe any way for any kind of coalition, or whether, if we get the enemy on the run, we should not keep him running until he loses a little flesh...As a general proposition I do not look with favor upon a mere price agreement and do not think it could be relied upon to last long because as conditions change the interests of the various parties change, and usually change enough to break up any combination. If we conclude to go in for a domination of the trade I do not see how a price concurrence could help us now. It would simply help our competitors to make more money and force us to pay the highest prices for their plants when we buy them.[108]

Thus, while he was buying up the U.S. plate producers, he also acquired Cadett & Neall Ltd., an English dry plate manufacturer.[109] During the same year, 1903, he tried to acquire Ilford Ltd., although this attempt failed. It was one thing to buy out smaller, privately owned competitors who "think they see in the steady advance of the Kodak Co. an avalanche that may overwhelm them - and they want to get on top of it instead of under." [110] It was quite another matter to make a hostile takeover bid for the shares of a publicly held foreign corporation. The London financial press made lively reading in May 1903. Writers to the editors of The Financial Times and other papers, signing themselves as 'Sick of the Americans,' 'Anti-Trust,' and 'Anti-Kodak,' used such phrases as 'hauling down the flag,' 'surrendering to Yankees,' 'degradation of

patriotic sentiment,' 'American monsters,' 'timorous defenders of British trade,' 'Advance America and take our blood,' 'behave like men and not like a lot of old women,' etc., in expressing their opposition to the Kodak proposal. Eastman had plainly overplayed his hand in this instance, and the proposal was eventually defeated by Ilford shareholders.[111]

To get the services of C.E.K. Mees to organize and direct the Kodak central research laboratory, Eastman had to buy Wratten & Wainwright Ltd., an old English plate sensitizer of which Mees was then Managing Director and in which he had an equity interest. By making this acquisition, Kodak inherited a contractual obligation to construct a dry plate factory in Vac, a suburb of the Hungarian capital of Budapest. Eastman was not enthusiastic about this project, feeling that a factory of the size planned would have a capacity much larger than the market opportunity offered by Austria-Hungary. He could not, however, escape the contractual obligation.[112] World War I halted the construction of this plant, but it eventually went into operation in 1919, sensitizing plates and papers. Although Eastman visited it once, he paid little attention to it, and it would appear that his subordinates did not either. The plant was never profitable, in part because over a twenty year period its general manager raked off a percentage of everything entering and leaving the factory. The plant was sold to the Hungarian government at the conclusion of World War II. [113]

Paper. Among the seven U.S. paper sensitizers acquired by the company following execution of its contract with the General Paper Co. so as to extend Kodak control over the U.S. photographic paper market was the American Aristotype Co.[114] That company had an agreement with the Vereinigte Fabriken Photographischer Papiere AG, a consortium of seven of

the largest paper sensitizers operating in the German city of Dresden. This consortium had acquired the business of Carl Christensen in 1902 and with it, the rights to Christensen's collodion emulsions for coating papers.[115] Vereinigte had licensed American Aristotype to use the Christensen emulsions in the U.S. Eastman wanted to sell this paper in Europe but was blocked by the original license. After some negotiations, a new contract was executed. This gave Kodak the right to sell these papers in France, Spain and Portugal. The terms prohibited Vereinigte from selling in the U.S. and Kodak from selling in Germany and Russia. Kodak paid Vereinigte with $171,000 par value of non-assignable Eastman Kodak Co. common stock.[116]

Cinefilm. Kodak sales revenues grew vigorously during the first decade of the twentieth century, increasing from $2.6 million at the turn of the century to $13.8 million ten years later.[117] This can be attributed to three major factors. One was the secular growth of photography, greatly stimulated by Kodak's own actions. The second was the consolidation of the many other enterprises acquired by Kodak during the decade. The third was the explosive growth after 1906 of the cinema. Kodak had played no role in the creation of demand for cinefilm. But as a result of its pioneering research in roll film, process engineering and successful conversion to continuous production of celluloid, the company was uniquely qualified to supply the film in high volume once the demand emerged. Subject to minor differences in detail, the product was identical to Kodak still camera roll film.[118] Such was the growth in the demand for this product that by 1909 Kodak cinefilm sales revenue had caught up to still films at $2.1 million. Three years later, Kodak cinefilm sales had grown to more than $5.8 million while those from still

films had increased to $3.2 million. The comparison of physical unit volume was even more dramatic. Kodak production of cinefilm in 1912 exceeded 389 million linear feet of 35mm film. On a comparable basis, this was nearly 2.7 times the company's production of still film.[119]

There are several contemporaneous indications in Eastman's correspondence that more than half, in some years substantially more than half, of Kodak's cinefilm production was exported to Europe during this era.[120] Kodak's largest single cinefilm customer by far was the French company of the brothers Emile and Charles Pathé. They had been among the pioneers of the French cinema. Having bought Edison's Kinetoscope in 1897, they became leaders in the theatrical exhibition of films. As such, they needed positive cinefilm. Pathé was almost completely dependent on Kodak during most of the decade. Three English firms, Ensign, Edwards, and Barnet, tried to make film but eventually fell by the wayside. The only other competitor was Lumière, but this French firm was at a serious disadvantage. It was still producing the base material on glass tables, a method Kodak had abandoned at the turn of the century. The quality of Lumière film was distinctly inferior to Kodak's.[121]

The demand for film grew to such an extent that Pathé began to recycle used Kodak film. This meant removing the original emulsion from the base and recoating it. Such conditions led Pathé to begin construction of its own film factory in 1907 in the Parisian suburb of Vincennes. Its planned scale was such that it would satisfy not only Pathé's internal film needs but enable Pathé to become an active Kodak competitor. Pathé was, however, at a cost disadvantage. They did not know how to make the film base and thus bought it from the American producer, Celluloid Co.[122] Pathé had succeeded in trading one

dependency for another.

As a result of Pathé's backward integration into film coating, Kodak's sales to Pathé slipped from 55 percent of the company's cinefilm revenues in 1907 to 25 percent in 1909. Growth in demand from other customers more than compensated for the loss of Pathé's business.[123] But Eastman reacted to the loss by attempting to organize the European cinema industry along lines that had developed in the U.S.

The business had been somewhat chaotic following Edison's invention of the equipment necessary for the production and exhibition of movies. A number of others developed such equipment. These people, knowing that the market for such equipment was quite limited though the market for its use was not, entered the business of producing movies. To avoid the claims and counterclaims against the infringement of their equipment patents by each other and to develop a source of continuing rents, seven of these enterprises formed the Motion Picture Patent Co. in 1908. The purpose of this entity was to pool all their patents under one agency, thereby creating the common control necessary for the collection of monopolistic rents. Kodak became the key player in this game. It became the exclusive supplier of raw film to the producers in this pool. Added to its own price of three cents per linear foot of film was a royalty of one half cent per foot. The royalty was collected from the motion picture producers and passed on to the pool which distributed it to its members. All participants in this scheme had to agree to maintain the same prices for their output. The agreement went into effect on the first day of 1909.

No sooner had agreement been reached than Eastman went to Europe to extend the agreement to the industry there. He was advised by Raymond

Poincaré, then his French legal counsel (and later to become President of the 3rd French Republic), that the scheme was illegal in France. (Indeed, several American courts subsequently found it to be illegal in the U.S. as well.) Thus, the scheme was never incorporated in a formal agreement in Europe, but several movie producers there joined the scheme informally.[124]

The arrangement did not last long in Europe. It broke down largely because of the emergence of competing raw film suppliers. These included, besides Pathé, Agfa and Gevaert. Like Pathé, Gevaert was at first dependent on Celluloid Co. supplied base. Agfa thus became the only really serious threat perceived by Eastman. Through intelligence provided by European customers and his roving technical adviser, J.T. Clarke, Eastman kept a close watch on every technical and commercial development at Agfa. By 1911, Eastman conceded that he had no means to prevent Agfa's entry into the business. At the beginning of 1913, he noted that Agfa had established itself as a significant factor in the trade.[125] A series of discussions, described elsewhere in this thesis (see Agfa, p. 42), led to an agreement between Kodak and Agfa in August 1913. That agreement called for Kodak to limit itself to 60 percent of the European cinefilm market and Agfa to take the remaining 40 percent. Any excess over these specified percentages was to be settled by compensating royalties.[126]

A German secondary source indicates that the same agreement provided for the total exclusion of Agfa from the American cinefilm market.[127] This seems improbable. The agreement was executed two months after Kodak had been indicted for violations of the U.S. anti-trust law. It is hardly conceivable that Eastman would not know, under these circumstances, that such an arrangement would be considered a flagrant

restraint of American interstate commerce. In fact, he did know. Within six months of the execution of the Agfa agreement, Eastman was approached by Pathé with a proposition that in return for an annual payment of $250,00 from Kodak, Pathé would stay out of the U.S. market. Eastman told Pathé that he could not enter into such an arrangement under the Sherman Act.[128]

Australia. The formation of Kodak Australasia Ltd. represented a marriage of convenience. The English Kodak company had opened a retail store in Melbourne in the late 1890s. This establishment was not profitable for two reasons. One was the physical remoteness of Australia. One-way communication by boat took 45 days from London at the turn of the century. Commenting on the store's losses, Eastman wrote :

> It is very difficult to carry stock conservatively at branches as far away as Melbourne or Cape Town and the losses from overstock and consequent deterioration of goods is almost sure to drag the branch into the hole.[129]

The other reason was that the store was subject to vigorous competition from a neighboring shop run by a local enterprise, Baker & Rouse. Thomas Baker had opened a plate sensitizing factory near Melbourne. J.J. Rouse was an aggressive merchandiser of photographic goods. The two had gone into partnership and had built their business into the largest of its kind in Australia. When Eastman tired of the continuing losses of his Melbourne branch, he had sold it to Baker & Rouse in 1903. The latter became Kodak's exclusive distributor in Australia.[130]

Within a year, however, Eastman was thinking that Australia would be an "awfully nice country to cinch by a combination;" Baker and Rouse were thinking along similar lines.[131] They had a factory and a distribution network. Kodak had superior product and technology. It took

until 1907 to come to agreement. A new company, capitalized at £150,000 was incorporated. Baker & Rouse got 49 percent of the shares. Kodak got the remaining 51 percent and first call on the Baker & Rouse shares after the sixth year, an option that Kodak eventually exercised. For their shares, Baker & Rouse contributed their tangible assets. The capital contributed by Kodak went into extension of the dry plate factory and later into facilities for sensitizing of film and paper. Baker was to provide his services for two years and Rouse his for five years.[132] The expansion anticipated in the agreement came rather quickly. In 1908, Australia enacted a highly restrictive tariff. In commenting on its passage, Eastman wrote that "we could not have improved the photo part much if we had actually framed it." [133]

World War I to 1932

France. Eastman had thought about manufacturing in France from an early stage. The first indication that the subject was on his mind appeared in 1891. It came up again ten years later.[134] By 1907, the scale economies achieved in Rochester caused him to reject the idea of a French factory.[135] A year later, Eastman was offered an opportunity to buy the business and factory of the brothers Lumière in Lyon. The Lumierès had begun to manufacture dry plates in 1883 and are generally credited with introducing cinematography to France in 1895. But they had not kept up with the changing technology, and late in the first decade of the twentieth century they were still sensitizing film on 50 meter long glass tables. Eastman rejected the opportunity to buy out Lumière.[136]

By 1916, Eastman had developed a plan for a French factory to

make film, paper, plates and cameras on a scale large enough to supply France, Belgium, Switzerland, Italy, Spain and Portugal.[137] That plan may well have had its stimulus in the U.S. government's anti-trust suit against the company. The 1915 verdict in that suit hinted at a possible separation of the American Kodak company into two or more independent entities.[138] Eastman was, however, ambivalent about where to put this planned factory. A year later, he was still undecided as to whether to put up such a plant in France or in Russia. The same indecision was still visible a year after the Soviet revolution had occurred.[139] No doubt the economic chaos brought on by World War I kept such plans from being executed. The idea kept coming up, however. Eastman rejected the idea again in 1924 when he justified his reluctance to spread production any further by expressing the view that "safety lies in concentration." [140] To put that decision in perspective, it is to be noted that when he made it, Eastman was approaching the age of three score and ten, and he was getting ready to turn responsibility for active management of the company over to Stuber and Frank Lovejoy in Rochester and T.C. Mattison in London. After 1925, Eastman was consulted only on really major decisions.

One such major decision was not long in coming. The idea of manufacturing expansion into France was kept alive by Mattison and his associate, Charles Z. Case, who was responsible for special developments at Kodak Ltd. in London. They entered into negotiations with Charles Pathé in 1926. Pathé was then 64 years old and ready to withdraw from the burdens of managing his film manufacturing business. After the war, Pathé's company had expanded into production of x-ray and industrial use film and had integrated backward into making his own film base. Pathé had also developed a 9.5mm format cinefilm system for amateur use. Pathé's

company had become the largest photographic enterprise in France by the 1920s. Following passage of the Fordney-McCumber Tariff Act by the U.S. in 1922, Pathé had entered into a joint venture with E.I. DuPont de Nemours & Co. to get access to the American market from behind its highly protective tariff barrier. While negotiating with Kodak, Pathé was simultaneously holding talks with DuPont to expand this venture.

Those talks may have convinced Eastman to act. Although the record is quite sketchy, it seems quite plausible that Eastman was in the end swayed by the desire to avoid the sudden expansion of a major competitor in his domestic market. He could tolerate the U.S. presence of Ansco and Defender, weak local producers which represented no threat to Kodak. But confrontation with an enterprise that combined the financial resources of DuPont and the photographic knowledge of Pathé was quite another matter.

Eastman approved the agreement Nattison and Case had negotiated with Pathé, and it was concluded in 1927. [141] This called for the formation of a new company, Kodak-Pathé S.A. Kodak took 51 percent of the shares. The 49 percent taken by Pathé was subsequently acquired by Kodak. Pathé kept his theaters but turned the Vincennes factory over to Kodak-Pathé. In addition to his shares in that company, Pathé received 134 million francs (about $5.3 million).[142]

Germany. Pathé was also indirectly involved in Kodak's next major acquisition. The chemistry and raw materials used in the production of celluloid film base were closely related to those used in some of the artificial textile fibers that emerged in the 1920s. It was thus a perfectly natural diversification for Agfa to get involved in the production of such fibers. One of the few companies that had escaped the

consolidation of the German chemical industry brought about by the formation of IG Farben in 1925 was a fiber producer named Vereinigte Glanzstoff Fabriken AG. The management of this company did not view kindly Agfa's entry into its domain. It therefore decided to retaliate by entering the photographic film business.

Glanzstoff learned rather quickly that manufacture of film required a great deal of knowledge that went well beyond its knowledge of cellulose compounds. Lacking this extra knowledge, Glanzstoff engaged Pathé to build a film factory in Berlin. With Glanzstoff paying the bills, Pathé spared no expense in building the most elaborate film plant in Europe. The $6 million cost became a source of serious financial embarrassment to Glanzstoff. The plant was completed and ready to start operations under Pathé technical guidance in the spring of 1927, a time closely coinciding with Charles Pathé's desire to get out of film manufacturing. Under these circumstances, it was virtually ineluctable that Pathé would bring Kodak and Glanzstoff together. The negotiations between these two companies led to the formation of a joint venture in which Kodak held a majority interest and a Glanzstoff subsidiary in effect became a silent partner. Kodak later acquired the Glanzstoff minority equity interest.[143]

The 1927 Annual Report of the Eastman Kodak Company covered these major expansions with the laconic statement that "during the year, the company's European business was reorganized. The facilities have been extended to include manufacturing plants in Copenick, Germany and Vincennes, France." [144] * The company's consolidated balance sheets showed a 1927 increase in fixed assets and capital investments of 33

* Copenick is the Berlin district in which the Glanzstoff film plant had been built.

percent, to nearly $53 million.[145]

The reorganization mentioned in the report divided the world into sales and administrative areas corresponding to the national markets served by the three major European factories. The Harrow plant shipped to the U.K. and its dependencies throughout the world. Vincennes shipped to France, Belgium, Switzerland, Italy, Spain and Portugal. Cöpenick shipped to Germany and all other countries in central and eastern Europe.

Cöpenick became a victim of World War II. As Kodak Ltd., the British subsidiary, was the nominal parent of Kodak AG., the German government seized the Cöpenick plant as enemy property after the outbreak of the war in 1939. Cöpenick was located in the sector of Berlin assigned to the Soviet occupation forces in 1945. They, in turn, not only seized the plant as enemy property but dismantled a substantial portion of its equipment and sent it to the Soviet Union.[146]

Kodak made one more important acquisition during Eastman's lifetime. The intent motivating this acquisition represented an interesting twist in the company's traditional policy and, in retrospect, it makes a fascinating contrast with that which was emerging at Kodak's major competitor in Germany. As related elsewhere in this thesis (see p. 47), Agfa was to learn in its highly successful 1932 box camera promotion that there was indeed a potentially large market in Germany for cheap and simple mass consumption cameras. This was not, however, the prevailing wisdom at the time. Following the 1925 introduction of the first Leica camera, the camera as a highly sophisticated optical precision instrument came to be widely accepted among German photographers as the standard of what a small camera ought to be.

Having acquired a film plant of enormous capacity in Cöpenick,

Kodak needed to expand the German population of film users. Although the Harrow plant had begun to manufacture cameras in 1927 and had been reasonably successful with this venture, these cameras were the typical Kodak mass consumption products. The company felt it needed something more serious for the German market. Having little company capability in sophisticated precision instruments, despite its by then formidable technical resources, Kodak decided to buy this capability rather than to develop it from within. Through the good offices of Victor Hasselblad, who had been Kodak's Swedish distributor since 1904, Kodak negotiators made the acquaintance of August Nagel, a German camera engineer. Nagel had formed his own company in 1908, and he had sold it to the Carl Zeiss interests in 1927, agreeing to stay with the company. He was, however, not satisfied with the arrangement and left Zeiss a year later to form a new Nagel camera works in Stuttgart. It was this factory that Kodak bought in 1931, retaining Nagel's services as camera designer and manufacturing engineer.

The first result of the Nagel-Kodak collaboration was a 35mm precision camera called the Kodak Retina. Its design had enough features for it to be taken seriously in Germany, but it could be made so as to sell at retail for 75 marks. It thus opened a new market niche somewhere between the traditional cheap Kodak product and the highly sophisticated and expensive cameras put out by Leitz, Zeiss, Voigtländer and other famous German producers. In time, this camera came to be exported all over the world.[147]

Other 1920s Expansion. The expansion of Kodak's international marketing network became explosive during the 1920s. After every major population center in the industrially developed world had been covered by

the establishment of a company owned retail or wholesale outlet or by the appointment of independent distributors, penetration continued into secondary cities and some fairly exotic places in the rest of the world. To celebrate the 25th anniversary of the founding of the Eastman Kodak Company of New Jersey, the company in 1928 published an Annual Report that gave a little more information about itself than the previously issued reports which had provided only the most condensed financial statements. This became a regular feature of the reports thereafter. It is possible to glean some indication of where the company was already operating by reviewing how far afield it was going in the late 1920s in its development of markets :

> 1927 : Within the year, the company has increased its direct representation by opening establishments in ...; Vancouver, B.C.; Lima, Peru; Hong Kong, China; Osaka, Japan; Soerbaja, Java; Medan, Sumatra; Warsaw, Poland.[148]
>
> 1928 : Subsidiaries were founded to distribute at wholesale from Panama City, Lima, Honolulu and Manila, and branches of existing subsidiaries were formed for the same purpose at Hong Kong, Tientsin, Breslau and Madras. The last-named two serve retail trade also....In Paris, a new shop opened, the sixth there....New stations for processing Ciné-Kodak Film began work in Honolulu, Johannesburg, Manila, Medan, Nairobi, Panama, Budapest, Warsaw and Colombo, making a total of 47 now serving amateur movie makers of the world.[149]
>
> 1929 : Wholesale or retail or photo finishing activities were added to the existing establishments in Genoa, Venice, Leipzig, Lodz (Poland), Bucharest, Prague, Calcutta, and in East Africa....Growing demand has necessitated the opening of five additional developing stations for Ciné-Kodak Film in such widely separated cities as Wellington, New Zealand; Algiers, Algeria; Lima, Peru;...[150]

The above mentioned Ciné-Kodak processing stations require a little elaboration. The company introduced an amateur use cinefilm sytem in 1923. This system brought with it some special requirements. The film

format was 16mm, a little less than half the width of the 35mm that was standard in the professional cinema. More important was that it was a reversal film. In its unexposed state, it was a negative. After processing, it became a positive.[151] The processing of exposed negative into positive required special techniques and equipment. These special requirements became even greater in 1928 when the company introduced color to its amateur cinefilm system.[152] The desire to control the quality of the processing and to appropriate the profits from a unique process thus became a significant force in the company's international expansion during the 1920s. Each processing laboratory became a small manufacturing operation. The means of transportation then available stimulated the international decentralization of this manufacturing operation. By 1930, the company was operating 54 such processing laboratories, and the great majority of these were in countries outside the U.S. [153]

Photofinishing laboratories for still films also played an important role in the company's foreign operations during the 1920s. In the U.K., the company achieved a good measure of control over the trade by acquiring a controlling interest in 27 such laboratories. Thereafter, these finishers used Kodak chemicals and papers exclusively. The largest 13 of these houses took on film wholesaling functions. Their steady deliveries of finished photographs to retailers, at whose stores the films had been dropped off by consumers, placed them in an excellent position to deliver new unexposed film rolls to these retailers.[154]

Conclusion

The place in which Eastman's company was spawned happened to be a provincial American flour milling city. A business such as the one he entered needs more than a geographic locus, however. Photography requires knowledge, and those who possessed it operated in an intellectual environment that recognized few national frontiers. Eastman acquired much of his early photographic knowledge from practioners in England, the country in which photography first flourished. The means by which he acquired this knowledge made it possible for him at the same time to acquaint himself with the possibilities for its commercial exploitation outside the U.S. It thus seems not at all extraordinary that Eastman should have begun to operate on an international scale at an early stage.

This having been stated, it should also be observed that this international scale was rather modest for the first twenty-five years of the company's history. It first became large as a result of growth in the cinema industry early in the twentieth century. Excepting the cinema, none of the manufacturers whose histories are covered elsewhere in this thesis emerged as significant roll film producers before World War I. This suggests that, while Eastman was ready for the world outside the U.S. before 1920, the rest of the world was not ready for him.

Eastman Kodak blossomed into an enterprise operating on a truly global scale during the 1920s. Although it was a decade during which Eastman gradually withdrew from active management of the business, he had appointed like-minded successors at Kodak Ltd. These people were prepared to continue the policies he had formulated many years earlier. Those policies bore rich rewards during the 1920s. Kodak's twenty-five year

technical lead over its European competitors in roll film based photography and its early development of an international distribution network enabled it to seize a commanding commercial position once the markets had developed. It was also a decade that saw a vast extension of photography to a variety of commercial and professional uses other than the cinema. Many of these were the direct result of the industrial research that Eastman had institutionalized earlier in the century.

Once the systematic search for market outlets for the product of that research had been set in motion, it took on a life of its own. This eventually led to a search for additional manufacturing opportunities behind the tariff barriers that had been raised in the aftermath of the first World War. Given these developments and Kodak's history of less than exclusive reliance on its proprietary knowledge for its competitive advantage, it was a natural outcome that its major foreign manufacturing expansions during the 1920s would come by way of acquisitions in France and Germany. The 1921 U.S. Consent Decree enjoining further U.S. acquisitions no doubt contributed to setting the stage for the company's moves in France and Germany.

In 1894, Eastman had written to Strong :

> The manifest destiny of the Eastman Kodak Co. is to be the largest manufacturer of photographic materials in the world or else to go to pot.[155]

Reflection on the industrial and commercial context in which that letter was written suggests that the first of those alternative destinies was not at all manifest at the time. The company was just emerging from a major crisis the eventual outcome of which was then by no means certain. In full recognition of the risks involved, Eastman was trying to reassure Strong and perhaps himself. The company's subsequent

rise to a position of preeminence was the result of Eastman's strategies which did not discriminate between domestic and foreign expansion.

Appendix

Eastman Kodak and the Economies of International Scope

Stephen Hymer postulated that the internationalizing firm enjoys certain advantages that must be large enough to compensate for the many disadvantages that inhere in operating abroad.[156] Charles Kindleberger summarized the sources of these advantages to include, among others, product differentiation, special marketing skills, retail price maintenance, administered pricing, patented technology, internal and external economies of scale.[157]

One thrust of this chapter has been to demonstrate that the Eastman Kodak Company enjoyed these advantages. Furthermore, it has tried to elucidate that Kodak's advantages had their roots not so much in a vaguely generalized set of market imperfections as in a consciously deliberated business strategy the execution of which created many of those imperfections. Eastman's strategy developed in the American business environment of his time. To the extent that the policies constituting that strategy turned out to be effective, they may be considered a valuable form of proprietary knowledge and skill.

The transfer of such knowledge and skill from a company's home country to a foreign country can be interpreted as an exploitation of the economies of scope. Panzar and Willig have used this term to cover the avoidance of costs where two or more product lines can be the joint beneficiaries of common inputs.[158] As Teece has observed, one of these inputs is organizational knowhow, the public goods nature of which makes its use in non-competing applications possible without diminishing its

value.[159] This line of thought is extended here to cover situations in which the knowhow, once acquired through the painful and often costly accumulated experience in Country A, may be transferred to Country B at relatively little incremental cost to the proprietor. The means by which such transfers are made abroad from the country of origin has become a fertile subject of inquiry by students of international business. This Appendix tries to make a modest contribution to the understanding of such means by citing some representative examples, drawn from Eastman's voluminous business correspondence, of how, by means of the written word, he tried to extend the understanding of the basis of the company's American success to other countries.

Market Definition. Eastman's conceptualization of his market as one of consumers for whom photography was to be made easy did not relegate the professionals to a negligible role. The arrangement under which the first Kodak cameras were sold required the camera and its exposed film roll to be returned to Rochester for development and printing of the pictures and reloading of the camera. If the market was to grow, this was clearly an impractical arrangement, and it turned out to be short lived. Pictures had to be developed and printed close to wherever the consumer happened to be. That was a job for professionals and one that Eastman was happy to externalize until new conditions of film technology and market growth made it attractive to internalize the function again.

An ultimate objective was to have satisfied consumers. One immediate commercial opportunity to be exploited as a means to reaching that objective was to sell sensitized paper to professionals doing the photofinishing. The issue of promotional policy implied by this market definition was how to position the product. That issue was at first too

subtle for the management of the English Kodak subsidiary. Eastman made it explicit in 1892 :

> I told Mr. Walker when I was in London that he was making a great mistake in pushing his papers for amateur use. There is five or ten times the business among professionals....We pay no attention whatever to amateurs. If they find the professionals use it they will fall into line fast enough; whereas the professionals look askance at any thing that has an amateur flavor.[160]

It will be recalled that the year 1892 was a very troubled one for the company. Until the problem of Kodak films losing their sensitivity was solved, revenue from sales of paper remained critical to the company. One of the products Kodak introduced in 1892 was Solio, a gelatin printing-out-paper that required special treatment, such as over-exposure, by the photographer. Eastman instructed his U.K. managers that the key to winning profesaional acceptance of this product was to have the company's demonstrator spend several days if necessary with individual professionals to make sure they learned how to use it properly.[161]

Eastman's instructions concerning such operational details were guided by his broader views of the market. In a rather testy tone, he expressed those views in late 1892 by writing :

> You are continually harping on the alleged differences between the English & American trade. There is nothing in your experience whatever to show that there is any substantial difference in the trade of the two countries.[162]

Eastman's views of the consumer camera market were spelled out to his U.K. managers in 1893 :

> We could go on for years trying to make a combination camera that would suit every crank that came along. The question with us is not to suit every crank but whether we can suit the mass of camera buyers.[163]

Eastman made his views on the interdependency of the durable and

consumable parts of his photographic system explicit to his U.K. management in 1895 :

> We ought to make at least as much off from the film used in it as off from the camera itself; probably more. I believe that every camera is good for at least twenty spools of film...[164]

The nature of the camera market and its relationship to the ultimate objective of selling film came up again in 1896 when he wrote to Dickman :

> I consider that there are two entirely different kinds of camera trade; one kind that wants a complicated camera with every device that can be put on it; and the other that either wants, or ought to have, the simplest possible camera. The latter class includes all new trade...The money to be made is almost entirely in this class...there are five people at least wo will pay $8.00 for a camera to one who will pay $15.00 or $20.00. On a complicated camera we would do well if we made $3.00, whereas on five of the cheap cameras we would make about $14.00, and beside have five people using the cartridge system instead of one.[165]

The epistomolgical ice on which we are skating here appears thin. The study of scope economies is concerned with the transfer of knowledge. The evidence cited thus far does not reveal knowledge as conventionally defined so much as Eastman's viewpoints, attitudes, desires, etc. Nevertheless, by expressing his ideas to the managers of his U.K. subsidiary as he does in this correspondence, he is implicitly saying "I know (or believe, hope, expect, pray) that whatever I am telling you to do will be the basis for the company's business success." To the extent his ideas indeed did form the foundation for the company's success, it is perfectly legitimate to consider them to be a form of knowledge. From a managerial perspective, it may be the most valuable form of knowledge that an enterprise can possess.

Distribution. Among the cornerstones of Eastman's U.S. sales policy was the direct sale of Kodak products to exclusive dealers. The evidence of Eastman's efforts to extend this policy abroad began to show up in 1899. A competing film, most probably one made by Lumière, made its

appearance on the French market that year. Eastman wrote to Strong :

> I have advised Davison to refuse to sell French dealers who handle the new film as it is put up in rank imitation of ours.[166]

A British press clipping from the year 1900 indicates that the same policy was at work in the U.K. It quotes the Chairman of the British Photographic Trade Association as characterizing Kodak's exclusivity policy to be "not only un-English and unfair, but it is totally unnecessary." [167] To enforce the exclusivity concept, Eastman priced the product so as to make it possible to pay periodic rebates to dealers who complied with Kodak's terms of sale. Starting in 1900, Eastman directed his London managers to adopt the same system in the U.K. [168] In addition to such fundamental strategic concepts, Eastman directed his U.K. subsidiary management to adopt the minutest operational details of the company's U.S. marketing. Thus, in 1900 he asked Davison to follow a new U.S. billing system under which customer statements were sent out on the fourth, rather than the tenth, day of the month.[169]

One of the means used by Eastman to develop the consumer market was through operation of Kodak owned retail stores. This was done abroad perhaps even to a greater extent than in the U.S. Nowhere was Eastman's rationale for this policy made more explicit than in a 1901 letter to a group of French dealers :

> I am in receipt of your letter of recent date protesting against the opening of a Kodak retail shop in Lyons and have given the matter careful consideration. To begin with I will admit that if your evident assumption is correct that there is only a certain fixed amount of trade in our goods to be had in your locality, and that our own object is merely to get away from our already established customers as much of that trade as possible for our own retail establishment then our action would be detrimental to your interests and quite unwarranted. Experience has shown us, however, beyond all question that the amount of Kodak goods that can be sold in any given territory is largely dependent upon the advertising that they receive and

> the prominence with which they are presented to the public. It follows naturally from this that wherever we have established branch houses the trade in that locality has grown very materially and that the effect has been, not to decrease the sales of our dealer customers but, on the contrary, to increase them....Our policy all over the world has been, and still is, the protection and encouragement of our dealer customers and I am quite sure that no move has been made in the present instance which will be detrimental to your interests unless you make it so yourselves.[170]

It may be of interest to note in this context that the transfer of wisdom from the company's accumulated experience did not always go only in one direction. In explaining the acquisition of the first U.S. retail outlets to his U.K. management, Eastman wrote :

> The general policy in purchasing these established businesses is to exploit both the wholesale and the retail business. The retail business can be very materially stimulated by our example, as it has been in Europe.[171]

Pricing. To appropriate the benefits of Kodak's advertising efforts and to keep the loyalty of his dealers, Eastman felt it necessary to enforce a system of rigid resale price maintenance. After he had adopted this scheme in the U.S. in 1894, he urged his London manager to do the same.[172]

When Eastman felt comfortable that the company's manufacturing scale economies permitted it, he lowered prices to attract a wider public. He had occasion, from time to time, to remind his European managers not to confuse form with substance. They sometimes reduced prices indiscriminately, and this aroused his ire. Thus, in 1903-1904, we find him writing :

> Heretofore, the business has been run too much like a Government office...Almost every time that we have gone out for the trade over there we have tried to do it by cutting prices. The result is that it will finally leave us nothing to work with...The thing to do is keep prices to the highest notch and get out and hustle for the trade.[173]

> The one fatal error we must avoid in Germany & elsewhere is the

> reduction of prices to a point where we cannot make any money...We ought to make quality our fighting argument.[174]

Protection of Proprietary Intangibles. In the 1890 letter outlining his patent strategy (see p. 227), Eastman instructed Walker :

> Next year when you get to earning plenty of money the best investment you can make will be to put out 4,000 or 5,000 pounds into patent litigation...$25,000 would put our patents in England on a foundation that would be unassailable.[175]

There was discussion between Eastman and Walker in 1892 concerning the extension of the company's operations into Germany. The correspondence puts Eastman's views of the policy issues into perspective. He outlined several options to Walker. Among these was the licensing of outsiders. He rejected this on the ground that just one licensee would create competition sufficient to destroy the value of any patents and to take all the profit out of the business.[176]

Among the policies on which Eastman placed heavy reliance was the maintenance of secrecy with repect to the company's chemical formulations. The head of each department in Rochester was under written orders not to communicate formulas in his custody to anyone else without the explicit written consent of Eastman himself. He had occasion more than once to upbraid his Harrow managers for violations of this rule.[177]

Eastman's policy with respect to the conservation of proprietary knowledge was spelled out in his reaction to an inquiry from the Asanuma company in 1906. Asanuma and other Japanese merchants were seeking a partner in establishing a dry plate manufacturing operation. (See Ilford, p. 139 and Konishiroku, pp. 161-162)

> The intention is very apparent that the Japanese would like to get some American or European experts to install their factory for them and then absorb it themselves. No prospective trade in Japan would induce us to take the risk of making them acquainted with our secrets. We prefer to sell what plates we can there as long as we can and then drop it.[178]

Monopolization. In the company's early internationalization, Eastman never relied as heavily on competitor acquisition as he had done at home. It is nevertheless clear that he was driven by the same ideas. As he was completing the consolidation of the American photographic paper industry at the turn of the century, he wrote his U.K. counsel that "it is possible that the Kodak organization will hereafter want to absorb other branches of the industry both in the U.S. and abroad." [179] In 1902, he sent Charles S. Abbott to London. Abbott had come to the company via the acquisition of American Aristotype Co. of which he had been a partner. Eastman announced the purpose of Abbott's visit to his U.K. manager as follows :

> I want him to thoroughly discuss with you the subject of a general European operating policy and get a plan outlined as far as possible before I come over, say a month later. The general question to be considered will be how far we can go toward pursuing the same policy that we have in this country in securing control of the whole business by the purchase of manufacturing and distributing concerns. Mr. Abbott will also take up the preliminaries of a combination with the Dresden syndicate.[180]

It was such thinking that led within a year to the acquisition of Cadett & Neall and the unsuccessful attempt to take over Ilford. In connection with the Ilford attempt, Eastman had advised his U.K. manager that

> So far we have not bought any declining businesses unless they were needed to make up an absolute control of the class of goods involved.[181]

Conclusion

The evidence cited in this Appendix is, to be sure, somewhat fragmentary. Any conclusions drawn from it must remain tentative. All of it, however, points in the same direction, and in no instance encountered

in the course of the present research does it point in a different direction. Eastman knew what he wanted to accomplish. He had tested in America the efficacy of whatever means he thought necessary to reach his goals. He then transferred his understanding of those means to the managers of his foreign affiliates. The result was a global business strategy, one that did not differentiate between home country and foreign countries in its basic elements.

Notes and References

1 This chapter and its Appendix are largely based on research through archival materials at the University of Rochester and public documents. Among the materials kept at the Department of Rare Books, Manuscripts and Archives in Rush Rhees Library of the University of Rochester, the following are cited with some frequency in this thesis :

1) Eastman-Butterfield Collection, Library Catalog No. D.4. This is a comprehensive collection assembled by Roger Butterfield in the 1950s as the raw material for an intended George Eastman biography that was never written. It includes, among other materials, most of George Eastman's business correspondence and some of his personal correspondence dealing with his business activities. This correspondence constitutes a primary information source of fundamental importance to the present account. To avoid needless repetition, citations of this correspondence are hereafter given in the form of "G.E. to ...". Unless the addressee, or writer if other than Eastman, is identified in the main text of this chapter, a parenthetical description of that person's title or function is given in these notes the first time the person is mentioned and not thereafter.

   Any other materials in the Eastman-Butterfield Collection are cited as UR-D.4.

2) Miscellaneous Materials, Library Catalog No.'s D.138 and D.139 are hereafter cited as UR-D.138 or UR-D.139.

3) Bachmann Papers, Library Catalog No. D.137. This comprises several draft manuscripts of an unpublished Eastman biography and company history written in the early 1970s by Lawrence P. Bachmann, Fellow of Green College, Oxford University. The kind permission of Mr. Bachmann to draw on these materials for this thesis is gratefully acknowledged. The documentation of Mr. Bachmann's research remains in the custody of the Eastman Kodak Company. References to the Bachmann manuscripts are hereafter cited as Bachmann, UR-D.137.

The public documents cited include :

1) United States v. Eastman Kodak Co. et al., District Court, Western District of New York, No. A-51, August 24, 1915 :
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   b) verdict, Vol. 226, Federal Reporter, 1st Series; hereafter cited as 226 Fed. Rep.
2) Goodwin Film & Camera Co. v. Eastman Kodak Co., District Court, Western District of New York, August 14, 1913 :
   a) transcript, U.S. Circuit Court of Appeals, 2nd Circuit, New York, N.Y.; hereafter cited as Goodwin v. EK Co.
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8 Government Exhibit No. 210., US v. EK Co., pp. 2,565-2,569.

9 226 Fed. Rep., p. 67;
207 Fed. Rep., p. 355.

10 Jenkins, Images & Enterprise, p. 111.

11 George Eastman testimony, Goodwin v. EK Co., p. 362.

12 Ibid., pp. 351-353.

13 G.E. to Myron Peck (EK stockholder and local Rochester social celebrity), 19 January 1892.

14 George Eastman testimony, US v. EK Co., p. 219.

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16 G.E. to Bureau of Corporations, Department of Commerce, Washington, D.C., 24 October 1914.

17 G.E. to Davison, 21 March 1902.

18 George Eastman testimony, US v. EK Co., pp. 230-231, 263.

19 "Instantaneous Photography," Scientific American, 15 September 1888, pp. 159, 164.

20 Ackerman, George Eastman, pp. 78-79, 128.

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29 Ackerman, George Eastman, p. 76.

30 Crowther Interview, p. 710.

31 UR-D.4, File 7.

32 G.E. to Dickman, 16 January 1896.

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34 Stock Prospectus for Kodak Ltd., London, November 1898, UR-D.138, Box 7, File 1.

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47 226 Fed. Rep., pp. 64, 68, 71;

G.E. to F.E. Stanley (owner of Stanley Dry Plate Co.), 1 December 1903.

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51 "Terms of Sale", US v. EK Co., p. 519;

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129 G.E. to Davison, 8 & 17 September 1902.

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131 G.E. to Abbott, 30 January 1904;

G.E. to Kodak Ltd., 7 October 1904.

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133 G.E. to Strong, 8 April 1908.

134 G.E. to Walker, 15 April 1891;

G.E. to H.M. Smith (Kodak manager in Paris), 8 July 1901.

135 G.E. to Smith, 14 March 1907.

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164 G.E. to Dickman, 27 December 1895.

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166 G.E. to Strong, 24 April 1899.

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169 G.E. to Davison, 6 August 1900.

170 G.E. to Messrs. Drepierre & Wayant Srs., A. Schirmayer and others, Lyons, France, 3 December 1901.

171 G.E. to Davison, 21 March 1902.

172 G.E. to Dickman, 30 January 1894.

173 G.E. to Davison, 31 December 1903.

174 G.E. to Davison, 30 January 1904.

175 G.E. to Walker, 23 October 1890.

176 G.E. to Walker, 30 April 1892.

177 G.E. to H. Senier (Harrow technical manager), 5 October 1901;

G.E. to Davison, 19 December 1903.

178 G.E. to H.C. Reiner (Seed Dry Plate Co. executive), 17 November 1906.

179 G.E. to Verden, 14 September 1900.

180 G.E. to Davison, 8 September 1902.

181 G.E. to Davison, 29 November 1902.

Chapter IX

Conclusion

Summary of Findings

> Competition was very good in its way, but it was good for the consumers and not for the producers.
>
> W. Ashmole at extra-ordinary general meeting of Ilford Ltd. shareholders, 25 June 1903, as reported in The Financial Times (London), 26 June 1903.

> The photographic manufacturing industry, Kodak says, has always been on an international basis; because of the cost savings of large scale production there are few factories and all manufacturers (including the Eastman Kodak group) are supplying some important markets by exporting to them over a tariff barrier since, in their view, this is more economical than setting up local factories.
>
> The (U.K.) Monopolies Commission, "A Report on the Supply and Processing of Colour Film," London : H.M.'s Stationery Office, 1966, p. 75.

It has been suggested in the Introduction that the carrying out of strategic intents by members of the photochemical industry led to certainty in the incurrence of fixed costs. If an enterprise is to survive in the long run, it must over the long run generate variable margins that exceed those fixed costs. Such generation is anything but certain, and while this uncertainty can never be completely eliminated, it can be substantially reduced. The effort to reduce it took two major forms, the restraint or elimination of competition and the search for markets wherever they were to be found or developed. Those entrepreneurs

who clearly understood these relationships and their implications were pioneers in seeking and developing markets abroad.

Despite a number of idiosyncratic twists and turns, the history of the photochemical industry is broadly consistent with this generalized interpretation. The remark by Ilford shareholder Ashmole quoted at the beginning of this chapter serves as a proxy for the following events :

1. The consolidation of Agfa and Bayer photographic interests by IG Farben.
2. The acquisition of Ansco by IG Farben for the benefit of Agfa.
3. The European cinefilm market sharing agreement by Agfa and Kodak.
4. The price fixing arrangement entered into by the European photographic industry between the two world wars.
5. The consolidation of the English photochemical industry by Ilford.
6. The wholesale acquisition of competing firms by Kodak.
7. The imposition of exclusionary sales terms in the U.S. and the U.K. by Kodak.
8. The acquisition and consolidation of Ilford, Lumière and Tellko operations by Ciba-Geigy.
9. The acquisition of Perutz by Bayer for the benefit of Agfa.
10. The fusion of Agfa and Gevaert operations.
11. The restriction of x-ray film imports by the Brazilian government once a local production facility had been established by Konishiroku.
12. The restriction of the largest Japanese wholesalers by Fuji to carrying only its own photosensitive materials.

These events and the discouragement of hundreds of early entrants led to the development of an oligopolistic industry structure. While oligopoly is defined by there being a small handful of producing enterprises, it is quite possible that a so defined industry could operate many factories. A distinguishing feature of the photochemical oligopoly is, as suggested by the second quotation opening this chapter, that it operates very few factories. Each of the few manufacturing facilities is capable of satisfying the demand for its output in markets larger than that provided by the nation in which the particular facility is located.

The need to find users for the output of this small number of factories led to the development of marketing networks the scope of which is more or less global. The international operations of the photochemical industry thus in large measure comprise marketing activities. Although there are minor plants of limited significance scattered around the world in response to various government imposed trade impediments, the only truly multinational manufacturers are Eastman Kodak and, to a more limited extent, Agfa-Gevaert. The multinationality of the industry largely consists in the operation of sales and distribution subsidiaries in those countries where economic development has progressed to a level that promises repetitive sales in volume sufficient to sustain the operations of these subsidiaries.

Although the present research has uncovered specific instances of nearly every conceivable type of relationship in conducting business across national frontiers, most of these have no strategic significance for the enterprises. By this is meant that if such relationships had never been entered into, this would have had little effect on the ultimate prosperity of the individual firms.

Significance of the Findings and the Industry's Experience in Perspective

Internationalization of business is a complex and imperfectly understood economic phenomenon. Its pervasive presence has stimulated the production of a large body of economic theory that attempts to explain it. The continuing appearance of new and revised formulations attests to varying levels of dissatisfaction with what has thus far been proposed.

The findings of the present research are far from complete and at least for this reason far from conclusive. The experience of the photochemical industry can nevertheless be examined in the light of several strains of relevant theory. The purpose of this examination is not so much to claim empirical support for any given theory or to deny its validity as it is to suggest how some theoretical formulations might be modified so as to broaden their generality or to deepen their insight. There are linkages between what has been proposed and reported in the preceding chapters and other recent studies of internationalization. The following discussion explores those linkages by focusing on two major themes that run through much recent theoretical work. These are the conception of markets and the characteristics and economic value of knowledge.

It is to be noted at the outset that some expansion of taxonomic domains is necessary for the discussion to be useful. The central concern of much recent literature is confined to two highly visible aspects of international business, Foreign Direct Investment (hereafter FDI) and the institution that emerges from FDI, the Multinational Enterprise (hereafter MNE). Good summaries of this work have been published by, among others, Calvet,[1] Caves[2] and Grosse.[3] With the somewhat rare exception of

passing mention of other business functions, this literature generally treats manufacturing as the object of FDI. A typical example of this treatment is given by Caves when he writes : "An important numerical proportion of foreign subsidiaries or branches takes the form of sales agencies, representing a vertical integration forward; the capital invested in them is small, however, and they will be neglected here as comprising adjuncts to their parents' export sales activities unless they undertake production and become 'horizontal'." [4]

This is an unnecessarily narrow conception, and at least two considerations call for broadening it. The essence of all business activity, whatever form it may take, is the creation and exchange of utility potentials. The physical transformations characteristic of manufacturing create potential functional utilities only, and those potentials are not normally realized at the factory door. The factory's output must get to the party that will use it, and ultimately there must be exchange with that party. The activities incident to getting a manufactured product from the factory to ultimate users fall within the domain of marketing, although they may with equal validity be described as the creation of locational utility. In the absence of such locational utility creation, the conduct of business would be reduced to a primitive level indeed.

It is generally accepted that FDI consists in the transfer of income producing assets abroad with the intent that those assets will be managed by the transferor. There is nothing in this definition that necessitates the transferred assets to be used solely in manufacturing, and it does not preclude the possibility of asset use in creating locational utility. To be meaningful in the present context, the concept

of FDI must cover the hundreds of instances in which the photochemical industry invested abroad to facilitate the performance of marketing functions.

A central concern of economic analysis of international business has for a generation been with one or another variety of market imperfection. Such analysis has nevertheless paid insufficient attention to elucidating what actually occurs in performing the marketing function. One intent of the following discussion is to suggest how some of the gaps might be filled. Before this can be done, an elaboration of the notion of markets is needed.

A market is an institution or set of institutions for facilitating exchanges between independent actors. Such actors are presumed to be protective of their self-interest and to behave accordingly as they enter into transactions and relationships leading to the execution of exchanges. The behavior of actors in markets is governed by rules that may or may not be codified. In either event, markets operate on the presumption that participants know and understand the rules and do not generally violate them. The knowledge of market institutions and of the rules governing behavior in those institutions is part of the cultural legacy of a given society. It is a sub-set of cultural knowledge and will here be referred to as market knowledge. Insofar as market institutions may include distribution channels specializing in a related group of products, some aspects of market knowledge may be highly product-specific. Market knowledge is necessary if the marketing function is to be carried out with reasonable efficiency and effectiveness.

Enterprise managers concerned with strategy have a related but somewhat broader conception of markets. To them, a market comprises the

set of buyers who ultimately realize the utility potentials created by sellers. The institutions used in the performance of the marketing function are conduits for reaching this set of ultimate users. To the extent that these conduits are seen to be necessary, they are certainly not forgotten, but the importance attributed to them is subordinate to that given to end users.

The nation-state plays a pivotal role in establishing the business environment in which market institutions operate and ultimate users reside. At the very least, it provides the locale in which market institutions and users are to be found. All market institutions and end users resident in a given country thus constitute a national market.

There are gradations of similarity and difference among national markets with respect to end user utility functions, characteristics of market institutions and operative transaction rules. The greater the differences, the more they become sources of transactional friction impeding exchange. Market knowledge serves as the lubricant easing such frictions.

The relevance of these ideas for the conduct of international business has been studied by scholars at the University of Uppsala. The essence of their findings, as summarized by Carlson, is that firms face frontier uncertainty as they begin to extend their transactions and relationships abroad. This frontier uncertainty is seen to arise from lack of cultural knowledge. The extent to which institutions and business practices differ from country to country is indicated by what Carlson calls cultural distance. The more they appear to differ, the greater the cultural distance is perceived to be. To minimize the psychological discomfort that accompanies frontier uncertainty, firms typically begin

their internationalization by dealing in countries characterized by the shortest cultural distance from home. They move progressively from the more familiar to the less familiar, and they hesitate to commit additional resources to a foreign country until the cultural or market knowledge needed to operate in that country has been acquired and the cultural distance between the two countries has thereby been shrunk.

This would appear to go quite far in accounting for the frequently observed country pattern in moving from independent distributors to marketing subsidiaries and eventually to manufacturing subsidiaries. It is noted, however, that Carlson reports it simply as an empirical observation rather than as an explanation.[5] It is also noted that cultural distance as defined by Carlson or lack of market knowledge as defined above is the source of the foreigner's commercial disadvantage identified by Hymer as one of the bases for his discussion of market imperfections as the source of compensating advantage.[6]

If the notion of cultural distance is stretched somewhat, there is much in the experience of the photochemical industry that conforms to the Uppsala model. Eastman Kodak set up its first permanent foreign sales establishment and its first foreign factory in England, a country the cultural distance of which from the U.S. can be presumed to have been minimal. The uses to which the English Kodak subsidiary was put extended beyond manufacturing and marketing in the host country. Eastman's permanent establishment in London was at the center of an empire that stretched around the world. His correspondence indicates that he was quite aware of the colonial market. It is taken for granted that the skills requiring application of market knowledge needed to reach users in the colonies were more likely to be found in London than anywhere else.

The managerial functions assumed by Kodak Ltd. also spread to foreign countries outside the British Empire. Because the cultural distance between Rochester and London was short, Eastman was able to communicate with his U.K. managers with relative ease. Kodak Ltd. thus became an instrument through which Eastman was able to multiply the effectiveness of his policies in many countries outside the Western Hemisphere.

In this hemisphere, Domingo Delgado possessed sufficient knowledge to begin the expansion of Kodak marketing activities in Latin America. This knowledge had been acquired in the course of his Puerto Rican upbringing and his experience in shipping and exports before joining the Kodak organization. The specific additional knowledge needed to establish Kodak in any given national market in Latin America was acquired easily enough by Delgado as he went along. The significance of this last point will be explored below.

The second and third foreign manufacturing ventures by Kodak were organized in Canada and Australia, countries that obviously were not culturally distant from the U.S. Perhaps as important in this context was what the company did not do. Eastman rejected several proposals to become involved in manufacturing in Japan. The xenophobic tone of his correspondence on this subject suggests that his frontier uncertainty was at its maximum with respect to commitment of resources to that country.

The first Gevaert permanent sales establishment in France is consistent with the Uppsala model. Although the evidence is weak, it could also be argued that Spain as the host country for Gevaert's first foreign manufacturing investment fits the same pattern. Spain exercised sovereignty over the Lowlands for a century and a half. During that time it left a cultural legacy remnants of which are still in evidence in

Belgium to the present day. It may thus not have been entirely fortuitous that the Garriga and Gevaert families and firms found themselves to have enough in common to make mutual understanding quite easy. Similar observations can be made about Gevaert's relatively early commitment to company distribution facilities in South America. Here also the ties of managerial hierarchy were eventually cemented by the marriage of one of Lieven Gevaert's daughters to an Argentinean who acted as the company's distributor in several South American countries.

Finally, the psychic discomfort that arises from the perception of cultural distance was eased for both Japanese companies by their dealing with Japanese expatriates. The early exports of both Konishiroku and Fuji were made, either directly or indirectly, to their own countrymen who had settled in nearby countries. Konishiroku's first and thus far only substanial foreign manufacturing investment was made in Brazil, a country that was also the host for Fuji's first foreign subsidiary. Were it not for the presence in Brazil of a large and economically important population segment of Japanese immigrants and their offspring, both Japanese companies would have found that country to be far too exotic for major resource commitments.

On the other hand, we should be hard pressed to invoke cultural distance in dealing with some other events in the internationalization of the photochemical industry. Among these are :

1. The establishment by Gevaert of distribution facilities in Russia eight years before doing the same in the Netherlands.
2. The establishment by Agfa of a sales subsidiary in Spain before doing the same in any of its Scandinavian neighbor countries.

3. The establishment by Agfa of a sales subsidiary in Italy before doing so in Austria.
4. The establishment by Kodak of sales subsidiaries in France and Germany before doing so in Canada.
5. The lapse of fourteen years between the first Kodak permanent foreign establishments in England and Canada, two countries presumably equidistant in a cultural sense except for Canada's bicultural heritage.

These exceptions point to an aspect of the Uppsala model that may limit its applicability. To firms seeking markets abroad, the apparent potential of a given national market may be a more important consideration than the obstacles posed by cultural distance. In any event, firms find ways to surmount or circumvent these obstacles.

If cultural distance is shortened by market knowledge, the perception that such distance exists must be a highly subjective phenomenon that is the product of ignorance. The limitations on international commerce imposed by ignorance can be overcome in a variety of ways. Carlson suggests that it is overcome in the course of accumulated experience and that this accumulation can be modeled by a learning curve.[7] During the time period in which this learning curve is taking shape, use of the requisite market knowledge can be acquired in a number of ways. The purest illustrative example of this is Gevaert's use of commission agents to sell its goods in several countries. As these agents had no other assets, all they were able to offer Gevaert was the use of their knowledge of local market conditions. Alternatively, the requisite knowledge can be internalized within the firm by employing people who either have the knowledge to begin with or who can quickly

acquire it at minimal cost. The Kodak experience with Domingo Delgado is a case in point. Another way to internalize market knowledge is to acquire a firm that already has it, which was done by Kodak in Canada among other places. The placement of its own employees into the organizations of some of its independent foreign distributors helped to decrease Agfa's ignorance of local markets, and the establishment of representative offices by Fuji served the same purpose. The foreignness of foreign markets was a rather temporary perception for those firms that took internationalization seriously, and the need to acquire market knowledge or its use does not appear to have been an insurmountable obstacle to the successful photochemical firms.

Although market knowledge may be the lubricant of international commerce, it is not the fuel. If the term, national market, is to take on operational meaning, the end users in a given country must indicate sufficient potential demand to make any marketing effort in that country worthwhile. They must, in short, have purchasing power.

The significance of purchasing power was elaborated by Linder, who tried to develop a more satisfactory model to explain actual international trading patterns than that offered by the traditional Heckscher-Ohlin elaboration of the theory of comparative advantage. The notion of internal demand in both importing and exporting country is at the core of Linder's model. Purchasing power is a necessary condition for internal demand in the importing country to be satisfied. For lack of better data, Linder used <u>per capita</u> income as the indicator of purchasing power. He concluded that trade in manufactured goods will be most intense between countries the <u>per capita</u> income of which is at more or less the same level.[8]

The experience of the photochemical industry fits the Linder model in that most of the international commerce in its output, both in value and in physical volume, flows from factory to foreign sales branches and subsidiaries; such extensions of the firm's own facilities have generally been set up in countries which either had the requisite purchasing power or, in a later day, those which had reached a stage of economic development that showed promise of reaching it within a foreseeable future. To be sure, the pioneers in the internationalization of this industry did not have the benefit of per capita income statistics in their market seeking deliberations and relied instead on other indicators of market potential. Where their output was an intermediate product for another industry, as in motion pictures, they went where the customers were. Where their output was a final product intended for individual consumption, they used indicators such as the proliferation of publications catering to satisfy the information needs of users. It can be argued that the existence of such qualitative indicators and quantitative indicators such as per capita income are joint manifestations of a certain level of economic development.

It is noted in passing that Linder perhaps overstated his case somewhat in his basic proposition that it is a necessary condition that a product be consumed at home before it can be an export product.[9] Few observers would quarrel with the generality that exported manufactures are usually sold first in the country where they are produced. The early experience of the photochemical industry suggests, however, that a confounding factor is introduced when Linder extends this generality to a necessary condition.

The Eastman-Walker system of photography was, for all practical

purposes, introduced simultaneously in the U.S. and the U.K., as was the first Kodak system. The early internationalization of Gevaert may perhaps be dismissed as an idiosyncratic aberration. While Gevaert's output found its first demand within Belgium, one of the smaller nations of the world, the company surely would not have lasted very long had its sales efforts been confined to its domestic market. Finally, the early experience of Agfa is instructive. The product which propelled Agfa to become the world's second largest photochemical producer had no market whatever in its home country at the time it was developed.

These experiences suggest that the need and search for markets explain exports at a higher level of generality than that proposed by Linder. Success in domestic marketing is by no means a necessary condition for exports. The initial domestic marketing successes of Eastman in America, Ilford in England, Konishiroku and Fuji in Japan serve only to show that the necessary market demand was close at hand. This obscures the more fundamental notion that the nationality of a market is of secondary importance to a market seeker. Exports generally enter the picture when there is asymmetry between the production capacity needed to operate with reasonable cost efficiency and domestic demand. The purest case is that of Agfa's entry into cinefilm production, where the required capacity was large indeed and the effective domestic demand for the output was zero.

Once the conditions propelling a photochemical firm to seek markets abroad had developed, some part of the marketing function was undertaken either by independent local agents and/or distributors or by branches and/or subsidiaries of the manufacturer. In any given national market, the former usually preceded the latter, although in a few

exceptional early instances, the use of independent middlemen was avoided entirely. At a minimum, the function undertaken by these intermediaries included that portion of locational utility creation which comprised the physical movement of goods from the factory to whatever distribution channel was appropriate for a given product in a given national market. In the extreme case, exemplified by Konishiroku, the entire marketing function was undertaken by another party.

At a superficial level of observation, these alternative means of foreign distribution appear to conform to the abstraction that models economic activity in terms of markets and hierarchies, these being viewed as polar alternatives for executing transactions.[10] It is implicit in this formulation that markets are perfectly competitive. In the analysis of why one alternative institution is used rather than another, the decision criterion generally is net transaction cost. Netting has to be brought into the computation because the use of managerial hierarchies entails the incurrence of governance costs that are avoidable when markets are used. As Caves expresses it by use of Darwinian metaphor, the MNE emerges and tends to prevail wherever it enjoys net transactional cost advantages over markets.[11]

This formulation requires some analysis if its insight is to be reconciled with two aspects of reality. Examine first the costs incurred in creating locational utility. At a minimum, these costs arise from performance of the following functions : Export packaging and labeling, documentation, transportation, customs clearance and other formalities related to crossing of national frontiers, warehousing, selling to intermediaries, distribution, demand promotion, and after-sales service if any. To keep the comparison fair, governance costs and the ability of the

MNE to manipulate transfer prices so as to minimize import duties are set aside. As Hirsch has pointed out in generalized form, the costs incurrred are completely independent of who has title to the goods and of who owns the organization that undertakes the above functions.[12]

Secondly, photochemical firms strive to create products that are either in objective fact unique or that users come to believe to be unique as a result of differentiation efforts. The independent distributor is in virtually all instances given the right to import and sell the product exclusively in a given national territory. The relationship between manufacturer and independent foreign distributor in this industry is thus best described as a bilateral monopoly. This is a most imperfect market situation indeed and has in common with the operation of markets only that the two parties are dealing with each other at arm's length.

The foregoing analysis suggests that application of the markets and hierarchies model to internationalization really subsumes two separate issues. One is the choice between perfect and highly imperfect market mechanisms, and the other involves the choice between such highly imperfect market mechanisms and an extension of the manufacturer's own organization to a foreign country.

The cost efficiency argument may settle the first of these two issues. There are minor scale economies that arise from concentration of functions. The documentation and related customs clearance costs are largely the same regardless of volume comprising a given lot of product. The costs assigned to each unit in such a lot will accordingly be less if the lot is large rather than small. These scale economies are here identified as minor to distinguish them from the major scale economies, discussed below, that arise from marketing operations usually conducted by

an organizational extension of the manufacturer.

Minor unit cost economies may thus account for the choice of a highly imperfect, meaning non-competitive, market institution for transferring goods abroad as opposed to a more competitive one. But the choice between such an imperfect arm's length institution and an equally imperfect internal organization remains as a separate issue.

This issue has been described and discussed by several scholars as a phenomenon of internalization. While the concept is relevant, its uncritical use in discourse sometimes leads its users to stray from the path of clarity. The idea that firms internalize markets was first broached in an international business context by Hymer.[13] The idea was picked up by Buckley and Casson for whom internalization of markets across national frontiers was the centerpiece of a theory of the MNE.[14] Rugman wrote of transporting knowledge within the internal market of the MNE.[15] Caves wrote of internalizing the market through vertical integration;[16] and this usage is beginning to find its way into textbooks.[17]

The cause of clarity may be served by introducing the opposite concept and delineating more precisely what may be the object of either internalization or externalization. Internalization implies the taking into the firm of something that was originally and inherently external to it. A cow grazing in pasture can in some sense be said to internalize grass, and in the same sense a firm may internalize skills, knowledge, rights, transactions, and at best, one or more institutions in the distribution chain, but never a market as that word has been defined above.

In the present context, the concern is with the right to sell photosensitive materials in countries that, from the point of view of the

manufacturer, are foreign. To keep the discussion simple, it is assumed that the government of the importing country sets up no inhibitions to the disposal of these materials within the territory under its jurisdiction by foreigners or organizational extensions of foreign firms. The materials belong to the manufacturer, and among the rights that inhere in property ownership, the right of disposal must count as central. If the right of disposal inheres in the firm that owns the property, it is surely appropriate to ask why the firm does or does not externalize this right. This is the crucial difference between title transfer to an independent distributor and to a subsidiary. By doing the former, which is to say by effecting title transfer to a separate economic entity, the firm externalizes the right to resale. By doing the latter, it keeps that right within the same economic entity and thereby maintains something that was internal in the first place.

It is general practice in the photochemical industry to externalize foreign distribution rights for quite limited time periods. Renewable one year and three year contracts are fairly typical. In the overwhelming majority of instances, these rights are reclaimed with the formation of sales subsidiaries in those countries where large potential market demand is believed to exist. The transformation of such potential demand into effective demand and the satisfaction of this effective demand require an expansion of marketing efforts that go well beyond those needed for physical distribution. The exertion of these efforts results in the incurrence of costs the behavior of which brings into existence the possibility of achieving major scale economies. This is because such costs are largely independent of physical unit volume. Moreover, such costs can often be recovered only over a relatively long time span.

Independent distributor and manufacturer can be assumed to be equally capable of generating the major scale economies arising from local marketing once the requisite market knowledge has been internalized by the latter. But when the possibility of achieving these economies comes into sight, the strategic interests of the two parties usually diverge. The independent distributor may be quite reluctant to incur costs the benefits of which may accrue only over the long run when he knows that resale rights may be revoked at the end of the current contract period.

By virtue of prior ownership of the goods, the manufacturer faces no such threat in most foreign countries. In the face of a necessarily short planning horizon imposed by the manufacturer, the distributor usually seeks to maximize short run profits by absolute cost minimization and charging relatively high prices. The manufacturer, by contrast, faces both a planning horizon long enough to encompass the eventual recovery of large scale marketing costs and the supply inelasticity that results from investment in large scale manufacturing facilities. These conditions make it far more likely that it will be the manufacturer that appropriates the benefits of large scale economies in marketing. The institution by means of which these economies are realized is the sales subsidiary.

In summary, the conclusion of the foregoing analysis is quite in accord with the view that managerial hierarchies enjoy transactional unit cost advantages over alternative institutions for bringing goods to a foreign market. The reasoning leading to this conclusion is, however, somewhat different in that the economies are seen to arise from strategic choice rather than from inherent market infirmities.

However, no business hierarchy ever survived for very long by

transferring product to itself, no matter how efficiently such transfer may have been carried out. Sooner or later there must be exchange with another economic entity, and it is this necessity that makes the internalization of markets an inappropriate notion. Low unit costs in marketing are of no consequence unless revenue is generated in the course of exchange and as a result of performance of the functions in the course of which costs are incurred.

As previously mentioned, the need or desire to generate revenue in a foreign country gives rise to what Carlson has described as frontier uncertainty. The view taken here is that this uncertainty reflects two separate phenomena, cultural distance as described by Carlson and ordinary commercial risk. It can be assumed that the market knowledge needed to shrink cultural distance has been internalized through all the previously described means by the time a manufacturer is ready to form a foreign sales subsidiary. The ordinary commercial risks remain, however, and in their efforts to minimize those risks, manufacturers of sensitized materials employed marketing strategies that had contributed to their survival as participants in emerging oligopolies.

The techniques of choice for achieving this survival are those that succeed in differentiation of product and producer in the minds of users. In the early years of the photographic industry, such differentiation could take the form of physical differences. As the industry matured and its products became physically standardized, successful differentiation came increasingly to depend on psychological factors.

The nature of photosensitive materials and their use give these psychological factors the importance they have in the minds of users. The

rearrangement of components comprising a photosensitive material takes place at the molecular level. The physical combination of molecules making possible the satisfaction of the user's wants and the necessity to keep it enveloped in total darkness before use prevent the user from assessing the presence or absence of desired characteristics prior to purchase. The performance of a photosensitive material cannot be demonstrated without at the same time destroying its future utility. Furthermore, there is time lapse in conventional photography between the exposure of the film and the visible result. During this time lapse the opportunity for capturing the image satisfactorily often disappears. End users thus perceive themselves to take on a considerable risk when buying a photosensitive product. It is among the purposes of the producer's differentiation efforts to persuade users that this risk is minimal when that producer's brand is purchased. The means used to deliver this reassurance include continuous advertising and ubiquitous display of the producer's trademarks.

When the use of such means succeeds, it affects both the firm's revenues and its unit marketing costs. On the revenue side, it consistently commands a price premium that is disproportionate to the costs incurred in generating the sales. In addition, it minimizes the power of intermediaries in the distribution chain, such as retailers, to influence the users' choice as to which brand is purchased. On the cost side, it is the success of these differentiation efforts that creates the decreasing unit costs characteristic of scale economies in marketing. The role of such marketing scale economies in perpetuating oligopolies was noted by Bain whose work provided one of the conceptual foundations for a good part of Hymer's original market imperfections thesis.[18] The point

is also discussed by Bergsten, Horst and Moran in an exposition of the role played by marketing scale economies.[19]

Differentiation thus provides the means by which producer and user resolve their respective uncertainties in a happy symbiosis. The producer's uncertainty of achieving repeated patronage is lessened, and the user's need for reassurance is satisfied. To the extent that the need for this reassurance is product-specific but not country-specific, it provides the opportunity for producers to cater to it in many countries. Photochemical producers thus tend to act out their oligopolistic reactions in conformity with the international behavior described by Knickerbocker except that they do it in their market behavior rather than by cross-hauling of investments in manufacturing facilities.[20] The only major instance in which the latter occurred in this industry took place during the 1927-1928 period when Kodak acquired a German film factory and IG Farben bought out Anaco in the U.S.

A successfully executed differentiation strategy may constitute an effective entry barrier in that it preempts a national market. The most telling examples are provided by the two industry leaders as they face each other in their respective home markets. Kodak effectively dominates the American market, enjoying a market share that exceeds its nearest rival by a factor of four, and the same is true of Fuji in Japan. Neither company gives much indication of making an effective effort to increase its minor market share where its opponent is most strongly entrenched. Both countries represent major national markets for photographic goods, and any cultural distance between them can be presumed to have shrunk to insignificance after decades of marketing by each company in the other's domain. Yet Fuji's efforts to stake out a

significant U.S. market position remain modest, and Kodak products are to the present day still marketed in Japan by a minor local trading company.

The great mass of end users in each country have come to believe that the brand to which they are loyal is the best. It is this belief that gives each company the effective control of the distribution channels that it enjoys in its domestic market. Such beliefs develop only as the result of experience accumulated over long time periods by both producers and users. To shake these beliefs requires the expenditure of vast resources over equally long time periods if the opponent maintains its product quality. With the end of the chemically based photographic product life cycle in sight, each company no doubt prefers to devote its resources to other, more promising business projects.

The extreme example of company recognition that a national market has been preempted is provided by Konishiroku's presence in the U.S. The company maintains a precarious foothold in this market by exporting to it a completely undifferentiated commodity. It is able to do so because the above described user need for assurance is not universal and may, with the passage of time, dissipate as segments of user markets become more sophisticated.

These experiences suggest that there need be no quarrel with the formulations of Kindleberger and Caves that attach the utmost importance to differentiation in the internationalizing firm.[21,22] But there is no need to succumb to the seductiveness of their suggestions that differentiation is a determinant of internationalization. When it is effective, differentiation is a means of crowding out competitors, thereby creating the imperfections in goods markets noted by these scholars. But the central proposition of the present thesis seems to this observer to

provide a somewhat more satisfactory generalization. This is that the pressures impelling firms to generate goods markets imperfections and to internationalize those goods markets have a common source.

No amount of differentiation effort on behalf of photosensitive materials can be effective over the long run unless the product consistently makes good on its implied promises in actual use. The achievement of this consistency requires the producer to possess knowledge. While the requisite knowledge is that of physical rather than social phenomena and it is used in manufacturing rather than marketing, the theoretical issues and their resolution are quite similar to those already discussed. These involve some distinguishing characteristics of knowledge, the requirements for efficient markets and the relationship between markets and knowledge.

As summarized by Williamson and Caves, the preference for transfer of knowledge within the firm over its externalization arises from transaction cost considerations.[23,24] Efficient markets do not develop, according to this line of thought, because knowledge carries a heavy burden of infirmities making exchange in arm's length transactions difficult. Among these are :

1. The public goods nature of knowledge.
2. The impactedness of knowledge, ie., the difficulty of separating it from the process in which it is employed or from the people who possess it.
3. The possibility of opportunistic behavior by its possessor in dealing with parties that do not have it.
4. The existence of the information paradox, meaning that its value cannot be determined by a potential buyer unless

it is disclosed but once this happens, the sales value to the seller is dissipated.

5. The risk aversity arising from the possibility that the information will be used improperly.
6. The difficulty of negotiating, executing and enforcing contingent claims contracts.

All of the foregoing difficulties are thought to lead to thin markets and therefore high costs. As in the above discussion of marketing transfers, it is to be noted at this point that the costs incurred in the actual transfer are quite independent of ownership; they will be the same whether the information is transferred to an outsider or within the firm. Therefore, the costs that make a difference are those that arise from the need to negotiate with strangers. For this reason, it is considered more efficient, net of governance costs, to transfer the knowledge within the firm.

The evidence on this point coming out of the present study is somewhat mixed. George Eastman encountered no difficulty in selling the foreign rights to his first invention. While the Ilford joint venture proposed by several Japanese traders failed to come to fruition, this failure cannot be attributed to the difficulties of negotiating and agreeing on the value of Ilford's knowledge contribution to that venture. The value of this contribution was precisely defined in that negotiation and in Ilford's realized joint venture with Valca in Spain. The sale by both Ilford and Konishiroku of technical knowhow to East European governments was not impeded by the highly imperfect market conditions under which those sales were concluded. Gevaert was not inhibited by any of the above considerations in licensing a peripheral and obsolescent

document copying technology to Remington Rand.

By contrast, there were several occasions that provided opportunities for the externalization of knowledge but no sale was made. Both Kodak and Gevaert rebuffed several approaches for technical help from Daicel on behalf of its nascent Fuji subsidiary; later, when Fuji was well established, Polaroid rejected licensing requests from Fuji for the use of proprietary technology. George Eastman made clear on several occasions that he considered the externalization of his company's technical knowledge to carry with it an intolerable long-term competitive threat. Efficient markets require willing sellers and buyers, and if sellers do not appear for reasons they consider to be strategic, such markets will not develop.

In general, the externalization of strategic core knowledge has been exceedingly rare in the photochemical industry. The technical knowledge has been guarded jealously by individual firms and has been exploited abroad through direct investment rather than licensing. A strategic perspective suggests that there is no need to abandon the minimal cost argument in explaining this phenomenon. However, understanding of why economic institutions develop and behave as they do may be enriched by accommodating the notion of cost minimization within a somewhat broader conception. The profits sought by firms are a function of both cost and revenue, and those responsible for the strategic conduct of the firm are primarily interested in maintaining a realistic long-term relationship between cost and revenue.

Firms generate revenue by satisfying the craving of ultimate customers for utility. While sellers seek to recover their costs in making exchanges, buyers do not buy bundles of cost; they buy only bundles

of potential utility. The technical knowledge required to produce an acceptable photosensitive material has no utility per se for the party that wants pictures. Its value comes into being only after it has been combined with a host of other production factors to make a product that is useful at a given time and place. In this sense, technical knowledge may well be impacted once it has been acquired, but photochemical firms acquire it in the first place as a means rather than as an end.

A firm may well have a hypothetical choice between externalizing its technical knowledge and using it in its internal operations. It may also be in the nature of knowledge that its use does not diminish the amount of it available for further use. But it would be fallacious to conclude from this that its value is not diminished by making it available to outsiders. Externalization decreases the value of technical knowledge to its original owner in that it helps to create the conditions for decreasing the original owner's long-term revenue potential. Whatever value the knowledge may have for the buyer does not inhere in the knowledge itself but in the right to sell the product in the manufacture of which the knowledge is used. A licensee, in short, does not buy knowlege so much as the right to exploit it. For all the reasons already described, reasons involving the appropriation of scale economy and differentiation benefits in marketing, the original owner will show a distinct preference for retaining those rights unless there are serious impediments to their exploitation. To act on this preference is to use the knowledge exclusively within the firm rather than to dissipate its long-term revenue potential by externalizing it. The sale of technical knowledge by Ilford and Konishiroku in Eastern Europe represents a second best solution employed only when the choice offered by a monopsonistic

buyer is that of selling it or selling nothing at all.

To summarize, two kinds of knowledge played a critical role in the internationalization of the photochemical industry. To the extent that either market knowledge or technical knowledge had not yet been acquired by individual firms, such ignorance proved to be a source of serious disadvantage. This was not, however, a permanent condition, and it was overcome by the expenditure of resources over time. There was a large asymmetry in the resources and time needed to acquire the two types of knowledge.

Although market knowledge, a sub-set of cultural knowledge, appears difficult for a foreigner to come by because it seems vague and eludes codification, the time needed to master it is measurable in years. The number of facts about market institutions and their transaction rules is relatively small, and the relationships among these facts are relatively simple. Market knowledge was acquired cheaply and quickly, and until it was internalized by photochemical firms, its used was hired in several ways.

Physical nature, by contrast, yielded its secrets most grudgingly, and the time needed to reduce them to precise algorithmic formulation was best measured in decades. The Eastman Kodak strategy of maintaining technical leadership over its rivals increased the differential in resources and time needed for acquisition of the two kinds of knowledge.

A strategic perspective suggests that early movers in the acquisition of technical knowledge of photochemistry enjoyed an enormous long-term economic advantage. They created technological gaps that took late entrants, such as Fuji, nearly four decades to close. The time

interval during which the gaps existed were used by the pioneers to entrench themselves in all but unassailable market positions in many countries. Successful execution of this policy depended on minimizing the externalization of resale rights at critical links in the chain of utility creation. The imperfections in both goods and factor markets that characterize the photochemical industry are the outcome of strategic choices made by the surviving firms.

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[9] Ibid., p. 87.

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Sydney T. Ferris	Ilford Ltd.	22 April	1983
Philip Jenkins	Ilford Ltd.	18 April	1983
George A. Jones	Ilford Ltd.	19 April	1983

Leverkusen and Cologne, Federal Republic of Germany :

Heinz Berger	Agfa - Gevaert	16 June	1983
Günter Gotzman	Agfa - Gevaert	7 June	1983
Martin Holder	Agfa - Gevaert	10 June	1983
Helmut Loehr	Agfa - Gevaert	8 June	1983
F.W. Rabenschlag	Agfa - Gevaert	24 May	1983

Mortsel, Belgium

Rene Bossaerts	Agfa - Gevaert	June	1983
Hendrik Le Page	Agfa - Gevaert	June	1983
Laurent Roosens	Agfa - Gevaert	June	1983
A.Van der Auweraer	Agfa - Gevaert	June	1983

Correspondence

Enrique Garriga	Agfa - Gevaert	5 January	1984
M. Lois Gauch	Eastman Kodak Co.	12 April	1984
Hans Jensen	Polaroid do Brasil Ltda.	22 March	1983
		29 March	1983
		11 May	1983
Esteban Negra Valls	Negra Industrial S.A.	16 February	1984
		3 May	1984
Hendrik Le Page	Agfa - Gevaert	1 August	1984
Laurent Roosens	Agfa - Gevaert	23 October	1984

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