

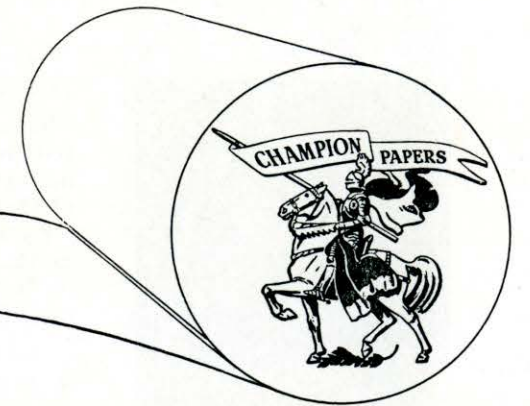
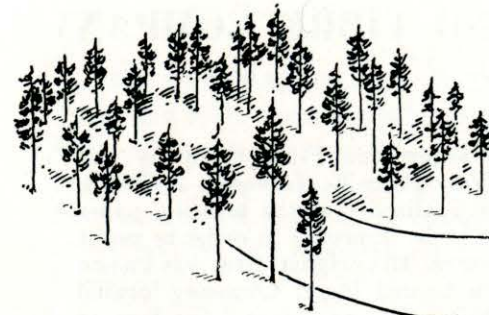
*The Story of the
Carolina Division*



THE CHAMPION PAPER AND FIBRE COMPANY

CANTON, NORTH CAROLINA

Mills Also at Hamilton, Ohio and Pasadena, Texas



*From
Forest to
Finished Product*

THIS BOOKLET, briefly outlining the more important phases of pulp and paper manufacture, has been prepared for the information of those who are interested in our industry. May it also serve as a reminder of a pleasant trip for those whom we have been privileged to conduct through our mills.

We are happy to have you observe an industry operating under our American system of free enterprise, employing men and women who live and work in a spirit of mutual understanding and cooperation.

H. A. Welder

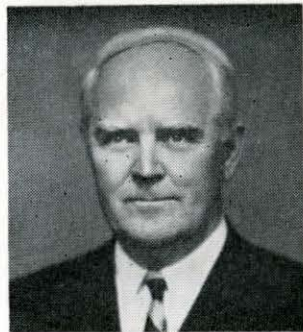
VICE PRESIDENT AND GENERAL MANAGER

THE CHAMPION PAPER AND FIBRE COMPANY



FOUNDER

The Champion Paper and Fibre Company was founded in 1893 by Peter G. Thomson, a Cincinnati printer who realized that the printing paper of that time had to be improved in order to use it for printing pictures. His original firm was known as the Champion Coated Paper Company located in Hamilton, Ohio. He was among the first to utilize Southern forests as a source of pulpwood.



PRESIDENT AND CHAIRMAN OF THE BOARD

Reuben B. Robertson pioneered the development of the pulp and paper industry in the South through his astute leadership of the Carolina Division from 1907 to 1935. Since then he has served as Executive Vice President and President of the entire Company and has been Chairman of the Board since 1950. He is nationally recognized as a champion of harmonious human relations in industry.



VICE CHAIRMAN (On Leave of Absence)

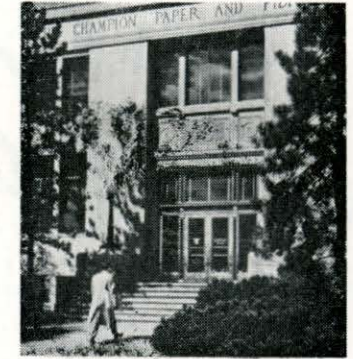
Reuben B. Robertson, Jr., is one of America's most dynamic young business men. Joining the Carolina Division in 1930 he learned the business from the ground up by actually working in each phase of operations. He became Executive Vice President of Champion in 1946, and was elected President in 1950. He has served the U. S. Government in many capacities both at home and abroad, and in 1955 took leave from Champion to fill the position of Deputy Secretary of Defense.



VICE PRESIDENT AND GENERAL MANAGER

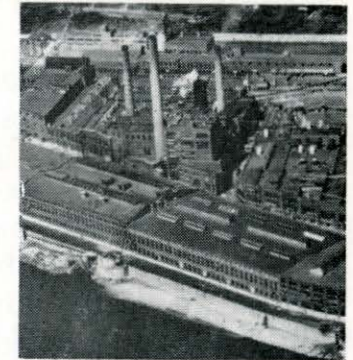
The steady expansion of the Carolina Division has been paralleled by the rise of Horatio A. Helder as an outstanding business executive. He came to Champion in 1908 as a chemist. Progressively he became superintendent of the extract department, chief chemist, technical director, assistant mill manager, mill manager, and has been general manager since 1946. He was named a Vice President of the company in 1952.

THE GENERAL OFFICE of The Champion Paper and Fibre Company is located at Hamilton, Ohio. Here, the manufacture and sale of the products of the Ohio, Carolina and Texas Divisions of the company are coordinated, and the broad policies for company-wide operations are formulated.



General Office

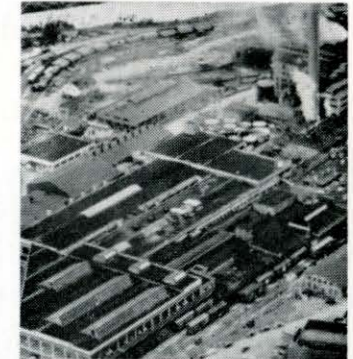
THE OHIO DIVISION, also located at Hamilton, is the parent plant of the company. Organized as The Champion Coated Paper Company in 1893, the original mill applied a smooth coating to the surface of papers purchased from nearby mills. This process provided printers with a coated paper which made possible great advances in the printing of fine halftone pictures.



. . . . In Ohio

In 1902 a paper mill was constructed adjacent to the coating operation, and from this beginning Champion has grown to be one of the largest manufacturers of printing papers in the world. The Ohio Division now specializes in fine grades of coated and uncoated printing papers and a variety of special papers.

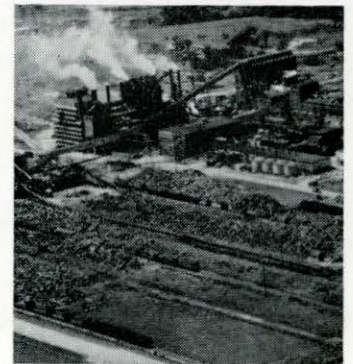
THE CAROLINA DIVISION, at Canton, North Carolina was established as The Champion Fibre Company in 1906 for the purpose of manufacturing pulp for use at the Ohio mill. This plant pioneered the pulp and paper industry in the South, and several new pulping and bleaching processes were developed here.



. . . . In North Carolina

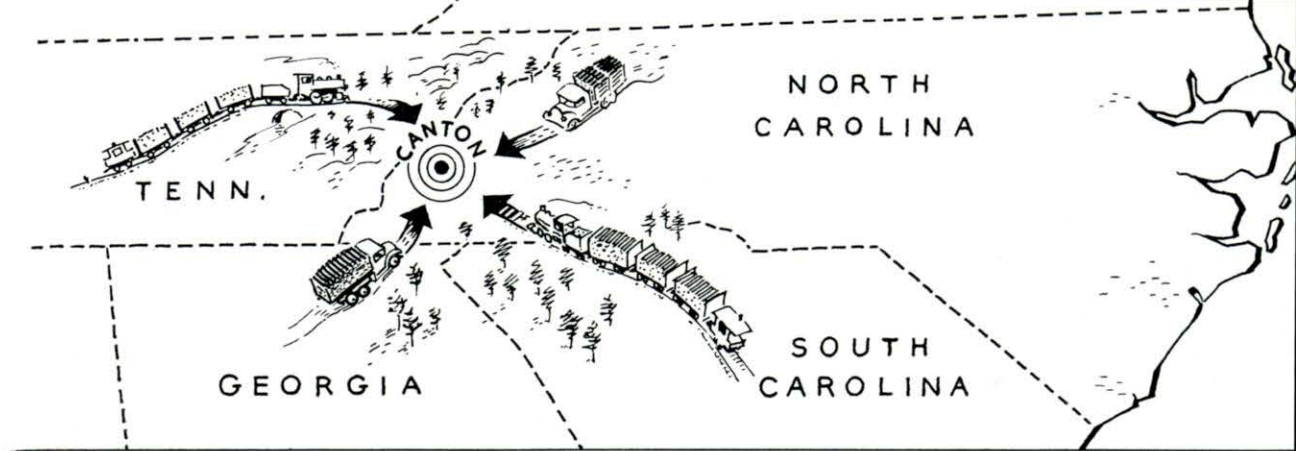
In 1922 the Carolina mill began the manufacture of business papers, and a decade later started making paperboards for food containers. Today this plant is one of the world's leading producers in these two fields.

THE TEXAS DIVISION, at Pasadena, Texas, was started in 1935 to produce bleached pine pulp. In 1940 equipment was installed for the manufacture of machine coated magazine paper, and subsequently other paper and paperboard machines were added. The Texas plant produced the first white paper made in the Southwest.



. . . . In Texas

Since 1936 the three divisions have been incorporated as The Champion Paper and Fibre Company, with general policy centered on mass production of white papers. Champion employs 9,600 people and produces more than 2½ million pounds of paper per day.



Half a century ago Peter G. Thomson needed a pulp mill to supply the paper mill of the Champion Coated Paper Company at Hamilton, Ohio. Instead of following the trend of that day of looking to the North, he envisioned the potentialities of the South as a source of pulpwood and a site for a pulp mill.

Canton, North Carolina, was selected because of the combination of timber supply, intelligent labor, suitable water, and accessibility to other essential processing materials and to markets.

Pioneering the industry in the South, construction started in 1906 and in 1908 The Champion Fibre Company started shipping pulp to Ohio.

This was the first mill in the world to make white pulp from chestnut wood; first to produce high quality white pulp from Southern pine trees; and first to manufacture bleached hardwood pulp by the sulphate process.

The Carolina mill began manufacturing paper in 1922. This plant now has four paper machines, including the two largest in the world for making white papers, producing 475 tons per day; three paperboard machines producing 225 tons per day; and one of the original pulp drying machines still supplies the Ohio mill with 250 tons of bleached pulp every day.

Building for the future, Champion at Canton is now engaged in an expansion program which will ultimately increase daily production to 1100 tons of pulp and 1050 tons of paper and paperboard.

Where It All Starts . . .

From hundreds of privately owned woodlots, and from Champion's own forests, in North Carolina, South Carolina, Georgia and Tennessee, comes the wood from which Champion papers are made. Carefully selected to conserve future supply, the trees are cut into five-foot lengths and delivered to the mill on rack cars and trucks.

Approximately 1200 cords of pine wood and 500 cords of mixed hardwoods, or a total of more than 1700 cords, are consumed each day.



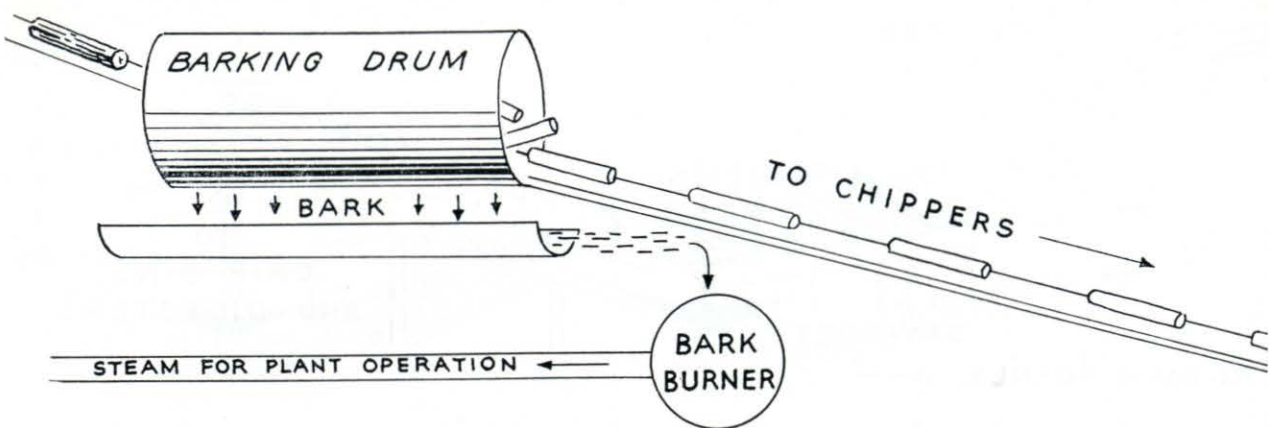
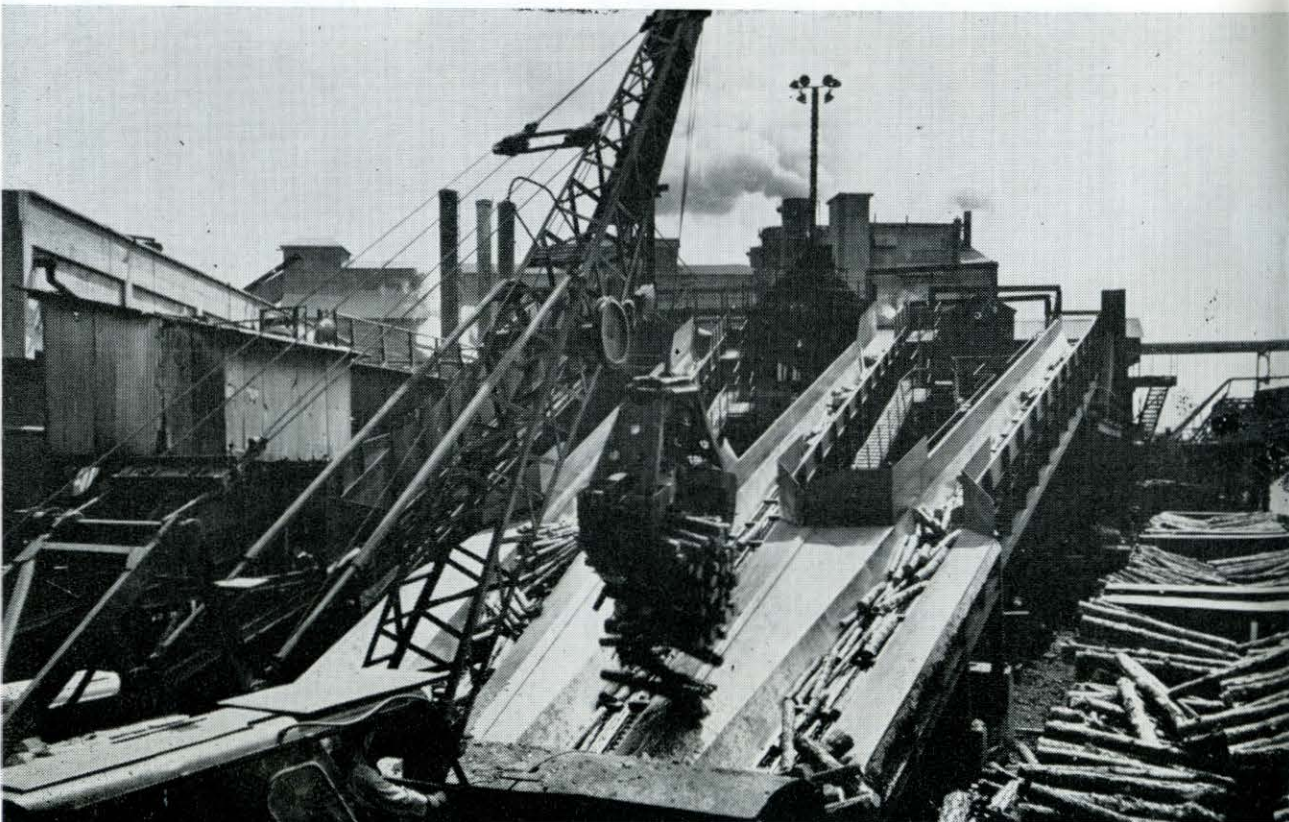


Up They Go . . .

Upon arrival at the mill the wood is unloaded by giant crawler cranes, which can snatch up a truck load at a time and drop it into the rugged conveyors. The five-foot logs are quickly carried up the long incline and dumped into the thundering barking drums.

To insure uninterrupted operation some incoming wood is stored in a 30-acre woodyard. This reserve supply usually amounts to about 60,000 cords, enough to last approximately five weeks.

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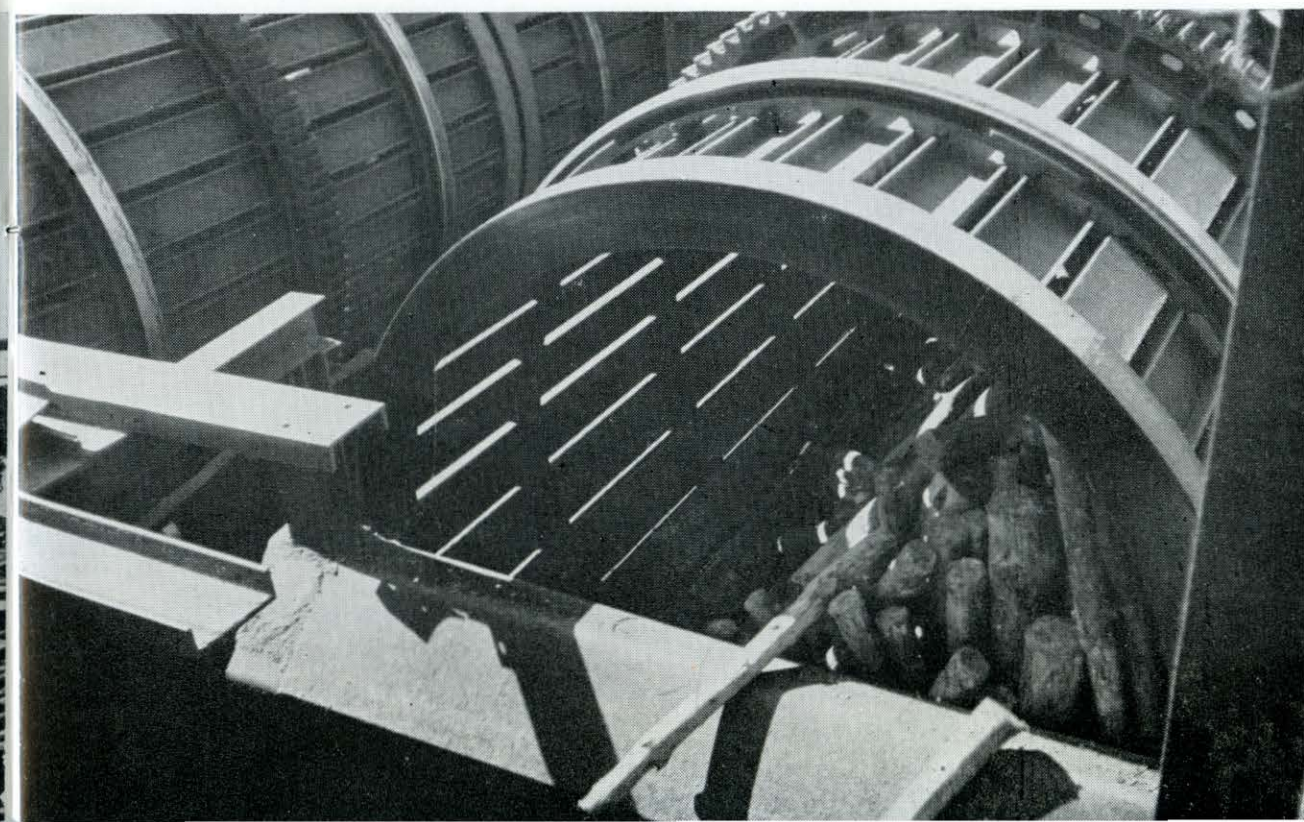


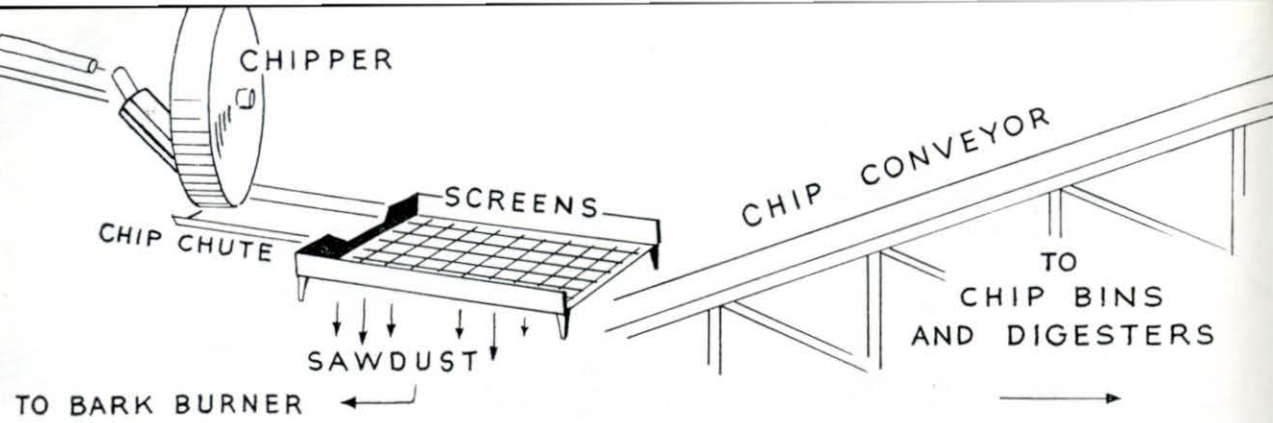
Off With the Bark . . .

The bark is removed from the rough logs as they pass through huge steel barking drums, 12 feet in diameter and 45-50 feet in length, which revolve slowly but relentlessly. The great force of the tumbling logs crashing against one another strips them of bark completely.

The bark is carried away for use as fuel, while the logs emerge into another conveyor where they are cleaned with a shower of water as they continue their journey to the chippers.

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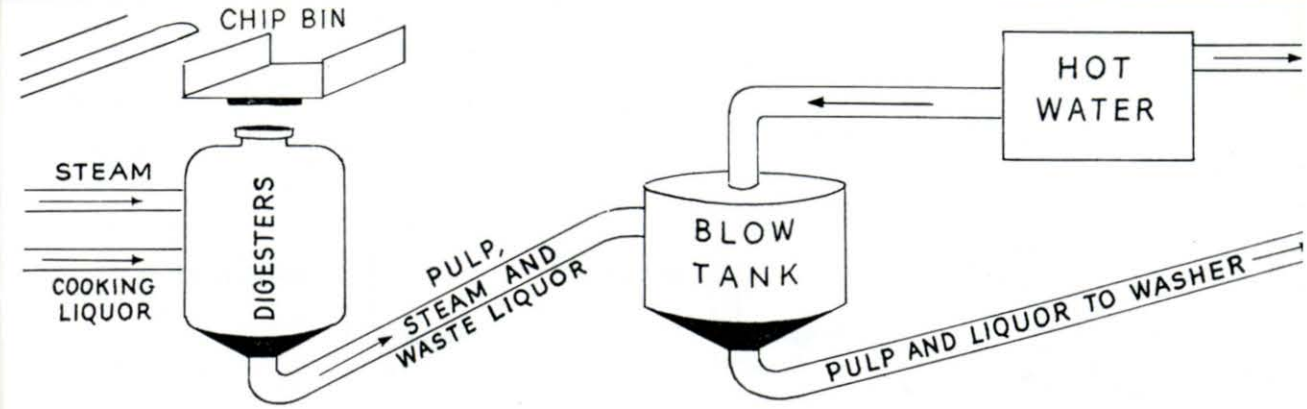


Chipping And Screening . . .

The clean wood plunges into the maw of the giant chippers. Here, at an almost unbelievable rate, the logs are cut into small chips by keen knives set in slots of huge discs that rotate at high speed.

After the chips come from the whirling blades they are passed over a series of screens to remove oversize chips, splinters and sawdust. From the screens an endless river of chips moves by conveyor belt to the storage bins.

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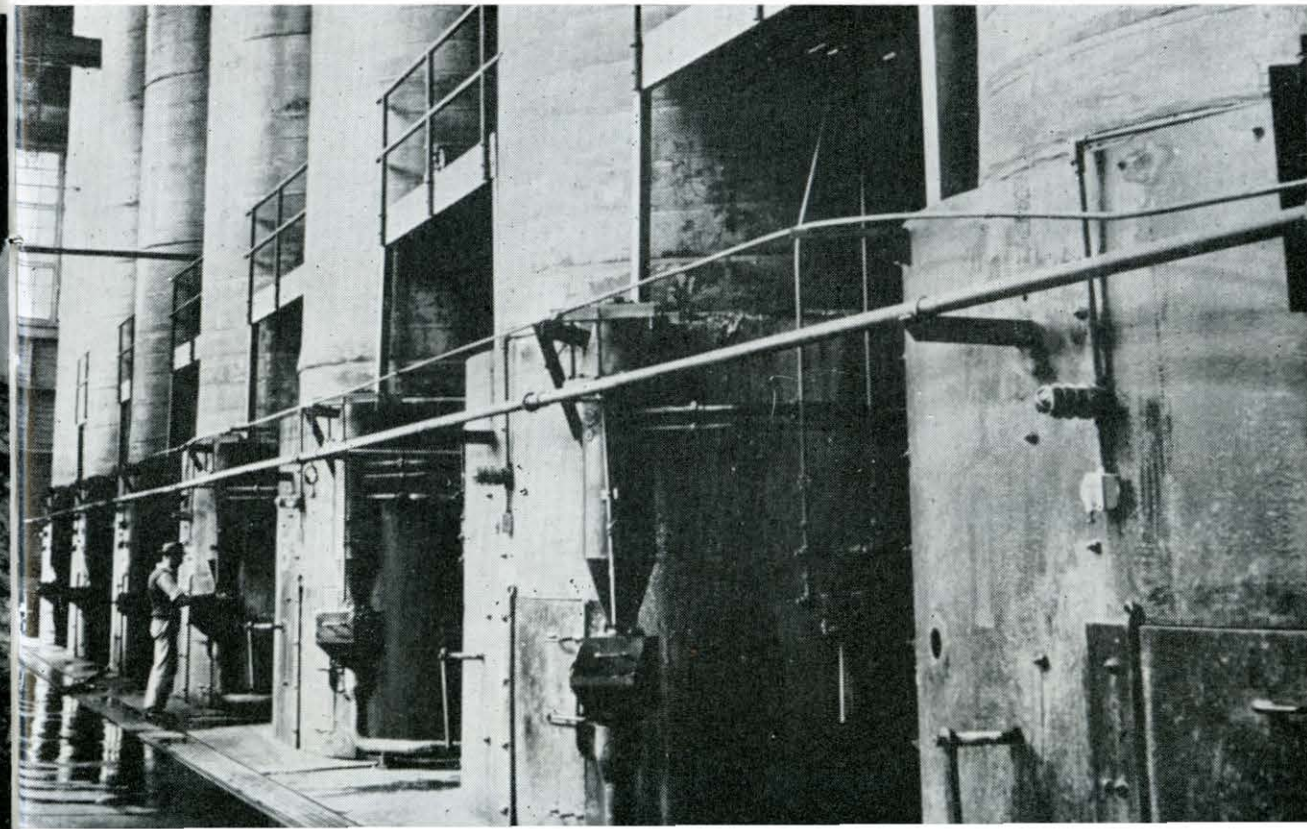


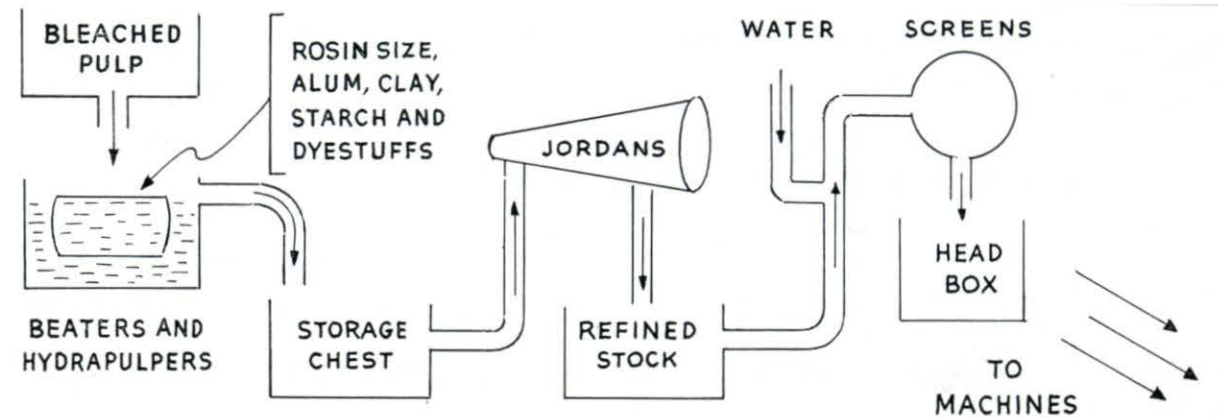
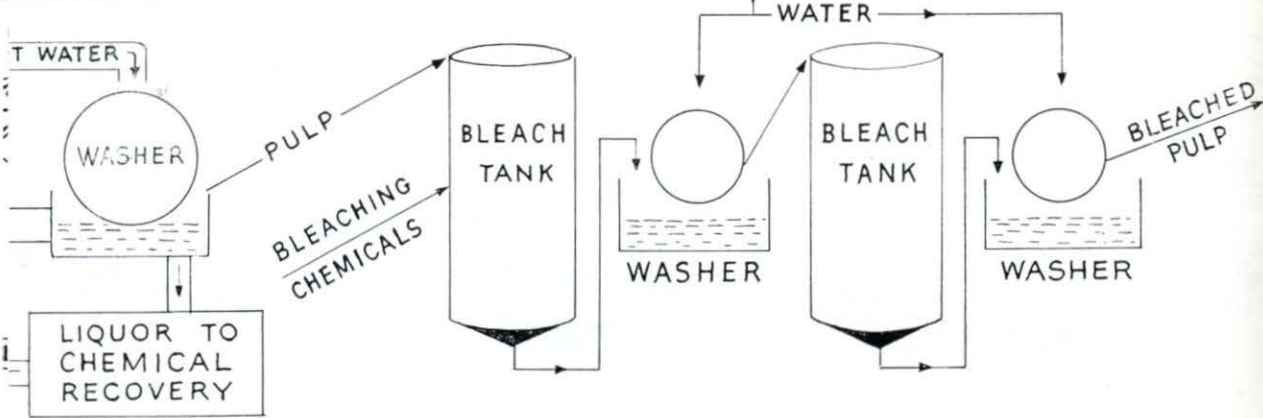
Cooking the Chips . . .

The chips pour from the storage bins into digesters (huge pressure cookers), mixed with a strong alkaline cooking liquor, and subjected to 120 pounds of steam pressure for about three hours. This cooking action separates the lignin, resins and fats in the wood from the cellulose fibres which are to be used in making paper.

When tests indicate that the chips have been properly cooked, the contents of the digesters are discharged into blow tanks for temporary storage.

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Washing And Bleaching . . .

Next the cooking liquor, containing the lignin, resins and fats, is rinsed out in a series of washing vats, leaving the dark brown cellulose fibres, now referred to as pulp.

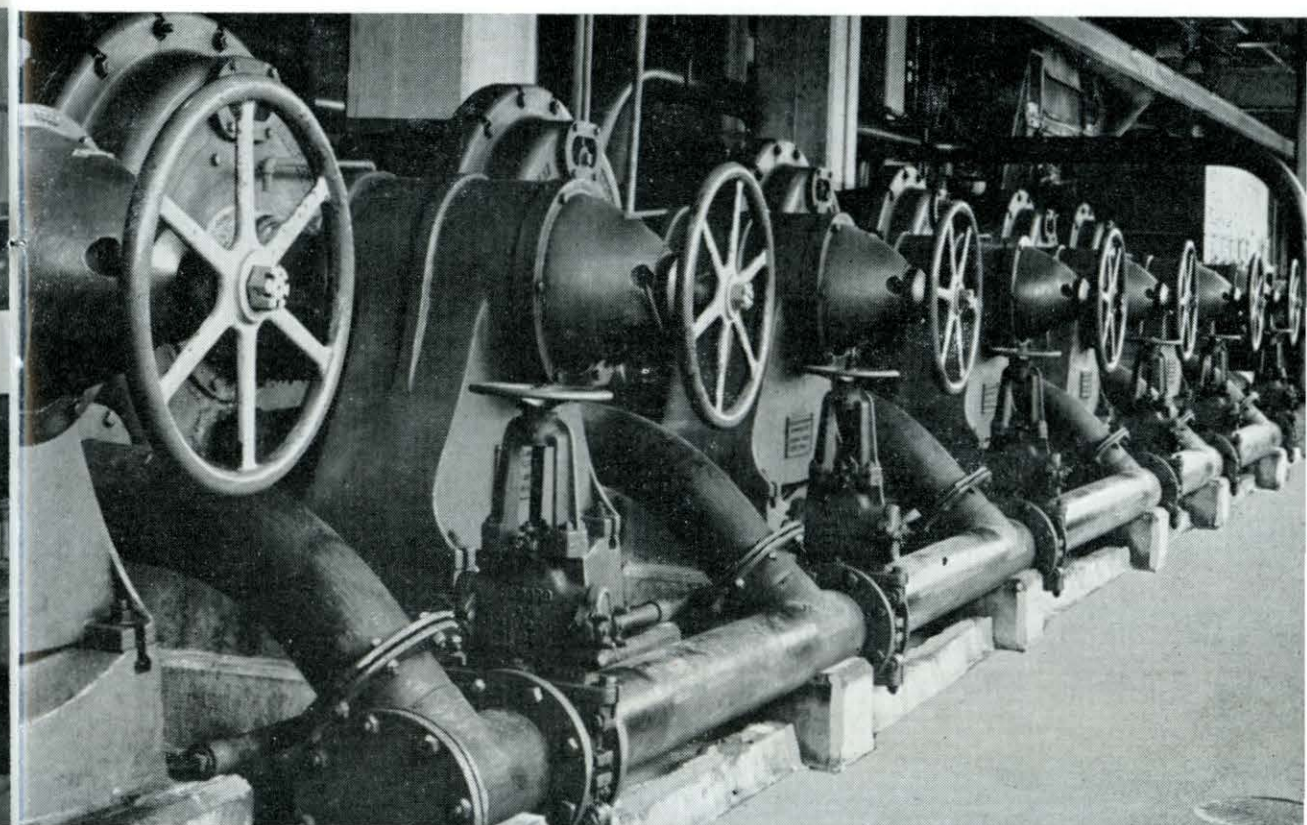
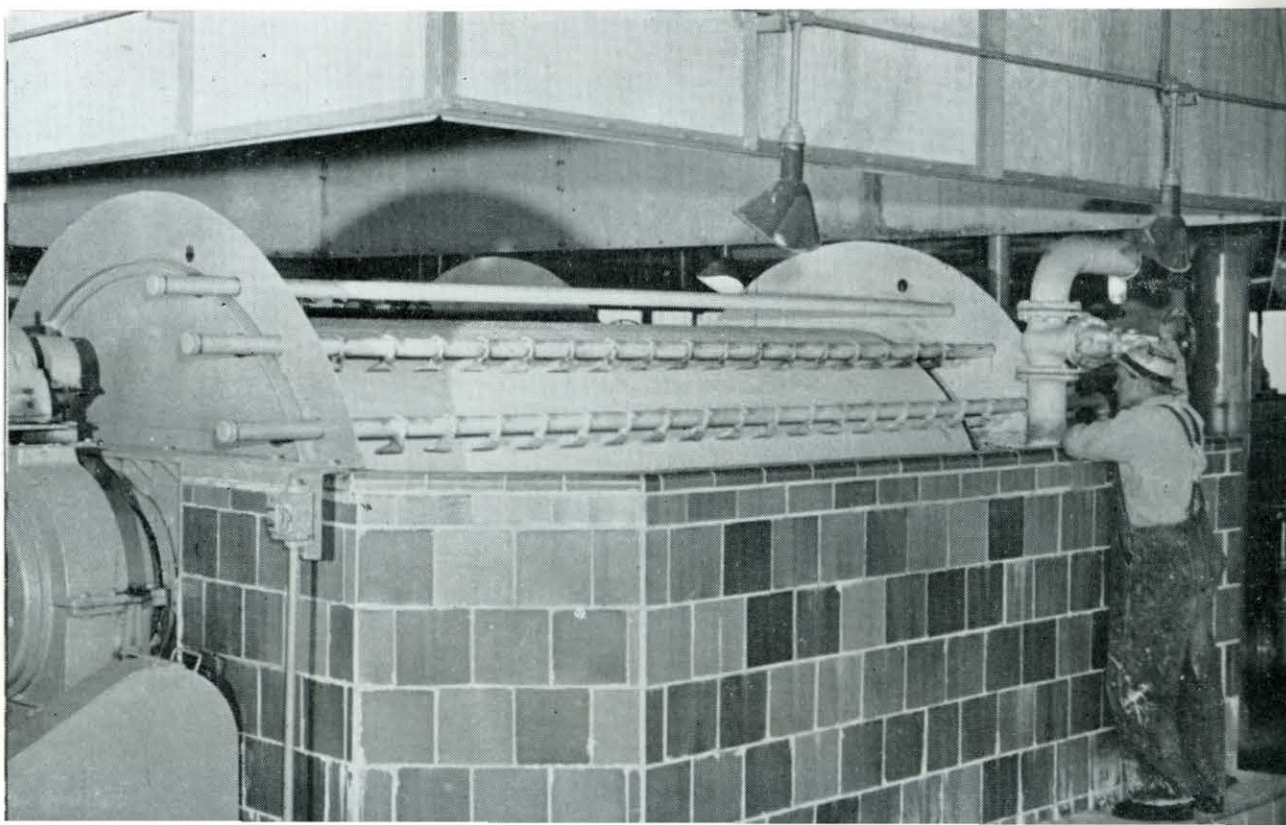
The liquor is sent to a recovery process to reclaim the chemicals for reuse. The pulp is screened to remove knots and uncooked clumps of fibres.

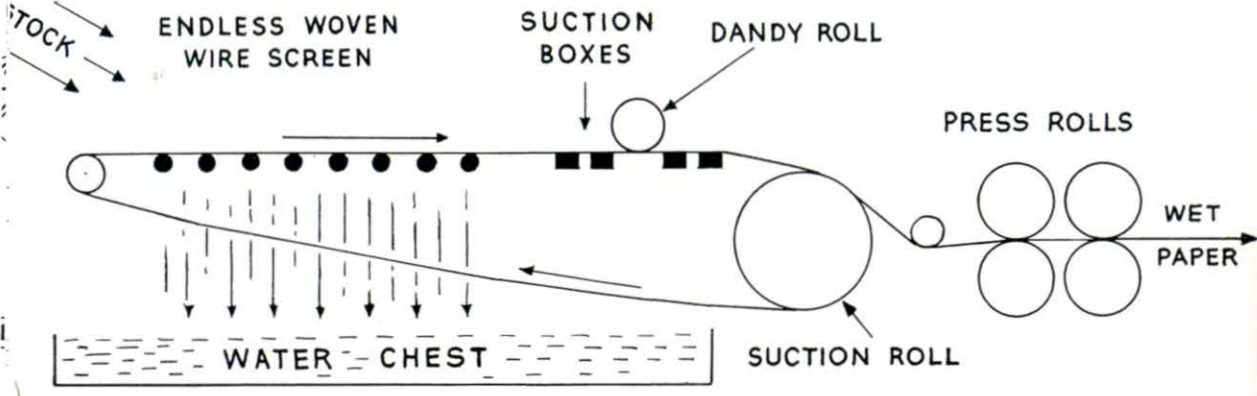
Chlorine and chlorine compounds are utilized in alternate stages of bleaching and washing to transform the brown pulp to a bright white color.

Beating And Refining . . .

The finished pulp flows to mixing machines, called Beaters and Hydrapulpers, where clay, rosin size, alum, starch and dyestuffs are added, according to formulas for the grades of paper to be made.

This pulp stock is refined in machines called Jordans, passing between whirling knives which cut fibres to proper length and brush out the ends. Then, diluted to $\frac{1}{2}$ of 1% pulp stock and $99\frac{1}{2}\%$ water, the mixture is screened and flows to head boxes of huge paper machines.

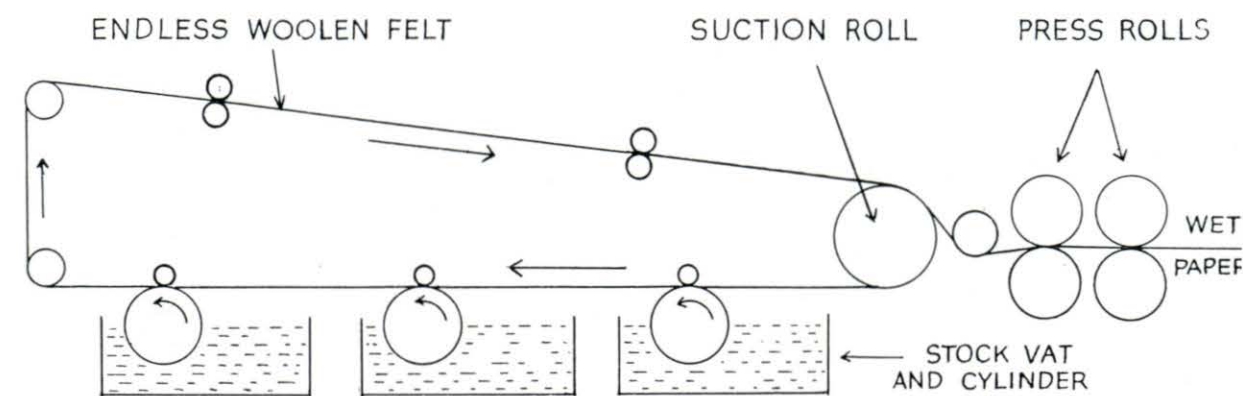
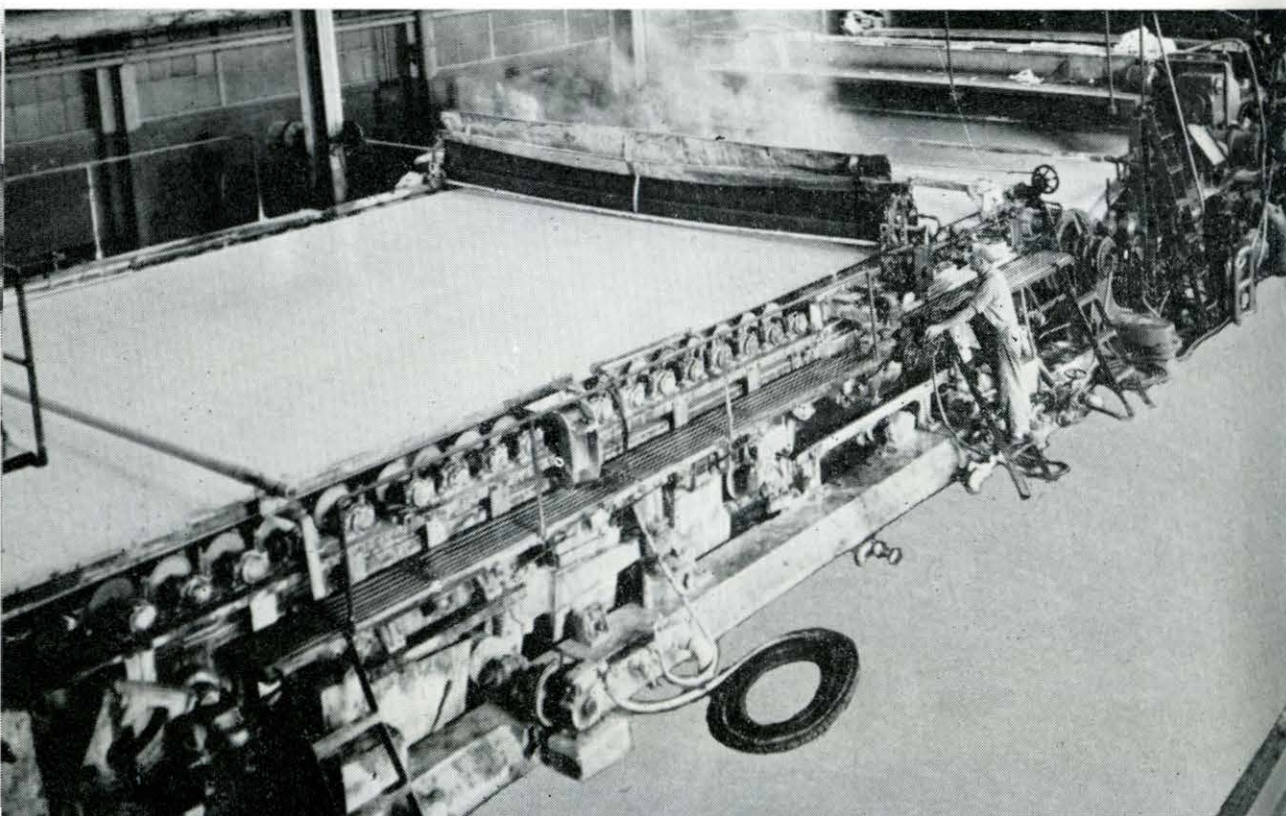




Pulp to Paper (Fourdrinier Process)

The diluted stock pours onto an endless, fine mesh screen known as the Fourdrinier Wire. Here, by sidewise motion and swift movement forward, the scrambling of fibres forms a loosely matted web that tightens as water is drawn from it through the wire by gravity, capillary attraction, suction boxes and suction roll.

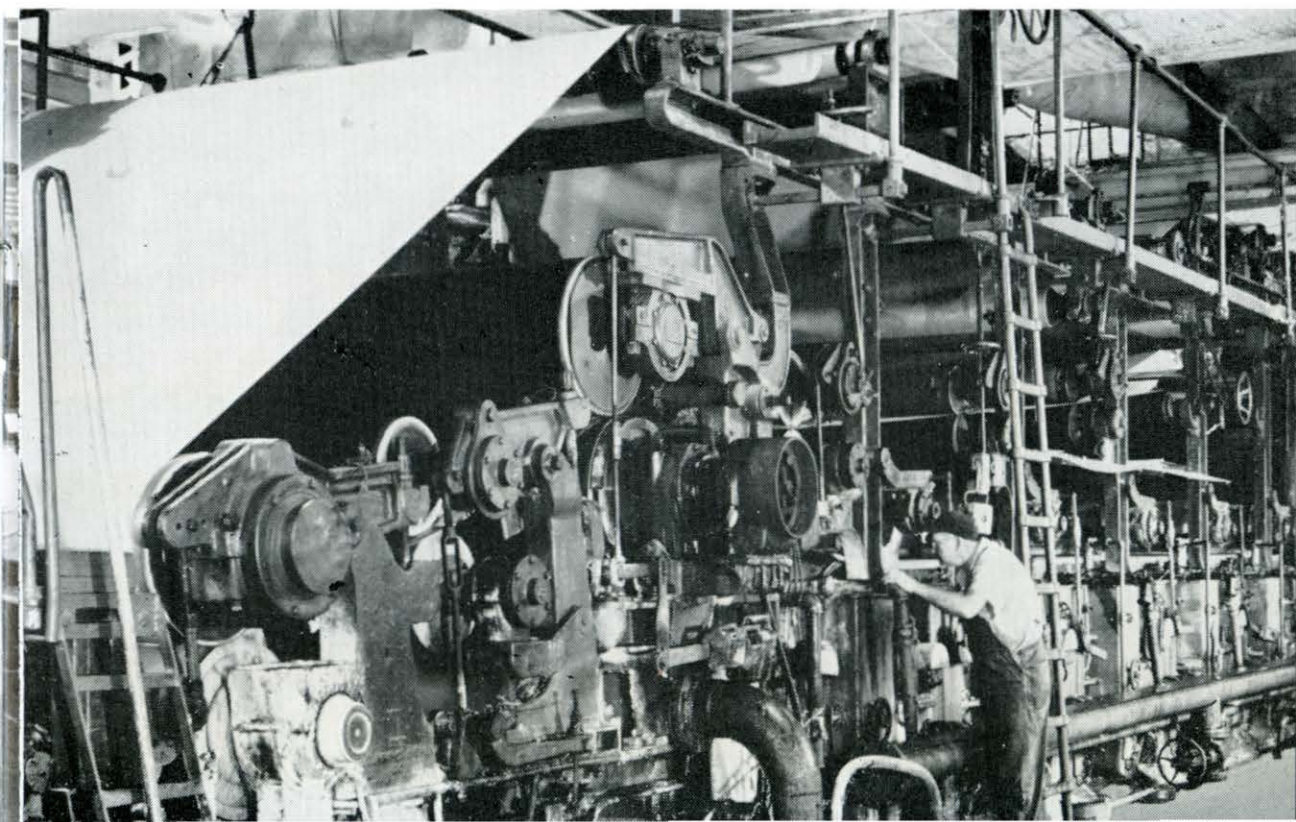
Leaving the Fourdrinier Wire, supported by continuous woolen felts, more water is removed by pressure and suction as the web of paper passes through the press and smoothing rolls on its way to the dryers.

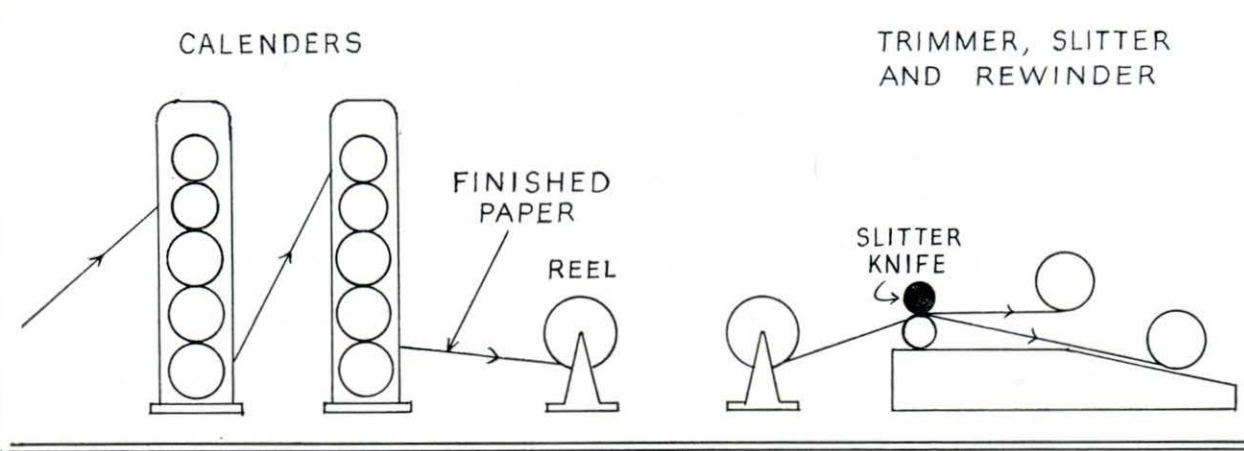
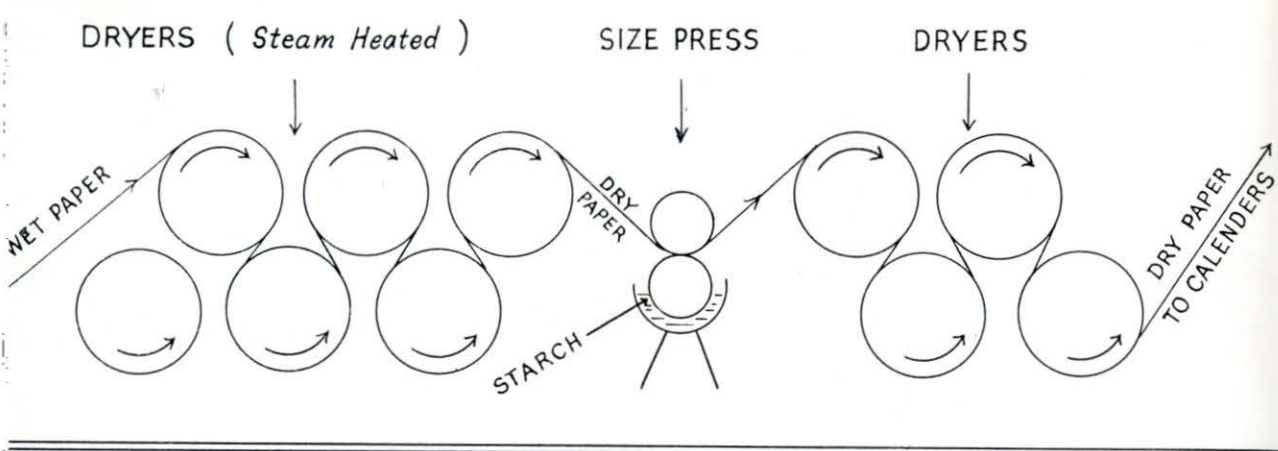


Pulp to Paper (Cylinder Process)

In the Cylinder process, used for forming most heavy paperboards, the diluted stock flows from the head box into a series of machine vats. Each vat contains a revolving cylinder, covered with wire mesh, which picks up the pulp from the water and transfers it continuously to an endless woolen felt.

A layer of pulp is picked up from each cylinder in operation, building up the desired thickness on the felt. Suction and press rolls remove excess water and squeeze the sheet into compact form.





Dried And Tub-Sized . . .

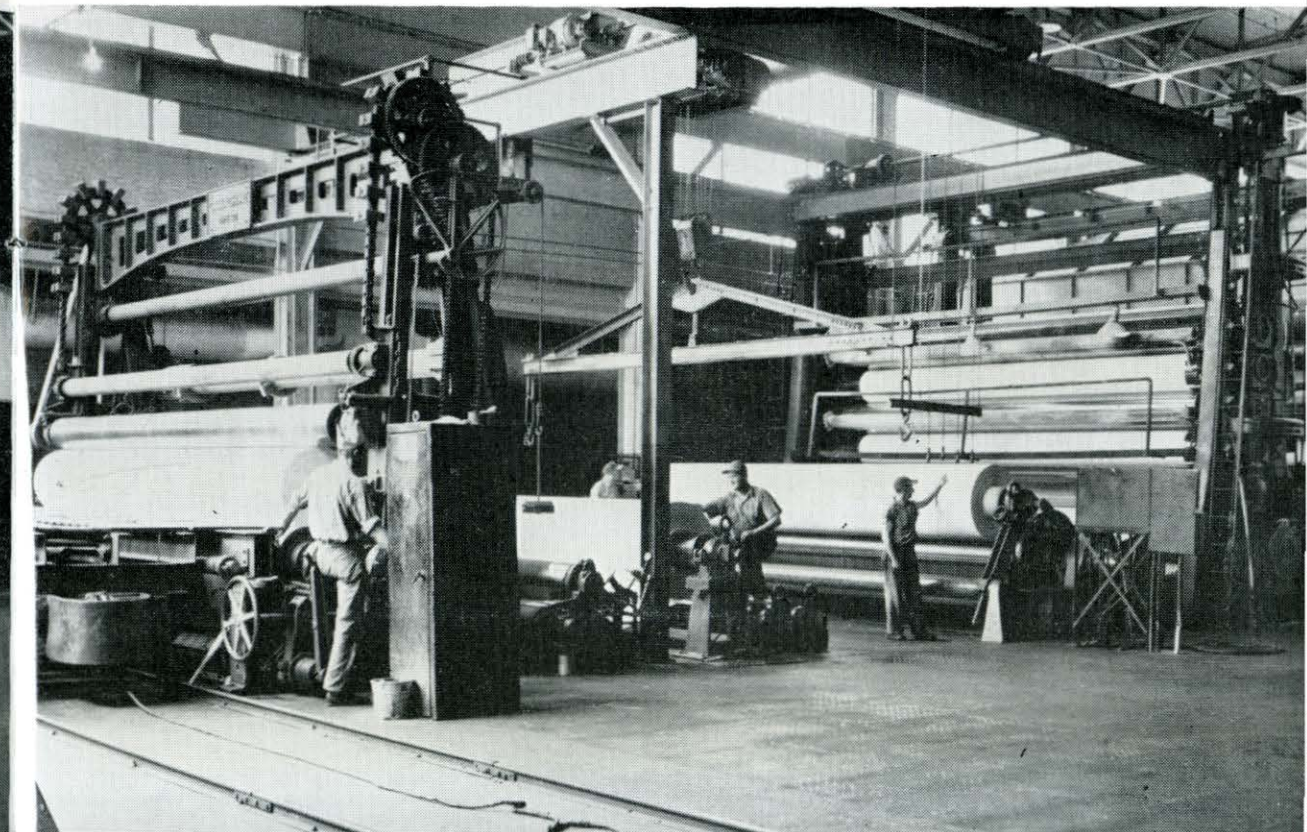
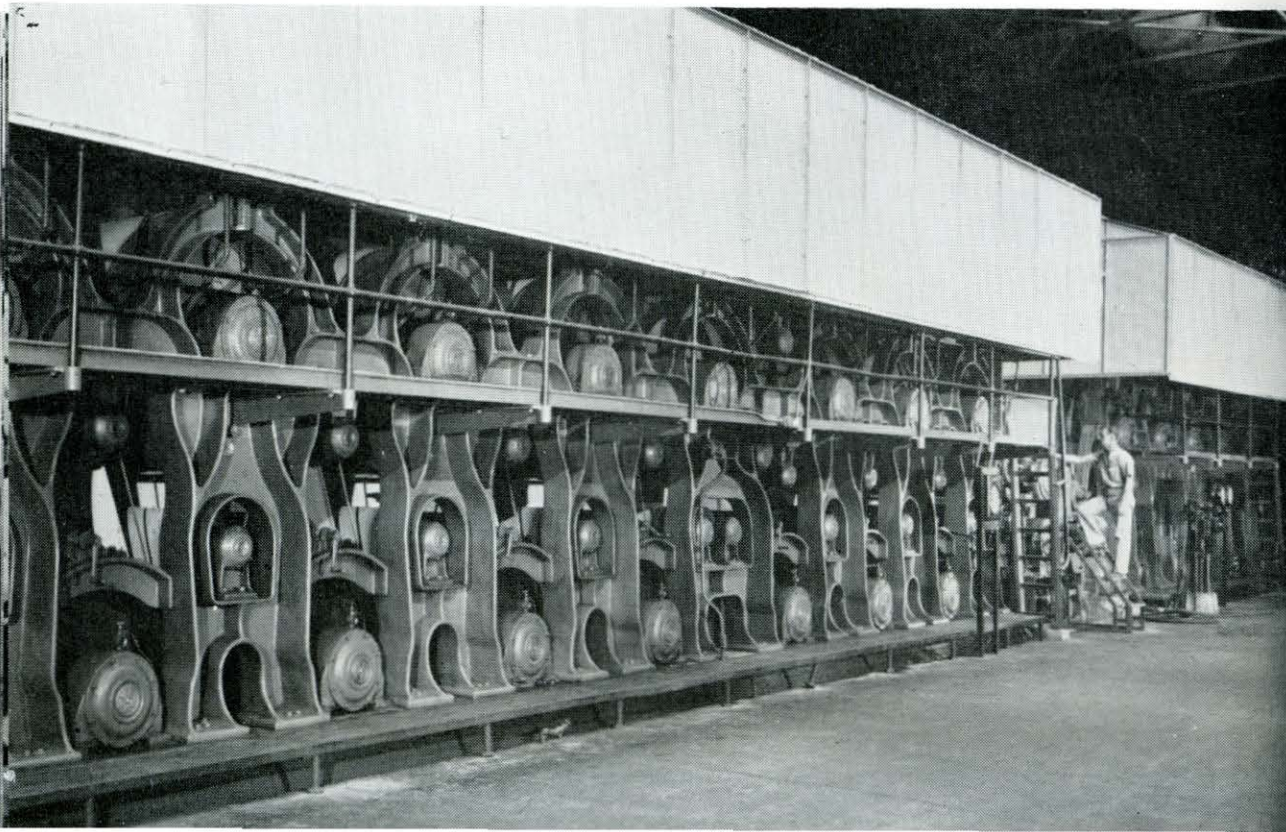
Paper from the Fourdrinier machines, and paperboard from the Cylinder machines, next enter the dryer section, a series of large steam heated rolls. Up, down, over and under it goes until it becomes dry, firm and strong. From every ton of paper or paperboard about 195 tons of water must be removed during the manufacturing process.

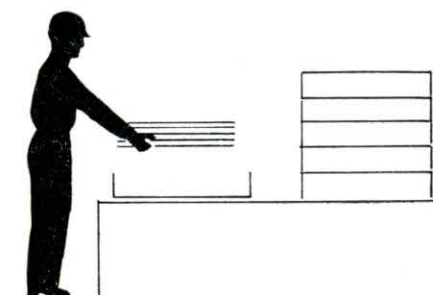
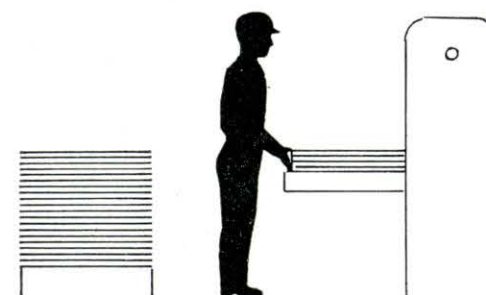
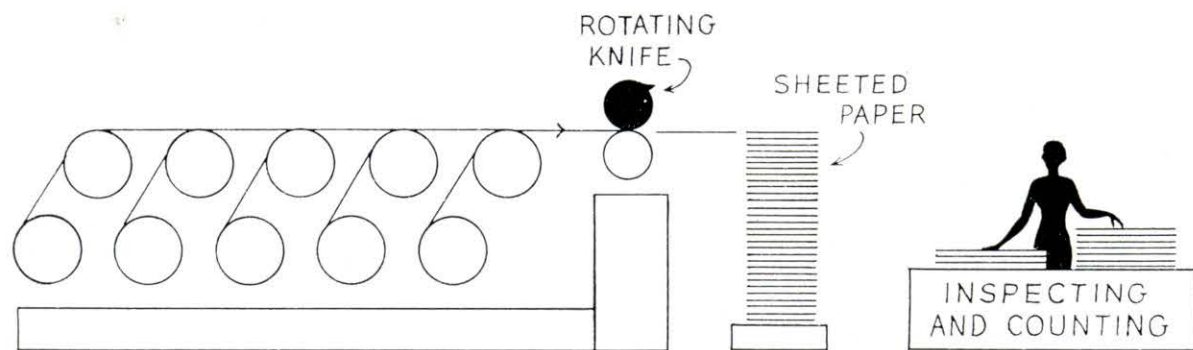
Fourdrinier papers are dried, then tub-sized with a starch solution to improve strength, finish and inking qualities, and dried again.

Ironed And Into Rolls . . .

After its roundabout trip through the dryers, the sheet enters the calender stacks and is "ironed" to the desired degree of smoothness by highly polished steel rolls.

The finished paper is wound on a reel as it leaves the calender stacks, then transferred to a rewriter which slits the sheet to widths specified by our customers, and rewinds the paper into rolls. Some paper is shipped in rolls and some is cut into flat sheets.





Sheeted And Counted . . .

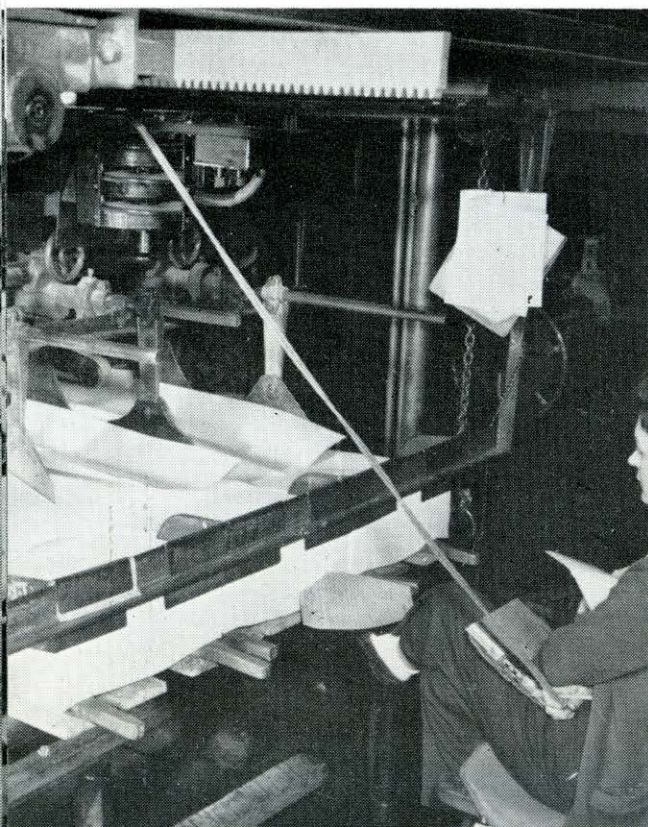
Finished rolls of paper are converted to flat sheets on rotary cutters capable of cutting as many as 12 rolls of paper at one time, to specified sizes. Mechanical and hand counting of the stacks of paper assure accuracy of shipments.

During the counting all stacks found to contain sub-standard paper are sent to the sorting line for culling of defective sheets. Careful inspection is maintained constantly to insure printers and converters of the finest possible performance.

Trimmed And Packed . . .

Some sheeted paper, particularly that which is to be die-cut into envelopes, is shipped to the customer untrimmed. Paper for printing, however, goes to huge guillotine trimmers which cut the edges square, smooth and true to exact sizes. This assures trouble-free runs on high speed automatic presses.

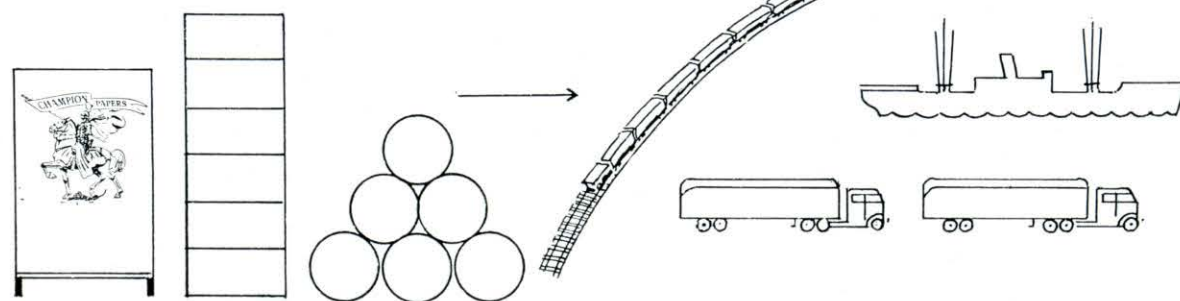
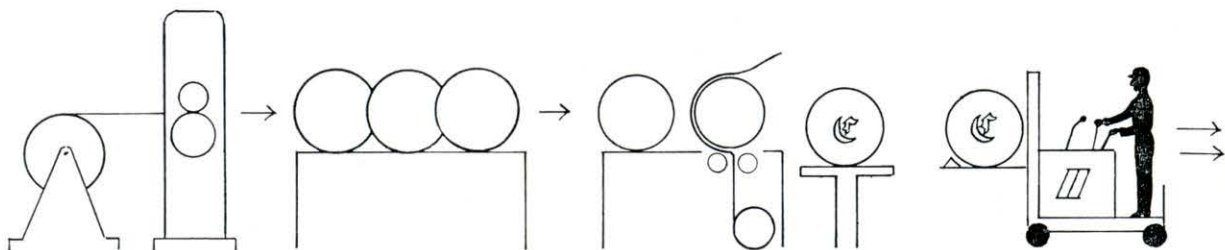
The paper is packed in bundles, cartons and cases, or on skids, as the customer desires. Special care is exercised in packing to prevent damage in transit.



Customers Want Paper in Rolls, Too!

REWINDING

WRAPPING



Rolls of All Sizes . . .

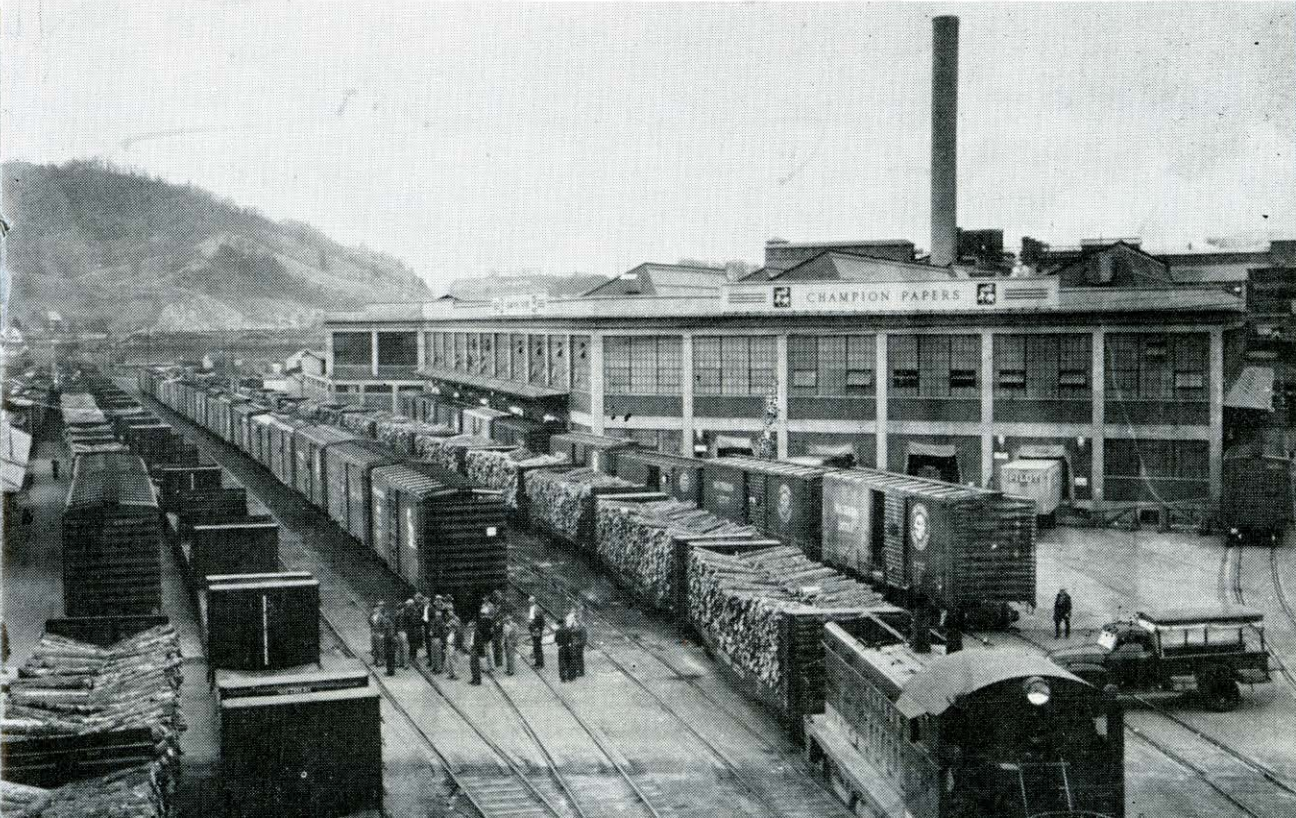
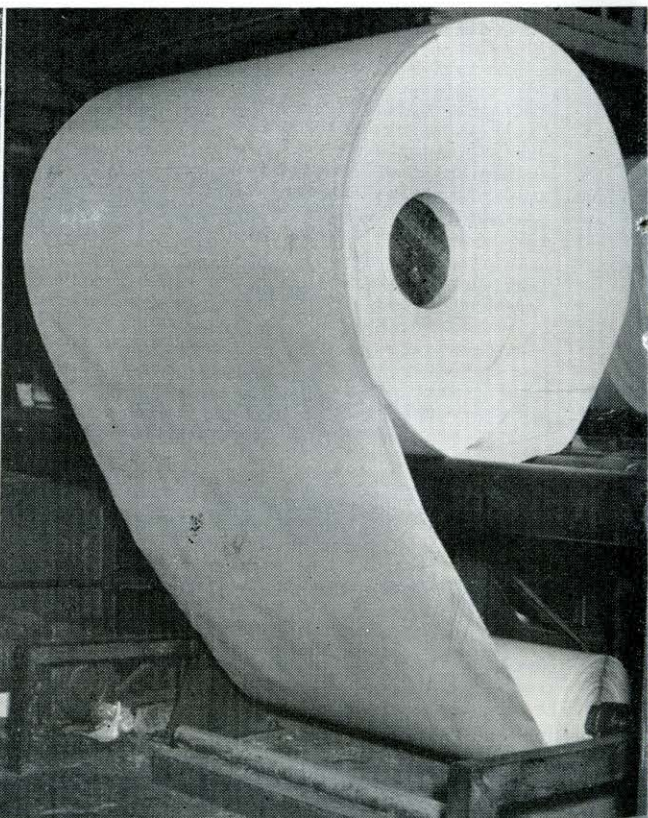
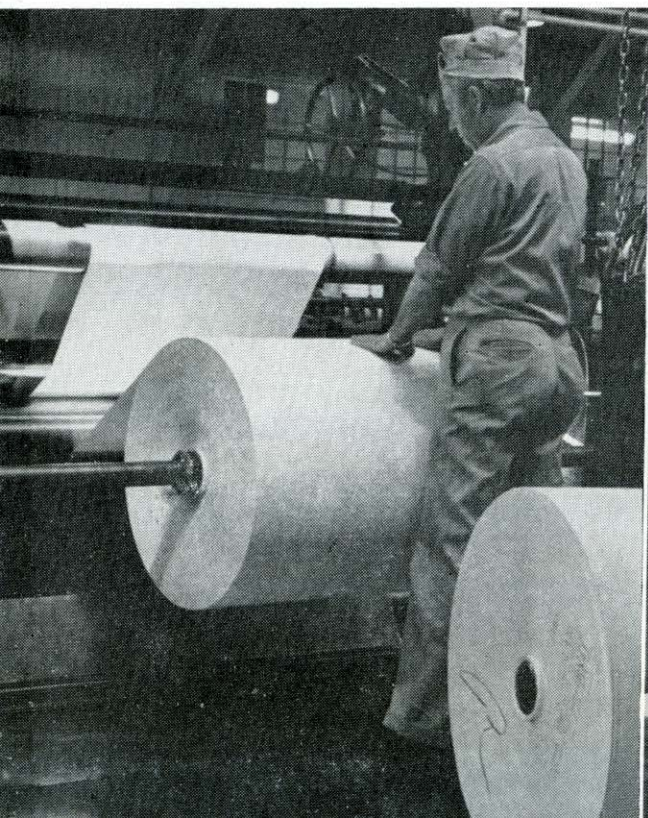
Approximately half of the paper and paperboard produced at the Carolina Division is shipped to customers in rolls of a wide variety of sizes and weights. Many are wrapped and shipped directly from the rewinders at the ends of the great paper machines. Most small rolls are processed from large ones on other rewinders as shown below.

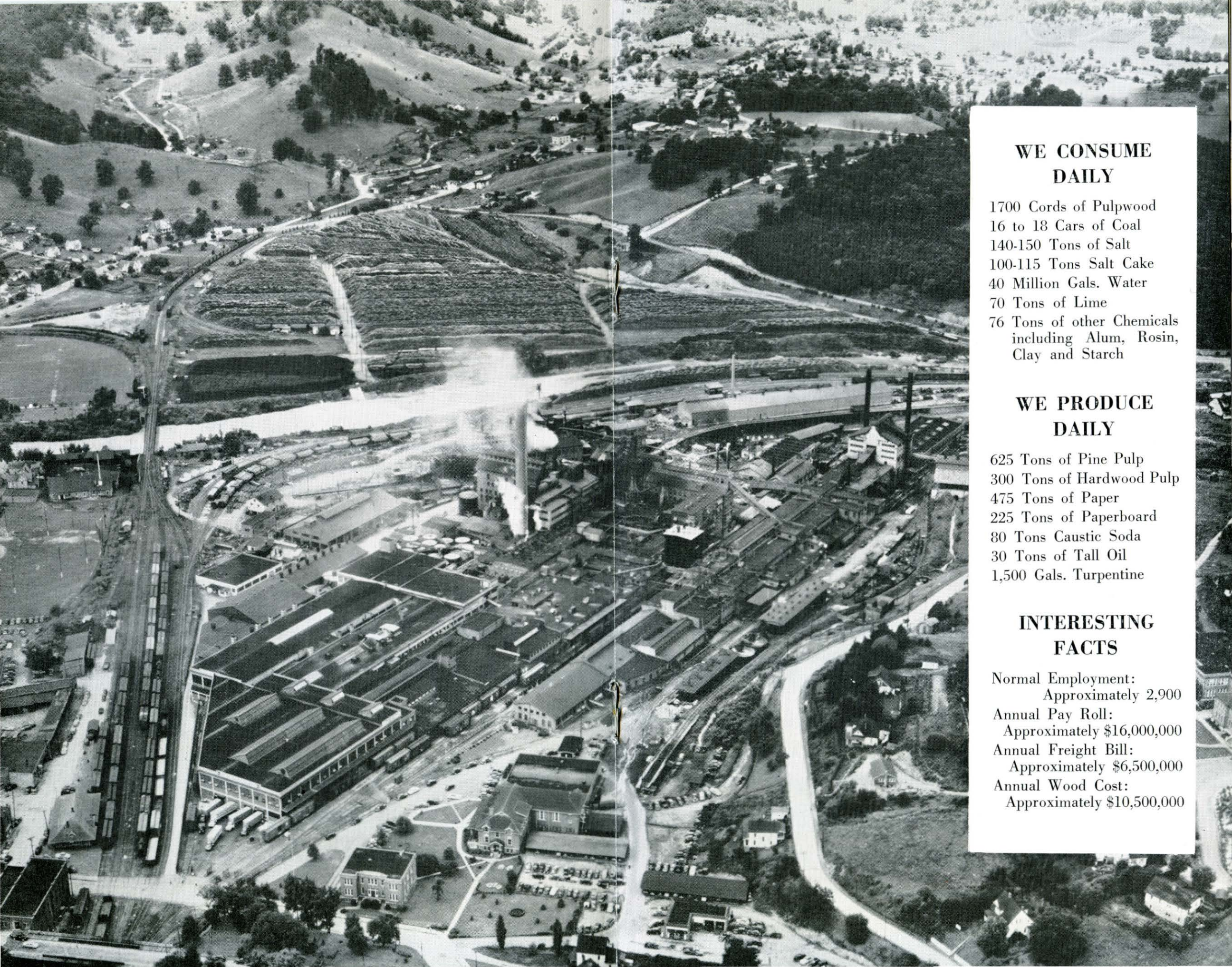
Samples from each roll are closely inspected to insure proper quality. Several layers of heavyweight wrapper are applied to protect each roll.

Off to Many Destinations . . .

Champion paper in many grades leaves the Carolina Division at the rate of 700 tons every day, destined for customers all over the United States and in many foreign countries. Also, 150 tons of pulp are shipped daily to Champion's Ohio Division.

135-140 freight cars, 15-20 trailer trucks, and 260-265 wood trucks enter or leave the mill each day bringing in raw materials and taking out our products. The total freight bill is more than \$6,500,000.00 annually.





WE CONSUME DAILY

1700 Cords of Pulpwood
16 to 18 Cars of Coal
140-150 Tons of Salt
100-115 Tons Salt Cake
40 Million Gals. Water
70 Tons of Lime
76 Tons of other Chemicals
including Alum, Rosin,
Clay and Starch

WE PRODUCE DAILY

625 Tons of Pine Pulp
300 Tons of Hardwood Pulp
475 Tons of Paper
225 Tons of Paperboard
80 Tons Caustic Soda
30 Tons of Tall Oil
1,500 Gals. Turpentine

INTERESTING FACTS

Normal Employment:
Approximately 2,900
Annual Pay Roll:
Approximately \$16,000,000
Annual Freight Bill:
Approximately \$6,500,000
Annual Wood Cost:
Approximately \$10,500,000

THROUGH the preceding pages you have followed the direct flow of pulp and paper manufacture. To complete the picture of the Carolina Division, we now present supporting functions that are vital to successful operation.

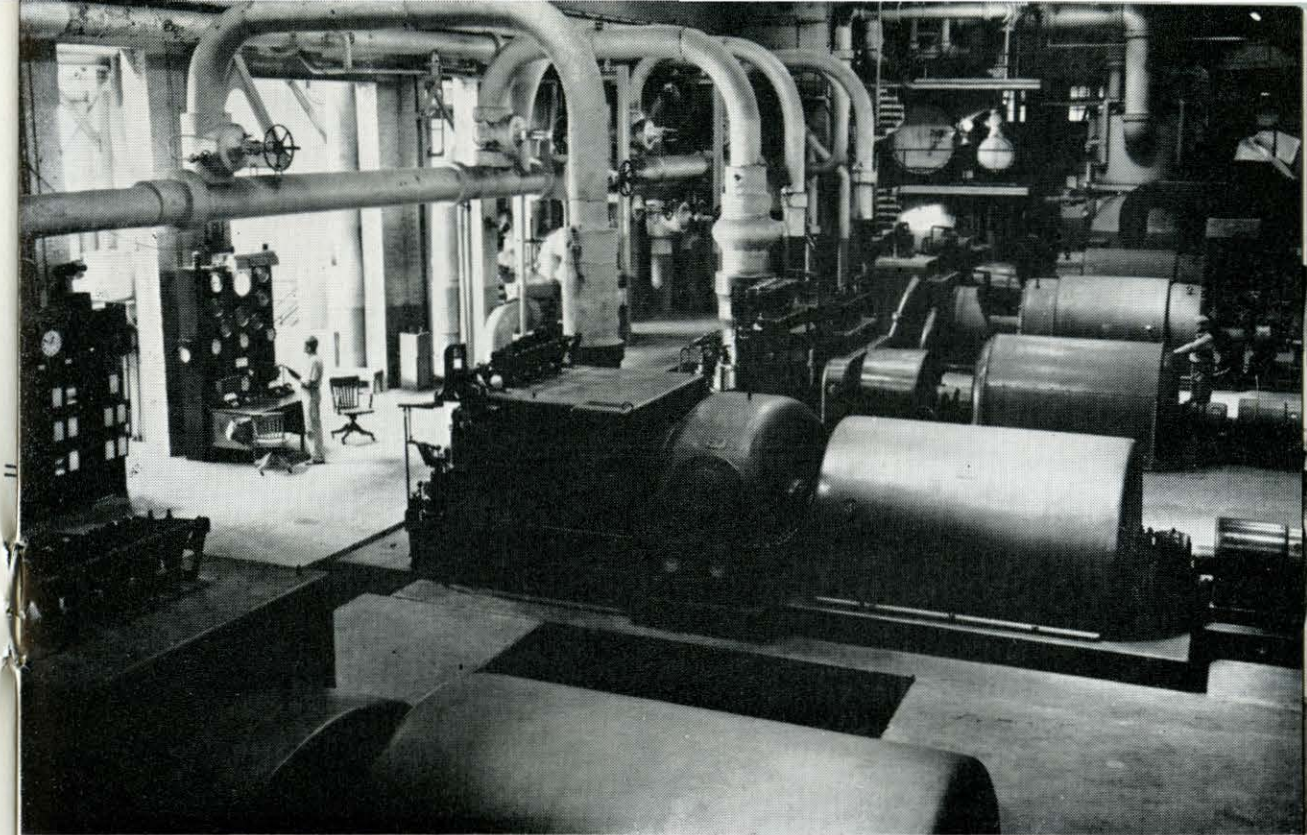
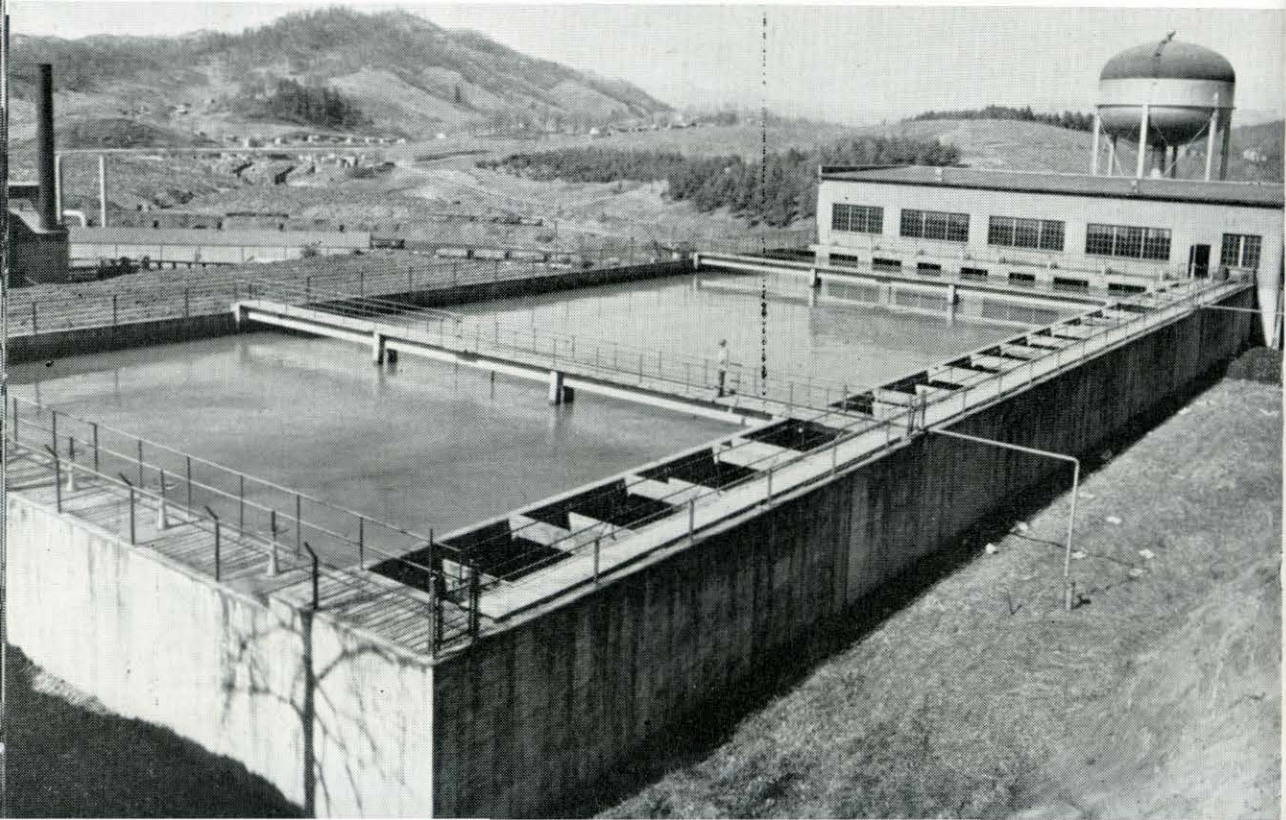
Water

Water is the lifeblood of a pulp and paper mill. It is used both chemically and physically in production processes, and is the medium for transporting pulp from stage to stage of operations.

The Carolina Division uses 40 million gallons of water daily. Our source is the Pigeon River, originating in Pisgah National Forest, and is supplemented by the Lake Logan reservoir with a capacity of 670 million gallons. Purification methods are essentially those of any municipality treating surface water.

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Filter Plant



Turbine Room

Steam And Electrical Power

The Carolina Division of Champion produces all of the steam and electrical power required for the operation of the entire plant. Steam is used in many of the manufacturing processes, for heating the buildings, and for generating vast amounts of electricity.

Three huge boilers develop 1,200,000 pounds of steam per hour, at 400 pounds pressure and a temperature of 700 degrees Fahrenheit. To make this steam, approximately 150,000 gallons of water are used per hour, and 14 to 16 carloads of coal are pulverized and burned every 24 hours. A battery of steam-driven turbines generate 50,000 k.w. of electricity per hour, enough to supply a city of 100,000 people.

Considerable supplementary steam for plant operation is obtained from the chemical recovery furnaces, and from the burning of bark with coal in the newest design of bark-burning unit developed here.

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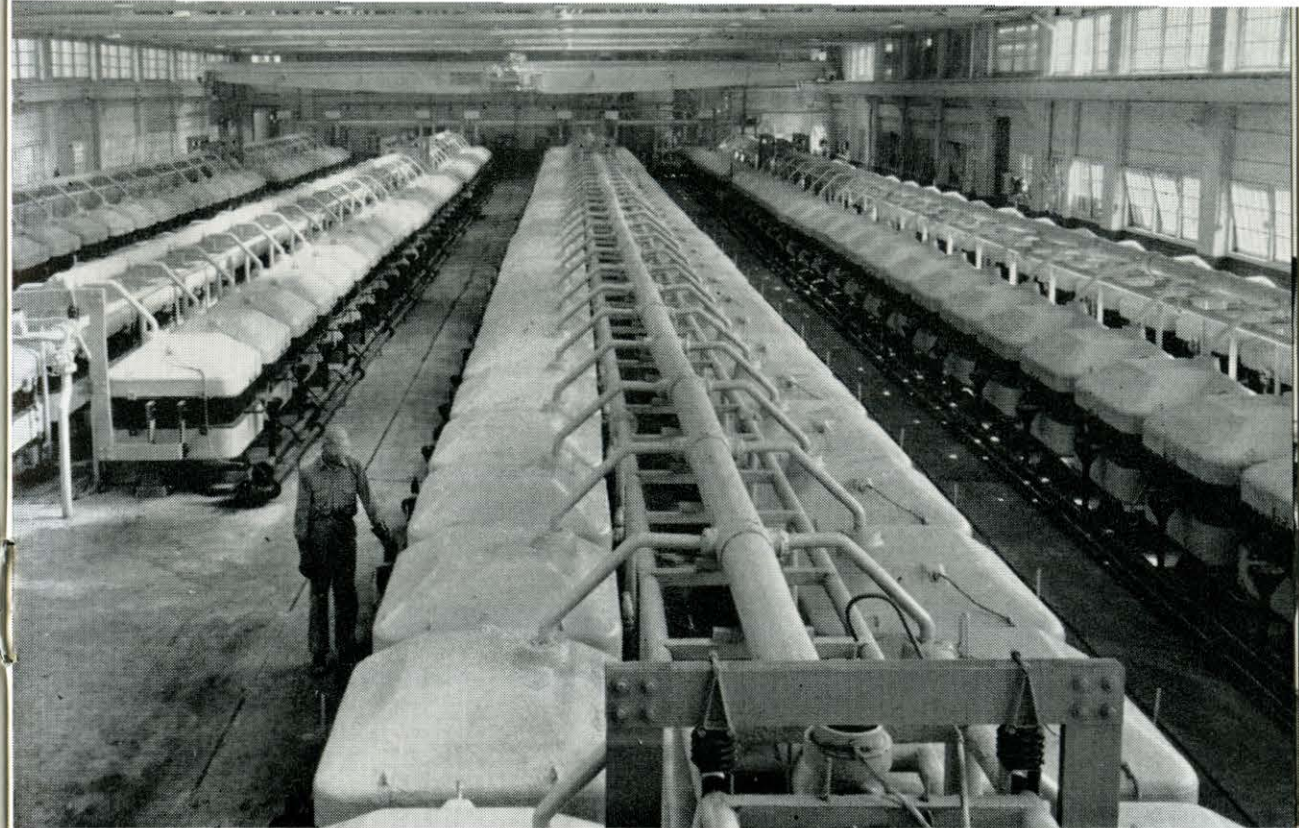
Drying Pulp For Shipment

Each day the Carolina Division produces approximately 250 tons of pulp in excess of the requirements for the manufacture of paper and paperboard. Some is converted to wet-lap sheets and stored as an emergency reserve supply, but most of it is dried, baled and shipped to Champion's Ohio Division for use in making the fine coated papers upon which this booklet is printed.

The excess slush pulp is formed into a sheet by the cylinder process, as described on page 13, from which the excess moisture is removed by press rolls and steam heated dryers just as in the manufacture of paper. The dried pulp is slit and cut into sheets, 30 x 30 inches, and powerful hydraulic presses compress it into 450-pound bales for shipment or storage.

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Baling Dried Pulp



Hooker Cells

Electrolytic Bleach Plant

Chlorine is the basic chemical used for bleaching brown pulp to a bright white color. The Carolina Division produces its own chlorine at the rate of 75 tons daily, with a resulting by-product of 80 tons of caustic soda daily. These chemicals are made by passing direct electric current through a saturated solution of sodium chloride (common salt), the reaction taking place in 254 Hooker electrolytic cells.

The chlorine is mixed with water for the first stage of bleaching pulp, and with lime water to form calcium hypochlorite for successive stages. The caustic soda is evaporated to a 50% solution, purified, and shipped in tank cars and tank trucks to customers in the textile finishing industry.

Our Electrolytic Bleach Plant uses 150 tons of salt, 35 tons of lime, and 230,000 k.w.h. of electricity each day.

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Recovery of Used Chemicals

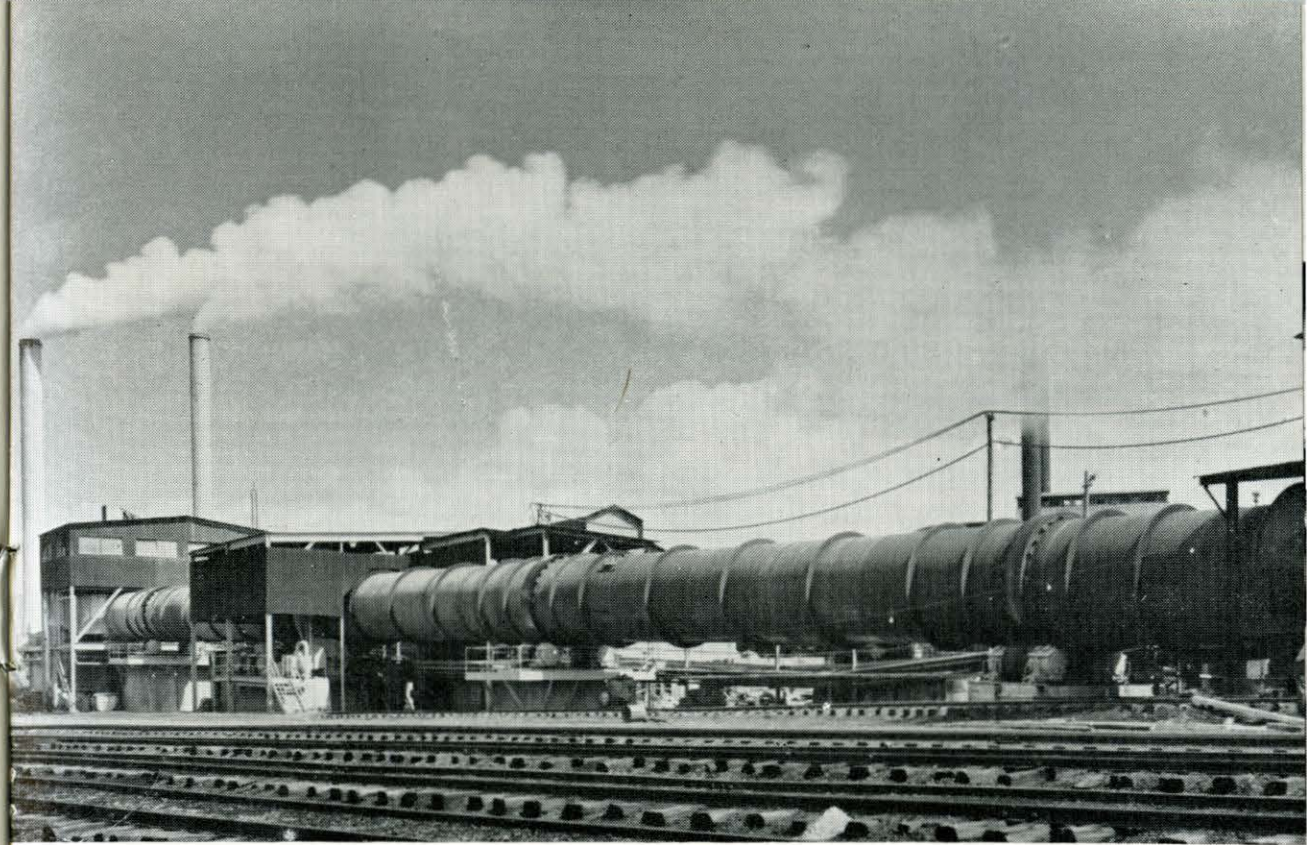
The cost of producing pulp and paper is subject to the degree of success with which used chemicals can be reclaimed for re-use. In order to remain competitive in the industry Champion has invested heavily to equip the Carolina Division with efficient chemical recovery units.

The chemical solution used in cooking wood chips gains enormous quantities of water during the process, and also contains the lignin which has been separated from the cellulose fibres of the wood. In this state it is called black liquor. The lignin will burn readily after excess water is removed from the solution.

More than a million gallons of black liquor per day pass through sextuple-effect evaporators, which remove 35,000 gallons of water per hour. Still more moisture is removed by disc evaporators, and at this point new make-up chemicals

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Smelter Furnace Building



Rotary Lime Kiln

(salt cake or glauber salt) are added. This mixture is sprayed into four smelter furnaces where the lignin burns, leaving a "smelt" residue of chemicals for use in making new cooking liquor. The heat generated thereby makes about 300,000 pounds of steam per hour for plant operations.

Large amounts of lime are also used in the preparation of cooking liquor. Recovery of used lime is accomplished in two tremendous rotary lime kilns, one 8 ft. by 317 ft. and the other 10½ ft. by 312 ft., with total daily capacity of 300 tons of reburned lime.

The used lime, in wet sludge form, is fed into the upper end of the kiln and gradually works its way to the lower end of the rotating drum. Coal gas entering the lower end is ignited and heats the kiln, driving off carbon dioxide and water in the sludge, leaving reburned lime ready to be used again.

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Chemical Laboratory

The Chemical Laboratory serves all operations. Raw materials are analyzed and the findings reported to those interested. Material in process, such as chips of wood, bleached and unbleached pulp, and cooking and bleaching solutions, require testing at many steps of the operations. This work is a laboratory function.

Fuel, flue gases, dyes, clay, sizing materials as well as many new products offered for use are the subject of laboratory study. The testing of pulp quality and chemical tests of paper, as well as the pre-shipping examination of our chemical products—Caustic Soda, Trostol and Turpentine—all come into the laboratory responsibilities. The constant watch over waste waters for loss of valuable materials is a laboratory duty of major importance.



Humidified Testing Room

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Chemical Laboratory



Paper Testing And Inspection

The function of the Inspection Department is to insure that established quality standards for finished products are maintained at all times. Continuous checking and testing of the various physical and chemical properties of the paper during the manufacture reveal any variations in quality. The manufacturing department is kept informed constantly of these test results, and thus is able to take corrective action promptly when indicated.

During the finishing processes, the Inspection Department checks the product for general quality and appearance as well as for dimensions, weight, strength, color and other characteristics.

This department also maintains a comprehensive inventory of samples of Carolina Division papers and paperboards as a service to customers and prospective customers.

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Plant Engineering

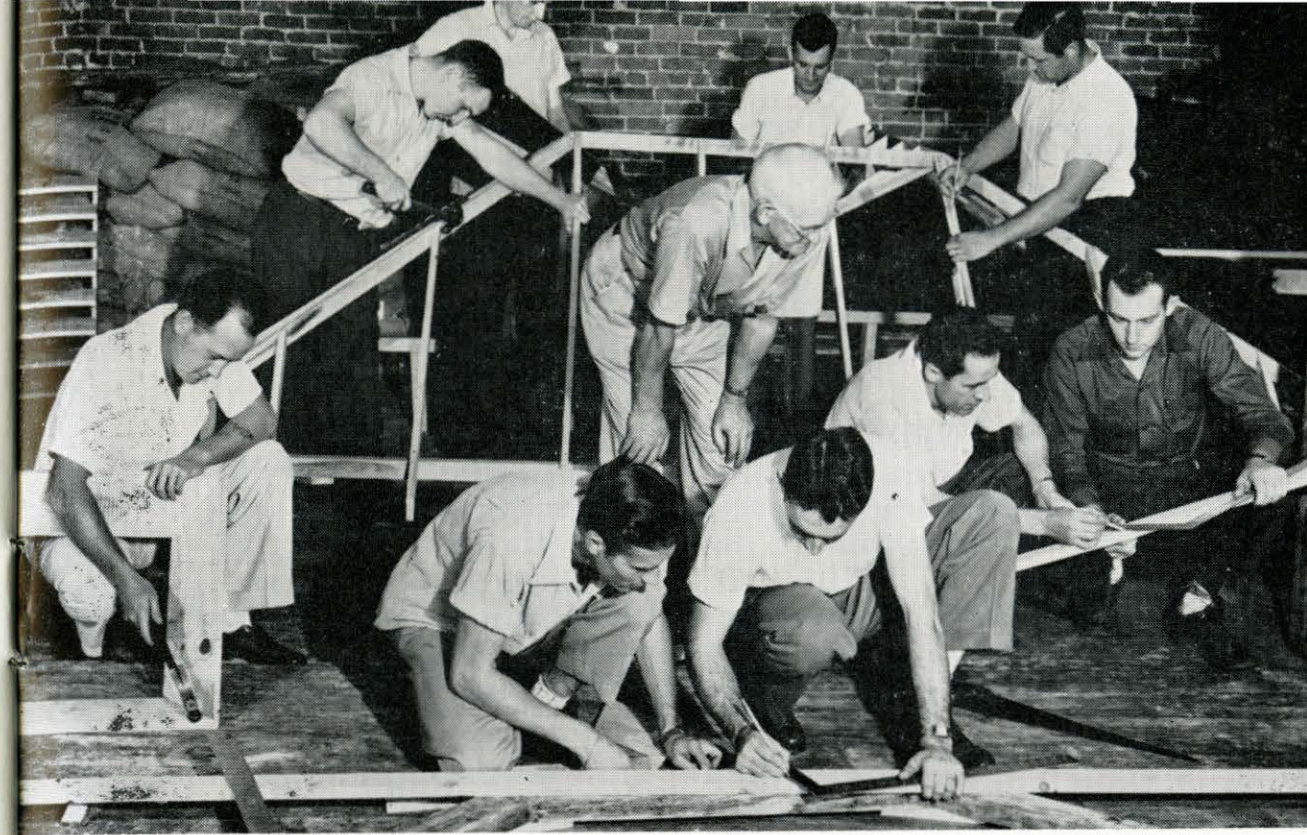
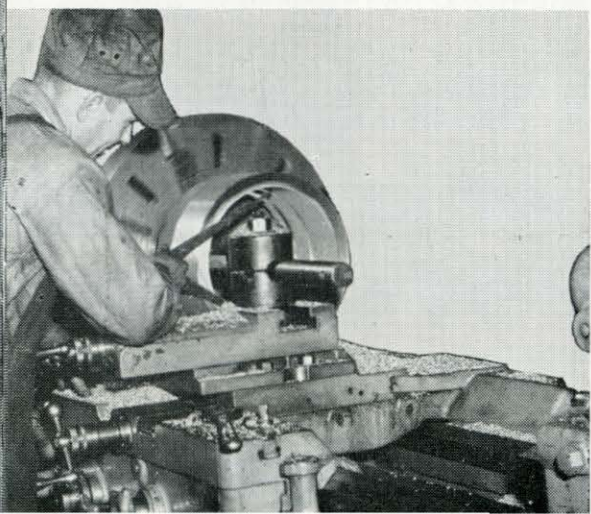
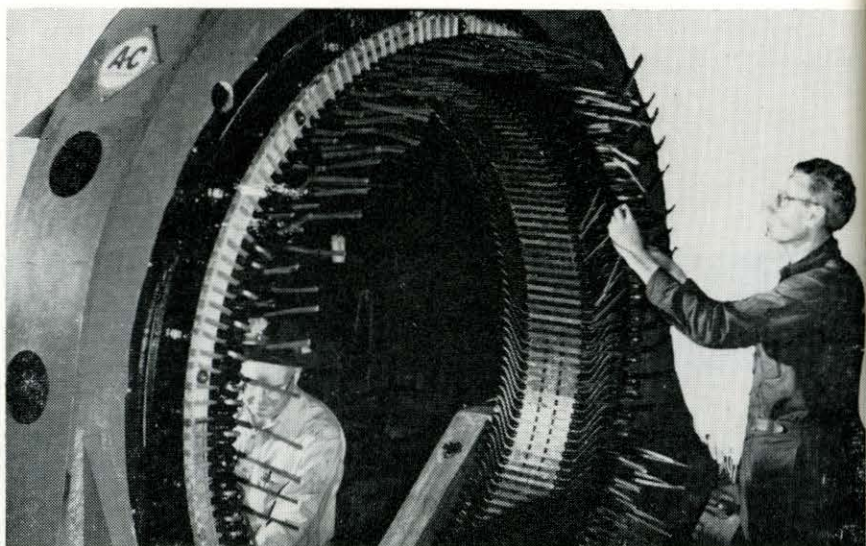
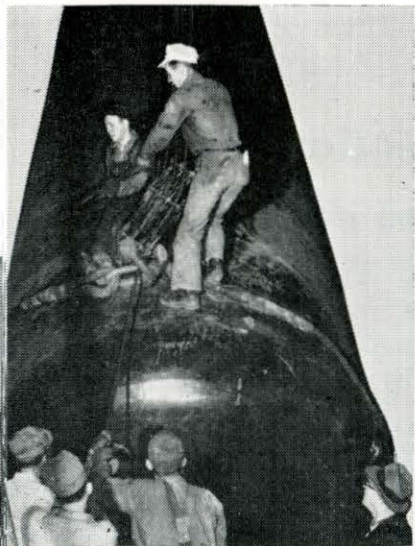
For Champion to maintain its leadership in the pulp and paper industry it is necessary that it have a well rounded and diversified plant engineering department.

The Plant Engineering Department is responsible for new construction, repairs and replacements, and routine maintenance and service for the continuous 24-hour per day plant operation.

This department is staffed with qualified and experienced engineers who are capable of dealing with the many technical

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Skilled Craftsmen at Work



Apprentice Training Class

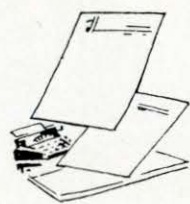
problems encountered in the design, construction, maintenance and operation of the plant.

The workers in this department represent nearly all of the skilled mechanical trades, there being foundrymen, pattern makers, machinists, welders, iron workers, sheet metal workers, millwrights, pipefitters, carpenters, riggers, oilers, truck drivers, concrete workers, painters, electricians, and also mechanics with special training in the care of some special equipment items.

To improve and maintain this working force, Champion provides a special Mechanical-Electrical Apprentice Training Program to train young men in the skills required in the mechanical trades. Classroom instruction is combined with actual job training (as illustrated above) in a five-year program leading to qualification as full-fledged journeymen.

Carolina Division Products

ENVELOPE PAPERS, in a wide variety of colors and weights, are used for business and personal correspondence, pay envelopes, church envelopes, heavy mailings, and countless other purposes in many sizes and styles.



BONDS AND WRITINGS, in white and six colors, are used for letterheads, envelopes, factory and office forms, and many other business uses. Made for fine printing, typing, and pen and pencil writing.

TABLET PAPER is made into school tablets, theme books, stenographers' note books, pocket note books, receipt books, score pads, and fillers for ring binders. Also suitable for economy grades of stationery.



POSTAL CARD is used by our federal government for producing the familiar two-cent postal cards, and by many business firms for direct mail advertising. It also has many other uses in the business world.

OFFSET PAPERS are suitable for fine black-and-white and multi-color printing. Many of the beautifully colored advertisements, travel folders, package labels and holiday cards are printed on Champion offset papers.



MIMEOGRAPH PAPERS are used by schools, churches, stores, offices and factories for quick production of an endless variety of printed forms on duplicating machines. Available in white and six attractive colors.

PRESSBOARD in the heavy, rigid weights is used for index dividers in filing cabinets and for covers of blank books, while the lighter weights are used principally for the covers of school tablets and note books.

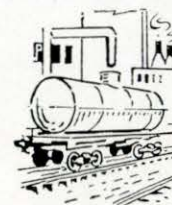


MILK CARTON and Food Container paperboard are manufactured under rigid specifications for conversion to milk bottles, ice cream cartons and cups, and other sanitary food containers of various sizes and types.

Many other grades of papers are made to customer specifications for special uses. Champion papers are sold from coast to coast and in many foreign countries.

By-Products

TROSTOL (Tall Oil) results from the treatment of resins and vegetable oils which are freed from pine wood during the pulping process. It is used in the manufacture of a wide variety of chemical products.



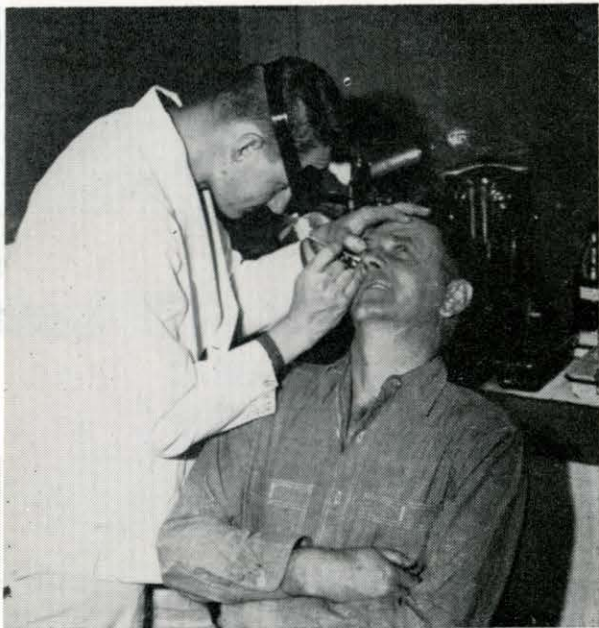
CAUSTIC SODA is obtained during the manufacture of chlorine for bleaching pulp (see page 25). It is used principally by textile finishing plants, and is supplied to them in liquid form.

TURPENTINE is distilled from the vapors which are drawn from the digesters during the cooking of pine wood. It is sold for use in paint, printers ink, insecticides and other similar materials.



But the Champion Story . . .

This booklet has briefly shown the endless flow of wood, the complicated processes, and the mechanical operations and services used by Champion to produce finished paper and by-products. But Champion means people, too, for machines are only as efficient as the intelligent minds and skilled hands that guide them.



Pre-employment physical exam and industrial medical service for employees



Great emphasis is placed on safe working practices and safe working conditions



Modern cafeteria and canteens provide hot food and refreshments at low prices



A credit union provides convenient savings and loan plans for employees

. . . Doesn't End With Production

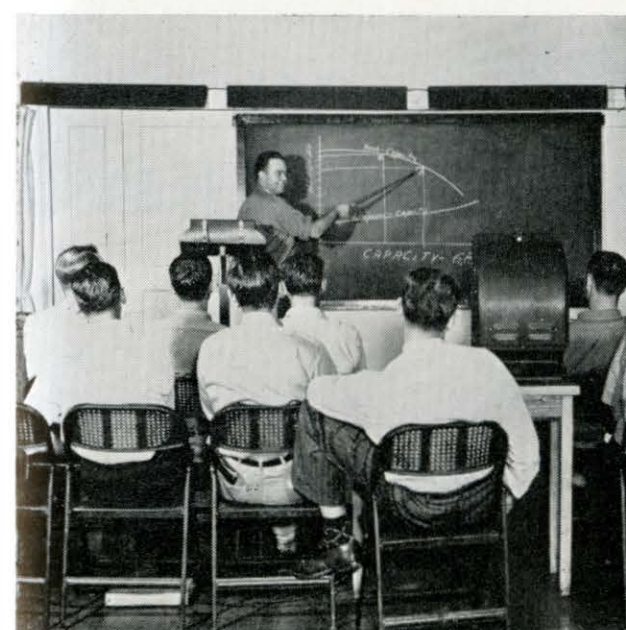
Many people have helped Champion grow over the years, and have themselves lived and grown as members of our organization. Champion is proud of this long and friendly association, and has always tried to provide every possible benefit for the comfort, convenience, safety and financial stability of its employees.



Hospital, Surgical, Health and Accident, Retirement and Death Benefits are provided at no cost



Clean, comfortable facilities for the personal convenience of employees



Many training courses help employees prepare for future job opportunities



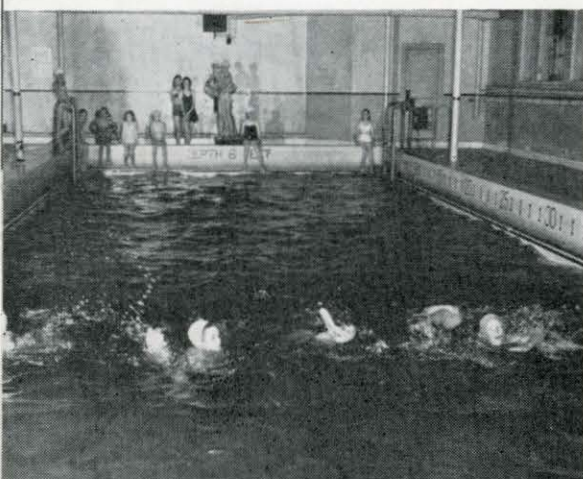
Champion policy provides for liberal paid vacations for employees



Checkers in the "Y" recreation room



Softball is popular in Canton



All ages enjoy the "Y" swimming pool



The men like pocket billiards

Indoor and outdoor recreation for the entire family at Camp Hope



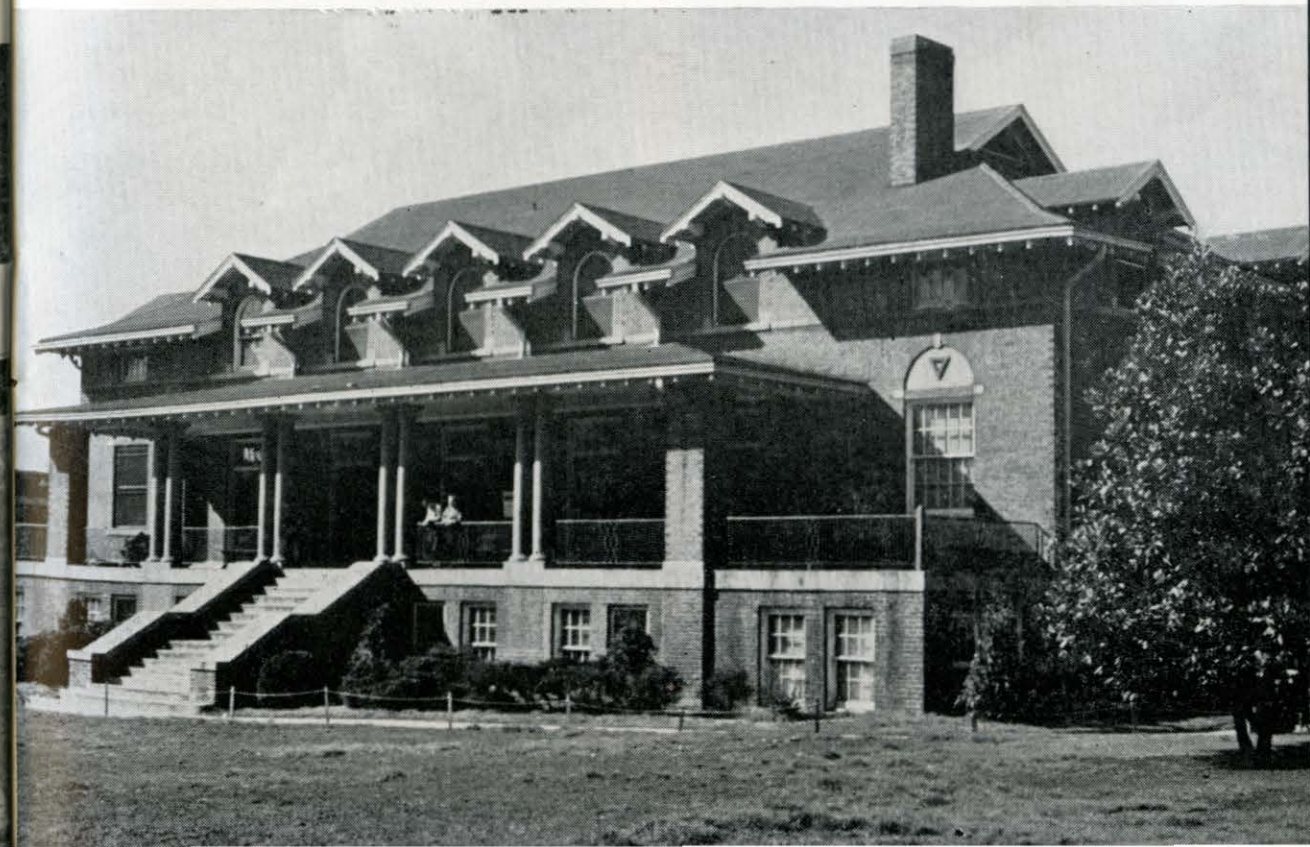
Recreation For Champion Families

Champion recognizes the value of wholesome relaxation during "off the job" hours. The Carolina Division sponsors a year-around program of recreational, social, educational and religious activities.

The services and facilities of the Champion Y.M.C.A. and beautiful Camp Hope, and the Canton High School grounds in summer, are provided for Champions and their families, and for Champion's neighbors in the community.



Social and recreational activities the year around at the Champion Y.M.C.A.



Good Forestry Habits

The pine and hardwood forests of North Carolina, South Carolina, Georgia and Tennessee play a vital role in the production of fine Champion papers. For this reason, and because of the value of the forests to the people as a whole, Champion is intensely interested in the conservation of this vast natural resources.

Champion conducts a comprehensive program of reforestation and conservation on its own holdings of approximately 260,000 acres in the four-state area, and encourages these practices among neighboring landowners. Several hundred thousand tree seedlings are purchased each year and contributed for planting on idle acres of private lands.

In this way Champion does its part to insure that our forests will continue to supply pine and hardwood for future generations.



Seedlings from forest tree nurseries . . .



. . . are later transplanted in timber country.

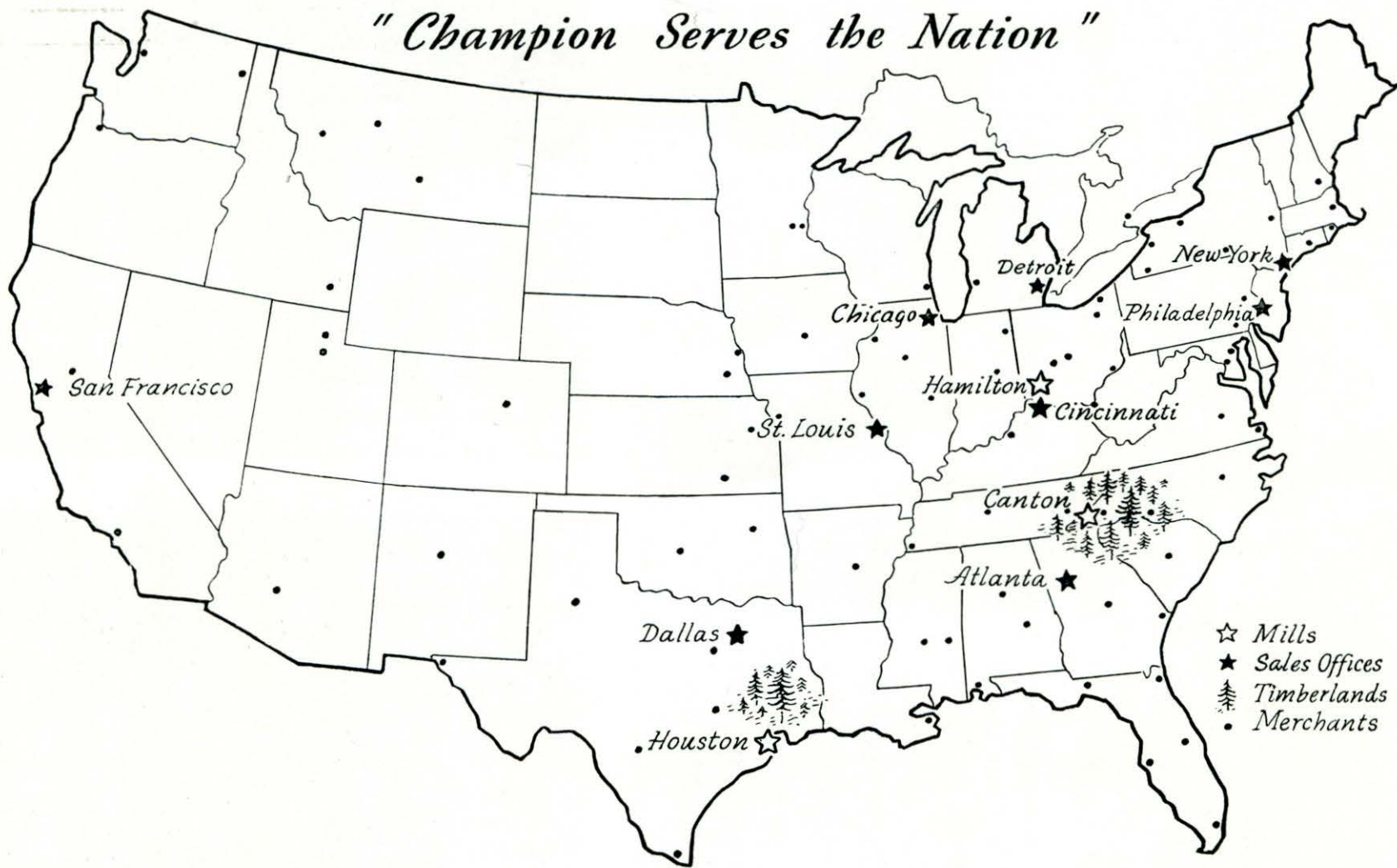


Trees are marked for proper cutting . . .



. . . to assure a good remaining stand.

"Champion Serves the Nation"



October, 1956