

CRUISING RACE OFF THE NEW ENGLAND COAST

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Market Studies for New Businesses

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“Invest in my new company and you will double your money in one year.” Individuals in a position to supply capital to new ventures hear variations of this theme with tiring frequency. After selecting the product idea, most entrepreneurs go directly to the product development stage without any hesitancy as to the salability of the product. There seems to exist a conviction that the market anxiously awaits the new product and the only problem of the new firm is to supply it. Quite clearly, investing in production facilities without something more than an assumption about sales is dangerous. Adequate market appraisals can give impetus to deserving new ventures and also help to forestall unsound ventures. They take part of the uncertainty out of the new enterprise field.

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ENTREPRENEURS should not be criticized unduly for starting new companies without adequate knowledge of the amounts of a new product that can be sold after production is established. They are confronted with several problems. The marketing research methods of well-established companies are usually unsuited to the needs of most new firms. Also, the talents and interests of men starting new firms typically do not lie in the area of marketing research. Even if he seeks advice, a new entrepreneur generally finds that there are no currently well understood methods of appraising the market potential of a new product. Lack of understanding is the usual obstacle that impedes adequate preliminary market appraisals. This report describes some useful market appraisal methods. Although they cannot be termed scientific, they are an advance over current practice. They provide a more informed basis for seeking financing to establish production.

Market Factors for the New Firm to Study

Each new product idea provides an individual problem in market appraisal. But there are at least seven

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fairly universal factors which should be determined.

What will make the product sell? It is important to become familiar with the problems and needs of the prospective customers. Any given trade or industry tends to develop unique practices and characteristics over the years. The assumption that the entrepreneur knows all of these is unwarranted.

It is advantageous to develop a product with performance data that speaks for itself. When the performance satisfies market needs in a superior fashion, sales resistance diminishes.

Who will buy the product? Entrepreneurs tend to regard the market as some kind of homogeneous mass rather than the summation of a large number of individuals with different needs. One cause of later marketing errors, as well as low initial sales, is the failure to identify with any degree of precision just who the most likely users of the new product will be.

A product with mass market appeal might permit the entrepreneur to view the market as homogeneous, but unfortunately the mass market is the most difficult for the new firm to enter. Frequently the financial requirements of promotion, extensive distribution, and volume production are prohibitive.

In selling the industrial market, the most successful method of identifying the immediate potential buyers is to seek out the “cream of the crop” type of customers. This technique builds a good reputation for the new firm, leads to large repeat orders, provides word-of-mouth advertising, and facilitates easier identification of customers. Usually large companies are more prompt in payment of bills.

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STUDYING THE COMPETITION

A new firm president observed the growing use of compressed air for industrial purposes and believed existing control valves were inadequate. He visited a number of firms using compressed air and found that control valves tended to pulse rather than maintain a perfectly even column of air. Another inadequacy of current control valves was the annoying humming.

As a result of his investigation, the new firm president concluded a market need existed which currently developed products were not satisfying. He developed a control valve which did not pulse or hum and found an immediate acceptance of the product.

What kind of industry am I entering? Customers located in highly competitive industries are especially interested in new products that promise to increase output and reduce costs. Conversely, customers located in industries enjoying rapid technological advances are anxious to keep abreast of new developments and take keen interest in new products that reduce costs or increase quality in some manner. Most new firms cannot rest on their laurels. They continue product development work to bring out differentiated models and to increase the performance levels of the original model.

How will the new product be used? A market appraisal must consider the use the market might make of the product and incorporate that information into the design and specifications of the production model. The product designed to prove its merit immediately has the advantage. A product that immediately reduces costs or speeds up output has an edge over the product that claims less downtime, longer life, lower upkeep, and less rapid obsolescence. The use of the product also influences its length of life and the resulting frequency of repeat sales.

What is the probable competition? After exploring the probable uses of the product in the market, and incorporating those findings into the design of the product, the entrepreneur needs to study other products that would seek to serve the same needs.

Considered broadly, the greatest competitive advantage of the new firm is the superior performance of the product, and the greatest competitive disadvantage is the lack of an established reputation for quality, service, and longevity.

How shall I create demand for my product? Entrepreneurs who rely solely on word-of-mouth advertising suffer very small sales during the earlier period of development. Word-of-mouth advertising is an important ingredient in demand creation for the new firm, but its effectiveness becomes apparent only after several years of operation so that enough products are in use to permit the "industry grapevine" to inform others.

Most entrepreneurs seem to underestimate the importance, difficulty, and expense of creating a demand for a new product. As a result, they underestimate their selling costs, and tend to understaff for the selling job.

Further, most entrepreneurs seem to know very little about promotion and think only of big campaigns in magazines, newspapers, and on radio and television.

In buying advertising, messages placed in trade journals are only as effective as the coverage they give of the market the new firm wants to sell. Frequently direct mail is a highly useful kind of promotion but the entrepreneur must know to whom he should send the letters. Trade shows have proved to be an unexpectedly effective means of promotion for the new firm. The new product sections in magazines also are effective.

How will I price the new product? No appraisal of the market is conclusive that does not consider the price-volume relationship, explore the quantities that might be sold at different prices, and try to decide the price most acceptable to the market which would still be consistent with the financial needs of the new firm.

When a new product has performance characteristics superior to those of existing products in satisfying a market need, the new firm has a basis for charging a premium price. When the product increases output and reduces costs, or when the product replaces several similar products in a single installation, the entrepreneur has a basis for charging a premium price well above the price level of existing competing products.

Strangely enough, some entrepreneurs charge a price similar to, or lower than, the price of inferior existing products, operating under the assumption that an attractive price is an important sales appeal. In fact, the prospective user sometimes fears he is being offered a "cut-rate" cheap product because it carries a low price. When a new firm needs to build prestige and market acceptance, it appears that a premium price policy is called for.

In practice, most new firm products have prices based on costs. The weakness of this method is twofold. First, the price has no relation to the market and, second, the costs of the new firm are hard to predict and usually too few costs are included in the calculations.

Preparation for Market Appraisal by the New Firm

After determining the market factors to appraise, there are several preparatory steps for the new firm to take before actually carrying on a market appraisal. By careful planning, the entrepreneur can maximize the effectiveness of his investigation in terms of accuracy of results and in avoidance of waste of time and money. There are four preliminary steps that lead up to a successful market study.

Learn the customs and practices of the market to be reached. The more the entrepreneur learns about the people he will be dealing with, the more chance he has of obtaining cooperation and respect.

Entrepreneurs with prior experience in a given industry who restrict sales to that industry usually fare better than inexperienced men who enter the industry.

If possible, develop a prototype of the new product. Many times in trying to describe a product, there is a good deal of hand-waving which is not effective in helping the prospect visualize what the new product will do. The entrepreneur always needs to implement words and hand-waving with some more tangible demonstration of the product. Whenever pos-

sible, a finished model of the product is the most effective. Even though it does not perform like the finished model yet to come, a prototype is often effective in showing prospects the uniqueness of the new product and the possibilities of the final production model.

In lieu of a prototype, the next best substitute may be to provide the prospective user with sketches and drawings of the new product. The better the drawings, the more likely they are to supplement the oral presentation and make a favorable total impression.

When the entrepreneur lacks a prototype to show prospective users, the effectiveness of the appraisal drops off sharply. If nothing more than oral presentation is used, the validity of the opinions of prospective users is so low as to be of little value and, in some cases, dangerously misleading.

Develop data contrasting the new product with existing products. Since the performance of a new product is always of great interest, the entrepreneur will find it effective to develop in as much detail as possible a set of data which describes the expected performance characteristics of the new product. This facilitates comparison with the performance of various existing products which satisfy the same end market need. If the contrast is impressive enough, the prospect may promise a future order at that time. If the contrast is not great enough to be significant, the prospect usually will not hesitate to say so. This contrasting information is an effective means of aiding the prospect to form an opinion about the product.

Effective contrasting information of interest to prospects may include operating savings resulting from higher speeds, increased quality, lower waste or rejects, reduced maintenance, and easier operation. Less tangible in a cost sense, but of great interest also, is such data as less vibration, noise, dirt, and weight.

One point that some entrepreneurs hesitate to include is data that does not contrast favorably with existing products. When such information is omitted, the entrepreneur is asking for a biased reaction — he is “whistling in the dark.” If the unfavorable information is not important to the prospect, there is no harm in revealing the data. On the other hand, some prospects may make valuable suggestions bearing on the design and development of the new product which will help to eliminate and overcome some of the existing shortcomings.

The projected data must be free of bias in order to get fair response. Where the prototype does not permit demonstration of the projected data, the assumptions underlying the data must be stated.

Obtain a representative appraisal of the new product. Some founders of new firms waste a lot of time talking to people in industry who do not occupy positions of enough responsibility to control future purchase decisions. Frequently the easiest man to see is the one who is able to render the least valuable opinion concerning the product.

In addition to seeing people who control purchase decisions, such as chief engineers, plant superintendents and general managers, vice-presidents, and presidents, the entrepreneur also needs to scatter the interviews. Carrying on all interviews in one locality, or in one specialized side of an industry, does not properly represent the entire industry. The dispersion of interviews

TAILORING THE PRODUCT

A new firm that planned to manufacture an electronic gauge first went to the market and studied the industry practices. It built the instrument to known customer needs. The firm knew no other product had the same performance characteristics. The product looked familiar enough for operators to accept it at the machine. In effect, the customer helped design and build the product and tailor it for the market.

needs to be as broad as the characteristics of the market to be sold.

Some prospects are much friendlier in their reaction toward the new product than others. There is value in pressing the unfriendly prospects, for they state the unfavorable comments about the product most strongly. These points can be brought up in later friendly interviews to test for contrasting reactions.

Market Appraisal Methods for New Firms

While some new firms do no market appraisal at all, other new firms attempt it on a somewhat hit-or-miss basis. Some firms act from a conviction of the necessity of the activity rather than a well-thought-out method of attack. Fortunately, there are some methods of market appraisal that are well-suited. Here are eleven useful guides to successful market appraisal.

Review secondary sources for preliminary information. Every new firm stands to gain by a thorough investigation of printed material bearing on the market for its new product.

An accompanying table lists some sources that are helpful in selecting prospects to call upon, in identifying smaller businesses in local areas, in describing specialized major markets, such as the paper and chemical industries, and in studying a broad market.

Go beyond the opinions of close friends and relatives. If the founder of a new firm is to use any single rule of thumb in constructing a sample of prospective customers, his best rule would be to see the big prospects first. A variety of interviews is needed to assure some representativeness, but few firms construct a scientific sample of the market.

In expanding a product test beyond immediate friends, the inclusion of hostile or indifferent prospects assures some balance to the danger of over-enthusiasm and bias. Such interviews tend to bring out the weakest points in the product and give some indication of the amount and kind of demand creation required to interest the most unlikely prospects to buy the product.

In seeing any prospective user, but especially the important ones, it is important to make the interview just as effective as possible. In order to accomplish that end, the entrepreneur needs to keep control of the discussion and cover certain definite subjects that give him a measure of reaction to the product.

Seek a definite order with payment in advance. In talking with the prospective user, the highest measure of favorable reaction is obtaining an order for the

MARKET SURVEY BY MAIL

The president of an electronics company needed to find out if there was enough interest in a wide band amplifier to make it practical to go ahead with its development and manufacture. He sent letters to the complete membership of the American Society of Physicists, describing the new product and inviting replies. He was quite surprised to get a high degree of response and interest. Several of the letters contained orders for the amplifier as soon as it got in production. The president judged the market reaction to be highly favorable and went ahead with the development of the product.

new product with all, or part, of the payment in advance. It is a matter of record that many entrepreneurs who offer needed new products in time of critical shortages actually are able to get the customer to help finance the new firm. While this helps to ease the financial burden, it is more important as a measure of market reaction to the product. A user will generally not risk money in advance to a new firm not yet in production, no matter how scarce the supply, if he fears the product will be no good or that the new firm cannot produce it.

Get permission to install a trial unit prior to an order. Some market appraisal methods for new products verge on being sales techniques. In approaching prospective users at the appraisal stage in a sales manner, new firms utilize their advantage over the well-established firms. New firms are able to ask for orders without setting any binding delivery date or assuming any liability if they do not succeed in making delivery. In turn, prospective users do not enter into such a tentative agreement if they do not strongly want to have the new product under examination.

When the prospect will not give a firm order with a flexible delivery date, with all or part payment in advance, the founder of the new firm then should try to get a firm order based on a satisfactory trial installation of the new product as soon as a production model is available. For prospects who think the entrepreneur is a "crackpot talking through his hat" but who want the new product if it is developed for the market, the trial installation is a workable method of overcoming natural doubts that exist at the time of the interview. All the entrepreneur then has to do is to go back to his new firm and prove that he can produce the new product.

It is easier to get a promise of a trial installation without any accompanying promise of an order. Such a market reaction indicates a less favorable chance for the success of the new product than a promise of an order as soon as the product proves itself. The entrepreneur has to overcome the "wait and see" attitude of prospects. One method of doing this is to remind the prospect that early production will be limited in volume and he might have to wait a considerable period of time to get delivery if other prospects place firm orders at the current stage of the development of the new firm.

One of the problems in handling these interviews is to properly represent the new product without being "high pressure" in conduct. Successful founders of new firms need the ability to measure the degree of favorable reaction without antagonizing the prospect. A confident but quiet demonstration and discussion of the merits of the new product plus a frank recognition of the problems of getting a new company started seems to be the most workable human relations approach to finding out just how far the prospect will go in terms of a positive reaction to the product. The more highly skilled entrepreneurs get the prospect to identify himself with the problems of the new firm and develop a resulting sympathetic treatment. The danger here is a positive bias on the part of the prospect.

Even when the prospect refuses to promise a future order, it is useful to get the promise to permit a trial installation. That in itself is a measure of favorable reaction. Sometimes doubt about the value of the new product to the company, and sometimes company policy, prohibits promising an order.

Try and get the prospective user to finance product development out of his research budget. Large and well-established firms are sometimes willing to assist in the development of new firms. This is especially true when the new firm is developing a new product that represents the translation to industrial use of a technological advance, and when the new product will improve the operations of the well-established firm. The large firms cooperate by helping to finance the new product development out of their research budgets.

Get information on unsolved user needs where help would be welcomed. In some cases a new product does not favorably impress prospective users because it is not designed to handle problems of the greatest interest to the prospect. It pays to discover desirable product performance characteristics and build them into the product. In cases where needs are not clearly identified in the entrepreneur's mind, two kinds of interviews are worth while. The first type is devoted to finding the needs, the second is to get user reaction to the product developed to fulfill those needs.

Get the reaction of professional buyers. A useful device for gauging the market reaction to a new product is to take the prototype to professional buyers and get their advice. For consumer products, the retail department store buyers, chain store buyers, mail order buyers, wholesalers, jobbers, and brokers are all able to give worthwhile advice. Their suggestions on the price tend to run a little lower than is acceptable to the consumer, but the rest of their advice on merchandising and design is usually sound and workable. In a few instances retail buyers and jobbers give conflicting advice. Retail buyers want to purchase the product directly from the new firm and sell it at a relatively low price while jobbers realize the price has to be higher if it is to provide for a longer distribution channel. In addition, the jobber has to sell to a number of different retail outlets so he frequently recommends that the new firm engage in advertising. Jobbers operate on the assumption that advertising creates demand, pulls customers into the store and is of interest to a large number of retailers.

The purchasing agents of industrial companies are

helpful in contrasting the new product with existing products used for the same end need. Purchasing agents are of limited effectiveness, however, because they personally control so few of the new product purchase decisions of their companies. Frequently they are able to suggest the men to see who do make purchase decisions on new products.

Call on college professors in hopes of unbiased and helpful evaluation. Entrepreneurs developing new products based on technological advances may be helped along by research professors. While these professors are usually not market oriented, they give worthwhile opinions on the performance characteristics of the product. Sometimes they may make suggestions for further improvements based on more recent perfection of the initial research discovery.

In gauging the reaction of the market to a new product, professors of marketing may be able to give some worthwhile pointers on devising workable marketing programs. They probably will not be of much help in predicting how the market will react just by looking at the product and talking about it, because they are not prospective users of the new product.

Send out letters of inquiry to determine interest in the new product. In most cases the man starting his own business is not able to tour the country getting the reaction of the market to the new product. He must restrict personal interviews to one state or region of the United States.

New entrepreneurs should carefully consider the direct mail technique of getting a measure of the national interest of a specialized market in the new product. The cost is only a few hundred dollars. It is money well spent when the new product concerned is so differentiated that its future reception is problematic.

Conduct small test sales. There are a few instances where the new product is not hard to make up, and the big problem is to determine market reaction. In such cases it is helpful to run a small test sale to gauge the interest in the product and see if it pulls any repeat sales.

For example, a refrigerator repair man in Chicago developed a chemical formula for cleaning white enamel and porcelain surfaces which was, in his estimation, superior to anything on the market. The solution not only cleaned, it also whitened the surface. After using it successfully on refrigerators he repaired, he made up a small batch and sold it on a door-to-door basis on the Chicago West Side. His customers reported a high degree of satisfaction when he called back to check on the results, and they purchased more of the cleaner. At this point the repair man incorporated a new firm and started turning out the cleaner on a regular basis. By demonstrating the product to buyers, he succeeded in establishing distribution through one large drug chain and three prominent Chicago department stores.

Conduct consumer panels. Consumer panels may be employed to test a low cost product that is easy to make, where market reaction is the important unknown. One entrepreneur, bringing out a new food specialty, got fourteen housewives in his home town to try out several different recipes and to report on the one giving the most satisfaction. His recipe catered to a racial preference in food, and the consumer panel was useful for this specialized purpose.

SOME SOURCES OF MARKET DATA

- Thomas' Register of American Manufacturers,**
Thomas Publishing Company, New York.
- Poors' Register of Directors of the U. S. and Canada,**
Poors Publishing Company, New York. (Annual)
- American Business Directories,**
Department of Commerce, Industrial Series No. 67, Government Printing Office, Washington, D. C., 1947.
- Who's Who in Commerce and Industry,**
A. N. Marquis Company, Chicago, 1947.
- Directory of New England Manufacturers,**
George D. Hall Company, Boston, Massachusetts. (Annual)
- State Directories of Manufacturing,**
Usually published by the state Departments of Commerce or Development Commissions.
- Industrial Research Laboratories of the U. S.,**
Callie Hull, National Research Council, Washington, D. C., 1946.
- The 1947 Census of Manufactures,**
Department of Commerce, Bureau of the Census, Government Printing Office, Washington, D. C., 1947.
- The 1943 Census of Business,**
Department of Commerce, Bureau of the Census, Government Printing Office, Washington, D. C., 1948.
- Sales Management — Survey of Buying Power,**
May 10, 1953, Sales Management, 386 Fourth Avenue, New York 16, New York. (\$4.00)
- Consumer Markets, 1952-1953,**
Standard Rate & Data Service, Inc., 1740 Ridge Avenue, Evanston, Illinois. (\$10.00)
- Market Research Sources, 1952-1953***
- Small Business Aids Series***
- Check List for the Introduction of New Consumer Products***
- Check List for the Introduction of New Industrial Products***

*U. S. Department of Commerce, Washington, D. C.

Conclusions

Many founders of new firms make important decisions on the size and capitalization of their firms without any real measures of the reality of their actions in terms of probable sales. Sooner or later they discover they should develop estimates of the volume of products to be sold at a given price over a given period of time. The importance of a price-volume estimate is reflected later in determining the amount of space, the size of inventory, the number of machines and employees, the method of distribution, and the requirements of working capital.

Firms which conduct some type of market appraisal end up with a better knowledge of the market, what its composition and make-up is, and who the most highly interested prospective users are likely to be. They identify the immediate special market they plan to sell, and they have an idea of how to broaden sales after operations are well established.

Most new firms are established without adequate information concerning the marketability of the new product. Such a procedure makes for a high degree of risk and corresponding economic waste. However, entrepreneurs find the marketing research methods of well-established companies beyond their reach and they do not know of methods currently available for appraising the potential of a new product. The methods suggested above are within the ability and financial reach of most entrepreneurs starting new firms. If followed, the chances of success of those new firms will improve.

REVIEW OF THE SECOND QUARTER:

Production and Consumption Continue High and Steady in New England

Business activity in New England continued to roll along at a high level during the second quarter. While no segment of the economy expanded activity greatly, no sector showed a major decline. The region enjoyed nearly full employment of its resources without any large price changes. Individual industries continued to adjust to changing conditions without upsetting the generally high rate of activity.

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MOST NEW ENGLAND business indicators showed that the boom still contained plenty of vigor. Freight carloadings of New England railroads ran slightly ahead of a year ago during April and May. The number of business failures in New England in April and May was well below year-ago figures, and also declined from the first quarter. Total nonagricultural employment in the region climbed during the second quarter as seasonal forces came into play. Construction, trade and service jobs increased steeply. Employment in manufacturing was stable as New England's important industries maintained a high level of production.

Total output of goods and services during the second quarter probably exceeded that of the first quarter, but there were indications that a leveling-off began. Industrial production in the nation reached a peak in March. The Federal Reserve Board's seasonally adjusted index of industrial production declined very slightly from the postwar record of 243 per cent of the 1935-39 average in March to 241 in April. The index remained stable at this high rate during May and June.

Industrial output in New England also continued at a high and steady level during the quarter. Individual industries showed small offsetting gains and losses.

Shoe production in the first half of 1953 was more than six per cent ahead of production in the first half of 1952.

Activity in the New England textile industry was substantially better in the second quarter of 1953 than a year ago. Employment in the industry during April and May ran about 9,000 higher than last year. Brisk demand for cotton broad-woven goods continued to highlight the textile recovery.

Efforts of the jewelry industry to level out its seasonal ups and downs in production met with considerable success. Activity during the second quarter centered on a strong sales program and on an extensive jewelry show. Preparations for the show and subsequent orders bolstered activity during a period which is usually slow.

Manufacturers of insulated wire were very busy. Makers of electric wiring devices also expanded production as a result of lively civilian business.

A few industries ran at less than full capacity, largely due to seasonal or irregular influences.

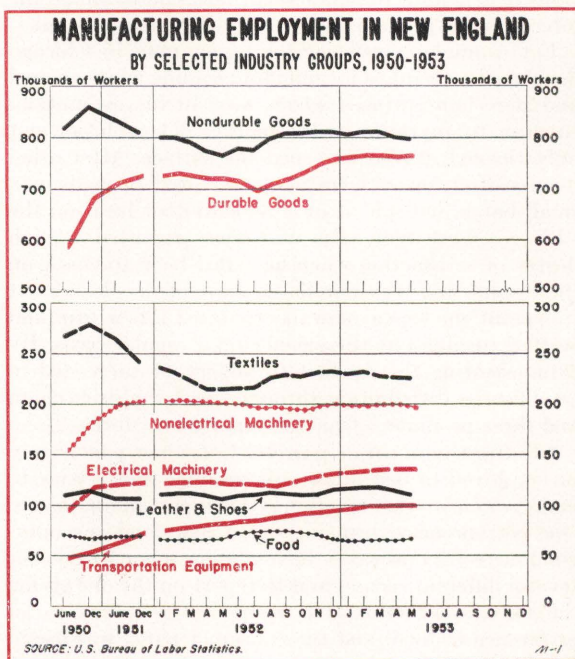
Steel mills in New England operated at an average

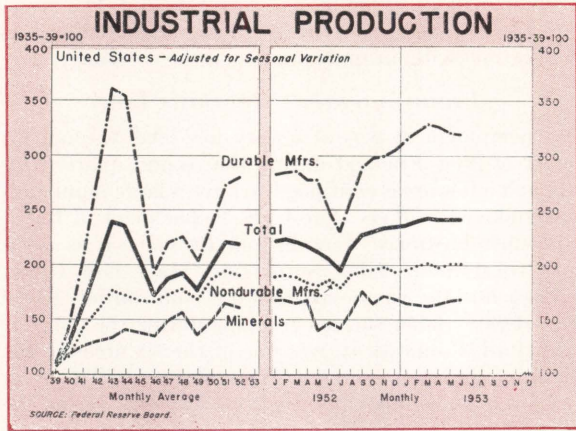
rate slightly above 88 per cent of capacity during both the first and second quarters. Production of pig iron slowed, and the Mystic furnace added to its inventory during the quarter. Foundries operated at two-thirds of capacity on the average.

The region's rubber industry, although trending downward slightly, remained remarkably firm for the season. Activity in New England's nonelectrical machinery industry dropped off slightly during May, partly because of a labor dispute in Connecticut.

Shortages of parts curtailed production at a large Massachusetts automobile assembly plant during May, but other automotive parts and assembly plants continued busy.

Sales of most manufacturing concerns appear to have kept up with production during the second quarter, so that additions to inventories were small. But a decline in sales could result in burdensome inventories in some industries. Supplies of some forms of steel remained inadequate in New England, particularly structurals, hot and cold rolled sheets, and heavy bars and plates. Steel warehouses added to inventories in other lines. Bad spring weather slowed sales of summer shoes, but manufacturers were not unduly worried about large inventories. They planned for a large volume of production after vacation shutdowns. Inventories of some manufacturers of household appliances increased as production ran higher than sales. Users of paper and paperboard products continued their hand-to-mouth





pattern of ordering. The industry tried to match production and consumption. As a result, inventories remained low, making the outlook for continued high production rates good.

New Orders and Order Backlogs

New England manufacturers received a good volume of new orders during the early part of the second quarter. As the vacation season approached, however, new orders began to taper off. A slackening appeared in the primary and fabricated metal, nonelectrical machinery, textile, chemical and rubber industries. But order backlogs were sufficient to maintain over-all production in the region at a high level during the quarter. Finished-goods inventories rose toward its close, however, indicating a decline in order backlogs in some lines.

Unfilled orders on the books of brass fabricators on June 1 were at the lowest level since January 1953. Demand for the better grades of northeastern white pine remained strong, but there was some weakness in orders for the lower grades. Some uncertainty appeared in the market for spruce and the lower grades of hardwood lumber, and price concessions were made. The market for high grade hardwoods remained firm. New England wood furniture manufacturers received orders during the second quarter which supported production at comfortable although not boom levels. Sharply falling orders from the government have caused concerns in the machine tool industry to worry about the future. All restrictions on civilian orders were lifted in April. While orders for machine tools for civilian production rose, they failed to provide a complete offset to declines in defense orders for machine tools.

The rate of defense contracting for most other New England manufactured goods moved upward rapidly during May and June as the 1953 fiscal year ended. Large aircraft contracts awarded in the first half of June accounted for nearly 10 per cent of the region's second quarter total. The ordnance industry held second place, closely followed by the electrical machinery industry in the quarterly estimates. Some large contracts for special fabrics and apparel early in June brought needed business to the region's textile and apparel industry. Wire manufacturers also continued to receive a good volume of government contracts.

Employment at private ordnance plants increased slightly during the second quarter and reached a new

record level. Government plants, however, experienced cutbacks and released some unskilled workers, while still seeking skilled workers. New defense contracts for ordnance placed with New England firms continued to decline from the peak reached in the fourth quarter of 1952. Expansion of facilities in the ordnance industry appears to be about over for the present. New England's part in the Air Force heavy press program was not affected by the June cutback in this program.

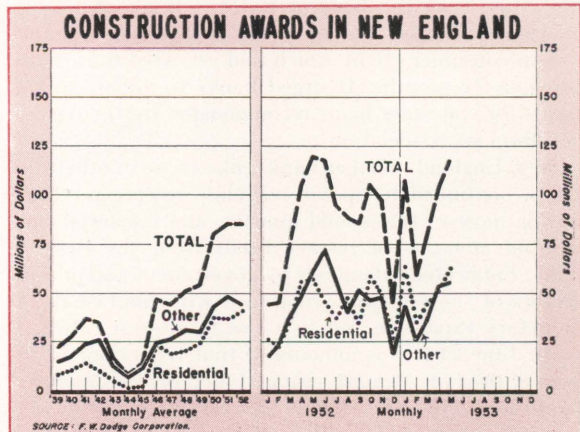
Military construction contracts awarded in New England during the first six months of 1953 were valued at \$23 million, a decline of 36 per cent from the corresponding period of 1952. On a quarterly basis, the peak of New England's military construction contract awards occurred during the fourth quarter of 1952 when the volume was \$26 million. During the first quarter of 1953 it fell to \$13 million, and in the second quarter declined further to \$10 million.

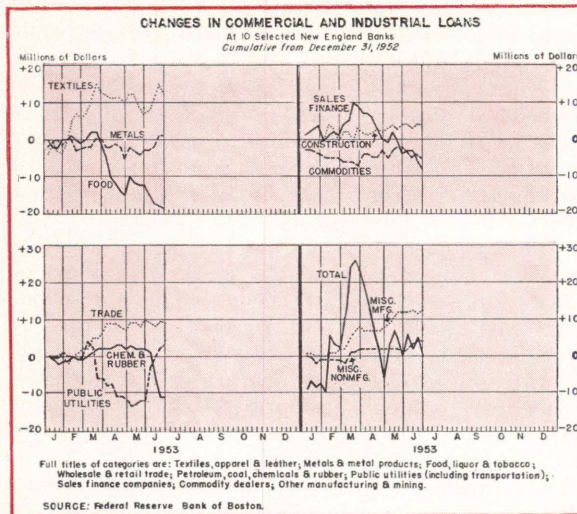
New England was the only section of the country that registered a larger number of housing starts in May than in April, according to the Bureau of Labor Statistics. The national decline was the first April-May drop since the end of the war. The valuation of contract awards for residential building in New England during April and May of this year continued at the same level as the valuation for the corresponding two months of 1952. It was nine per cent below last year in April and the same amount above in May. Gains registered in awards for speculative and custom building of single dwellings were offset by losses in awards during the quarter for construction of apartment houses.

Awards for construction of manufacturing buildings showed a 13 per cent higher value during April and May of 1953 than in the same months of 1952. The total value of non-residential construction awards was eight per cent higher than year-ago figures.

Residential mortgage lending within the district increased moderately at New England financial institutions during the second quarter as total building activity continued at a rate slightly above last year's. Supplies of funds were adequate to meet demand for VA, FHA, and conventional loans.

As the general rise in interest rates continued during the quarter and supplies of funds tightened, some lenders further reduced their purchases and commitments on VA and FHA mortgages from outside the First District. Rates on most FHA insured and VA guaranteed





loans were raised early in May to $4\frac{1}{2}$ per cent.

Even after these rates became effective, corporate bond yields and conventional mortgage rates continued to be more attractive than those on federally backed mortgages. Some lenders allocated increased amounts of funds for corporate and other bond purchases. Lenders continued to be cautious and selective in acquiring both local and out of district mortgages.

Business loans at New England weekly reporting member banks showed a sustained strong demand for credit during the quarter. Although down moderately from the record peak attained in March, these loans remained generally stable until the latter part of the quarter when commodity dealers, chemical manufacturers, utilities, and sales finance companies made heavy net repayments, mainly to fund bank debt. Net repayments by these groups more than offset increases in borrowings by metal manufacturers and textile and trade firms during the quarter. On July 1, however, business loans were still \$10 million above the amount outstanding at the year end and totaled \$1,114 million.

Paced by automobile loans, consumer credit outstanding at district member banks increased about eight per cent during the second quarter. This rate was moderately higher than that shown during the first quarter of the year and in part reflects a seasonal increase. In mid-May 1953 the Federal Reserve Bank of Boston cautioned member banks about the extremely rapid rise in consumer credit which had occurred during the previous 12 months. It urged banks to adhere to the terms for consumer loans recommended by the American Bankers Association.

New England member banks, like those in other districts, continued to operate on close reserve positions during most of the second quarter, and borrowed substantial amounts of reserve funds from the Reserve bank. Large credit demands by government and private sectors of the economy, combined with limitations on monetary expansion, led to a rise in interest rates.

On June 24 it was announced that reductions in required reserves against demand deposits of member banks would be made effective in early July. This action released about \$1,156 million of reserves in the nation,

including about \$45 million in New England. The measure was designed to provide assurance that credit needs will be met without undue strain on the economy.

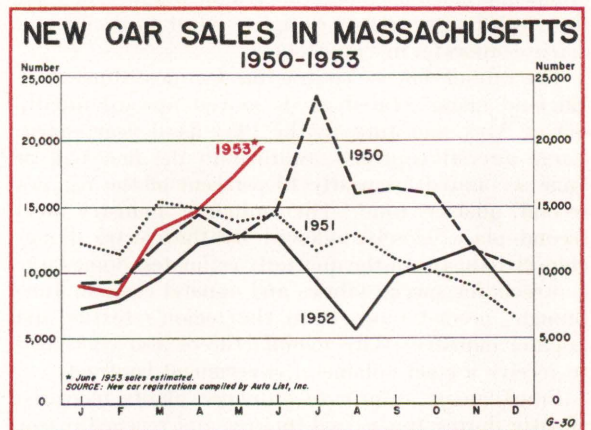
Unemployment Remains Low

Unemployment was at a very low level throughout most of New England during the second quarter, although a few areas continued to have a large number of unemployed workers. The U. S. Department of Labor classified Lawrence, Lowell, and Providence as areas of "substantial" labor surplus in May. Fall River, Massachusetts, was moved from the "substantial" to the "moderate" labor surplus grouping during the quarter. Hartford, Connecticut, was one of the six areas in the country classified as a labor "shortage" area. The overall level of unemployment in New England during the second quarter, as measured by claims for unemployment insurance, stood about 40 per cent lower than it did a year ago.

No clear trend in average weekly earnings of factory workers in New England emerged during April and May. Each of the states, however, reported that earnings were higher in May than a year ago. Connecticut led the list with a year-to-year gain of almost ten per cent as hourly earnings reached an all-time high. Average hours worked in factories were the same or lower in May than in March for all states in the region. A number of industries renegotiated wage rates during the quarter. Some workers in the steel, leather, shoe and electrical industries obtained wage increases, although a few wage cuts occurred in textile machinery.

Total income of individuals continued to edge slowly upward during the second quarter. Consumers spent a large part of their additional income, although continuing to add to their savings at a steady pace. More attractive interest rates and some consumer uneasiness about the future helped to maintain a high rate of saving. Deposits in New England mutual savings banks climbed steadily. While the rate of increase declined slightly from that in the first quarter, it remained ahead of the rate of gain in the second quarter of 1952. Savings bonds were a little less popular during the second quarter. Sales decreased and redemptions rose. Life insurance sales were far ahead of a year ago, and rose faster than they had in the first quarter.

The increase in consumer buying during the second



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quarter was most substantial in the automobile field. New car sales, as measured by registrations of new automobiles in Massachusetts, showed year-to-year gains of 18 per cent in April and 35 per cent in May. In June, registrations were 46 per cent higher than in June 1952. Commercial bank loans for the purchase of automobiles reflected the high rate of sales. Automobile loans at 26 New England banks exceeded those of a year ago by 48 per cent in April and 31 per cent in May.

Sales of used cars in Massachusetts during the second quarter ran about 20 per cent lower than a year ago. Used car prices have declined since last fall, while stocks have been rising. As the quarter ended, stocks of new cars were still reasonable in relation to sales except among scattered independents.

Department Store Sales

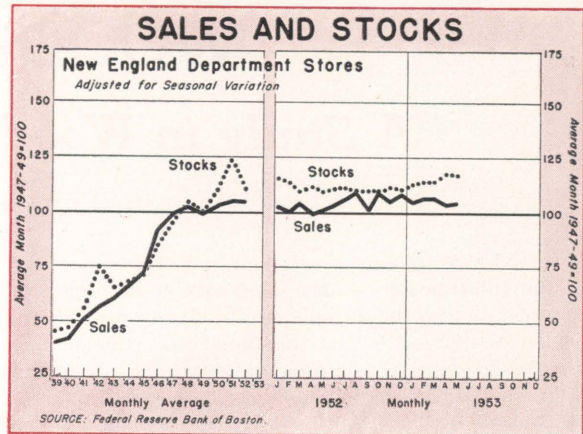
Consumer spending at New England department stores slowed somewhat during the second quarter. The seasonally adjusted index of department store sales for the district, which stood at 106 in February and March, dropped to 103 in April and recovered only one point in May. The dollar volume of department store sales for the second quarter, however, was about equal to that for the same period a year ago. Some sales volume normally expected in April was moved up to March because of the advance of a week in the date of Easter this year. May sales suffered from the loss of one shopping day, but a day was gained in June.

Consumer buying of durable goods at department stores fell off substantially from the high levels of the preceding year. During the first quarter, sales of homefurnishings departments ran well ahead of a year ago. From early in May, however, homefurnishings sales generally lagged behind last year's figures. Sales of major household appliances were particularly slow. In soft-goods departments, improving weather late in the quarter brought increased purchases of ready-to-wear apparel. Sportswear showed the largest year-to-year gains. The increases were sufficient to lift total store sales about even with year-ago levels.

The May decline in homefurnishings sales of department stores was accompanied by a four per cent drop in instalment sales in comparison with those of the corresponding month in 1952. This was the first year-to-year decrease in instalment sales in more than twelve months. Outstanding instalment accounts of department stores, however, remained 22 per cent above year-ago figures at the end of May.

Department store inventories moved upward in April but eased slightly in May. After seasonal adjustment the stocks index rose from 114 at the end of March to 118 in April and dropped to 117 in May. At this level, stocks were about seven per cent higher than they were on May 31 last year. Retailers apparently were not worried about the level of inventories, because department store orders for new merchandise stood 23 per cent higher at the end of May than a year ago.

Stability typified average wholesale and retail prices during the quarter, although a seasonal upturn in food prices occurred in June. The Massachusetts retail price index was 0.3 per cent lower in June than it was a year ago, but 9.6 per cent above its level at the start of the Korean War.



The weekly index of primary market prices remained steady during the second quarter. The more sensitive daily index of prices on commodity markets and organized exchanges declined three per cent during the same period. This moderate change averaged out wide fluctuations. New England industrial users of copper bought on a hand-to-mouth basis because they expected a cut in the price of Chilean copper. Hide and skin prices showed the biggest monthly jump between April and May since the Korean War began.

Unusually wet spring weather this year cut down the volume of early-season vacation travel to New England resort areas. Lodging proprietors reporting to the New England Vacation Business Index entertained about five per cent fewer guests in April and eight per cent fewer in May than they did in the corresponding months last year. Gross receipts of these establishments were below year-ago levels by three per cent in April and one per cent in May.

Despite the season's slow beginning, heavy advance reservations for June, July and August point to another record-breaking amount of summer business if the weather is favorable. At the end of May, advance bookings for all three months were substantially higher than they were at the same time last year.

June 1953 was the driest June on record since 1912. While dry conditions harmed crops, they aided dairymen in harvesting a high quality hay crop.

The number of chicks hatched for flock replacements has been only slightly higher than a year ago, despite a more favorable egg-feed ratio. Commercial stocks of shell eggs in storage are half those of the most recent five-year average. Thus leaders of the industry believe egg prices will be good the rest of 1953.

Broiler producers are not able to foresee as bright a future. From the week of March 8 through the week of June 20, the 12 major broiler-producing areas "started" each week a larger number of chicks than in the comparable week of last year. The accumulated increase for the interval was 10 per cent above that of the same period a year ago.

Despite low prices this spring, early evidence points to a substantial increase in the production of potatoes in Aroostook County this year. Conventional lenders operated conservatively. Financing for the increase in potato production came largely from operator's reserves or from their family funds.

WOOD FLOUR:

A Study in Wood Waste Utilization

By EDWARD D. GRUEN¹

THE NEW ENGLAND wood flour industry cannot lay claim to attention because of its size or its important contribution to the region's income. It can nevertheless claim distinction for having found one commercially successful solution to a problem of wood waste utilization. Whether or not it has blazed the trail for other technical advances, it has written its own "success story." It reflects the ability of New Englanders to take advantage of opportunities that come their way.

By any yardstick, wood flour manufacturing is "small business." New England's seven plants together employ less than 250 people. Their combined annual output, even if each machine were to run 160 hours per week at full capacity, would be worth only a little more than three million dollars. This comes to less than one-third of one per cent of the value of New England's forest products in 1950.

The importance of New England's wood flour industry does not rest solely on its volume of output. Its contribution can be expressed in other values: The industry is the region's outstanding example of successful utilization of sawmill residues. It is also a leader in the effort to increase the value of an important natural resource in New England.

The history of wood flour offers a clear demonstration that technological progress can hold the master key to New England's forestry future. The industry confirms the validity of a basic rule for New England's industrial development — look first to the region's material base and create a valuable product for local markets by the use of mechanical ingenuity, capital and careful research.

The term "wood flour" has for nearly fifty years been loosely applied to wood which has been reduced to finely divided particles approximating those of wheat flour in size, appearance and texture. Wood flour is used chiefly as a filler in molded plastics and linoleum. Its role is to take up space as cheaply as possible. Today, to qualify as wood flour, the material must be able to pass through a 60 mesh screen. For most uses, the flour must have a maximum moisture content of six to ten per cent. It must also be light in color and density, low in resin content and free of bark, dirt or other impurities. Premiums are paid for the lighter shades and for fineness of screen size achieved without loss of fibrous structure. The average degree of fineness specified is rapidly approaching 100 mesh and many technical uses now call for flour resembling face talc, ground to pass through 140 and even 200 mesh screens.

Dry sawdust and shavings have in almost all cases formed the raw material for wood flour. As very little

finely fragmented material can be obtained from the original sawdust pile by screening, it is necessary to grind the whole mass. Burr stone mills were first used for this purpose in Norway in 1906. The process was similar to that used for grinding wheat and other grains. Adaptations of this abrasion technique can be seen in today's so-called attrition mills. Today, corrugated metal discs or grooved steel rollers are substituted for stones, and mechanical power is applied to revolve them in opposite directions. Besides abrasion, the modern wood flour plants have turned to impact fragmentation in "hammer mills" and "beater mills." For the finest sizes, a process of pulverizing or crushing the particles between a moving roller and a stationary anvil has been successfully employed.

Whatever grinding process is used, the making of wood flour to meet the present rigid standards is a highly specialized business. Operation has become almost completely automatic. Capital input is relatively high and direct labor costs are correspondingly low. Plant protection costs are exceptionally high, owing to the ever-present hazard of fire. The dust explosion danger can be minimized, perhaps eliminated, but only through the use of special equipment and plant design. Productive capacity tends to vary inversely with the size of flour particles. The finer the screen size used, the lower the output per machine hour. Power needs are even more severely affected by each reduction in particle size. For some equipment, 200 mesh flour would require four times as much power as a 100 mesh product.

Relatively large capital investment requirements, operating hazards, and rigid market specifications have resulted in concentration of wood flour production in a small number of plants. More than half of these plants are owned or controlled by linoleum and plastics manufacturers. The situation in New England is fairly representative. Of the seven plants located in the region, two are owned by linoleum companies and two are owned by plastics producers. In addition the Armstrong Cork Company has had a long-term contract to purchase a substantial portion of another New England firm's wood flour output for making linoleum.

There are two other plants which produce solely for the open market. One of these was erected in 1906 at South Windham, Maine, by the duPont Company, and is probably the first wood flour installation in the United States. It is so designed that dynamite stock makes up a large fraction of its output.

The presence of so many subsidiary plants in the field testifies to the importance attached by the principal consumers to having an assured supply of this filler in the exact grades required for their finished products. In only one instance has mill waste utilization as such provided an important motive for establishing a wood flour plant in New England. In this case

¹ The author, an Assistant Professor of Finance and Statistics at The Amos Tuck School of Business Administration, Dartmouth College, prepared this article under a research grant from the Federal Reserve Bank of Boston. The findings and conclusions are the author's. They are published by this Bank because of their widespread interest to the New England community.

the Wilner Wood Products Company at Norway, Maine, the largest manufacturer of pine wood heels in the country, was successful in developing a process for reducing its solid plant residues as well as its fine waste to quality-grade flour.

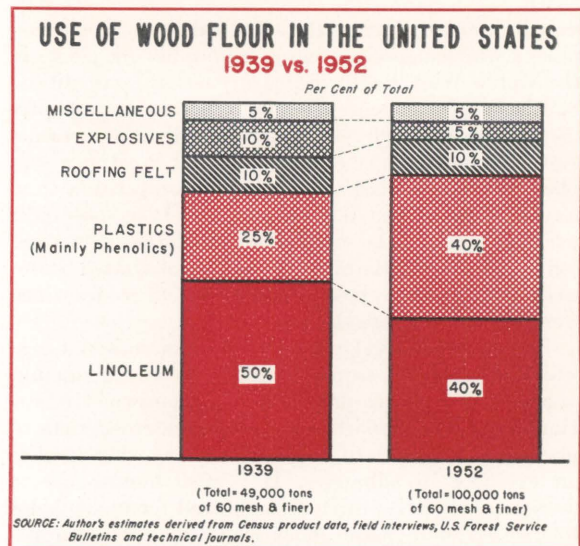
Two factors were largely responsible for bringing the wood flour industry to the Northeast: nearness to markets and an adequate supply of suitable, low-cost raw material. In the 1920's, market demand rested almost entirely on needs for inlaid linoleum. Today, plastics consume a volume equal to linoleum's share of the market. In the case of both industries, output continues to be concentrated in the East. The roofing felt, explosives, rubber goods, toy and other markets — which together account for 20 per cent of consumption — are also well represented within an economic shipping distance from New England plants.

There are good reasons for preferring eastern white pine as a source of raw material. Its fine sawmill and planing mill residues remain superior to those of any other species for the better grades of flour. They combine light color and density with low resin content.

New England's forest economy is benefited substantially by the wood flour industry. There are an estimated 600,000 tons of sawdust and shavings which have to be disposed of each year. Considerably more than half of this mill waste contains more than 20 per cent moisture, so it is effectively excluded as a raw material source for flour. Also, most of these mill leftovers contain bark and are thus further disqualified. There is probably a potential supply of 200,000 tons of *bark-free and dry* sawdust and shavings suitable for treatment by a wood flour type process. Only a little more than half of this potential — the white pine portion — would meet present wood flour standards. The region's wood flour plants are estimated to have used some 70,000 tons of these fine residues in 1951. On this basis, the wood flour industry alone can be credited with removing at a profit to the supplying mills roughly 60 per cent of the potentially available and usable white pine material. This is more than a third of the potential available from all species.

This does not mean that there are no procurement problems for the wood flour plants. Wood flour producers have offered three to six dollars a ton for dry sawmill waste, FOB the seller's mill. They have offered to absorb freight to their plant as high as five dollars per ton. Nevertheless, there have been a number of occasions in recent years when the supply of raw material fell short of demand. The difficulty stems in part from a seasonal problem for which there is no easy solution. Raw material offerings regularly reach a peak in the summer and autumn because of seasonality in lumber production and weather favorable to air-drying of lumber. On the other hand, linoleum companies make their heaviest demand for flour in the winter and early spring to prepare for the seasonal upturn in housefurnishings sales. The flour plants find it costly and generally unsafe to store more than fourteen to thirty days' supply in the form of sawdust or flour.

As a partial offset, the wood flour plants have turned to the use of year-round contracts at favorable prices with a nucleus of dependable suppliers. Typically, these are box and wood heel plants, and finished lumber and



custom-sawing mills. These operations are generally equipped with kilns for year-round drying. There is always uncertainty, however, about winter deliveries.

Factors Affecting Growth

The development of wood flour cannot be traced with statistical accuracy. There are no Census figures on this commodity and the industry has no trade association. It is possible, however, to draw several meaningful comparisons. Known techniques respecting the use of wood flour have been used with Census data on finished products to estimate production and use patterns. Benchmarks on past production appear in U. S. Forest Service bulletins. Trade sources have been very cooperative in offering information on plant capacity and recent trends.

The major shifts in the use pattern for wood flour since 1939 are shown in an accompanying chart. The striking change is that within this short space of time plastics manufacturers have increased their share of the wood flour market from 25 per cent to 40 per cent. Their estimated rise was from 12,000 tons in 1939 to 40,000 tons in 1952. Phenolic molding powders are largely responsible for this rapid rate of growth. Wood flour is 60 to 80 per cent of the weight in nearly half of these compounds. Linoleum manufacturers increased their use of wood flour from 25,000 tons to 40,000 tons. The total volume of linoleum produced more than doubled during the period, but inlaid linoleum gained little.

New England accounted for 60 per cent of the total output of wood flour in the country during 1952. Furthermore, plants located in the region have ample capacity for handling a larger volume of orders.² No factors are in sight which would indicate that New England is in danger of losing its lead to other regions. The presence of subsidiary plants is something of a guarantee against this happening. The preference for native white pine

² Plant capacity estimates are in terms of installed grinding machine capacity and assume year-round operation on a 3-shift basis, i.e., 160 hours per week. Moreover, they are valid only for the production of wood flour in the 60-100 mesh range and are weighted toward the lower limit of that range. With customer specifications for linoleum as well as phenolics making 80 mesh the minimum today, the effective machine capacity may be reduced as much as one-fourth from the level shown in the chart. The erratic receipt of raw material also interferes with sustained round-the-clock operations.

may be another. Among the softwoods, only Ponderosa pine, a western species coming from millwork plants in the Middle West, has furnished any serious competition. Southern softwoods are effectively barred from quality uses due to their high resin content. Wide transportation cost differentials have excluded the Far West as a supplier to Eastern markets. Thus far, competition from foreign sources has not reappeared. It is not clear whether this is to be credited to the 25 per cent tariff (effective since 1931) or to the ability of United States wood flour plants to produce the technical grades which were imported before the war.

The one new development in the raw material field which seems likely to persist is the increasing amount of wood flour being produced from hardwood waste. Hardwood flour imparts somewhat greater strength to plastics and appears to be less absorptive when used as an extender in adhesives. It is also finding use in foundries where its mixture with sand for molds helps to take up some of the shock when the hot metal hits the mold.

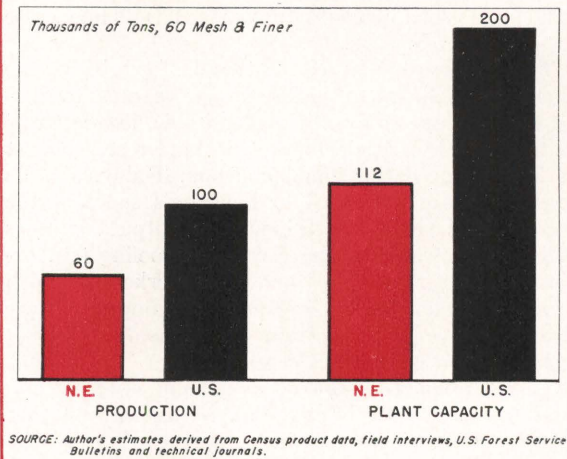
The Heywood-Wakefield Company of Gardner, Massachusetts (the largest manufacturer of furniture in New England), is completing experiments on a pilot plant basis with flour made from hardwood waste. Solid hardwood waste, chiefly birch, is cut to chip size and then ground to 100 mesh flour. Their plans now call for commercial operation within the next year. The objective is twofold: to find a more profitable use than fuel for about 65 tons a day of plant residues, and to develop a high-quality resin compound for molded institutional furniture parts such as chair seats.

Other types of filler material offer little or no threat to wood flour at present. Wood flour possesses greater fiber strength than such lightweight, inexpensive materials as cork or bark. Its resilience, color and absorptive qualities are adequate. Its low price in terms of either weight or volume is unmatched. One pound of wood flour is used per square yard in a standard grade of inlaid linoleum. The recent price for 120 mesh wood flour has been forty dollars a ton or two cents a pound. Even at this price, the cost of this filler amounts to only two per cent of the average manufacturer's sale price for the linoleum.

The minor fraction which wood flour represents to finished product prices is also illustrated by the phenolic molding compounds. The products sell in the 20 to 40 cents per pound price range, yet the bulk of their weight may well be wood flour. In contrast, mica costs eight cents a pound and is thus restricted to uses where its electrical resistance will allow the higher price to be paid. The alpha celluloses at eight to sixteen cents per pound qualify for the ureas, melamines and vinyls where whiteness and susceptibility to coloration in pastel shades may be specified. Asbestos and cotton fluff, also selling at higher prices, impart extra strength.

But even with its competitive position among the fillers assured, the future of the wood flour industry is itself dependent on the trends in the principal consuming industries. It is likely that linoleum will continue to lose ground to other hard-surface floor coverings. Asphalted felt-base floor coverings have for 25 years cut into the low-priced end of the market. They now make up two-thirds of the volume.

WOOD FLOUR PRODUCTION AND CAPACITY New England and United States, 1952



Should inlaid linoleum sales also suffer from quality competition with vinyl or other new plastic surfacings, the demand for wood flour still might not be affected proportionally. Predictions on this score should be hedged until it is demonstrated that wood flour cannot be effectively used as a filler in the vinyl floorings. Only moderate increases are anticipated for the other hard-surface floor coverings, asphalt and rubber tile.

In sharp contrast, the outlook for the phenolic plastics industry is much more favorable. The Bakelite Division of Union Carbide and Carbon, a leading producer of the molding powders for which wood flour is specified, estimates that by 1960 the total output of phenolic molding materials may reach 450 to 500 million pounds, or double the amount produced in 1952. If growth at a rate approaching this is realized, then it seems clear that plastics would be in a position to claim half of all wood flour produced. Such an expansion would more than compensate for a possible decline in the demands by linoleum manufacturers.

A large-scale expansion in the use of ureas, melamines and the thermoplastics is also predicted. At present, wood flour is not used to any appreciable extent in these plastics, but further development may lead to increasing use. The tan coloration imparted by wood flour has been a defect for moldings being produced in light pastel shades.

In an age of rapid technological change — illustrated as sharply in the chemical field as anywhere — an industry such as wood flour cannot be said to have a perfectly assured future. But of one thing there can be no doubt — New England's wood flour industry has proved for more than a generation that mill scraps and other discarded material can be converted into products of real value to modern industry.

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