

POLAROID CORPORATION

During the war the Polaroid Corporation, like most companies placing heavy emphasis on scientific research, was largely engaged in the invention, development, and manufacture of war products under government contracts. With the end of active hostilities in August, 1945, the company's volume of business, which had expanded to 16 times its prewar base, declined rapidly to an unprofitable level. Mr. Carlton P. Fuller, Executive Vice President and Treasurer of the company, was faced with the necessity of appraising the company's financial ability to undertake its ambitious plans for the postwar development of its business. In considering the financial implications of various expenditures under discussion, Mr. Fuller realized that any decisions made would have to conform to the basic policies of the company - policies largely determined by Edwin H. Land, Chairman of the Board of Directors and President, but heartily concurred in by Mr. Fuller.

Mr. Land's conception of the basic policies which Polaroid should follow were well known to Mr. Fuller. Indeed, Mr. Land's views had been publicly expressed on a number of occasions; Mr. Fuller regarded the following quotation from a speech of Mr. Land's as typical of his views:

I believe quite simply that the small company of the future will be as much a research organization as it is a manufacturing company, and that this new kind of company is the frontier for the next generation.

The business of the future will be a scientific, social, and economic unit. It will be vigorously creative in pure science, where its contributions will compare with those of the universities. Indeed, it will be expected that the career of the pure scientist will be as much in the corporation laboratory as in the university.

Internally this business will be a new type of social unit. There will be a different kind of boundary between management and labor. All will regard themselves as labor in the sense of having as their common purpose learning new things and applying that knowledge for public welfare. The machinist will be proud of and informed about the company's scientific advances; the scientist will enjoy the reduction to practice of his basic perceptions.

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Economically such small scientific manufacturing companies can, I believe, carry us into the next and best phase of the industrial revolution.¹

Mr. Land's intense interest in scientific research and his conviction that it could be profitably conducted by a small business enterprise had long been evidenced by his deeds as well as by his words. Mr. Land left college in his senior year to devote his entire time to experimentation with polarized light. Shortly thereafter, in 1932, Land and G. W. Wheelwright, a laboratory assistant at Harvard, set up the Land-Wheelwright Laboratories, Inc., in Wellesley, Massachusetts. Their intention was to undertake general engineering practice and to bring their new light polarizer into commercial production. Somewhat later, they moved to a basement on Dartmouth Street, Boston.

During this early stage the enterprise was financed largely by moderate advances from the families of Land and Wheelwright. The young inventors worked in dingy surroundings and spent as little as possible.

By 1934 the development had progressed to the point where contracts could be negotiated with prominent manufacturing companies. In November, 1934, the Eastman Kodak Company signed a contract calling for the manufacture by the Polaroid enterprise of photographic light filters called Polascreens. Revenue from sales to Eastman was instrumental in financing subsequent research. A second important contract, signed in 1935, called for the manufacture of Polaroid Day Glasses by the American Optical Company.

By 1937 the organization was ready for outside capital. A staff of some 50 individuals had been acquired. Numerous applications of light polarization had been developed to the stage where investment prospects appeared promising. Beginning in early 1937, negotiations for outside financing were carried on, first through an intermediary, and later directly with Schroder Rockefeller & Co., Incorporated, and Kuhn, Loeb & Co., of New York. After early negotiations had failed to materialize, an agreement was finally reached in a contract dated August 10, 1937.

Under this contract the Land-Wheelwright interests agreed to organize the Polaroid Corporation with an authorized capital stock of

7,500 shares of 5% cumulative, Class A stock
with a par value of \$100 a share,

¹Edwin H. Land, "Research by the Business Itself," printed in The Future of Industrial Research (Standard Oil Development Co., 1945), page 81.

2,500 shares of \$5 cumulative, Class B stock
with a par value of \$5 a share, and

100,000 shares of common stock with a par value
of \$1 a share¹

The Lands and Wheelwright also agreed to transfer to the new corporation all patents and patent applications owned by Land and all other interests of Mr. and Mrs. Land and Wheelwright in the development. This contribution was valued at \$132,627, the total cost of the development to August, 1937. Moreover, Land agreed to enter into an employment contract with the new company for a period of 10 years.

In exchange, the Lands and Wheelwright received the entire issue of 2,500 shares of Class B stock and, in effect, approximately 60% of the common stock. In addition, a Voting Trust Agreement was negotiated which guaranteed to Land personal control over 71,500 shares of common stock for a 10-year period.²

¹Class A stock has first preference as to dividends and assets, and Class B stock has second preference. In voluntary liquidation, Class A and Class B stocks are entitled to \$100 a share and accrued dividends. Note that Class B stock is entitled to \$100 a share in voluntary liquidation even though its par value is only \$5. In involuntary liquidation the net assets after the payment of all debts are to be distributed pro rata, share and share alike, among the holders of the shares of the three classes of outstanding stock. That is, in involuntary liquidation one share of common stock has a claim on the residual assets equal to that of one share of Class A or Class B preferred stocks. Subject to certain restrictions, Class A and Class B stocks are callable at \$100 a share at any time on 60 days' notice. Consent of a majority of the Class A stock is required for certain transactions, such as the creation of mortgage debt, or other long-term debt in excess of a total of \$150,000 outstanding, the issue of stock ranking prior to or equal to Class A stock, and mergers or consolidations. The common stock has sole voting power except that the preferred stockholders may elect minority representation on the Board of Directors if unpaid preferred dividends accumulate to \$10 a share or more. Subsequent to the organization date, the authorized and issued common stock was increased to 107,000 shares. The additional 7,000 shares were issued as part of a settlement with an outside group in the acquisition of certain patents related to light polarization.

²In the financing the Lands and Wheelwright originally received the entire authorized issue of 100,000 shares of common stock. A separate clause in the agreement, however, required them to turn over 22,500 shares to the purchasers of the Class A stock as part compensation for the \$750,000 supplied by these purchasers. Moreover, an additional 18,733-¹/₂ shares were sold by

(continued on page 4)

Outside capital amounting to \$750,000 was supplied through Kuhn, Loeb & Co. and Schroder Rockefeller & Co., Incorporated. Half of this amount was to be paid immediately; the remainder was to be paid at any time prior to December 31, 1939, at the call of the company, and was so paid. In exchange, the Kuhn-Loeb and Schroder-Rockefeller interests received the entire issue of 7,500 shares of Class A stock and 22,500 shares, or 22.5%, of the common stock. In effect, a block of one share of Class A stock and three shares of common stock was sold for \$100, the par value of the Class A stock.

With the aid of this outside capital, Polaroid's expansion proceeded at an even more rapid rate. Sales rose, as Exhibit 1 shows, from less than \$200,000 in 1938 to just over \$1,000,000 in 1941, the last year of large peacetime sales. Sales in 1941 consisted mainly of sun glasses, desk lamps, and polarizing filters. The markets for these products were, of course, still in the process of development.

Moreover, the management was convinced that products on which laboratory research was in process during the period 1937-1941 contained even greater potentialities for increased sales. A large part of the several hundred thousand dollars spent on research during these years was devoted to the development of products which were not sold commercially prior to the war. In particular, extensive research was done in the areas of automobile lighting and of photographic and motion picture applications.

During the war Polaroid's business continued to expand with great rapidity. The company's volume of operations rose from \$1,000,000 in 1941 to over \$10,000,000 in 1943 and to an annual rate of over \$16,000,000 during the first eight months of 1945. Many new products were developed, as the following partial list taken from the company's annual report for 1943 indicates:

(Continued from page 3)

the Lands and Wheelwright at the nominal price of \$1 a share to other individuals who had participated in the financing negotiations. Thus, 39,233-1/4 shares, or approximately 40% of the common stock, were transferred directly to other parties. In addition, options were also granted to participants in the financing deal to purchase, over a four-year period, at prices commencing at \$25 a share, Voting Trust Certificates representing 7,500 shares of common stock. These options were exercised to the extent of 7,000 shares. The exercise of the options reduced the ownership interest of the Lands and Wheelwright in the common stock to less than 54%. Finally, the Lands and Wheelwright also sold some shares for cash, partly to pay for certain obligations assumed by them in connection with the prior development.

Goggles for a variety of services:

Variable-Density Goggles, for aircraft and anti-aircraft gunners to use in reducing glare from the sky and sun.

Dark-Adaptor Goggles, for preconditioning the eyes for night vision.

All-Purpose Goggles, for general use by all branches of the Service, as protection against glare, wind, and dust.

Aviation Goggles, for Army and Navy flying personnel.

Fog-Free Goggles, for eye protection under conditions which cause lens-fog in ordinary goggles.

Polarizing Filters and Nonpolarizing Colored Filters, for use in gunsights, range finders, periscopes, binoculars, and other military instruments.

Vectographic Materials and Field Processing Equipment, for making three-dimensional aerial views of terrain.

Precision Plastic Optical Parts, for telescopes, fire control and signalling devices, and other instruments.

Blind Flying Training Equipment for blacking out aircraft used in training pilots to fly at night.

Position Angle Finders for finding the elevation of aircraft above the horizon.

Anti-Aircraft Machine Gun Trainers, for teaching gunners how to use tracer bullet observation in the control of anti-aircraft gunfire.

The wartime expansion was financed without raising additional equity capital although at one time substantial bank loans were obtained. As Exhibit 2 indicates, the company operated with a very narrow margin of working capital during the early war years even though the company's working capital was conserved wherever possible. Salaries were moderate, no dividends were paid on the common stock and substantial arrearages were accumulated on the preferred stock, and commitments in fixed assets were held to a minimum. During 1944 and early 1945, however, the company's financial position eased somewhat. As of V-J Day, Mr. Fuller estimated that Polaroid had succeeded in building its net working capital to slightly over \$1.5 million. Exhibit 3 presents the balance sheet of the company as of December 31, 1944.

Mr. Fuller had been acutely aware for some time that decisions would have to be made promptly after the company's war production was cut back, in order to avoid serious losses. The company's overhead expenditures had expanded so much during the war, relative to its financial resources, that even a brief period of indecision on the part of management would have resulted in serious inroads on the company's limited financial resources. Even so, Mr. Fuller had delayed as long as possible in making any fixed decisions on what course of action to propose to Mr. Land and the executive committee, inasmuch as the company's internal position, as well as many external factors, contained so many uncertainties.

Mr. Fuller was careful, however, to keep at his finger tips all the available information so that he could move quickly when the occasion demanded. In his thinking, Mr. Fuller grouped the company's financial needs into four categories: (1) current working capital, (2) financing of research and development expenditures which might not yield a monetary return for some years, (3) financing of badly needed new plant and equipment to replace the inefficient wartime setup, and (4) the maintenance of a "financial cushion" to give the company some flexibility of operations and protection against unforeseen contingencies.

For none of these categories, however, was he able to make reliable estimates of amounts of capital needed. All these capital needs, for example, would largely be dependent on the company's postwar sales volume. But, except for the very near future, Mr. Fuller was unable to prepare sales estimates which he regarded as reliable even within a very great margin of error. For the near term, Mr. Fuller believed that sales of the company's prewar products with adaptations and improvements would run to at least \$2,000,000 in the first postwar year and, barring unforeseen difficulties, should reach a volume of \$5,000,000 within two or three years. Beyond this point, however, he believed that the most significant factor in determining the future expansion of sales would be the introduction of radically new products. Some of these products, such as the company's system for eliminating headlight glare and the use of Polaroid products in the manufacture of three-dimensional movies, had already been announced; others were closely guarded secrets. Once these new products were taken into consideration, Mr. Fuller believed that attempting to estimate the company's sales potential five to ten years ahead was like picking a number from a hat; \$50,000,000 or \$100,000,000 seemed about as reasonable as \$5,000,000 or \$10,000,000.

Moreover, even if Mr. Fuller had been able to estimate the potential sales volume of the new products which the company hoped to introduce, he could not then make even approximate estimates of the company's working capital needs without making other basic decisions. For instance, Polaroid might license the

manufacture of all or part of its new products to other companies. Indeed, the company had licensed the manufacture of some of its products in the past and was not, in principle, opposed to this policy. Mr. Fuller had observed, however, that other companies often did not push the sale of Polaroid's products as intensively as he desired. He realized, therefore, that Polaroid might find it necessary in the future, as it had in the past, to do its own manufacturing and selling in order to develop consumer demand for new products.

As for the second major drain on working capital - expenditures for research and development - Mr. Fuller had more definite information. He knew that Mr. Land placed primary emphasis on the continuance of a heavy research program and would be extremely loath to curtail the company's annual research expenditures below a minimum of, say, \$500,000. He also knew that Mr. Land would like to spend considerably more than this amount on research as soon as the company's financial resources would permit.

Mr. Fuller thought that without considering research expenditures, the company would probably about break even in its first postwar year. If research expenditures were charged against current operations, therefore, he anticipated that the first 12 months of postwar business might show a deficit approximately equal to the amount spent on research. This deficit might, of course, continue beyond one year if the company's postwar volume of sales did not increase as rapidly as he hoped that it would.

During the early months of 1945, Mr. Fuller had followed closely the course of proposed tax legislation in Congress. In particular, he was interested in a proposal sponsored by the Treasury Department to permit an accelerated payment of the so-called 'carry-back refunds.' Without attempting to follow the detailed complexities of the proposed change in the law, he knew from conferences with his tax adviser that the change, if enacted, would in effect enable Polaroid to reduce its federal tax payments during 1946 on its 1945 tax liabilities by approximately 72 cents for each dollar of deficit incurred in 1945. In considering the danger of a serious short-run financial stringency immediately after the war, therefore, he was pleased to note that the Treasury proposal was enacted by Congress in July, 1945.

With reference to the third major need for working capital - the acquisition of an efficient plant for the company's production and research activities - Mr. Fuller was acutely aware that the existing arrangement was highly unsatisfactory. The company had never purchased any real estate, preferring to conserve its limited capital for other purposes. During the war, as the company's volume expanded, one small piece of property after another was leased wherever vacant space could be located.

By mid-1945 the company occupied under short-term lease, or tenancy at will, nine parcels of property, aggregating approximately 175,000 square feet of floor area, at separate locations in Cambridge, Massachusetts. It also occupied one parcel with 50,000 square feet in Boston. None of the buildings was of recent construction and, although they had been extensively remodeled, Mr. Fuller regarded them as very inefficient. He did not have any precise estimate of the operating economies which could be achieved in a centralized plant, but he was certain that these economies would be substantial. He also knew that various members of the management group were anxious to consolidate all operations of the company in modern centralized plant facilities. Until new facilities could be made available, however, he anticipated no serious difficulty in renewing or extending such of the present occupancy arrangements as the management might desire to retain.

In previous discussions with Mr. Land and other top management men, several limitations had been placed on the site for a new plant. First, it was agreed that no location more than 15 miles from Boston would be considered. Many employees owned their homes and would be seriously inconvenienced if the plant were moved to a point beyond a reasonable commuting distance; this problem was, of course, aggravated by the acute housing shortage in almost all industrial areas. The management was also anxious to maintain a close contact with the scientists at Harvard and Massachusetts Institute of Technology as well as to have ready access to the Libraries of these institutions. Within the area agreed upon the management wished to avoid some localities in which the character of the municipal government and the probable trend of local tax rates appeared particularly uninviting.

A brief survey of the acceptable localities failed to reveal any plant for lease which would satisfy the company's requirements. It therefore, appeared that new facilities might have to be built if the company were to move to a new location. As a rough estimate, Mr. Fuller believed that \$750,000 might be needed to acquire manufacturing and laboratory space adequate for the company's near-term needs. He realized, though, that this expenditure might have to be multiplied two or three fold in the relatively near future if the company's expansion continued at anything like its prewar rate.

In surveying these needs for capital, Mr. Fuller was naturally led to consider the possibility of raising new capital from outside sources. The feasibility of doing so, however, was complicated by several factors. First, and most important, Mr. Fuller knew that Mr. Land placed strong emphasis in his thinking on maintaining the control of the company firmly in his own hands. Mr. Land recognized that his management policies were sufficiently unorthodox so that it was

always possible that outside interests might be inclined to question them if they should obtain control of the company. Moreover, he knew that the company's patents were sufficiently valuable and its prospects were sufficiently enticing so that the possibility that some outside group or large competitor might attempt to acquire control would have to be considered in formulating future policies.

At the time of the original financing in 1937, no further equity financing was contemplated. The amount of capital raised at that time was believed to be enough to carry the company to the point where funds needed for continued expansion would be provided by retained earnings. The financial structure set up at that time, heavily weighted with two classes of preferred stock, was not conducive to additional outside financing except through the issuance of more common stock. The possibility of raising additional capital was further complicated by accumulated arrearages on the preferred stock, amounting in August, 1945, to \$20 a share on the Class A stock and to \$40 a share on the Class B stock.

In August, 1945, Mr. Land had firm control over the company for at least two more years, at which time the Voting Trust Agreement would expire. In addition, Mr. and Mrs. Land together owned beneficially 36.6% of the common stock of the company.

During the early summer of 1945 Polaroid's common stock rose rapidly in price, selling for close to \$100 a share at the end of August. As Exhibit 4 shows, in August the stock was selling for two and one-half times its price at the end of 1944. This rapid increase led Mr. Fuller to consider more seriously the possibility of raising additional equity capital. He thought that at the price at which the company's stock was selling in August, 1945, the company might be able to acquire substantial new funds without seriously weakening Mr. Land's control position, and that perhaps Mr. Land might be willing to consider an issue of new common stock under such circumstances.

Exhibit 1

POLAROID CORPORATION

Net Sales and Other Income, Net Profit or Loss Before Provision for Taxes on Income, and Net Profit or Loss After Taxes, of Polaroid Corporation, 1938-1944, Inclusive.

Year Ending December 31	Net Sales and Other Income	Net Profit or Loss Before Provision For Taxes on Income	Net Profit or Loss After Provision For Taxes on Income
1938	\$ 195,038	\$ (72,971) ^a	\$ (72,971) ^a
1939	761,488	35,873	27,947
1940	719,590	(96,166) ^a	(96,166) ^a
1941	1,032,426	152,704	126,286
1942	4,119,121	428,946	97,831 ^b
1943	10,739,226	759,640	152,152 ^b
1944	13,154,874	1,639,734	344,040 ^b

^aNet Loss

^bNet income for 1942, 1943, and 1944 is after transfer to Contingency Reserve in the amounts of \$50,000, \$50,000, and \$100,000 respectively, for the three years.

Exhibit 2

POLAROID CORPORATION

Current Assets, Current Liabilities,
and Net Working Capital of Polaroid
Corporation, as of December 31, 1937,
through December 31, 1944, Inclusive

(In Thousands of Dollars)

As of December 31	Current Assets	Current Liabilities	Net Working Capital
1937	352	12	340
1938	71	19	52
1939	478	89	389
1940	245	66	179
1941	480	89	391
1942	2,223	1,727	496
1943	4,847	4,299	548
1944	3,779	2,723	1,056

Exhibit 3

POLAROID CORPORATION

Condensed Consolidated Balance Sheet of
Polaroid Corporation as of December 31, 1944

Assets

Current Assets

Cash		\$ 569,393
United States Treasury Certificates of Indebtedness		100,000
Accounts Receivable (Including \$1,953,354		
Due from or Chargeable to U.S. Government)	\$2,130,967	
Less Reserve for Doubtful Accounts	<u>25,000</u>	
		2,105,967
Merchandise Inventories		861,890
Advances to Subcontractors		<u>141,554</u>
Total Current Assets		\$3,778,804

Machinery, Equipment, Furniture, and Leasehold Improvements less Reserves for Depreciation and Amortization		227,860
Patents, Patent Applications, and Trade-Marks less Reserves for Amortization		128,949
Deferred Expenses and Other Assets		52,073
Postwar Refund on Excess Profits Taxes		<u>128,414</u>
Total Assets		\$4,316,100

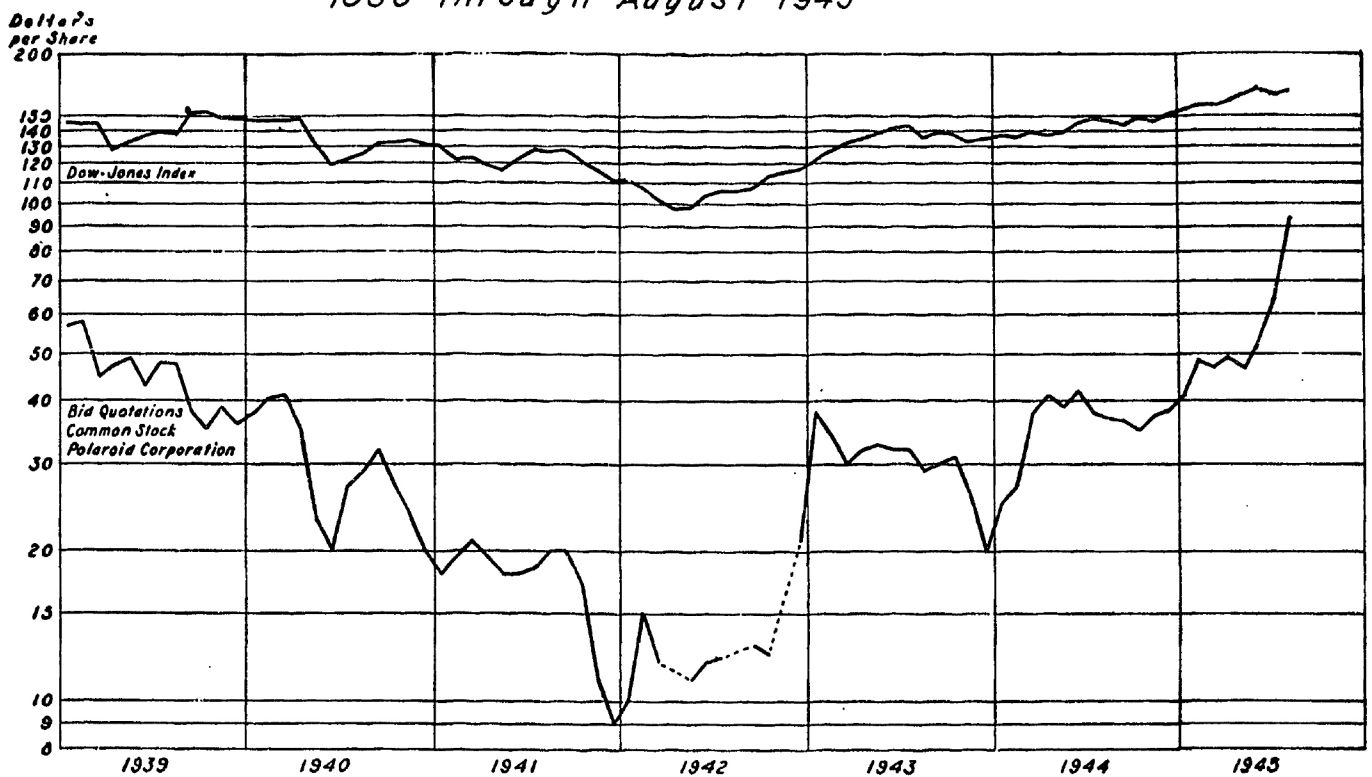
Liabilities

Current Liabilities

Accounts Payable		\$1,012,804
Provision for Taxes Payable		1,657,515
Accrued Payrolls and Expenses		<u>52,569</u>
		\$2,722,888
Reserve for Contingencies		200,000
Capital Stock		
Class A Preferred	\$750,000	
Class B Preferred	12,500	
Common	107,000	
Capital Surplus	31,826	
Earned Surplus	<u>491,885</u>	
		<u>1,393,212</u>
Total Liabilities and Capital		\$4,316,100

Exhibit 4

Prices of Polaroid Common Stock and Dow-Jones Index of 30 Industrial Stocks,
1939 through August 1945



Sources: *Bank and Quotation Record* and *Survey of Current Business*.