Injuries and Accident Causes in Textile Dyeing and Finishing

A Detailed Analysis of Hazards and 1945 Injury-Frequency Rates by Region, Size of Plant, and Occupation

Bulletin No. 962

UNITED STATES DEPARTMENT OF LABOR

BUREAU OF LABOR STATISTICS

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Maurice J. Tobin, *Secretary*

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Ewan Clague, *Commissioner*

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Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
BUREAU OF LABOR STATISTICS,
Washington, D. C., Sept. 26, 1949.

The SECRETARY OF LABOR:

I have the honor to transmit herewith a report on the occurrence and causes of work injuries in the textile dyeing and finishing industry.

This report, a portion of which appeared in the July 1948 Monthly Labor Review, constitutes a part of the Bureau's regular program of compiling work-injury information for use in accident prevention work. The statistical analysis and the preparation of the report were performed in the Bureau's Branch of Industrial Hazards by Frank S. McElroy and George R. McCormack. The specific accident prevention suggestions were prepared by the staff of the Safety Standards Division of the Bureau of Labor Standards.

EWAN CLAGUE, *Commissioner.*

Hon. MAURICE J. TOBIN,
Secretary of Labor.

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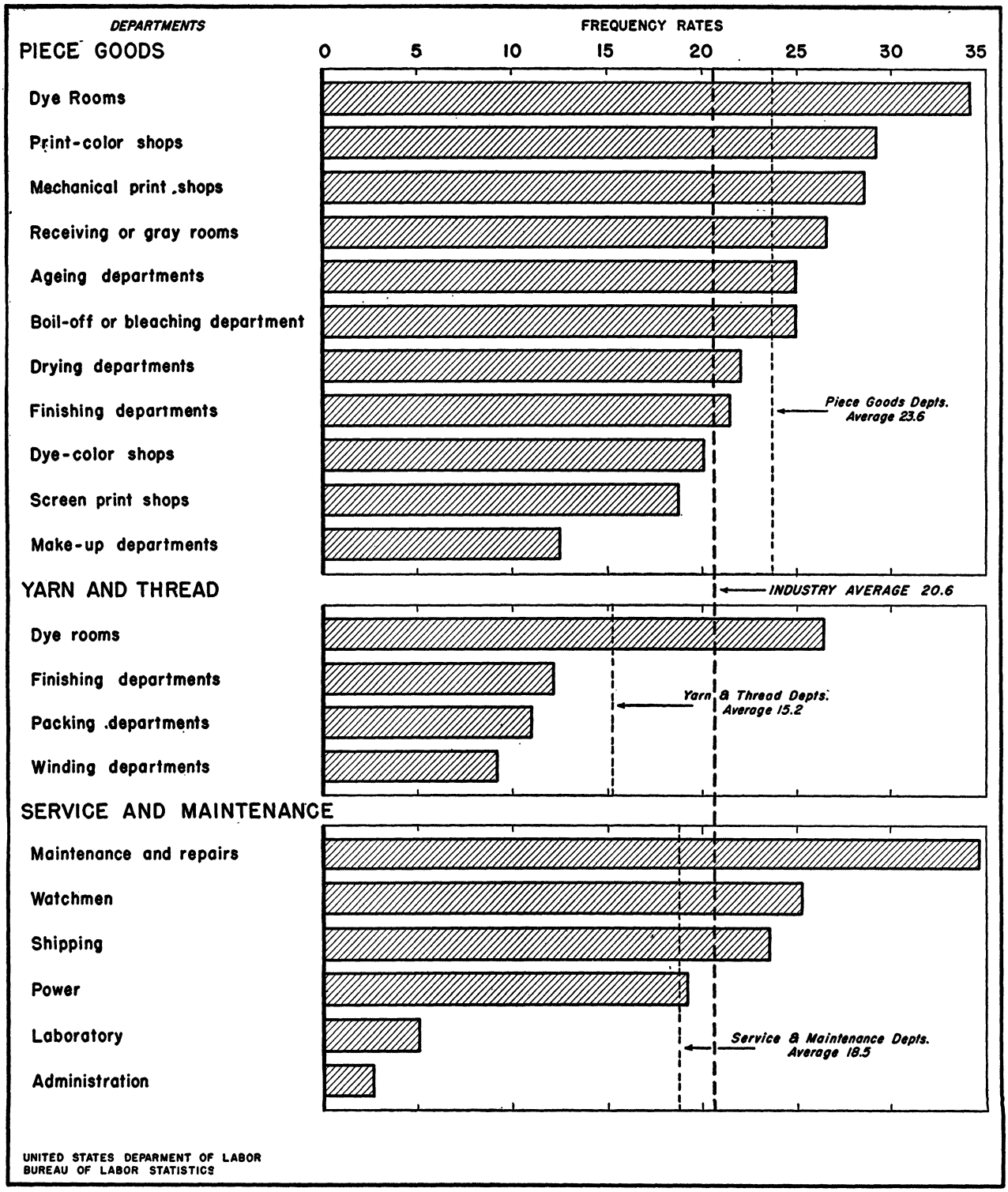


Injuries and Accident Causes in Textile Dyeing and Finishing

The Industry Record

In each of the 12 years for which the Bureau of Labor Statistics has compiled injury rates for textile dyeing and finishing, this industry has had one of the least favorable accident records among the industries comprising the textile manufacturing group. In 1936 the injury-frequency rate for dyeing and finishing was 13.9, while the rate for all textile manufacturing was only 8.8.[1] Both of these rates were lower than the all-manufacturing rate of 16.6.

During the years 1937–40 the injury-frequency rate for all manufacturing showed a general downward trend. The all-textile rate showed little change in this period, but the dyeing and finishing rate rose to 15.5 in 1940.

In the following 3 years, expanding operations and the necessity of replacing experienced employees with untrained workers led to higher injury-frequency rates in most manufacturing industries. In 1941, the all-manufacturing rate was 18.1; in 1942 it was 19.9; and in 1943 it reached 20.0. Injuries in the textile industries followed the general trend and the all-textile manufacturing average rose to 10.9 in 1941; to 11.9 in 1942; and to 14.0 in 1943. In the dyeing and finishing industry, however, the rise was much more pronounced. In 1941 the dyeing and finishing injury-frequency rate of 17.7 was still somewhat below the all-manufacturing average. A sharp rise to 24.8 in 1942 carried the rate well above the all-manufacturing average and it remained higher through 1947.

In the years 1943–47 the dyeing and finishing injury-frequency rate moved erratically. A slight drop to 23.6 in 1943 was followed by a rise to 24.5 in 1944. A similar swing in the next 2 years carried it down to 20.6 in 1945, from which it rose to 21.7 in 1946 and then dropped to 19.2 in 1947. At this level it was slightly above the all-manufacturing rate of 18.8 and was nearly 6 points above the all-textile rate of 13.2.

The import of these historical comparisons is not simply that the frequency of injuries in the dyeing and finishing industry is high, nor that it has risen sharply since 1936. This has also been true in many other industries. More pertinent is the fact that, in terms of the injury-frequency rate, the dyeing and finishing industry has lost relatively more ground than have most other manufacturing industries. The specific reason for this is not clear, but the evidence at hand supports the conclusion that accident prevention probably has been given more attention in other industries than in dyeing and finishing. The possibility of improvement through an intensified safety program in the industry is apparent when the dyeing and finishing experience is compared with that of other industries in which safety has been emphasized. In 1947, for example, the frequency rate of 19.2 for dyeing and finishing presented a sharp contrast to the rates of 4.8 for the aircraft industry; 5.3 for the explosives industry; 5.6 for the ordnance industry; 8.2 for the iron and steel industry; 9.5 for the electrical equipment industry; 9.5 for the motor-vehicle industry; and 10.8 for the cement industry.

Injury-frequency rate comparisons serve an important purpose in pointing to the existence of a safety problem and in indicating its relative magnitude. The abstract qualities of frequency rates, however, give injuries somewhat the status of bookkeeping entries and tend to obscure the human and economic factors which constitute the fundamentals of the problem. The suffering, despair, and frustration of injured workers and their families cannot be measured. Nor can the full monetary cost of accidents be determined from any available records. It is possible, however, to approximate the economic loss arising from the injuries and thereby to bring the problem into better perspective.

[1] The injury-frequency rate is the average number of disabling injuries for each million employee-hours worked. A disabling injury is one which results in death or permanent physical impairment, or renders the injured person unable to work at a regularly established job throughout the hours corresponding to his regular shift on any day after the day of injury.

An Estimate of Injury Costs

In 1945, the year on which this detailed study was based, the injury-frequency rate for the textile dyeing and finishing industry was 20.6. This represented about 1 disabling injury for every 22 full-time workers in the industry. It is estimated that approximately 3,150 dyeing and finishing workers were disabled by injuries experienced on the job during 1945. About 15 of these injuries resulted in death and 135 in permanent physical impairment; the remainder were temporary disabilities, each of which involved the loss of at least a full day of work, but left no permanent ill effects.

Without allowance for the continuing loss in production and earning power arising from deaths and permanent impairments, it is estimated that actual time lost by the injured dyeing and finishing workers amounted to at least 72,000 man-days during 1945. On the basis of standard time charges for deaths and permanent impairments, it is estimated that the future economic loss accruing from the more serious injuries will eventually amount to at least 265,000 man-days—making the total employment loss about 337,000 man-days of work. Measured in terms of the average earnings of dyeing and finishing workers during 1945 ($36.02 per week),[2] this represents a wage value of nearly $2,500,000. As workmen's compensation payments are never equivalent to full wages, a considerable portion of this loss in earnings falls upon the injured workers. On the other hand, the employer's share in this wage loss, which he pays in the form of insurance premiums or as direct compensation payments, represents only a part of the actual costs which the industry must bear. In addition, there are payments for medical and hospital care for the injured workers and many indirect costs, such as damaged materials or equipment, lost production, and supervisory time spent caring for the injured or reorganizing operations after the accident. These indirect costs seldom are a matter of record, but this does not lessen their reality. Studies by H. W. Heinrich[3] have indicated that for manufacturing generally the indirect costs of injury-producing accidents averaged about four times the direct cost of compensation payments plus hospital and medical payments. On the assumption that this ratio is approximately correct for the dyeing and finishing industry, it may be estimated conservatively that the indirect costs associated with injuries in the industry during 1945 amounted to at least 6 million dollars, perhaps as high as 8 million, and that the total cost probably ranged between 8 and 10 million dollars.

[2] Hours and Earnings, Bureau of Labor Statistics press release, April 26, 1946.

[3] Industrial Accident Prevention, by H. W. Heinrich, New York, McGraw-Hill Book Co., 1941.

Scope and Method of the Survey

The injury rates for 1945 compiled in this survey were based upon voluntary mail reports from 446 plants engaged in dyeing and finishing yarn, thread, or piece goods. These plants reported a total employment of over 64,000, with more than 139 million employee-hours worked during 1945. The disabling injuries reported totaled 2,876, including 8 deaths and 129 cases of permanent impairments. Along with the plant totals, most of the reports included a breakdown of the injuries and employment by operating departments, which permitted the computation of departmental injury-frequency rates.

In addition to supplying summary reports for use in evaluating the magnitude and general aspects of the injury problem in dyeing and finishing operations, 174 of the cooperating plants also made their original accident records available for detailed analysis. This group of plants employed nearly 50,000 workers. Their combined injury-frequency rate was 22.4, which is slightly higher than the industry average, but not enough higher to indicate that their accident experience was other than typical of the industry.

A representative of the Bureau of Labor Statistics visited each of these 174 cooperating plants, and, insofar as the data were available, transcribed from their records the following items regarding each accident: Place where the accident occurred; the

occupation, age, and sex of the injured worker; the nature of the injury and the part of the body injured; the type of accident; the object or substance (agency) which caused the injury; and the unsafe condition and/or the unsafe act which led to the accident. In order to broaden the analysis and permit a greater degree of detail, this part of the survey was extended to cover not only disabling injuries but also all injuries requiring treatment by physicians. A total of 2,419 disabling injury cases and 5,188 medical-treatment cases were recorded. In addition, records of 11,570 first-aid cases were obtained from 32 of the plants. All of these cases were used in the injury analysis. Only the disabling and medical-treatment cases were used in the accident-cause analysis. The cause-analysis procedure follows the provisions of the American Recommended Practice for Compiling Industrial Accident Causes, as approved by the American Standards Association, August 1, 1941.

The Industry and Its Hazards

Textile dyeing and finishing includes bleaching, dyeing, printing, and finishing both fabrics and thread. Because these operations normally require a great deal of expensive machinery and because there are so many variations in the types of finishing required, it is customary for textile manufacturers to contract these operations to plants which specialize in this work. These specialty plants, engaged primarily in contract work, constitute the dyeing and finishing industry as covered in this survey. Plants primarily engaged in processing knit goods, including dyeing and finishing hosiery, are generally considered a part of the knit-goods industry and for this reason were excluded from the survey. During 1945 approximately 70,000 workers were employed in the dyeing and finishing industry as defined above.

Because no cloth or thread requires all the dyeing and finishing operations offered by the industry, the sequence of operations varies widely. In general, however, the production departments in yarn- and thread-processing plants include a receiving or stock room, a drug room, a dye house, a finishing department, a winding department, and a packing department. In plants which process piece goods the most common departmental units are the receiving or gray room, the boil-off or bleaching department, the dye room, the dye-color shop, the printing department, the print-color shop, the finishing department, and the make-up department.

Piece-Goods Department

Receiving or Gray Room.—When cotton cloth is received at a processing plant, it is generally taken by truck to the warehouse where it is stored until time for processing, although it may be taken directly to the gray room in which the first processing operations are performed. Occasionally cotton cloth is received in rolls containing about 500 pounds of cloth but usually it arrives in large bales. Each bale contains a number of relatively short pieces of cloth weighing from 75 to 100 pounds per piece. Each piece is plaited throughout its length in widths of approximately 3 feet and piled so that each fold may readily leave the pile in later processing operations. The bale is enclosed in burlap and fastened with wire tie bands or metal straps.

Workmen called "goods layers" or "lay-out men" break the tie bands, remove the burlap, and lay out or re-pile the pieces of cloth in proper order on a hand truck, a skid, a platform, or on the floor, depending on the procedures within their plants. While re-piling the cloth the workman places it so that the faces of the various pieces are all lying in the same direction. At the same time he pulls out the ends of each piece and leaves them hanging over the edge of the pile. Next a sewing-machine operator sews the tail end of each piece to the head end of the following piece throughout the pile so that when the operator is finished the pile may contain a continuous piece of cloth 2,000 yards or more in length.

Generally, cotton cloth is then run through a singeing machine in which the fuzzy ends of the fibers in the cloth are burned off. In some plants the singeing machine is located near the lay-out operations so that the cloth may be drawn across a series of rollers into the machine. In that case, the tail end of the last piece of cloth in each pile is sewed to the head end of the top piece in the following pile on the lay-out room floor. Thus a continuous length of cloth up to 50,000 yards may be obtained. This length of cloth, known as a "lot" is generally kept in one piece

throughout the gray-room, bleaching, and drying operations. When the singeing machine is located at some distance from the lay-out operation, each pile is taken by hand truck to the machine and combined into a lot as the singeing operation progresses. The singeing machine has an open flame, or two very hot plates or rollers, over which the cloth is passed at a high rate of speed. Because of the speed at which the cloth travels, only the loose surface fibers are burned. However, to prevent fires which may result from sparks adhering to the surface of the cloth, the singeing machine also has a tank containing a liquid bath through which the cloth passes immediately after the singeing operation.

Usually a sizing compound is placed in cotton cloth during the manufacturing process. To insure good results in later dyeing and finishing operations, this sizing compound must be removed. Therefore, when cloth containing sizing is processed, a chemical which will react with the sizing is placed in the liquid bath of the singeing machine. As the cloth leaves the singeing machine, it passes through a round, porcelain guide, about 6 inches in diameter, called a "poteye," which gathers the cloth together in a rope form. The cloth is then placed in bins called "size bins" where it is stored for 3 or 4 hours while the chemical placed in the cloth as it passed through the desizing bath softens the sizing. These bins are approximately 15 feet square and about 15 feet deep. To utilize space and to prevent the tangling of the cloth during removal from the bins, the cloth is plaited into the bins. Overhead mechanical plaiters, which guide the cloth so that piles build up evenly in the bins, are now extensively used. Where mechanical plaiters are not available, men or women do the plaiting by guiding the cloth into position with short sticks.

From the size bins, the cloth is pulled through poteyes or other guides to a washing machine where the sizing and the desizing chemicals are removed. The washing machine consists of a tank filled with water, a power-driven roll by which the cloth is pulled from the size bins and dropped into the tank, and a set of rolls, under pressure against each other, called "squeeze rolls" which pull the cloth from the tank and remove the excess water from the cloth as it leaves the tank and passes between them.

Although rayon and woolen cloth may be subjected to the same operations as cotton in the gray room, or the receiving room as it is more generally called in the rayon and wool processing plants, they are usually handled somewhat differently. Normally, there is very little singeing done on rayon or woolen cloth and the processing of these textiles is done in much smaller lots than those of cotton. Receiving-room operations in the rayon and woolen processing plants therefore are greatly simplified. Regardless of whether the cloth is received in rolls, boxes, or bales, it is generally "beamed" or wound into rolls containing about 250 yards each. Some sewing may be necessary to secure the required lengths for processing.

Among the hazards in the gray room, the possibility of injury from lifting or moving heavy bales of cloth is outstanding, as each bale is handled several times within the department. Hand trucks and mechanical industrial trucks used to transport the bales or piles of cloth present additional hazards. Improper handling of tie bands or straps may result in cut or lacerated hands or fingers; while failure to keep bands or straps, as well as loose burlap, from the floor presents a tripping hazard. Wet and slippery floors are common near the singeing and washing operations. Other hazards include unguarded size bins, into which workers may fall, exposure to flames or to steam lines on singeing machines, and unguarded squeeze rolls on the washing machines.

Boil-off or Bleaching Department.—From the gray room the cloth is generally delivered to the bleaching or boil-off department, where all color is removed and the cloth is cleaned. When cotton cloth is received in this department, it has a distinctly yellowish appearance, the color of unbleached cotton thread. The removal of that color is a bleaching process and the term "bleaching department" applies primarily to the processing of cotton cloth. In addition to the removal of the color, all foreign matter such as wax, gum, or grease, that may have become impregnated in the cloth during the manufacturing process, is removed during the bleaching operations. Cotton cloth is generally delivered to the bleaching department in rope form and is left in that form throughout the bleaching process. It is pulled from one operation to the next by power-driven rolls on the machine in the next succeeding operation. Poteyes serve as guides for the cloth between operations.

As the first operation in the bleaching department, cotton cloth is generally kier-boiled. In this operation the cloth is plaited down in a large tank called a kier boiler. The boiler is from 9 to 12 feet high and 6 or

more feet in diameter and holds approximately 35,000 yards of cloth. It is fitted with a heavy air-tight lid which covers the opening in the top of the boiler through which the cloth passes into the kier. Kiers are generally built in groups of 3 to 9 or more. For a working surface, a platform or floor is constructed on a level with the tops of the kiers. The cloth may be piled in the kier by a mechanical plaiter or by hand plaiting. After the kier is filled, the cover is fitted and clamped into place, water and caustic soda are added, and the mixture boiled for a period of 2 to 12 hours, depending on the cloth that is being processed. After the prescribed number of hours, cold water is run over the cloth to reduce the pressure inside the boiler as well as to wash the caustic soda from the cloth. From the kier the cloth passes through a washing machine and then through a weak solution of an acid, usually hydrochloric acid. This latter operation is known as "chemicking." The cloth is then plaited down in a bin, called a white bin, where it remains about 2 hours. Then it is washed again and placed in another bin for about 1 hour. It is then given a final washing, after which it is ready for drying.

There is very little bleaching done on rayon or woolen cloth. These textiles are generally bleached before they are woven. However, all grease and other foreign matter must be removed from the cloth before it is dyed or printed. To do this, the cloth is usually run through a "boil-off" machine in which it is treated with caustic soda and then washed. From this operation the department gets its name "boil-off department" which primarily refers to the cleaning of rayon or woolen cloth. There are several types of boil-off machines. In one, the tank which holds the cloth is comparatively long and the cloth, moving slowly, passes through the caustic solution only once. In the other, the cloth is hung in loops over a power-driven roll rotating above the caustic soda. As the roll turns, the cloth moves through the caustic soda bath, over the roll, and back into the caustic soda on the opposite side of the roll. In this operation the cloth may be run through the caustic soda bath a number of times. The cloth may be washed either in the boil-off machine, in which case the caustic soda is replaced by water, or in a standard washing machine such as that described for use in the gray room.

Floors throughout the bleaching and boil-off departments are generally wet and slippery. In addition to the slippery floors, other sources of falls include the stairs or ladders to the working surface at the top of the kiers, the white bins, and the convex surfaces of the tops of the kiers. Caustic soda, which is used extensively in the bleaching and boil-off operations, presents the possibility of serious chemical burns. Contact with live steam or steam lines may result in other burns or scalds. In most of the mechanical operations of this department, water and other solutions are squeezed from the cloth by running the cloth between two squeeze rollers. This is a particularly hazardous operation as those rolls are seldom guarded and any accident involving them may result in a serious disability. A hazard peculiar to the kier operation is that of lifting the cover of the kier boiler back into place. These covers are quite heavy and are awkward to handle. In addition, the convex surface of the top of the kier adds to the difficulty of maintaining a good footing while placing the cover.

Drying Department.—Cloth may be dried after any one of a number of different operations and, in many cases, the drying operation is considered as a part of the department in which the drying is performed. However, as drying operations are similar, regardless of where the operation takes place, and as many plants have separate drying departments in which some, and perhaps all, of the drying is done, they have been considered as a separate department in this study. Among the different drying machines used in this industry, the more common are dry cans, loop driers, net driers, extractors, and ranges.

Probably the most common of these are the dry cans which consist of a number of steam-heated cylinders around which the cloth passes in drying. These cylinders, about 18 inches in diameter, are usually arranged in several series or banks, each bank composed of from two to eight cylinders, placed one above the other. All cylinders within a given set of dry cans are connected and driven directly by gears so that the speed of all cylinders is identical, permitting the cloth to be drawn tightly across each steam cylinder. Each alternate cylinder rotates in a reverse direction and the cloth is threaded back and forth over each can of the group. To reduce the hazard of threading the cloth over the hot cylinders, a narrow tape about 6 inches in width, called a "lead" or "leader" is threaded through the cans when the machine is not in use. When cloth is to be run through the dry cans, it is first sewed to the end of the lead which acts as a guide for the cloth through the machine. When the cloth has been threaded through-

out the machine, the lead is removed and attached to the tail end of the lot. At the completion of the run the cloth is unfastened from the lead, leaving it in the machine to guide the next lot.

The loop drier is essentially an enclosed steam-heated chamber, about 9 feet high and 30 feet long. The cloth is suspended in long loops from poles or rods which are moved horizontally through the enclosed area at a comparatively slow speed. As the poles or loops are moved forward, the heat within the enclosed area dries the cloth. The net drier is similar to the loop drier, except that the cloth is simply laid in nets which are suspended in the heated chamber and slowly moved through it.

The extractor is used primarily for drying rayon or other synthetic cloth which is in small lots. It is a small machine, about 4 feet high and 4 feet in diameter. The essential part of the extractor is a rotary tub in which the cloth is loosely piled and then rotated at high speed. Water is released from the cloth by centrifugal force and permitted to flow from the extractor through an opening in the bottom of the tub.

The range is a combination drying and finishing operation. It is essentially a tenter frame, which will be described more fully under finishing-department operations, and it operates through a heated chamber about 30 feet long.

Cloth must be fed into the dry cans and loop driers in open or sheet form. When the cloth is delivered to these machines in rope form it must first be opened into the flat, or sheet, form. This is done by placing a machine called a "scutcher" at some distance from the drying machine and passing the cloth over it. Primarily, it is a heavy, elliptical ring which is rotated very fast. As the ring beats against the cloth, it loosens the folds and permits the cloth to flatten out as it reaches the drying machine. At the delivery end of the dry cans or loop driers, the cloth is either rolled onto shells or plaited down in hand trucks for transportation to the storage room or to succeeding operations.

The danger of burns from heated surfaces is an outstanding hazard in this department, particularly when the cloth tears or breaks and it becomes necessary to re-thread the machines while they are hot. Hand trucking with its inherent hazards is also an important danger in the drying department because a considerable amount of cloth is delivered to and removed from the machines on hand trucks. The lifting and handling of heavy rolls of cloth is the source of many injuries. Gears, through which power is transmitted to the dry cans, constitute a particularly serious hazard because injuries resulting from contact with them often become permanent disabilities.

Dye Room.—In the dye room, color may be imparted to the body of the cloth in several different ways. Generally, cotton cloth is dyed in a jig, and rayon and wool in a dye reel or dye beck, but these are, by no means, exclusive. The dye jig consists of a vat containing about 100 gallons of the dye liquid. Above the vat are two spindles, one at the front and the other at the back of the machine. Parallel to the spindles but within the vat are a number of guide rolls which are used to insure the immersion of the cloth in the dye bath. The roll of cloth to be dyed is placed on one spindle, threaded under the guide rolls, and then wound on an empty shell placed on the second spindle. During the operation the cloth passes from one spindle to the other. The jig is constructed so that the motion of the cloth may be reversed in order that the cloth may be passed through the dye liquid as many times as necessary to secure the required depth or shade of color. Generally, cloth that is to be jig-dyed is given a preliminary pad-dyeing operation. In that operation the cloth, in sheet form, is passed through a dye bath and between two pressure rollers. The pressure rollers serve two functions: first, they press the dye into the cloth and, second, they squeeze out the excess dye. From the pad, the cloth is wound onto a second roll and then is taken to the jig.

Cloth may be processed either in rope or sheet form in the dye beck. Although there are several different kinds of dye becks, they all operate on the same general principle. Each beck has a tank which contains the dye liquid and a powered roller over which the cloth is suspended into the dye. In the operation of the dye beck, a piece of cloth, about 100 yards or more in length, is hung over the roller and the two ends joined together, making one long loop of cloth suspended in the dye bath. As the roller rotates, the cloth moves through the dye, over the roller, and again through the dye. In this operation the cloth is given a number of immersions in the dye liquid.

From the dyeing machine the cloth is run through a soaper or washer where the excess dye is removed, after which the cloth is ready for drying. Several of

the larger establishments now have continuous dye machines which perform all of the necessary operations in consecutive order without the necessity of rehandling the cloth between operations.

Wet and slippery floors are general throughout the dyeing department. Not only do they present a slipping or falling hazard but they increase the possibility of lifting accidents in those operations which involve lifting and handling heavy rolls of cloth. Many plants have now installed block and tackle equipment for the jig-dyeing operation to reduce the lifting hazard. Again, in the dyeing department the hazards connected with hand trucking are noteworthy because of the large extent of such operations. Serious disability may also result if workmen's fingers or hands are caught between the pressure rolls of the pad-dye machine, the soapers, or the washers. Similarly, serious injuries may result from attempts to straighten the selvedge or edge of the cloth in the jig-dyeing operation. In these accidents fingers or even arms may be broken as they are pulled around the rolls of cloth. Steam is used to maintain proper temperatures in the dyeing machines and burns or scalds may result from contact with the steam or exposed steam pipes. The absorption of dyes or other chemicals causing dermatitis is also an important hazard of the dyeing department.

Dye-Color Shop.—Although some dyeing-machine operators mix dye stuffs in their machines, most establishments have central dye-color shops in which dyes are mixed, or dyestuffs and chemicals are weighed for the dyeing department. Workmen in the dye-color shops weigh specified amounts of chemicals and dyestuffs into small packages. Then, according to prescribed formula, the chemicals and dyestuffs are placed in containers where the ingredients are mixed with water and heated by steam. In this department there may be some lifting of heavy bags of materials. Serious chemical burns may result from caustic soda which is used in some dyeing mixtures; live steam and exposed surfaces of steam pipes may be responsible for other burns or scalds.

Mechanical Print Shop.—Colored designs may be applied on cloth either by hand, as in screen printing, or by machine. There are two general types of printing machines—the roller printing machine and the flock and lacquer printing machine. In roller printing the design is engraved on copper rolls, each of which will print only one color, although the shade may vary according to the depth of the engraving on the roll. Therefore, for each color used in the design a separate roll must be made on which is engraved the design for that color. From the engraving room these rolls are first delivered to the "jack room" where the rolls are forced on a mandrel by a machine called a "jack." The rolls are then taken to the front of the printing machine at which point the mandrels with the copper rolls are placed in their positions on the machine. Just below each copper roll is a tray containing the coloring corresponding to that for which the roll was designed. Between each roll and its tray there is a circular brush which revolves through the coloring and brushes it on the copper roll. At a point on the surface of each copper roll midway between the point of contact of the brush and the point at which the roll touches the white cloth a sharp-edged blade called a "doctor blade" scrapes the coloring from the smooth part of the roll, leaving the coloring only in the engraved portion. The printing machine is designed so that at the point where the cloth comes into contact with the copper roll the cloth to be printed and the surface of the copper roll move in the same direction and at the same speed. As the cloth and copper roll meet, the color is transferred to the cloth.

The roller printing machine is constructed so that the roll of white cloth is placed on a spindle at the rear of the machine. From the roll the cloth is threaded through the various parts of the machine, which include the printing and subsequent drying of the color. To prevent smearing the back surface of the cloth a second roll of cloth, called "back-gray cloth" is run through the machine as a backing for the cloth being printed. The back-gray cloth is placed on a spindle near that for the white cloth. This gray cloth and the white cloth meet overhead and are run to the front of the machine for the actual printing operation, after which the two cloths are separated, the printed cloth going through a series of dry cans overhead and the back-gray cloth going to the rear of the machine, where it is removed and washed for re-use.

Flock and lacquer printing is a specialized kind of mechanical printing by which one type of dotted swiss material is made. The required design is placed on a thin, flat copper plate by punching small holes through the plate. After the design has been completed, the two ends of the plate are joined together

to make a cylinder 12 or more inches in diameter. This cylinder is then placed in position on the printing machine and a tray containing the coloring is inserted inside the roll. The coloring passes through the holes in the copper plate as it rotates with the cloth, thus transferring the design to the cloth. The excess color which penetrates the cloth adheres to a backing roller which conveys the cloth past the cylinder. The color adhering to the backing roller is scraped off by a doctor blade after which the roll rotates through a tray containing a cleaning solution. From the printing operation, the cloth passes to the flock box where short fibres called "flock" are dropped onto the cloth. As the cloth is conveyed through the flock box on a leather belt it is vibrated or bounced. This vibration causes the flock to penetrate the coloring on the cloth and to adhere to it. From the flock box the cloth passes through a loop drier where the coloring is dried. After drying, the cloth is brushed by machine to remove the excess flock.

Work in the printing department requires a great deal of heavy lifting. In roller-printing operations, rolls of white and gray cloth must be lifted into position on the machine, and although the printed cloth is generally plaited into hand trucks as it comes from the machine, the gray cloth is usually delivered from the machine in rolls which again must be lifted. In flock and lacquer printing, the cloth is generally received at the machine and delivered from the drying operation in rolls. The heavy copper rolls used in roller printing must be lifted both in the jack room and in the printing room. Placing them on the printing machine is particularly dangerous, as that operation involves working in close spaces and sometimes from rather awkward positions. The coloring used in the printing operation is somewhat thick and, when dropped on the floor, presents a slipping hazard. Hand trucks are used to a great extent in the printing department, not only for delivering and removing the cloth but for delivering color from the print-color shop. The doctor blades are extremely sharp and utmost caution must be used in placing them on or removing them from the printing machine. Because of the high concentration of flock in the air around flock and lacquer printing operations, the atmosphere may be somewhat uncomfortable, although there was no evidence that the particles cause any permanent damage to the respiratory system. This condition may, however, present a dust explosion or fire hazard. The cleaning solution used in the printing machine is also a source of fire. Burns may also result from contact with the dry cans or exposed steam pipes.

Screen Printing Department.—The most common of the hand printing operations is called "screen printing." If the design is small, as for example in the printing of handkerchiefs or napkins, a wooden frame 3 or 4 feet square is made. This permits the use of four or more identical patterns on the screen. Next, wet nylon or silk cloth is stretched over the frame. When dried, the nylon or silk becomes very taut. The frame is then placed, face downward, over the desired pattern and the lines or colored portions of one color are drawn on the back of the screen with a paint soluble in water. For each color used in the design a separate screen must be made. After the lines and colored portions of one color in the pattern have been placed on the screen and dried, the entire back is painted with a nonsoluble paint. When the paint has dried, the front or face of the screen is sprayed with water, which loosens the soluble paint from the screen and permits it to be pulled from the back, leaving a transparent figure of the design on the screen. In the printing operation the coloring is forced through the transparent portion of the screen.

The actual printing is done on long tables fitted with guides into which the screens are placed so that there will be no movement of the screen during the printing operation. The cloth is tacked or pinned on the table and the printer places the screen in position face down. A coloring, corresponding to the color for which that particular screen was made, mixed with gum to give it body, is placed on the back of the screen. A rubber-edged slide called a "squeegee" is then moved back and forth across the back surface of the screen, forcing some of the coloring through the design on the screen and onto the white cloth. The screen is then picked up and placed in the next guide where the operation is repeated. With a second screen, a second color is placed on the white cloth, then a third, and so on until all the colors of the design are in place. The cloth is then untacked and suspended above the table for the coloring to dry while succeeding pieces of cloth are being printed.

Pin pricks while pinning or removing the pins from the cloth on the tables, and splinters from rough

screen frames or from the edges of work tables are among the more common but minor hazards in this department. Other cuts or lacerations may result from workmen bumping against the metal guides which extend out from, and slightly above, the table tops. The gum used in the coloring is usually received in flake or powdered form, mixed with water, and cooked in kettles by steam. The mixture is continually stirred during the mixing operation by power-driven paddles. Contact with the steam lines or with the hot gum may result in burns, and serious disabilities to workmen's fingers or hands may result if they are caught in the gears by which power is transmitted to the paddles.

Print-Color Shop.—Colors used in the printing department are mixed in the print-color shop. In this department dry dyestuffs and chemicals are mixed together and then placed with water in a kettle, where they are heated with steam. Power-driven paddles are used to stir the mixture, which is comparatively thick. After the coloring is prepared, it is poured into tubs and taken by hand truck to the printing department.

Slippery floors constitute an important hazard in the print-color shops. Water and steam are used in great quantities in these departments for cleaning tubs and kettles, and, as a result, the floors are generally quite wet. In addition, coloring is frequently spilled or splashed onto the floor in these departments. Lifting heavy tubs of color or barrels or bags of ingredients may result in serious strains, and contact with the coloring may result in dermatitis. Other hazards of the print-color shop include those of hand trucking, use of live steam, exposed steam lines, and unguarded gears on the cooking kettles.

Aging Department.—After the cloth has been printed, the colors must be developed and set. This process is known as aging and generally consists of running the printed cloth through a machine called an "ager" or "steamer" and then washing and soaping it, which fixes the color in the cloth. Essentially, the ager is a chamber in which the cloth is exposed to steam or ammonia. The object of this machine is to develop the colors and bind them to the cloth. The soapers and washers are similar to those used in other departments. The cloth is usually run through a series of these machines which alternately soap and rinse it. Generally, one of the washers contains a chemical which fixes the color—i. e., prevents fading. When the cloth goes through the soaping and washing in rope form, the machine is called a "rope soaper." When it goes through flat, the machine is called an "open soaper."

After each soaping or washing the cloth is passed through a set of rolls which squeeze the excess liquid from the cloth. These squeeze rollers are particularly dangerous because of the chance of serious injury in the event that a workman's hands or fingers become caught between them. Floors in the aging department are generally wet and slippery, especially around the washing and soaping operations. The hazards incidental to hand trucking and the use of steam are also important in this department.

Finishing Department.—The cloth receives its final treatment in the finishing room. Here it is pressed, stiffened, shrunk, stretched, or subjected to any one of a number of other processes which tend to improve its appearance or character. Since there is such a wide variety of these finishing operations and since no cloth is given all of the assorted treatments, no attempt will be made to discuss the processes in the proper sequence of operations; only the more important ones will be described. Frequently several of these operations are placed in tandem and run as one process.

Practically all cloth handled in the textile dyeing and finishing industry is eventually run through a tenter frame. In this machine the cloth is stretched to increase its width and the weave of the cloth is straightened. The tenter frame may be anywhere from 20 to 100 feet in length, depending on the processing requirements. On each side of the frame there is an endless chain carrying a series of clips spaced very close together. These clips automatically grab the selvage of the cloth as it is fed into the machine and convey the cloth to the end of the frame, where the clips release and the cloth is wound on rolls or is plaited into trucks. In order that the width of the cloth may be increased, the tenter frame is constructed so that the chains may be adjusted to travel in slightly diverging paths. As the chains diverge, the cloth is stretched to the desired width. Some tenter frames are also equipped with an attachment which straightens the weave of the cloth during its passage through the machine. Frequently tenter frames are attached to other machines and are

arranged to operate in tandem with them.

One method of imparting a luster to the cloth is called "mercerizing." Essentially, this operation consists of passing the cloth through a caustic soda bath, a tenter frame, and then through a water mangle to remove the caustic. In some cases the caustic may be sprayed onto the cloth as it passes through the tenter frame. Although mercerizing is actually a cloth-finishing operation, it may be done at any stage in the processing; frequently it is performed just before the bleaching operation.

The calendering machine is also used to give cloth a smooth and lustrous appearance. In this machine the cloth is passed between a series of pressure rolls which may be steam heated.

The embossing operation is similar to the calendering process, except that two or more rolls are engraved with a suitable pattern. When the cloth is passed through the machine, the design on the rolls is pressed into the cloth.

On the other hand, it is frequently desired that the finished cloth have a fluffy appearance, as, for example, blankets. This is done by raising the fibers on the cloth by passing it through a napping machine. The essential part of that machine is a large rotating frame on the surface of which are a number of circular wire brushes. As the frame rotates it carries the cloth across the wire brushes, which in turn rotate against the cloth, scratching the surface and raising the fibers or "nap." The brushes are so arranged that each alternate brush rotates clockwise while the other half of the brushes rotate counterclockwise. Following the napping operation, the cloth may be run through a shearing machine, which cuts the ends of the fibers so that they are all about the same length.

Chemicals are placed on the surface or in the body of the cloth by mangles. One of the most common of these is the starch mangle which is used for placing starch in the cloth to give it stiffness. In the starch mangle the cloth is run in open form through a tub or tray containing hot starch and then through a set of squeeze rolls which press the starch into the body of the cloth. Generally a range or other drying apparatus is run in tandem with the starch mangle. Other mangles, similarly constructed, are used for waterproofing, mildewproofing, or fireproofing cloth.

Probably the most common type of shrinking process is that known as sanforizing. In that operation the cloth is first passed through a steam spray to induce shrinkage. From the spray the cloth passes through a short tenter frame and then under electrically heated shoes placed snugly against a steam-heated drying cylinder. An endless heavy blanket is used to convey the cloth around and keep it in contact with the cylinder. The cloth is then plaited into hand trucks or wound into rolls.

Since no cloth receives all of the various finishing operations performed in the finishing department, it is not practical to design a continuous process for the cloth passing through this department. For example, one lot of cloth might be run through a calender while the finish for the next lot would require that it be run through a napping machine. For that reason, each operation in the finishing department is generally independent of the others even though there is a tendency to place two or more operations in tandem where requests for such operations are sufficiently common to warrant it. As a result there is a great deal of hand trucking, with all of its hazards, in the finishing department. In addition there is a considerable amount of handling and lifting of heavy rolls of cloth. Gears and belts are used on many of the machines in this department. Together with the squeeze rolls, these gears and belts are very hazardous and injuries resulting from contact with them are likely to be quite serious. Threading cloth through the squeeze rolls is particularly dangerous. In that operation the operator usually places the end of the cloth at the point where the rolls make contact and then "jogs" the starting switch of the machine until the cloth is drawn between the rolls. Steam is used extensively for heating starch, liquids, and the hot rolls of many of the finishing department machines. Hot steam pipes and live steam therefore constitute one of the more important hazards in this department. Wet and slippery floors are common hazards around some of the operations, and the use of caustic soda presents the possibility of serious chemical burns.

Make-up Department.—From the finishing room the cloth is taken to the make-up or put-up department, where it is prepared for shipping. Usually rayon cloth is shipped in rolls, in which case a winding-machine operator rewinds the cloth on empty shells. During the rewinding operation the operator inspects the cloth for flaws and cuts or tears out any seams that may have been placed in the cloth to splice various pieces together in previous operations. Generally these rolls contain not more than 100 yards of cloth.

Some wide cloth, particularly cotton cloth, is folded lengthwide and then rolled on cardboard. These operations are performed with a doubling machine. Most of the cotton, however, is folded into bolts and shipped in crates or bales. In that case the cloth is first folded with a folding machine or hooker. The essential part of the hooker is a moving arm called a blade, which folds the cloth in plaits 1 yard wide. The name "yarder" or "yarding machine" is therefore also applied to the hooker. Here again the operator inspects the material for flaws and cuts or tears out any seams that had previously been placed in the cloth.

From the hooker the cloth is taken by hand truck to an examining table where it is given a final inspection and then is folded twice, by hand, to make a bundle or bolt approximately 12 inches wide. Thread is then drawn through the bundle, with a needle, to fix the fold. Next the cloth is taken by hand truck to a "shader," who sorts the cloths by shade of color so that, when packed, all bolts in one package are as near alike in color as possible. From the shader the cloth is taken, again by hand truck, to the "packers" and "wrappers," who prepare the bundles for shipment.

A great deal of hand trucking is necessary in moving cloth from one operation to another in this department. Hand trucking, therefore, presents one of the greatest hazards of the make-up room. These operations also require a considerable amount of lifting but the packages are generally light in weight. The swinging blade of the hooker is a hazard peculiar to the make-up department. Actually the blade of the hooker is not sharp but simply an arm by which the cloth is folded back and forth. However, to hold the fold, the blade places the edge of each fold in a section of the machine table called the "jaws." Although attempts have been made to guard this swinging blade, guarding has not become widespread and it is still general practice to stop the machine by grabbing the blade as it swings away from the operator. Should the operator make an error in judgment and grab the blade as it swings toward him, the blade invariably carries his fingers into the jaws of the table, resulting in serious finger injuries. As the machine must be stopped frequently, this hazard is of utmost importance to the hooker operator. Another hazard of this department arises from the use of hand tools. Scissors and knives are used extensively throughout the department and hammers are used in the packing operations to close the containers. Some of the larger plants make their own wooden packing cases, which may involve the use of powered woodworking equipment. In the baling operations, the metal straps used to bind the bales are generally sharp-edged.

Yarn and Thread Department

Yarn or thread may be processed either in skeins or in rolls. As the materials usually arrive at the plant in the form in which they are to be processed, the stockroom operation consists mainly of hand trucking and piling. From the stockroom the yarn and thread is delivered to the dye house for coloring. Skeins of yarn are usually dyed by suspending the yarn in the dye. In one dyeing machine of this type the skeins are suspended from poles which are then lowered into the vat containing the dye liquid. In another type the skeins are placed around a wooden wheel which is then lowered into the dye and rotated. Rolls of thread, called reels, are generally placed in dye kettles, where the dye is forced through the reels. After dyeing, the yarn or thread is ready for drying, which is usually done in extractors and hot-air chambers. Much of the cotton thread is mercerized in the finishing department to give it a lustrous finish. In the winding department thread is wound on quills, cones, reels, or spools and yarn is placed in balls or skeins.

The floors of the dye house are generally wet and slippery and constitute one of the chief hazards in the processing of yarn and thread. Although not as extensive as in the processing of piece goods, hand trucking operations, nevertheless, present a considerable hazard in this department. There is also a great deal of lifting and handling of materials. This, however, is generally lighter work than that which is necessary for the processing of piece goods. The chief hazard of the winding department is the possibility of contacting the moving parts of the winding machines. The use of dye and other chemicals in the dyeing and finishing operations also presents an occupational disease hazard.

Factors in the Injury Record

The injury record of any plant or of any group of plants is a composite of a great many factors. The kinds of material processed; the types of processing performed; the safety regulations of the States in which the plants are located, and the extent to which those regulations are enforced; the kind of personnel employed; the size of the plants; and the extent of the safety programs carried on in the plants all have a direct bearing upon the volume of injuries experienced. In particular instances the influence of these factors may offset each other, but in comparisons based upon large groups of operations their effects frequently can be demonstrated, as in the following break-downs of the 1945 experience of the dyeing and finishing industry.

Operating Comparisons

Form of Materials Processed.—Among the plants reporting in the survey, those which were predominately engaged in processing piece goods generally had the higher injury rates, indicating that the hazards involved in these operations are greater than in the processing of yarn and thread. Specifically, the piece-goods plants had an average frequency of 21.3 disabling injuries per million employee-hours worked as compared with an average of 15.9 for the yarn and thread plants.

Kind of Materials Processed—The effect of variations in the kind of materials processed upon the volume of injuries may be ascribed largely to the differences in the processes used rather than to any differences in the inherent hazards of the materials. It is important, nevertheless, as a part of the over-all analysis to know how the materials processed are related to the injury record.

Plants specializing in the processing of cotton materials generally had the best injury records. For this group the average injury-frequency rate in 1945 was 18.1. In comparison, the plants which predominately process woolen and worsted goods had an average rate of 24.5, while those processing rayon, other synthetics, and silk had the high average of 29.4 disabling injuries per million employee-hours worked.

Type of Processing.—Textile dyeing and finishing involves three major types of processing, namely, bleaching, coloring, and finishing. Each of these major processes is subject to wide variations depending upon the kind of material to be handled and the final result desired. Most plants in the industry specialize to some degree and only a few of the larger establishments have facilities to perform all of the different types of operations.

Among the reporting plants those with the greatest variety of operations had the highest average injury-frequency rate. These were plants which perform bleaching, dyeing, machine printing, and finishing operations. For this group the average rate was 24.7. Within the group the plants processing rayon and other synthetic materials had the high average rate of 34.2, while the plants processing cotton materials had an average of 21.1.

Plants performing bleaching, dyeing, and finishing operations, but not engaging in machine printing, had an average injury rate of 19.7. The difference between this average and that for the previous group, which included machine printing, points to machine printing as being one of the more hazardous operations in the industry. In this group, also, the plants specializing in the processing of synthetic materials had the highest injury rate, 27.7, as compared with 24.8 for the woolen and worsted goods plants, and 17.2 for those processing cotton goods.

Among the various groups of more specialized plants, those limiting their operations to flock and lacquer printing had an average frequency rate of 19.4; those engaged in screen printing had a rate of 18.3; those which apply waterproofing, fireproofing, and other types of coatings to textiles had a rate of 16.7; and the plants performing bleaching operations had a rate of only 12.3.

Size of Plant

Generally speaking, the very small plants (with less than 50 employees) and the very large plants (with over 1,000 employees) had the lowest average injury-frequency rates. The distribution of frequency rates within the various size groups, however, indicated that size of plant need not be a controlling factor in safety. In all size groups there were plants which reported excellent safety records and in most size groups there were a few with exceptionally poor records. Plant size, in one way or another, may either facilitate or impede the functioning of a

safety program, but it seems evident that regardless of size, those plants which take a genuine interest in safety do have lower injury-frequency rates than those which make only perfunctory efforts toward safety.

Plant size becomes a factor in the advancement of safety in many ways. In small shops the supervisor, who is frequently the owner with a personal financial interest in keeping the accident volume at a minimum, is generally able to keep all operations under observation. He can, therefore, see unsafe conditions and practices as they develop and can take immediate precautions to eliminate incipient hazards.

In very large shops the volume of production generally makes it possible to give special attention to safety. These plants usually can afford to employ a safety engineer to carry on a scientific accident prevention program, and generally can afford to provide all guards and safety equipment known to be available. Large plants also can maintain some form of medical or trained first-aid service upon the premises. They have the advantage of professionally engineered plant lay-out and work processes, and are generally in a position to utilize mechanical equipment more extensively than are the smaller plants. This is of particular importance in connection with material-handling operations in which the provision of mechanical conveyors, hoists, and power trucks can do much to avoid many of the injuries associated with the manual performance of such operations.

In medium-size plants the problem of safety is complicated by the fact that the responsible head of the plant seldom can devote much of his time to observing shop operations, and, therefore, must delegate much of the responsibility for safety to others. Unfortunately, these safety responsibilities usually must be vested in foremen or supervisors who rarely have had safety training and who frequently feel that their production responsibilities are of much greater importance than attention to safety.

Supporting these generalized obervations which summarize the findings not only of this survey, but also of surveys in several other industries, the highest injury-frequency rates in the dyeing and finishing industry were found among the plants employing between 50 and 500 workers. In the range of 50 to 250 employees the average rate was about 25; in the range from 250 to 500 employees the average dropped to about 22; and in the range from 500 to 1,000 employees it was slightly below 20. The comparatively small plants in the 25 to 50 employee range had an average rate of about 16 and the very small plants employing less than 25 workers had an average of about 13. The very large plants, employing over 1,000 workers apiece, had the best record. Their average frequency rate was only 9.8.

The group averages, however, tend to obscure the widely divergent records of the individual plants within the various size groups. Actually more than a third of the plants included in the survey operated throughout the year without a single disabling injury. Most of these were small plants, but the list included 1 with 300 employees and 6 others with over 100 employees. Although none of the larger plants achieved a zero frequency rate, 1, employing 740 workers, reported only 1 disabling injury, giving it a frequency rate of 0.7. Another, employing over 2,000 workers, ended the year with a rate of 3.5. All of the 4 plants employing over 1,000 workers had rates of less than 20. In total, 44 percent of the reporting plants had frequency rates of less than 10 and another 16 percent had rates less than 20.

At the other extreme, nearly 2 percent of the reporting plants had rates exceeding 100. These were all plants with less than 100 employees. Another 6 percent, including 1 plant with 350 employees, had rates above 50. In the employment range of 100 to 500 workers, more than a third of the plants had rates above 30.

Regional and State Differences

Variations in injury rates between geographic areas may reflect any one or a combination of a number of factors. State safety laws and their enforcement, local safety programs, the age and maintenance of plants and their equipment, and employment factors, such as the experience of available workers, all tend to influence the injury rate levels.

One of the most important of these factors in the textile dyeing and finishing industry is the composition of the industry in each area. Although textile dyeing and finishing plants are widely scattered throughout the country, the industry is largely concentrated in three geographic areas[4]—the New Eng-

[4] The regional groupings and the States included in each region are as follows: *New England.*—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. *Middle Atlantic.*—New Jersey, New York, and Pennsylvania. *East North Central.*—Illinois, Indiana, Michigan, Ohio, and Wisconsin. *West North Central.*—Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota. *South Atlantic.*—Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia. *East South Central.*—Alabama, Kentucky, Mississippi, and Tennessee. *West South Central.*—Arkansas, Louisiana, Oklahoma, and Texas. *Mountain.*—Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming. *Pacific.*—California, Oregon, and Washington.

land, the Middle Atlantic, and the South Atlantic. In the South Atlantic area most of the plants process cotton materials. The Middle Atlantic area, more specifically New Jersey, is the center of the rayon processing industry, although there are a considerable number of plants engaged in dyeing and finishing cotton goods in that area. In New England, cotton and rayon processing plants predominate, but most of the woolen and worsted processing plants are located in that area.

Many plants in both the Middle Atlantic and New England areas are old and, because of a lack of manpower during the war years, were badly in need of repairs in 1945. On the other hand, many of the plants in the South were new and quite modern.

The 446 establishments included in this study were scattered throughout 7 of the 9 geographic areas in the United States and were located in 22 of the 48 States. However, because the number of plants reporting in some areas and in some States was too small to permit the computation of representative averages, figures are shown for only 5 areas and 12 States. Of the 5 areas for which figures are shown, the 2 areas with large proportions of rayon processing plants had injury-frequency rates greater than the average for the entire industry, and the three areas primarily engaged in dyeing and finishing cotton had better than average records. The highest regional rate was 24.2 for the New England region. The Middle Atlantic average of 23.3 was only slightly lower. The lowest regional injury-frequency rate was 10.6 for the East North Central area. The South Atlantic area with a frequency rate of 14.8 and the East South Central area with a rate of 15.7 both had averages considerably better than that of the industry as a whole.

The severity of the disabling injuries, however, followed a much different pattern. The New England area, which had the highest injury-frequency rate, had the lowest proportion of serious injuries; only 1.6 percent of all disabling injuries in that area resulted in death or permanent impairment. Only one other area, the East North Central, achieved a better average than that for the entire industry. In that region less than 3 percent of the injuries resulted in serious disabilities, compared with 4.8 percent for the industry. Approximately 8.7 percent, or one of every 11 disabling injuries in the East South Central area, and 7.0 percent, or one of every 14 disabling injuries in the Middle Atlantic area, resulted in death or permanent disability. In the South Atlantic area the proportion of serious injuries averaged 1 for every 20 disabling injuries.

Severity as measured by the average time lost per disabling injury followed a similar pattern. The best record achieved by any area was that of the East North Central area, where each disabling injury averaged 48 days lost time. Less-than-industry averages were also attained in the New England area, 67 days lost per disabling injury, and in the South Atlantic area, 83 days. The East South Central area with 263 days lost per injury and the Middle Atlantic area with 148 days both had averages considerably above the industry average of 107 days lost per disabling injury.

The highest of the 12 State injury-frequency rates was 27.5 for New Jersey. Injury severity was also high in New Jersey—nearly 9 percent of the disabling injuries were reported as permanent impairments. In Rhode Island the average frequency rate was 26.3, but less than 1 percent of the injuries resulted in death or permanent impairment. In Massachusetts the frequency rate was 24.8, but only 1.4 percent of the injuries were permanent.

Three States had injury-frequency rates of less than 15. Georgia, with an average of 10.4 disabling injuries per million hours worked, had the lowest rate, followed by South Carolina with 11.2 and Ohio with 11.7. Although the frequency rate for South Carolina was among the best, the number of serious injuries experienced by employees in that State placed it among the worst in the severity of the resulting injuries, over 9 percent of the disabling injuries resulting in death or permanent disability. Only 2 other States, Virginia, with 11.4 percent and Tennessee, with 10.0 percent, had greater proportions of serious injuries. New York, with a better-than-average frequency rate of 17.9, experienced a large number of serious injuries. Over 6 percent of all disabling injuries in that State resulted in death or permanent impairment. Five of the 12 deaths or permanent-total disability cases reported in this study occurred in New York establishments.

Safety Programs and First-Aid Facilities

Because textile dyeing and finishing is a relatively small industry, there has been no known attempt to compile a good industry-wide safety code. Several plants, which were visited during this survey, had compiled safety rules for their workers, but as they were directed to the employees, they mainly re-

flected rules or warnings against the commission of unsafe acts and, therefore, cannot actually be considered as industry safety codes. The nearest approach to an industry safety code is the Textile Safety Code, adopted by the American Standards Association in 1929. However, that code is not limited to dyeing and finishing, but covers the entire textile industry. Consequently, the greatest portion of that code deals with textile manufacturing processes.

Relatively few dyeing and finishing plants have organized safety programs. Of the 122 plants which furnished details on their safety activities, nearly 42 percent reported that they had neither safety engineers nor safety committees. Only 20 plants employed full-time safety engineers. As might be expected, most of these were large establishments. Included in the group, however, were 2 plants with less than 100 employees and 4 others with less than 200. Seventeen of these 20 plants also reported active safety committees. Details on safety committees were not reported for the other 3 plants. About one-half of the plants which did not employ full-time safety engineers reported that they had organized safety committees.

The use of personal safety equipment is common even in those plants which have no organized safety programs. Rubber gloves and aprons are generally furnished for workers in the dye rooms and color shops, and goggles are usually provided for workers who must handle caustics. In addition some plants have also provided wooden clogs for workmen in dye rooms to prevent dermatoses resulting from wet feet, and other plants have provided protective creams for workmen in the dye rooms and color shops.

An analysis of the injury rates of this group of plants indicates some rather striking facts. For the plants without safety engineers, the 1945 injury-frequency rate of 24.7 was 50 percent greater than the rate of 16.4 for the plants employing safety engineers. Much better records were achieved, however, by some individual plants. For example, one plant with an average employment of 700 reported only 2 disabling injuries during 1945 for a disabling injury-frequency rate of 1.3; another plant with 350 employees reported a frequency rate of 2.9 and a third plant with over 2,000 employees operated the full year of 1945 with the low rate of 3.5. Altogether, 5 of the 20 plants employing safety engineers reported injury-frequency rates of less than 6.

The reduction in the number of injuries through the employment of safety engineers generally appeared to be in the category of temporary disabilities, although none of the 6 fatalities and permanent-total disabilities reported were experienced by employees in the plants with safety engineers. For each million hours worked during 1945, there were, on an average, 1.5 permanent-partial disabilities in plants employing safety engineers, compared with 0.9 in those plants without safety engineers. This greater frequency of permanent-partial disabilities was also reflected in the average time lost per disabling injury. Although the average time lost per temporary disability was 22 days in the plants employing safety engineers and 25 days in the plants without safety engineers, the average time lost per disabling injury was 149 days in the former group of plants, compared with 104 days in plants without engineers.

The use of first-aid equipment is generally widespread in the textile dyeing and finishing industry; only 6 of the 122 plants for which information on first-aid equipment was available had neither first-aid rooms nor first-aid kits. Altogether 78 plants reported that they had established first-aid rooms. Of these, 38 were staffed by physicians or registered nurses and 32 were staffed by employees who had been trained in first-aid methods. In addition, 34 plants reported that, although they had no first-aid rooms, first-aid kits were available for the treatment of minor injuries.

The value of first-aid rooms in preventing injuries from becoming disabling is apparent from an analysis of the injury experience of these plants. On the average, disabling injuries were much less frequent in the plants with first-aid rooms than in the plants without such facilities. In plants employing safety engineers, the injury-frequency rate for establishments with first-aid rooms was 15.9, compared with 20.6 for those plants without first-aid rooms. In plants that did not employ safety engineers, the frequency rate of the plants with first-aid rooms was 23.6, compared with 28.4 for the plants without such facilities.

Furthermore, it is evident that professional first-aid attendants can do much to prevent injuries from becoming disabling. In the group of plants with both safety engineers and first-aid rooms, the frequency of disabling injuries was only 14.0 when injuries were treated by physicians or registered nurses, while the rate was 28.9 when injuries were treated by nonprofessional employees. Similarly, in plants that did not employ safety engineers, the injury-

frequency rate for plants with physicians or registered nurses in attendance at the first-aid rooms was 21.8, compared with 26.8 for plants with employees having only limited training, in attendance.

Departmental Injury Rates

The extent to which details were available concerning the injury experience of workers in particular operations varied greatly among the reporting plants. In many of the small plants and also in some of the large plants there was very little departmentalization. Workers in these plants commonly move from one job to another as the need arises and no records are kept of the time spent on particular operations. The majority of the plants, however, were able to report their experiences in three broad categories: Piece-goods processing, yarn and thread processing, and plant service and maintenance operations. A substantial number also provided greater detail within these major categories.

One of the more important facts disclosed by this break-down is that the industry frequency rate is considerably diluted by including the experience of administrative, clerical, and laboratory workers who are exposed to relatively few of the hazards peculiar to the industry. The extent of their influence upon the over-all averages is partially indicated by the fact that nearly 10 percent of the total employment reported was in the clerical and administrative category, and that the average injury-frequency rate for this group was only 2.6.

Frequency Rates

Among the three major categories of operations, the processing of piece goods had the highest injury rate—23.6. The service and maintenance group of departments, which includes the administrative, clerical, and laboratory workers, had an average rate of 18.5, and the yarn and thread-processing departments had an average of 15.2.

The most pertinent detail for accident-prevention purposes, however, lies in a comparison of the injury rates for the various specific operating departments. The highest departmental frequency rates were for the maintenance and repair department (34.5), the piece-goods dye room (34.1), the print-color shop (29.1), the mechanical-print shop (28.5), the piece-goods receiving or gray room (26.5), the yarn and thread dye room (26.3), and the watchmen's department (25.3). All of the departments handling piece goods, except the screen-print shop and the make-up department, had injury rates above 20. In the yarn and thread group, however, only the dye-room rate was above 13. In the service and maintenance group, the shipping-department rate was 23.4 and the power-department rate was 19.0.

Injury Severity

Injury severity followed much the same pattern as the injury-frequency rates. In the piece-goods processing departments 5.3 percent of all disabling injuries resulted in death or permanent disability; in the service and maintenance group of departments 4.4 percent resulted in serious disabilities; but in the yarn- and thread-processing departments only 2 percent resulted in permanent impairments.

Among the piece-goods processing departments there were 3 which had very high proportions of serious injuries. In the mechanical-print shops 1 in every 11 disabling injuries resulted in death or permanent impairment. In the finishing departments the ratio was 1 in 14 and in the boil-off or bleaching departments it was one in every 17. In contrast, none of the 40 disabling injuries reported in the aging departments and only 2 of the 104 reported in the drying departments resulted in permanent disabilities. When ranked according to the average number of days lost or charged per disabling injury, the screen-print shop, with an average of 179 days, led all departments in the piece-goods group. High averages were also recorded for the mechanical-print shops, 145 days; and for the finishing departments, 140 days. The lowest departmental averages in the group were 34 days for the gray rooms, 40 days for the print-color shops, and 44 days for both the aging and dye-color shops.

Only 4 of the 196 disabling injuries reported in the production departments of the yarn- and thread-processing plants resulted in permanent disabilities, and there were no fatalities. The dye-room departments had the highest average time charge per disabling injury in this group, 94 days. For the yarn- and thread-finishing departments the average was 27 days; for the winding departments it was 25 days;

and for the packing departments it was only 15 days.

In the service and maintenance group of departments injuries tended to be very severe in both the power and watchmen's departments. In the power departments over 10 percent of the reported disabling injuries resulted in death or permanent impairment. As a result, the average time charge per disabling injury was 372 days and the standard severity rate of 7.1 days lost per 1,000 hours worked was also extremely high.

The watchmen's departments also had a high ratio of permanent impairments, 5.4 percent of all disabling injuries. This resulted in a high average time charge —224 days per case, and a high severity rate—5.7. In the maintenance and repair departments about 4 percent of the disabling injuries were serious cases and the average time charge was 92 days per disabling injury.

Kinds of Injuries Experienced

Disabling Injuries

In the broad review of the types of injuries which were disabling, the most striking fact was the high proportions of strains, sprains, bruises, contusions, and hernias, which, together, constituted 63 percent of the cases examined. These are all types of injuries which are commonly associated with heavy work, particularly with the manual moving of heavy materials. In this connection it is pertinent to note that previous studies of this nature have been made in the foundry, longshore, and brewing industries, each of which have a great deal of heavy manual work.[5] In the brewing industry only 55 percent of the disabling injuries were in these categories; in the longshore industry the ratio was 53 percent; and in the foundry industry it was only about 40 percent. Of specific interest is the fact that 5 percent of the disabling injuries in dyeing and finishing were hernia cases in comparison with 1.5 percent in breweries, 1.3 percent in foundries, and 0.9 percent in longshore operations.

Nearly 36 percent of the disabling injuries in dyeing and finishing were injuries to the trunk. Almost half of these were back strains. Because it is frequently impossible to determine the specific incident which produced a back strain, these injuries constitute a difficult problem in accident prevention. The high proportion of these injuries, however, indicates that the dyeing and finishing industry should carefully review its material-handling procedures and consider revamping those procedures to eliminate the possibilities of overexertion.

About 17 percent of the disabling injuries were foot and toe cases and about 10 percent were leg cases. The toe injuries were primarily bruises and fractures, all of which probably would have been prevented if the injured persons had been wearing steel-toed safety shoes. The foot and leg injuries were mostly bruises and sprains.

Over 10 percent of the disabling injuries were finger cases. Another 9 percent were hand injuries and 7 percent were arm injuries. The most common hand and finger injuries were cuts and bruises and the most common arm injuries were bruises and fractures. Injuries to the upper extremities were particularly important because of the high proportion resulting in permanent impairments. One in every 6 of the disabling finger injuries was a permanent impairment, as was 1 in every 18 of the disabling arm injuries and 1 in every 27 of the disabling hand injuries.

More than 7 percent of the disabling injuries were head injuries. About half of these were eye cases. The eye injuries were predominately burns inflicted by chemicals or hot liquids. If the generally accepted safety rule calling for the use of goggles while working with or near acids, caustics, or hot liquids had been more closely followed, a large proportion of the eye injuries might have been prevented.

Nondisabling Injuries

Because of the fact that records of nondisabling injuries are difficult to maintain and therefore not generally available, the customary procedure in evaluating the injury record of a plant or an industry is to consider only the disabling injuries. The frequency rates used for comparison, therefore, present only a part of the injury picture. It is true that the disabling injuries represent the more serious segment of the accident problem, but it is also recognized that the

[5] See Bureau of Labor Statistics Bulletin No. 764— Injuries and Accident Causes in the Longshore Industry, 1942; Bulletin No. 805—Injuries and Accident Causes in the Foundry Industry, 1942; and Bulletin No. 884—Injuries and Accident Causes in the Brewing Industry, 1944.

nondisabling cases, because of their great number, present a problem of considerable magnitude. Particularly in respect to costs, it is frequently maintained that the nondisabling injuries are just as important as the more serious disabling injuries. Nearly every nondisabling injury results in the loss of some productive time, even though the injured person does not leave the premises.

Studies made over a long period in a wide variety of plants have indicated that for manufacturing as a whole about 29 nondisabling injuries occur, on the average, for every disabling injury.[6] This generality has received wide acceptance as a basis for making broad comparisons. Its author, however, has pointed out that this ratio cannot be considered as representative of conditions in any specific industry and that it is to be expected that there will be wide variations in the experience of different industries or of different plants.

In the present survey an attempt was made to collect information concerning nondisabling injuries in order to provide some indication of the volume of such injuries in the dyeing and finishing industry and, incidentally, to indicate how the record of this industry differs from the ratio generally accepted as normal for manufacturing as a whole. These data were available in 32 of the plants which were visited. As a group, these 32 plants had 612 disabling injuries and 13,154 nondisabling injuries during 1945, indicating a ratio of 21 nondisabling injuries for every disabling case. This ratio, however, must be considered as an absolute minimum, because a substantial number of minor injuries were known to have been unreported.

Nearly half of the nondisabling injuries were cuts or lacerations, over a fourth were bruises, about one-tenth were burns, and nearly one-tenth were strains or sprains. In the cuts and lacerations category there were approximately 100 nondisabling injuries for every disabling case. For burns, the ratio was 31 to 1; for bruises, 19 to 1; and for strains or sprains 6 to 1.

Proportionately, injuries to the arms, hands, and fingers appeared less likely to become disabling than were injuries to any other part of the body. In the group of cases affecting the upper extremities, there were 60 nondisabling injuries for every disabling injury (for fingers alone the ratio was 107 to 1). For injuries to the head the ratio was 39 to 1 (eye cases, 52 to 1); for those affecting the lower extremities it was 10 to 1; but for trunk injuries it was only 4 to 1.

Re-treatment of First-Aid Cases.—Although no records of the actual time required for the treatment of first-aid cases were available, it was apparent that these so-called minor injuries in the aggregate are responsible for the loss of a substantial amount of paid time.

Only the very large plants have physicians on duty in the first-aid rooms. Consequently employees who experience injuries which require professional attention generally have to be taken to the physician's private office or to a hospital. This frequently will result in the loss of a half day or more for the injured person and for his escort as well. When retreatments are required, this loss of time may grow to considerable proportions.

For the cases which can be treated within the plant, the loss of time per case may be relatively small, but because of the volume of cases the total amount may represent a very important cost item. In the absence of actual records of the time required for treatments on the premises, the various first-aid attendants were asked to estimate the average time required for a visit to the first-aid room. The concensus was that each visit required at least 20 minutes. Six of the plants maintained complete case records, which indicated that over 16 percent of all first-aid cases required re-treatment and that the average number of treatments for all first-aid cases was 1.4 per case. On this basis the average time loss for each first-aid case may be estimated as approximately 30 minutes.

Among the various types of nondisabling injuries, burns most commonly required retreatments. For this group of injuries the average was 1.8 treatments per case. Strains and sprains required an average of 1.6 treatments per case, while bruises and dermatosis each required an average of 1.4 treatments.

[6] Industrial Accident Prevention, by H. W. Heinrich, New York, McGraw-Hill Book Co., 1941.

Accident Analysis

The Agencies

The determination of the particular physical items which are most commonly involved in the occurrence of injuries constitutes a fundamental step in the development of a successful safety program. When these items are known, it becomes possible to learn the types of accidents in which they are generally involved, to determine why they contribute to the occurrence of injuries, and then to take measures to overcome their injury-producing possibilities.

To permit the precise determination of the items, which are commonly termed "agencies," the American Recommended Practice for Compiling Industrial Accident Causes defines an agency as "the object or substance which is most closely associated with the injury, and which in general could have been properly guarded or corrected."

For the industry as a whole, the most prominent agencies of accident, in descending order of their importance, were: machines; working surfaces; vehicles, primarily hand trucks; rolled cloth; containers; chemicals; and hand tools. Items in these groups were involved in 3 out of every 4 of the reported accidents. Machine accidents, in addition to being the leading source of injuries, were also of particular importance because they produced a high proportion of the more serious injuries. Nearly 10 percent of all the injuries caused by machine accidents resulted in death or permanent impairment.

Among the accidents involving working surfaces, falls on slippery floors were most common. Practically all of the vehicular accidents resulted from the misuse of hand trucks. In many instances workers were caught between moving trucks and fixed objects or had their fingers pinched as they attempted to move the trucks in spaces where there was inadequate clearance. In most of the accidents involving rolls of cloth the injuries were strains resulting from attempts to lift or move the heavy rolls.

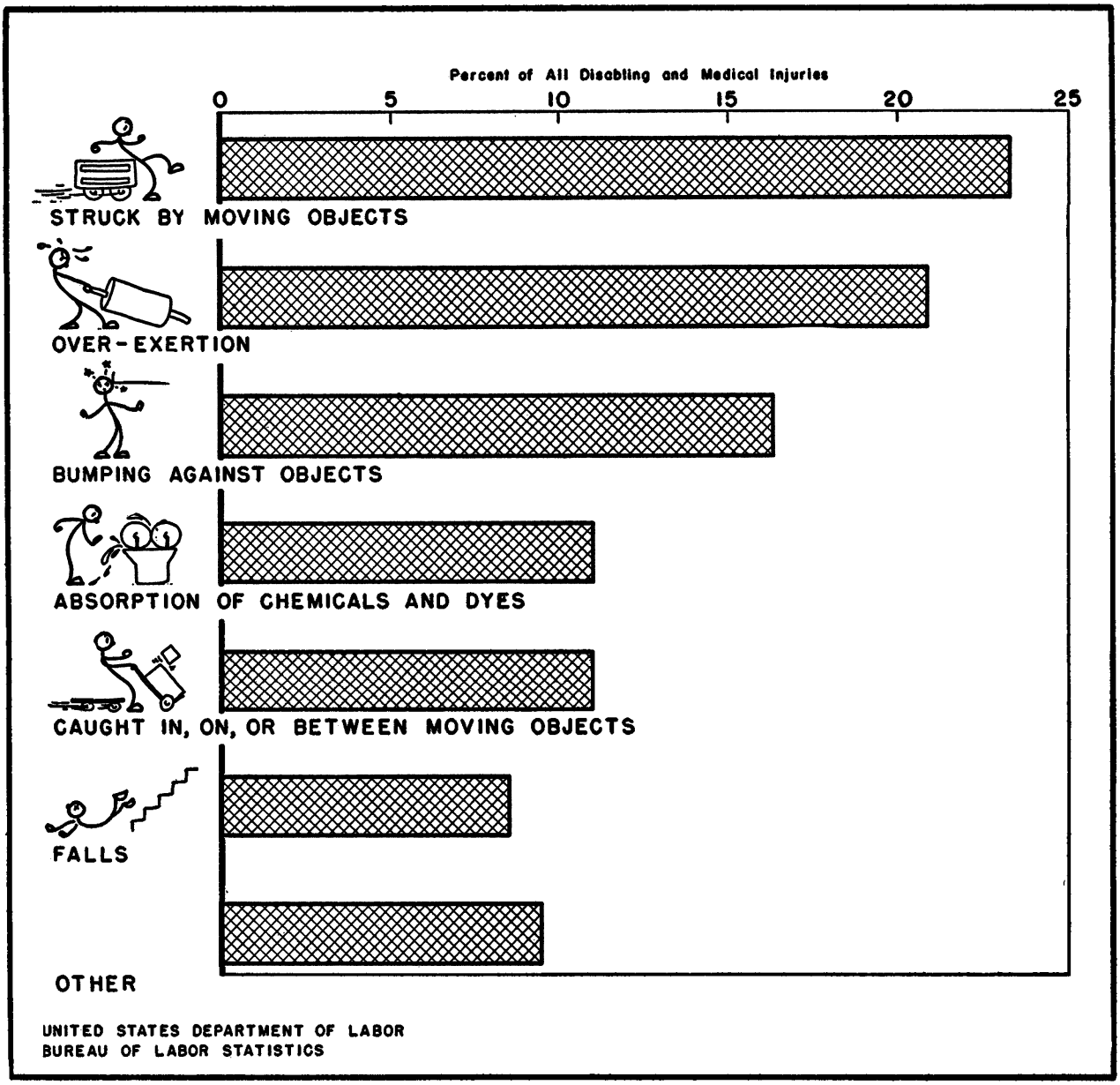
The specific containers most commonly involved in accidents were bales, cartons, kettles, buckets, vats, and bins. The accidents involving chemicals most commonly resulted in dermatosis caused by the absorption of dyes or printing colors into the skin.

A more specific application of the analysis to the operations which had the highest injury-frequency rates indicated that the outstanding accident agencies in the maintenance and repair shops, in the order of their importance, were machines, hand tools, and working surfaces. Machines were also of first importance in the piece-goods dye rooms, but here they were followed by chemicals, rolls of cloth, working surfaces, and vehicles. In the mechanical-print shops, machines again were the most common of the agencies, with rolls of cloth and metal parts in second and third place, respectively. Containers were the leading agency items in the receiving or gray-room departments, followed by vehicles, working surfaces, and machines.

Types of Accidents

Accidents in which workmen were struck by moving or falling objects were the most common source of injury. About 23 percent of the reported injuries resulted from accidents of this type. Overexertion, primarily in lifting or moving rolls of cloth, produced about 21 percent of the injuries; and accidents in which workers bumped into or struck against objects were responsible for another 16 percent. Approximately one-ninth of the reported injuries resulted from workers being caught in, on, or between moving objects, and a like number resulted from the inhalation, absorption, or ingestion of chemicals or fumes. Most of the latter group were dermatoses, resulting from the absorption into the skin of dyes or color pastes. Falls accounted for about 8 percent of the injuries, with falls on floors or other level surfaces outnumbering falls from one level to another by 2 to 1. Slips not resulting in falls, and contact with extreme temperatures were each responsible for about 4 percent of the reported injuries.

Chart 2. Major Types of Accidents in the Textile Dyeing and Finishing Industry, 1945



Accident Causes

Modern accident prevention is based upon two premises—first, that there is an identifiable cause for every accident; and second, that when an accident cause is known, it is generally possible to eliminate or to counteract that particular cause as the probable source of future accidents of the same character. In many instances, it is true that a variety of circumstances contribute to the occurrence of an accident, and the line which accident prevention should take may seem confused because of the multiplicity of the possible courses of action. It is generally recognized, however, that every accident may be traced to the existence of some unsafe working condition, to the commission of an unsafe act by some individual, or to a combination of these accident-producing factors. In the analysis of individual accidents for the purpose of establishing an effective safety program, therefore, it is essential that particular attention be given to the identification of these elements in the chain of circumstances leading to the accidents. Concentration upon the elimination of the unsafe conditions and practices identified by such analysis, with emphasis upon the elimination of the elements which are found to have contributed to many accidents, will almost invariably result in improved safety records.

The correction of unsafe working conditions generally is entirely within the powers of management. The avoidance of unsafe acts, on the other hand, requires cooperation and understanding by both management and workers. Management must take the lead, however, by providing safety-minded supervision and by making sure that all workers are acquainted with the hazards of their operations and are familiar with the means of overcoming them.

Unsafe Working Conditions

Practically all of the unsafe conditions revealed by the analysis fell into three general groups: Hazardous arrangements or procedures (responsible for nearly 43 percent of the accidents), defective agencies (responsible for 36 percent), and improperly guarded agencies (for 19 percent).

Hazardous Arrangements or Procedures.—Lack of proper lifting equipment or lack of sufficient help in lifting heavy objects was most common among the particular unsafe conditions included in this general group. Rolls of cloth and containers were involved in the majority of these lifting accidents.

The practice of moving rolls of cloth by hand and of hand-lifting the rolls into position on machines is quite common in the dyeing and finishing industry, even though some of the rolls may weigh as much as 500 pounds. In placing one of these heavy rolls on a machine, the workman generally moves the roll as near to the machine as possible on a hand truck from which he lifts first one side of the roll and then the other.

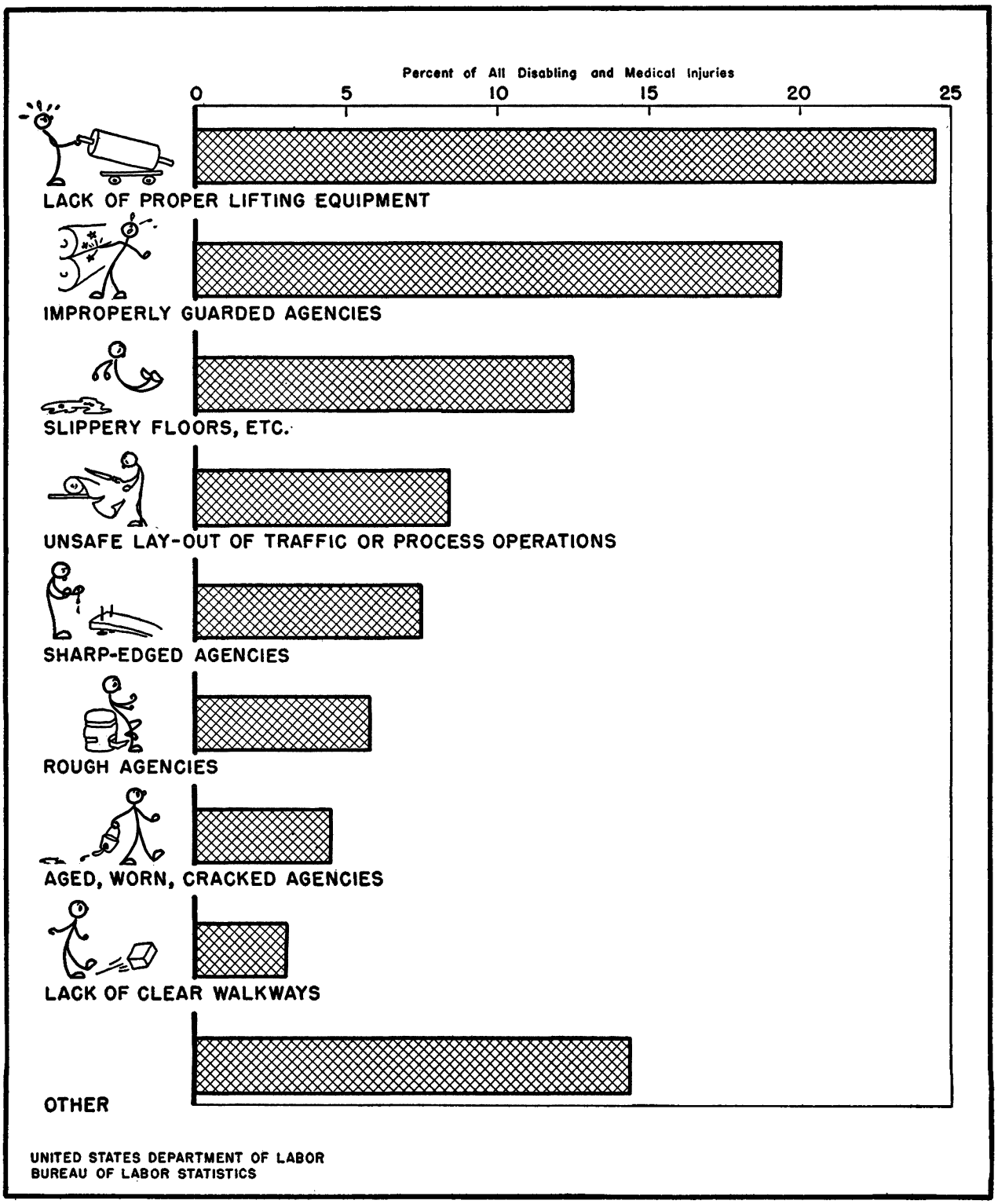
Although the injury possibilities involved in handling heavy rolls of cloth are obvious, relatively few of the plants have taken any steps to eliminate the hazard. In one plant, however, the problem was solved by plaiting all cloth into box-type hand trucks at the delivery end of each machine, which practically eliminated rolls of cloth in the processing operations. Another plant used specially designed hand trucks in place of the loading and unloading jacks at the entry and delivery ends of the machines. The cloth is threaded directly from one of these trucks through the machine and into a second truck at the delivery end, thereby eliminating the lifting at both ends of the machine. Another plant used powered lift trucks to place the cloth in the machines, and several plants had installed block and tackle equipment to do the lifting. One of the plants had also installed overhead rails on which the block and tackle with its suspended load could be moved from one operation to another.

To reduce the number of strains experienced by workers in the warehouse, one plant constructed special racks for storing rolls of cloth. By having these racks built to the same height as the beds of the hand trucks used in transporting the cloth and by limiting storage on the racks to one roll high, the cloth could be rolled on and off the hand trucks without lifting.

In the gray room and make-up, shipping, and warehouse departments much of the lifting problem centered in the handling of bales and crates. In the color shops, kettles and drums were the agencies most frequently involved in lifting accidents.

Departmentally, the lack of proper lifting equipment or the lack of sufficient help in lifting operations

Chart 3. Major Types of Unsafe Working Conditions in the Textile Dyeing and Finishing Industry, 1945



constituted an outstanding hazard in each of the piece-goods departments and in the shipping, yard, and warehouse departments. Among the piece-goods departments, at least a third of all the accidents ascribed to unsafe working conditions in the dye-color shops, the finishing departments, and the mechanical-print shops were chargeable to this particular hazard. In the finishing department this hazard was frequently encountered in calendering and tentering operations.

Unsafe planning or lay-out, either of traffic or process operations, was second in importance among the groups of hazards classified as hazardous arrangements or procedures. Hand tools, chemicals, machines, and containers were the agencies most frequently involved in the accidents arising from hazards of this general nature.

Extensive use of sharp knives to cut cloth constitutes a major hazard in the industry. The general failure to provide proper sheaths or convenient racks to hold the knives when not in actual use was responsible for a substantial volume of the reported injuries. Lacking these proper facilities the workers commonly lay the knives on their work tables or on other nearby surfaces where they frequently strike against them as they move about in their work. In a few plants where knives were not furnished and the workers were expected to tear the cloth whenever necessary, they frequently used their own pocket knives and experienced injuries when the blades snapped shut on their fingers.

Although the toxic properties of the dyes and chemicals used in the industry are well known, the operating procedures present many possibilities for the workers to come into direct contact with these materials. Skin infections, therefore, are an outstanding problem in many departments of the industry. As individual susceptibility varies greatly, some plants attempt to meet the problem by transferring the more susceptible workers to other work. In some instances, all workers exposed to contact with dyes or chemicals are given periodic medical examinations in an effort to catch dermatosis in its early stages. Much remains to be done, however, in a more direct approach of developing less toxic materials or of re-engineering the processes to eliminate exposure to the materials now in use. Success in this effort, it is believed, would eliminate about 25 percent of the injuries experienced by workers in the piece-goods dye-color shops and print-color shops; about 15 percent of those experienced by workers in both the piece-goods and the yarn and thread dye rooms; and from 10 to 12 percent of the injuries incurred in mechanical and screen-print shops.

Hazardous procedures in the use of machines were found to be many and varied. The operation most commonly resulting in injury, however, was that of threading heated drying cans, which produced a great many burns. Less common, but producing more serious injuries, was the practice of permitting workers to enter heated or fume-filled chambers of machines to make adjustments.

Transporting hot starch, dyes, and other chemicals in open buckets from which the materials can splash, or in glass containers which may break if dropped, is common throughout the industry and is responsible for many injuries. In finishing departments it is customary to mix the starch, used in mangles, in "starch rooms." The hot starch is then carried in buckets to the mangle and poured into the machine by hand. The reports indicated that the starch frequently splashes on the worker performing this operation and often causes very painful burns. One plant had eliminated this hazard by placing the starch-mixing operation on the floor above the finishing room and running a pipe directly to the mangle from the mixing tank. This simple utilization of the force of gravity not only eliminated the hazards involved in transporting the starch but also reduced the amount of labor required to place the starch where it was needed.

In relatively few of the plants was there any indication of a serious traffic problem. One plant reported that it had had a number of accidents involving powered trucks at blind corners, but this hazard had been overcome by installing electric eyes, which operated warning signals, in passageways leading to the danger points.

Hand plaiting in kier boilers is particularly hazardous because the heat may cause the worker to faint. If this happens, he may be suffocated by the cloth piling on him. However, the widespread use of automatic plaiters apparently has practically eliminated accidents of this type. None were reported in 1945 by the plants included in this analysis.

Poor housekeeping was a common source of accidents in many plants. Cluttered working surfaces and passageways caused many workers to trip and fall, and unsafely piled or stored materials frequently fell on workers or presented bumping hazards. Another hazard often resulting in injuries to machine

operators and maintenance men was the general lack of a safe means of reaching the elevated parts of machines. The provision of safe ladders or platforms for work at levels beyond easy reach from the floor would have prevented most of these injuries.

Defective Agencies. — Slippery working surfaces were an outstanding source of accidents throughout the industry, particularly in boil-off or bleaching departments, dye-color shops, dye rooms, mechanical-print shops, aging departments, drying departments, and gray rooms. In most instances this hazard was due to water, printing colors, or dyes which had been spilled or splashed in the working areas. In general, there was little evidence of any effort to reduce the hazard of slippery floors, although everyone in the industry seemed to be aware of the danger involved. In a few instances, however, rough-grained concrete floors had been installed, and in some plants the workers were furnished with wooden clogs for use where floors were generally wet.

Sharp-edged agencies, such as metal tie bands on bales and crates, clips in the selvedge of cloth passing through machines, and slivers projecting from shells which were rotating on machines were particularly common sources of severe cuts and abrasions. Projecting nails or splinters on working surfaces, splintered handles and rough frames on hand trucks, broken floors, and rough or splintered benches, tables, and chairs were also responsible for many injuries of this nature. The prevalence of this latter group of unsafe conditions was a strong indication of the need for more adequate inspection and repair of the equipment, tools, and materials used in the industry.

Improperly Guarded Agencies.—The proportion of accidents ascribed to inadequate guarding was unusually high in the dyeing and finishing industry—19 percent as compared with less than 10 percent in most of the other industries surveyed by the Bureau of Labor Statistics in recent years. The importance of this group of accidents, however, is even greater than is indicated by its volume. In general, accidents arising from inadequate guarding tend to produce serious injuries. Over 13 percent of the injuries resulting from this group of accidents, in this survey, were cases of death or permanent physical impairment.

Machines, boilers and other pressure vessels, containers, and working surfaces were most frequently involved in accidents resulting from inadequate guarding. In the machine group unguarded gears, belts, and pulleys were the most common sources of injury. The lack of guards on squeeze rolls accounted for a number of injuries and the lack of splash guards on washing, soaping, and dyeing machines was primarily responsible for many cases of dermatosis. One of the most serious hazards in make-up departments was in the operation of hookers, or folding machines. Few attempts have been made to guard these machines and many management officials maintain that no effective guard can be applied. In two plants visited, however, this problem had been given careful study and guards had been designed. One of these, a gate guard, had not yet been installed, so its effectiveness could not be checked. The other, which was operating satisfactorily, consisted of an electric eye, across the front of the machine, which activated a brake on the motor when the operator's hand entered the danger zone.

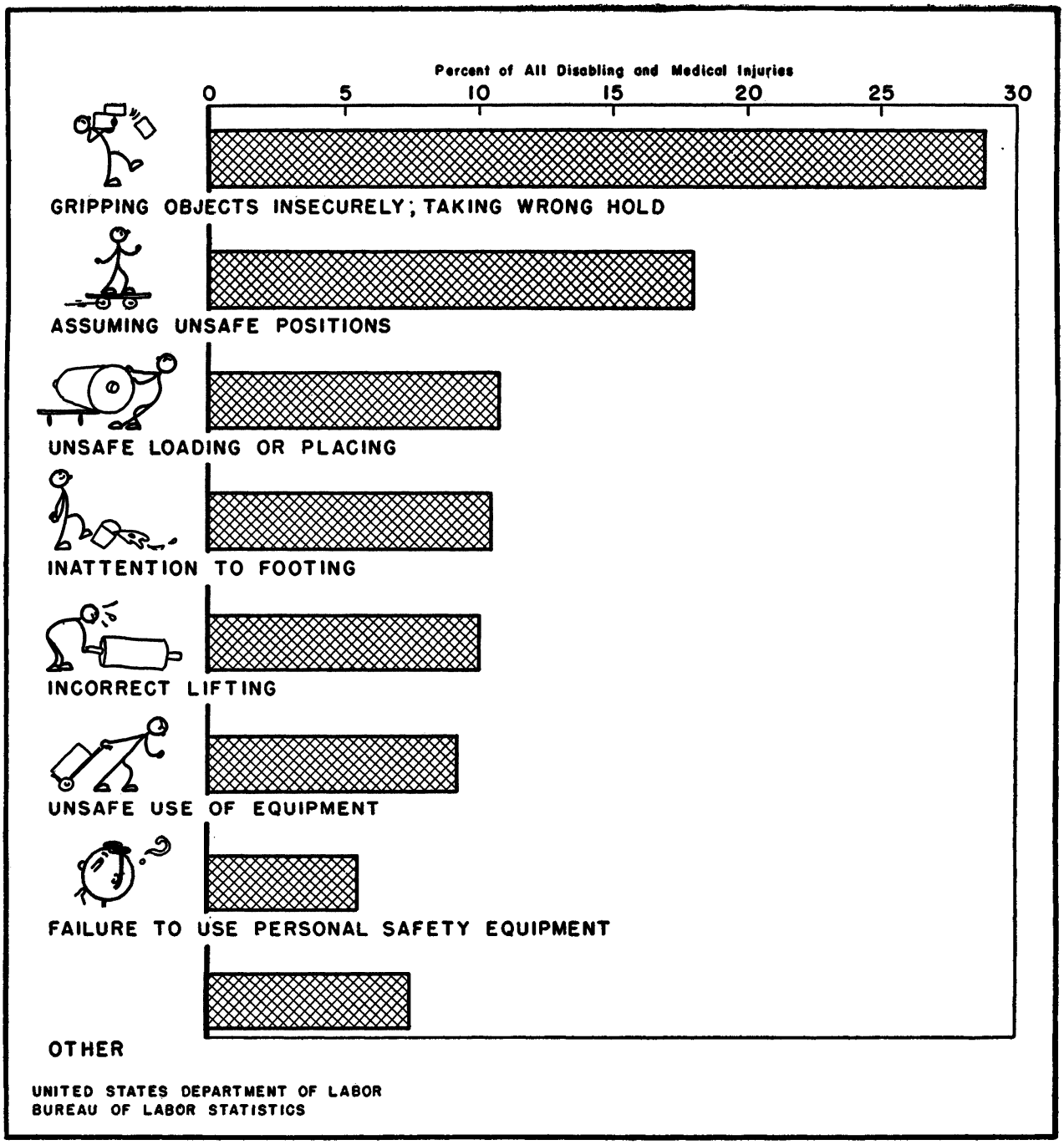
Most of the accidents ascribed to unguarded boilers or pressure vessels were cases in which workers touched hot steam pipes or other heated surfaces. The unguarded containers involved in accidents were chiefly uncovered buckets used in carrying acids or other harmful chemicals. Unguarded working surfaces were generally elevated platforms or walkways not provided with adequate railings. There were, however, a number of accidents traceable to unguarded manholes and unguarded cloth bins.

Unsafe Acts

For the purpose of accident analysis, an unsafe act is defined as "a violation of a commonly accepted safe procedure."[7] Literally, this definition means that no personal action shall be designated as unsafe unless there was a reasonable and less-hazardous alternative method or procedure. There is, however, no implication that the alternative safe procedure must have been known to the person who acted in an unsafe manner, nor that his unsafe act was the result of a considered choice between the two possible procedures. In many of the accidents studied in this survey it was apparent that the individual knew the safe procedure, but consciously decided not to follow it. In other cases, circumstances indicated that the person acted unsafely simply because he did not know the alternative safe method. The first step toward the elimination of unsafe acts, therefore,

[7] American Recommended Practice for Compiling Industrial Accident Causes, approved by the American Standards Association, August 1, 1941.

Chart 4. Major Types of Unsafe Acts in the Textile Dyeing and Finishing Industry, 1945



is to make sure that all workers are thoroughly instructed in the safe methods of performing their duties and that they are familiar with the hazards connected with deviations from those methods. The second essential step is to exercise strict supervision to see that safe procedures are followed.

Most of the accidents attributable to unsafe acts fell into two general groups: Nearly 40 percent resulted from the use of unsafe equipment or the unsafe use of equipment, and 38 percent from workers assuming an unsafe position or posture.

Equipment—Unsafe, or Unsafely Used.—Within this group the outstanding type of unsafe act was that of taking an incorrect hold or not maintaining a good grip on objects being handled. For example, in many cases, shells, center bars, boxes, rolls of cloth, and similar objects slipped from the worker's hands because he attempted to handle the material with wet hands, grasped the material at a sharp or rough spot which caused him to release his grip, or did not hold it firmly enough to control its movements. Cuts on the hands and pinched or crushed fingers and feet were the most common injuries resulting from these practices. Similarly, taking an incorrect hold on objects which were being piled or placed in machines and pushing hand trucks other than by the handles led to many crushed fingers and hands.

Use of hand tools or other equipment for purposes other than those for which they were designed was a common source of injury. Additional examples of the misuse of equipment included running with hand trucks and carelessness in handling vehicles at blind corners. Basically, all of these unsafe acts indicate inadequate supervision.

Unsafe Position or Posture.—Inattention to footing and unsafe lifting were the outstanding unsafe acts in this general category. In the inattention-to-footing group there were many cases of tripping over objects lying on the floor and of falls on slippery surfaces. Lifting with a bent back while in a cramped or awkward position, or while standing on irregular or insecure surfaces caused many of the lifting accidents. Other unsafe practices in this general group included such actions as working, walking, or standing in the path of moving vehicles; unnecessarily working or passing under suspended objects; entering chambers of machines or other enclosures which were unsafe because of high temperatures or fumes; and riding in an unsafe position on vehicles.

Unsafe working conditions, particularly those created by poor housekeeping and the lack of proper lifting equipment, were also involved in many of the accidents associated with assuming an unsafe position. Correction of the unsafe working condition, to eliminate the possibility of any worker exposing himself to the hazard, would be the most effective safety measure. Nevertheless, it is apparent that workers should be more thoroughly trained to recognize and cope with hazards which they may encounter on the job.

Other Unsafe Acts.—In the general category of unsafe placing or mixing of materials, a substantial number of accidents involved collapse of insecurely built piles of material. Splashing of dyes or chemicals during mixing operations was also responsible for a considerable number of injuries. In many instances these accidents resulted from the introduction into the mixtures of steam under too great a pressure.

Other types of unsafe acts, which produced accidents in sufficient volume to indicate that they are fairly common in dyeing and finishing operations, included failure to use proper safety equipment where required; wearing of unsafe clothing, such as loose sleeves or neckties while working on moving machinery; running in the workplace; operating equipment at unsafe speeds; and operating equipment without authority.

Occupational Analysis

For accident-prevention purposes the most useful kind of information is that which furnishes the greatest degree of detail and most closely relates the existing hazards to the specific operations or occupations which are affected by those hazards. To supply this desirable detail, an effort was made in this survey to compile the injury and accident data on an occupational basis. Unfortunately only 37 of the cooperating plants had records from which full occupational detail could be drawn. As a result the

volume of data for many of the individual occupations was severely limited. Strict adherence to the Bureau's usual standard of not publishing data for any classification unless the coverage includes at least one million employee-hours of exposure would have prevented publication of much of the occupational detail. However, in view of the great interest inherent in an occupational analysis, it was considered desirable to deviate from the regular procedure in this instance and to present injury rates for each classification for which the reported exposure amounted to 100,000 or more employee-hours worked. On this basis it was possible to prepare a comparative analysis of the injury experience of workers in 44 different occupational classifications. These were all plant occupations. Office and administrative positions were excluded.

Among the listed occupations, the disabling injury-frequency rates ranged from 5.2 for napper tenders to 71.0 for gray-cloth tenders. Six other occupations had disabling-injury rates below 10. These were: Starch mixers, 6.0; cloth folders, 6.6; cloth-mercerizer operators, 8.6; foremen, 8.8; cloth bale headers, 9.6; and continuous-dyeing machine operators, 9.8. High rates were recorded for: Laborers, 62.7; back tenders (printing), 62.2; padding-machine operators, 53.5; dye-reel operators, 50.2; back-end men, 47.8; and jiggers, 42.0. Twelve other occupations had rates between 20 and 30, and 11 had rates between 30 and 40.

Injury details for the several occupations appear in tables 24 to 30. A description of the major operations involved in each of the occupations, an outline of the principal hazards encountered, and a summary analysis of the injury and accident record of workers in these occupations is presented in table 31.

Accident Prevention[8]

Accident prevention is not merely a form of humanitarianism—it is good business which pays off well in reduced operating costs and more efficient production.

Personal interest and continuing leadership by top management are essential to the success of any accident-prevention program. Definite responsibility for the operation of the program should be assigned, but the chief executive should keep in close touch with results and should make sure that all employees are aware of his continuing support for the program.

A complete accident-prevention program must have two objectives—(1) to reduce physical hazards to an absolute minimum and (2) to develop safe procedures for each operation which will minimize the possibility of accidents arising from human errors or misunderstanding.

Ideally, an accident-prevention program should start with the original planning of the plant or undertaking. Safety engineering applied at the design stage can avoid the creation of many hazards which may be exceedingly difficult to eliminate if they are not discovered until after operations have started. This advance planning will simplify, but obviously can never eliminate the need for, a continuing accident-prevention program.

There is no standard pattern for successful accident prevention. Experience indicates, however, that the following basic elements constitute the framework of any effective program.

1. Regular safety inspections of all premises, equipment, and operations to detect hazardous conditions and unsafe practices.
2. Job safety analysis to determine job requirements and to help in the development of safe work methods.
3. Accident investigation to determine the specific hazards and unsafe acts which cause accidents.
4. Safety education to arouse general employee interest in safety and to increase the workers' knowledge of safe practices.
5. Safety training to develop worker skill in particular safe practices.

Accident Investigation

As every accident constitutes proof of the existence of an uncontrolled hazard or of the commission of an unsafe act, it is most important that a thorough investigation be made in each instance to determine what these accident factors are.

Accident investigation is essentially a simple procedure. Maximum results will be achieved, however,

[8] This section of the report, including the analysis of typical accidents, was prepared by the engineering staff of the Safety Standards Division of the Bureau of Labor Standards. Each of the listed accidents was investigated at the point of occurrence, and the recommended measures for the prevention of similar accidents were based upon the facts developed in those investigations.

if the following general principles are observed:

1. Qualifications of the investigator:

(*a*) Common sense and clear thinking are essential. The investigator must neither jump to conclusions nor accept the unverified opinions of others. He must be able to collect his own facts, evaluate the evidence, and formulate a reasoned conclusion.

(*b*) His familiarity with the equipment, operation, or process should be sufficient to give him an understanding of the possible hazards of the activity.

(*c*) He should have a good general knowledge of the types of hazards most commonly involved in accidents.

2. Responsibility of the investigator:

(*d*) Neither the investigation nor the investigator should be under the control of the supervisor of the operation in which the accident occurred. The approach, however, should be that of cooperating with the supervisor in the determination of the necessary corrective action.

3. Procedure:

(*e*) Each clue should be investigated fully. Seemingly reasonable conclusions are frequently changed as a result of exploring factors which superficially appear of little importance.

(*f*) As both a physical hazard and an unsafe act are involved in most accidents, both possibilities should be investigated fully.

(*g*) Every investigation should lead to a definite recommendation for corrective action and no investigation should be considered as satisfactorily completed unless such a recommendation is included in the report.

(*h*) Whenever possible more than one person should investigate—two heads are better than one.

(*i*) Promptness is essential. Conditions may change quickly and details may soon be forgotten. Moreover, promptness in making the investigation will indicate to the workers the degree of importance which management attaches to safety.

(*j*) Every accident should be investigated. The seriousness of an accident is often a matter of pure chance. Conditions which led to a minor accident may later result in a serious injury or fatality.

Typical Dyeing and Finishing Accidents

To illustrate the general types of accident problems encountered in dyeing and finishing operations, a number of recently reported accidents were selected for detailed investigation. Brief descriptions of these accidents accompanied by the recommendations of the Bureau of Labor Standards investigator are given on the following pages.

Receiving and Shipping

1. A truck driver and his helper were unloading 300-pound drums, using a metal skid. As one of the drums slid down the skid it caught on a crosspiece between the skid rails. The jar caused the skid to slip and the drum toppled over onto the helper's foot.

Investigation disclosed that the skid consisted of two channel irons connected with cross braces. One of the cross rods had become bent so that it caught the drum as it slid down. No means had been provided for anchoring the skid, which was simply leaning against the truck bed. The injured worker was not wearing safety shoes.

(a) *The design of the skid should have included proper bracing for the cross rods with a lengthwise member, possibly a plank.*

(b) *Provision should be made for fastening skids to the truck body or to the platform floor to prevent their slipping.*

(c) *Damaged equipment should be removed from service until repaired. Frequent inspections of all materials-handling equipment is an essential safety measure.*

(d) *Workmen who handle heavy materials should wear safety shoes.*

2. A workman was loading a case of cloth onto a trailer truck from the loading platform. When the case tipped, he tried to stop it from falling and suffered a strain.

Investigation disclosed that the trailer truck was about 10 inches higher than the platform and that the worker had bridged this difference with a short metal skid. The effort required to push the loaded hand truck up this skid was too great for the worker.

(a) *A longer skid which would reduce the angle of incline should be used. The skid should also be firmly secured.*

(b) *The load limits that can be handled safely on a hand truck by one man should be determined and extra help should be assigned when loads exceed that limit.*

3. Two employees were stocking wooden cases

three high in a warehouse. One of the workers suffered a hernia.

Investigation disclosed that each case weighed approximately 250 pounds. Hand stacking was customary and, because the possibility of strains was recognized, each employee had been instructed in safe lifting methods. Because of the close quarters in which they worked, additional employees could not be assigned to help in the lifting.

No amount of instruction can prevent strains and hernias under these circumstances. The minimum corrective action would be to redesign the warehouse lay-out to allow adequate space for additional help. The most effective action would be to use a mechanical stacker instead of doing the work by hand.

Bleaching

4. While he was opening a small valve in the chlorine line, a bleachery employee received a shot of chlorine in the face.

Investigation disclosed that these valves had leaked repeatedly and that no provision had been made to prevent injuries of this type.

(a) *Shields should be placed in front of these valves to direct leakage away from the worker.*

(b) *All persons performing this work should wear face shields.*

(c) *All lines and other equipment carrying chlorine should be inspected periodically and promptly repaired, if necessary.*

5. An employee was pouring acid from a carboy into a small container. The acid splashed and burned his face and hand.

Investigation disclosed that no protective clothing was worn in this operation; that no facilities for the mechanical handling of carboys were provided; and that no attention had been given to the prevention of splashing.

(a) *Suitable personal protective devices, including face shields and acid-resistant aprons, should be provided for employees who handle acids.*

(b) *Carboy tilters should be used in handling carboys.*

(c) *Whenever possible, safety siphons should be used to transfer acids from one container to another.*

6. A kier helper brushed against a steam pipe and burned his arm.

Investigation disclosed that a considerable amount of steam piping and fittings within easy reach were not insulated.

All steam piping and fittings that are within reach of working floors and platforms should be insulated.

7. A workman standing on the rim of the gray and white bin fell into the bin and fractured his shoulder.

Investigation disclosed that no provision had been made for safe footing on these bins.

Where access to the tops of these bins is required, railed platforms should be provided.

8. A workman sprained his ankle in stepping from a ledge on the bleaching vat to the floor.

Investigation disclosed that the floor was of old planking with wide spaces between planks and that the planks were not level.

Every floor, working place, and passageway should be kept free from protruding nails, splinters, holes, or loose boards.

Dyeing

9. Employees in the color shop complained of headaches, nausea, and dizziness while handling aniline and some other colors.

Investigation disclosed that this occurred chiefly in connection with the work of weighing and preparing batches. Respirators had been provided but their use had not been enforced.

(a) *The full extent and seriousness of this hazard can only be determined through a study by a competent industrial hygiene technician. The services of such a technician should be secured for that purpose.*

(b) *While his findings might include the use of respirators, it should be emphasized that, as far as practical, the hazard should be eliminated or controlled by the prevention of air contamination and of contact with hazardous substances.*

10. An employee was using a bucket to carry caustic to a jig. Caustic soda, dripping from the bucket, burned his leg.

Investigation disclosed that the bucket had been dropped and was severely bent. As a result the seam in the bucket was no longer watertight.

All equipment should be inspected frequently on a regular schedule. Defective equipment should be repaired immediately or removed from service until repairs have been made.

11. A jig operator was pouring caustic from a bucket into a jig. The caustic splashed out of the jig and burned his arm.

Investigation disclosed that no protective clothing was worn in this operation; that it was general practice to pour caustic into jigs from buckets; and that

no attention had been given to the prevention of splashing.

(a) *Caustic should never be poured from buckets or other containers. Where possible, it should be piped to the point of use. If piping is impractical, safety siphons should be used to transfer caustic from one container to another.*

(b) *Suitable personal safety equipment should be provided for all employees handling caustic.*

12. Two employees were removing a roll of cloth from the jig by hand. One of the workers sprained his back.

Investigation disclosed that no mechanical aids had been provided for this operation; no instructions had been given to these men in the safe methods of lifting heavy objects.

(a) *Mechanical lifting apparatus should be installed for lifting heavy rolls of cloth onto and from the jigs.*

(b) *All workers handling heavy objects should be carefully instructed in the safe methods of lifting.*

13. A jig operator was cleaning equipment when a jig started to boil over. To close the steam valve it was necessary for the operator to pass the jig. In doing so he was burned by the boiling water.

Investigation disclosed that the jig did not have an overflow pipe nor splash guards; the steam controls were not conveniently located; and the workman was excitable and not systematic in performing his work.

(a) *All jigs should be equipped with overflow pipes and splash guards.*

(b) *Control valves should be within easy reach at all times. If necessary, two or more control valves should be installed.*

(c) *Proper job placement and careful training are essential for safety.*

14. A dye-box operator contracted dermatitis of the hands and arms as a result of contact with dyes used in the dye box.

Investigation disclosed that during the operation of the dye box the dye liquor splashed over the front of the machine.

(a) *Splash guards should be installed to reduce splashing to a minimum.*

(b) *Supervisors or plant nurses should frequently examine the hands and arms of employees engaged in this and similiar work to detect infection before it becomes serious. Employees who are susceptible to this infection should be placed on other work.*

(c) *Protective creams should be supplied to employees engaged in this work and all workmen should wash all exposed parts of their bodies thoroughly before and after each shift.*

15. A dye-box operator lacerated his finger on a dye-box control rod.

Investigation disclosed that the rod was badly rusted and rough. The wet condition in this department caused metal parts to rust very quickly.

(a) *Particular attention should be given to the prevention of rusting, by first cleaning the rust from the metal parts, and then applying a coating of rust-preventative such as aluminum or asphaltic paint.*

(b) *New equipment, as far as practical, should be of rust-resistive materials.*

Drying

16. A dry-cans operator was threading cloth through the machine. His helper, at the controls, thought he heard the operator call to start the machine. As the helper started the dry cans, the operator was caught in the rolls and fatally injured.

Investigation showed that no standard system of signals had been provided for this operation; that the nip lines of the rolls were not guarded; and that the control switch was a considerable distance from the machine.

(a) *Bar guards should be provided along the nip lines of all rolls.*

(b) *Wherever possible, the control switch should be located so that the threading operation can be seen from the switch.*

(c) *A definite system of signals should be developed and always used in such operations.*

17. A dry-cans operator strained his back while lifting a roll of cloth from the dry cans.

Investigation disclosed that these rolls of cloth averaged 500 pounds per roll; that it was customary for the employees engaged in this work to lift or slide one end of the roll from the machine and then the other.

(a) *Mechanical lifting apparatus should be installed for lifting heavy rolls of cloth to and from machines.*

(b) *All workers handling heavy objects should be carefully instructed in the safe methods of lifting.*

18. While threading the dry cans, an employee burned his arm on a steam pipe.

Investigation disclosed that the steam pipes leading to the dry cans were not insulated.

All steam piping and fittings within reach of working areas should be insulated.

19. When a dry-cans operator bumped a shell

which was leaning against the machine, it fell on his foot, fracturing his toe.

Investigation disclosed that the operator had, shortly before the accident, removed the empty shell from the unwinding jack of the machine and placed it at the side of the machine; that no provision had been made for accommodating the empty shells.

Racks should be provided at all machines for the safe storage of shells which are not being used.

20. While changing trucks under a dry-box, a workman tore his hand on the sharp edge of a piece of metal projecting from the truck body.

Investigation disclosed that many of these box trucks had sharp, projecting edges due to prolonged usage; no provision had been made for the systematic return of hand trucks to the maintenance department for repairs.

This equipment should be included in periodic inspections and provisions should be made for the prompt repair of all defective equipment.

21. The operator of a set of steam drying cans was cleaning color from the surface of the cans with a cloth while the machine was in motion. The cloth caught and drew his hand between the cans.

Investigation disclosed that it was a regular practice for this employee to clean the cans while the machine was in motion because he disliked the repeated stopping and starting necessary to expose new areas of the cans for cleaning.

(a) *Strict enforcement of the rule "no cleaning or adjusting of machinery in motion" is essential to safety. Lax supervision is apparent in this case.*

(b) *Whenever possible, machinery of this type should be equipped with an inching device to facilitate cleaning.*

Finishing-Department Machine Operations

22. While threading calender rolls, the operator was caught between them and fatally injured.

Investigation disclosed that the rolls were unguarded.

An angle or bar guard extending the full length of the nip line should be installed on all in-running rolls.

23. Two men were removing the weight from the bowls of the calender. When they released the ratchet crank the dog failed to hold, allowing the crank to spin and strike the hand of one of the workers. His wrist was fractured.

Investigation disclosed that the ratchet teeth were badly worn and that there had been no recent inspection of the ratchet and pawl.

All lifting devices should be inspected frequently on a regular schedule. Defective equipment should be repaired immediately or removed from service until repairs have been made.

24. As was customary at the start of each workday, a tenter-frame operator was cleaning the rolls at the entrance end of the tenter frames. When his helper started the machine without warning, the operator's hand was caught and pulled into the machine.

Investigation disclosed that the bell used to give the starting signal on this machine had the same sound as the bell of an elevator nearby and that the helper mistook the elevator bell for a signal from the operator to start the machine.

(a) *The starting signal should be distinctive so as to avoid confusion with other signals.*

(b) *The starting signal should include two-way communication between the employee at the controls and the employee working on the machine. After receiving a signal, the workman at the controls should confirm the signal before starting the machine.*

25. A sanforizer operator stopped his machine so that a maintenance mechanic could examine the belt drive. A short time afterwards, the operator, thinking that the mechanic had completed his work on the belt, restarted the machine. The mechanic's hand was caught in the V-belt drive and his finger amputated.

Investigation disclosed that although the safety rules required that the mechanic place a "Do not operate" sign on the control switch, he had failed to do so; and, further, that this mechanic had repeatedly failed to observe that safety rule.

(a) *A control-switch which can be locked in the open position should be installed. Each mechanic should be provided with his own lock and key and should be instructed to lock the switch before starting work on machinery.*

(b) *Because of the high degree of hazard in all maintenance work, particular attention should be given to training each mechanic in safe working procedures and in the strict observance of all safety rules.*

26. While threading cloth through a mercerizing machine, the operator climbed on the caustic supply line over the mercerizing frame. When he attempted to step down, he slipped and fell to the floor, fracturing his ankle.

Investigation disclosed that it was common prac-

tice to climb on the machine while threading, as no ladder or steps had been provided.

Where workmen are frequently required to climb to, or work from, an overhead position, a permanent ladder and platform should be provided to insure safe access and a safe working surface.

Printing

27. While lifting a printing roller into place on the printing machine, a back tender strained his back.

Investigation disclosed that these rollers each weighed several hundred pounds; that in placing these rollers on the printing machine, employees frequently must work from stooped or other awkward positions.

(a) *Adequate help, trained to work as a team, should be provided for this operation.*

(b) *A study of this operation should be made with a view of replacing manual lifting with mechanical lifting where possible.*

28. The back tender on a printing machine reached above the track roll to straighten the selvedge of the cloth. His hand was caught in the track roll and was lacerated.

Investigation disclosed that the worker had been properly instructed, but the roll was unguarded.

A horizontal safety board or guard should be placed about 6 inches above the track roll and parallel to it.

29. As an employee was removing an empty shell from the unwinding jack, a sliver entered his finger.

Investigation disclosed that the shell was very rough due to prolonged use.

All shells and similar equipment should be inspected frequently on a regular schedule. Rough or worn shells should be repaired immediately or removed from service until repairs have been made.

30. Doctor blades for the printing machines were stored on a rack. As an employee walked past the rack, he bumped one of the blades and cut his hand.

The rack for doctor blades should be designed so that the blades will not project beyond the frame.

Make-up

31. A folding-machine operator was struck on the elbow by the side arm of the folder.

The side arms of all folding machines should be enclosed in mesh guards.

32. When a hooker operator dropped a string in the folded cloth to mark a defect, her finger was caught between the blade and jaw of the hooker.

Investigation disclosed that it was common practice to place the string without stopping the machine and that no guard had been provided.

All moving parts of machines should be guarded to prevent accidental contact by employees.

33. When a hooker operator grabbed for the blade to stop the machine, her hand was caught between the blade and the jaw of the machine.

Investigation disclosed that it was general practice to stop the hooker or folding machine in this manner because the control button of the machine failed to stop the blade immediately.

(a) *A positive control which would activate a brake on the machine should be installed on each hooker or folding machine.*

(b) *The hooker blade should be guarded to prevent accidental contact by employees during its operation.*

34. A worker at the cloth-examining table laid his scissors on the table. A seam in the cloth passing over the table caught the scissors and carried them into the winding roll. The ends of the scissors projected from the roll and as the roll turned, the scissors lacerated the worker's hands.

Investigation disclosed that the examining-table operators were supposed to carry the scissors in a scabbard but that this instruction was frequently disregarded.

Since this work can be done from one position, the scissors should be hung from a chain within convenient reach or kept in a scabbard mounted on the side of the table.

35. A shader was sorting cloth from a flat or skid. When he placed his hand under the last piece of cloth on the flat, a splinter punctured his hand.

Investigation disclosed that the surface of the flat was rough; and that the skids were not inspected for defects.

All equipment such as skids should be inspected frequently on a regular schedule. Defective equipment should be repaired immediately or removed from service until repairs have been made.

36. When a beamer started a rolling machine, the roll of cloth fell from its position in the machine and struck the operator on the foot.

Investigation disclosed that the operator failed to place the clamp over the center bar after setting the roll of cloth in the machine and that the operator did not wear steel-toed safety shoes.

(a) *The clamp should be interlocked with the starting mechanism of the machine so that the rolling machine could not be started unless the safety pin was in place.*

(b) *Employees handling rolls of cloth should wear steel-toed safety shoes.*

Trucking

37. An employee was trucking bales of cloth with a two-wheeled hand truck. As he passed close to a pile of bale ties, his hand struck the ties which lacerated his knuckles.

Investigation disclosed that there had been a number of similar accidents.

(a) *Truck handles should be fitted with hand guards to prevent hands from being scraped against objects as in this accident.*

(b) *Aisle lines should be plainly marked on the floors and careful attention should be given to placing objects so that the aisleways are free from obstructions.*

38. Two workmen were pushing a truck loaded with cloth. At a blind intersection the truck struck another employee, who was walking in the cross aisle.

Investigation disclosed that truckers seldom slowed down at this point.

(a) *Mirrors should be installed at blind corners to provide a view of approaching traffic.*

(b) *Vehicles should be required to come to a full stop before entering a blind intersection.*

39. A hand trucker tripped over a bolt projecting from the floor and injured his knee.

Investigation disclosed that the maintenance crew, working on the floor below, had run this bolt through a beam to provide a temporary support for their hoist. This was a common practice and had resulted in numerous tripping accidents.

Either a new method of supporting the hoist should be devised or a railing guard should be placed around each such projecting bolt.

40. A bleachery employee fell and bruised his knee while pushing a four-wheeled truck loaded with wet yarn.

Investigation disclosed that the truck was hard to push because it had poor bearings and that the floor in this area was continually wet.

(a) *Trucks should be equipped with free-rolling bearings and should be inspected regularly to insure that they are in proper condition.*

(b) *Where floors are likely to be wet they should be designed for good drainage and should be surfaced with a material having good anti-slip properties even when wet.*

41. Two workmen were lifting a roll of cloth from a table to a four-wheeled truck. The loose end of cloth caught the table causing one worker to drop his end of the roll and throwing the weight of the roll on the second workman, who strained his back.

Investigation disclosed that these rolls of cloth frequently became partly unrolled in handling and that similar accidents had occurred repeatedly.

Suitable clips or ties should be used to secure the cloth when the roll is formed.

42. An electric tow-motor and trailer unit jammed against a wall when the operator tried to make a sharp turn on the warehouse platform. In attempting to free the equipment, the operator was crushed between the motor unit and the trailer.

Investigation disclosed that, because of the limited space for maneuvering, the operator had been instructed not to take the truck and trailer unit onto the platform. In attempting to free the equipment, the operator had gone between the motor and trailer to release the coupling and while standing in this position had tried to inch the motor forward. In reaching for the controls, which he could not see, he contacted the "reverse" button instead of the "forward" button.

(a) *In this particular instance the most effective safety measure would be to enlarge the platform as it was entirely too small for the volume of goods passing over it. More generally, however—*

(b) *Rules for the operation of power trucks should be strictly enforced so that operators will not be inclined to violate instructions.*

(c) *Operators should be given thorough training in the safe handling of their vehicles. This should include specific instructions that under no conditions should anyone stand between the truck and trailer.*

Miscellaneous

43. An employee was cutting metal tie bands from a bale of cloth. As he cut one band, it sprang back and pierced his eye.

Investigation disclosed that the worker stood directly in line with the metal tie band as he was cutting it.

This operation should be performed by standing to the left of the cut, holding the band with the left hand and the cutter with the right. The free end of the band will then move away from the worker when it is cut.

44. An employee cut his finger on a loose tie band as he was picking it from the floor.

Investigation disclosed that these tie bands had

sharp edges and that no gloves had been provided for workers engaged in this work.

Heavy canvas gloves or other suitable hand coverings should be provided and their use made mandatory for all workers engaged in handling metal straps in the gray room.

45. A spooling department employee stepped on a small spool, fell against the frame of a machine, and fractured her skull.

Investigation disclosed that the spool had fallen from a conveyor belt.

(a) *Conveyors should have guard rails to keep material from falling, or a mesh basket should be provided under the belt to catch falling spools.*

(b) *Employees should be required to pick up promptly any spools or other loose objects on the floor.*

46. A machine operator stepped into an open sewer manhole while adjusting a water valve and injured his ankle.

Investigation disclosed that other workmen who had been flushing the sewer had neglected to replace the manhole cover.

All manhole covers should be hinged and, preferably, arranged to guard the opening when not set down into place.

47. Light rolls of cloth had been piled on a table. To remove a roll from the top of the pile, a workman stepped up on a pipe. He slipped and fell, injuring his back.

Investigation disclosed that these piles were frequently high enough so that they could not be easily reached from the floor level.

(a) *Portable steps with a batter on all sides of 1 inch per foot in height should be provided for this type of work.*

(b) *Specific instructions to use these steps for this work should be issued and strictly enforced.*

48. A worker stepped on a bench about one foot high to straighten the cloth being delivered from the aging machine. The bench tipped and the workman fell, fracturing his ankle.

Investigation disclosed this bench to have a 2-inch overhang at each end. It also had no side batter and tipped easily.

All portable steps and benches should be designed without overhang and should have not less than 1-inch batter per foot of height on all sides.

49. The machine tender on an open soaper noticed that the cloth had slipped out of a guide. As he ran to the machine to correct the alignment of the cloth he slipped and fell, fracturing his shoulder blade.

Investigation disclosed that the floor around this soaper usually was wet and slippery, due to splashing.

(a) *Splash guards should be installed to reduce splashing to a minimum.*

(b) *The floor should be properly drained and should have a surface which will not be slippery when wet.*

50. In order to reach the top of his locker, a workman climbed onto the bottom shelf. His weight pulled the unit of four lockers over on him.

Investigation disclosed (1) the worker was of unusually short stature and could not reach the top of the locker from the floor; and (2) the lockers were merely set on the floor and were not fastened in place.

All lockers should be fastened.

51. A janitor on his regular duty had occasion to use the elevator, but found that the entrance to the elevator was blocked by an electric truck. He attempted to back the truck from the passageway, but when he pressed the control button, the truck started forward, crushing his feet.

Investigation disclosed: (1) the control buttons on the truck were not marked and that the injured workman had pushed the wrong button; and (2) the janitor had not been instructed in the operation of electric trucks.

(a) *The control buttons on electric trucks should be plainly marked.*

(b) *Plainly marked parking areas should be provided and the operators should be required to place their trucks in those areas when they are not in use.*

(c) *All workmen who have occasion to use electric trucks should be given adequate training in their operations.*

APPENDIX.— STATISTICAL TABLES

TABLE 1.—Industrial Injury Rates for 489 Textile Dyeing and Finishing Establishments, Classified by Industry and Kind of Goods Processed and by Extent of Disability, 1945

Industry and kind of goods processed [1]	Number of establishments	Number of employees	Employee-hours worked (thousands)	Number of disabling injuries				Frequency rate—[3]				Severity			
					Resulting in—							Average number of days lost or charged per injury			Severity rate [4]
				Total	Death or permanent-total disability [2]	Permanent-partial disability	Temporary-total disability	All disabling injuries	Death and permanent-total disability	Permanent-partial disability	Temporary-total disability	All disabling injuries	Permanent-partial disability	Temporary-total disability	
Dyeing and finishing textiles except knit goods	446	64,276	139,460	2,876	(4) 12	125	2,739	20.6	0.1	0.9	19.6	107	1,361	23	2.2
Piece goods	334	55,530	121,156	2,584	(2) 9	122	2,453	21.3	.1	1.0	20.2	109	1,387	24	2.3
Yarn and thread	104	8,529	17,707	282	(2) 2	3	277	15.9	.1	.2	15.6	64	(5)	19	1.0
Dyeing and finishing knit goods (including hosiery)	43	2,062	4,332	49	.....	1	48	11.3	.....	.2	11.1	30	(5)	25	.3

[1] Totals include figures not shown separately because of insufficient data.
[2] Figures in parentheses indicate the number of permanent-total disability cases included.
[3] The frequency rate is the average number of industrial injuries for each million employee-hours worked.
[4] The severity rate is the average number of days lost for each thousand employee-hours worked.
[5] Averages not computed because of small number of cases included.

TABLE 2.—Industrial Injury Rates for 446 Textile Dyeing and Finishing Establishments, Classified by Kind of Textiles Processed and by Extent of Disability, 1945

Kind of textiles processed [1]	Number of establishments	Number of employees	Employee-hours worked (thousands)	Number of disabling injuries				Frequency rate—[3]				Severity			
					Resulting in—							Average number of days lost or charged per injury			Severity rate [4]
				Total	Death or permanent-total disability [2]	Permanent-partial disability	Temporary-total disability	All disabling injuries	Death and permanent-total disability	Permanent-partial disability	Temporary-total disability	All disabling injuries	Permanent-partial disability	Temporary-total disability	
Total	446	64,276	139,460	2,876	(4) 12	125	2,739	20.6	0.1	0.9	19.6	107	1,361	23	2.2
Cotton	211	44,938	96,963	1,755	(2) 7	66	1,682	18.1	.1	.7	17.3	100	1,408	24	1.8
Rayon and synthetics	130	12,736	28,060	826	(1) 3	45	778	29.4	.1	1.6	27.7	112	1,246	23	3.3
Woolen and worsted goods	39	2,535	5,543	136	1	6	129	24.5	.2	1.1	23.2	155	(5)	24	3.8
Silk	3	800	1,460	43	.....	.....	43	29.4	.....	.....	29.4	12	.....	12	.4

[1] Totals include figures not shown separately because of insufficient data.
[2] Figures in parentheses indicate the number of permanent-total disability cases included.
[3] The frequency rate is the average number of industrial injuries for each million employee-hours worked.
[4] The severity rate is the average number of days lost for each thousand employee-hours worked.
[5] Averages not computed because of small number of cases included.

TABLE 3.—Industrial Injury Rates for 446 Textile Dyeing and Finishing Establishments, Classified by Type of Processing and Kind of Textiles Processed and by Extent of Disability, 1945

Type of processing and kind of textile processed [1]	Number of establishments	Number of employees	Employee-hours worked (thousands)	Number of disabling injuries				Frequency rate—[2]				Severity			
					Resulting in—							Average number of days lost or charged per injury			
				Total	Death or permanent-total disability [3]	Permanent-partial disability	Temporary-total disability	All disabling injuries	Death and permanent-total disability	Permanent-partial disability	Temporary-total disability	All disabling injuries	Permanent-partial disability	Temporary-total disability	Severity rate [4]
Total	446	64,276	139,460	2,876	(4) 12	125	2,739	20.6	0.1	.9	19.6	107	1,361	23	2.2
Bleaching, dyeing, and finishing	294	39,224	85,150	1,674	(3) 10	56	1,608	19.7	.1	.7	18.9	109	1,548	22	2.1
Cotton	129	27,290	59,639	1,028	(1) 5	28	995	17.2	.1	.5	16.6	97	1,748	21	1.7
Rayon and synthetics	97	8,244	17,667	489	(1) 3	19	467	27.7	.2	1.1	26.4	100	[5]	22	2.8
Woolen and worsted goods	31	2,276	4,830	120	1	6	113	24.8	.2	1.2	23.4	174	[5]	25	4.3
Bleaching, dyeing, machine printing and finishing	53	17,243	37,457	925	(1) 1	59	865	24.7	[6]	1.6	23.1	109	1,207	27	2.7
Cotton	28	12,155	25,920	546	(1) 1	34	511	21.1	[6]	1.3	19.8	105	1,057	30	2.2
Rayon and synthetics	19	3,999	9,288	318	.....	25	293	34.2	.....	2.7	31.5	134	1,410	26	4.6
Bleaching only:															
Cotton	3	1,689	2,929	36	.....	1	35	12.3	.....	.3	12.0	33	[5]	25	.4
Screen printing	34	1,743	3,832	70	1	.....	69	18.3	.3	.....	18.0	100	.....	15	1.8
Cotton	18	1,372	3,029	63	1	.....	62	20.8	.3	.....	20.5	110	.....	15	2.3
Flock and lacquer printing	11	726	1,647	32	.....	2	30	19.4	.....	1.2	18.2	237	[5]	20	4.6
Coating, waterproofing, fireproofing, etc.	34	2,998	6,961	116	.....	7	109	16.7	.....	1.0	15.7	66	[5]	24	1.1
Cotton	23	1,936	4,303	57	.....	1	56	13.2	.....	.2	13.0	41	[5]	29	.5

[1] Totals include figures not shown separately because of insufficient data.
[2] Figures in parentheses indicate the number of permanent-total disability cases included.
[3] The frequency rate is the average number of industrial injuries for each million employee-hours worked.
[4] The severity rate is the average number of days lost for each thousand employee-hours worked.
[5] Averages not computed because of small number of cases included.
[6] Less than 0.05.

TABLE 4.—Industrial Injury Rates for 446 Textile Dyeing and Finishing Establishments, Classified by Size of Establishment and by Extent of Disability, 1945

Size of establishment	Number of establishments	Number of employees	Employee-hours worked (thousands)	Number of disabling injuries				Frequency rate—[2]				Severity			
					Resulting in—							Average number of days lost or charged per injury			
				Total	Death or permanent-total disability [1]	Permanent-partial disability	Temporary-total disability	All disabling injuries	Death and permanent-total disability	Permanent-partial disability	Temporary-total disability	All disabling injuries	Permanent-partial disability	Temporary-total disability	Severity rate [3]
Total	446	64,276	139,460	2,876	(4) 12	125	2,739	20.6	0.1	0.9	19.6	107	1,361	23	2.2
Less than 25 employees	125	1,451	3,057	40	1	4	35	13.1	.3	1.3	11.5	232	[4]	21	3.0
25 to 49 employees	83	3,015	6,778	109	(2) 2	6	101	16.1	.3	.9	14.9	158	[4]	18	2.5
50 to 99 employees	69	4,904	11,217	276	1	11	264	24.6	.1	1.0	23.5	87	[4]	19	2.1
100 to 249 employees	98	15,237	32,994	854	(1) 5	33	816	25.9	.2	1.0	24.7	108	1,306	24	2.8
250 to 499 employees	39	14,185	30,676	670	1	16	653	21.8	[5]	.5	21.3	64	[4]	21	1.4
500 to 749 employees	21	13,349	28,236	542	(1) 2	25	515	19.2	.1	.9	18.2	116	1,400	31	2.2
750 to 999 employees	7	5,945	12,511	248	.....	29	219	19.8	.....	2.3	17.5	221	1,714	23	4.4
1,000 employees and over	4	6,190	13,991	137	.....	1	136	9.8	.....	.1	9.7	24	[4]	22	.2

[1] Figures in parentheses indicate the number of permanent-total disability cases included.
[2] The frequency rate is the average number of industrial injuries for each million employee-hours worked.
[3] The severity rate is the average number of days lost for each thousand employee-hours worked.
[4] Averages not computed because of small number of cases included.
[5] Less than 0.05.

TABLE 5.—Industrial Injury Rates for 446 Textile Dyeing and Finishing Establishments, Classified by Geographic Area and State, and by Extent of Disability, 1945

Geographic area and State [1]	Number of establishments	Number of employees	Employee-hours worked (thousands)	Number of disabling injuries				Frequency rate of—[3]				Severity		
				Total	Resulting in—							Average number of days lost or charged per injury		Severity rate [4]
					Death or permanent-total disability [2]	Permanent-partial disability	Temporary-total disability	All disabling injuries	Death and permanent-total disability	Permanent-partial disability	Temporary-total disability	All disabling injuries	Temporary-total disability	
Total	446	64,276	139,460	2,876	(4) 12	125	2,739	20.6	0.1	0.9	19.6	107	23	2.2
New England area	106	19,025	41,304	1,001	(1) 3	13	985	24.2	.1	.3	23.8	67	29	1.6
Connecticut	22	3,711	8,441	158	(1) 1	6	151	18.7	.1	.7	17.9	113	24	2.1
Massachusetts	42	6,846	14,408	358	2	3	353	24.8	.1	.2	24.5	67	23	1.7
Rhode Island	42	8,468	18,455	485	.....	4	481	26.3	.....	.2	26.1	53	35	1.4
Middle Atlantic area	256	22,691	50,107	1,167	(3) 8	74	1,085	23.3	.2	1.5	21.6	148	22	3.5
New Jersey	110	11,978	27,026	743	1	65	677	27.5	(5)	2.4	25.1	153	24	4.2
New York	81	5,026	10,735	192	(1) 5	7	180	17.9	.5	.7	16.7	228	24	4.1
Pennsylvania	65	5,687	12,346	232	(2) 2	2	228	18.8	.2	.2	18.4	68	14	1.3
East North Central area	16	1,666	3,666	39	.....	1	38	10.6	.....	.3	10.3	48	29	.5
Ohio	6	1,264	2,733	32	.....	.....	32	11.7	.....	.....	11.7	33	33	.4
South Atlantic area	51	19,215	40,512	599	.....	31	568	14.8	.....	.8	14.0	83	17	1.2
Georgia	5	1,825	3,567	37	.....	.....	37	10.4	.....	.....	10.4	14	14	.1
North Carolina	28	6,526	12,945	237	.....	8	229	18.3	.....	.6	17.7	82	16	1.5
South Carolina	10	8,096	17,456	196	.....	18	178	11.2	.....	1.0	10.2	112	20	1.3
Virginia	4	870	1,957	35	.....	4	31	17.9	.....	2.0	15.9	180	24	3.2
East South Central area	5	1,236	2,931	46	1	3	42	15.7	.3	1.0	14.4	263	25	4.1
Tennessee	3	1,130	2,674	40	1	3	36	15.0	.4	1.1	13.5	301	28	4.5

[1] Totals include figures not shown separately because of insufficient data.
[2] Figures in parentheses indicate the number of permanent-total disability cases included.
[3] The frequency rate is the average number of industrial injuries for each million employee-hours worked.
[4] The severity rate is the average number of days lost for each thousand employee-hours worked.
[5] Less than 0.05.

TABLE 6.—Industrial Injury Rates for 122 Textile Dyeing and Finishing Establishments, Classified by Kind of Safety Organization and by Extent of Disability, 1945

Safety organizations [1]	Number of establishments	Number of employees	Employee-hours worked (thousands)	Number of disabling injuries						Frequency rate of—[3]				Severity			
					Resulting in—									Average number of days lost or charged per injury			
							Temporary-total disability										
				Total	Death or permanent-total disability [2]	Permanent-partial disability	Total	Of known duration	Of unknown duration	All disabling injuries	Death and permanent-total disability	Permanent-partial disability	Temporary-total disability	All disabling injuries	Permanent-partial disability	Temporary-total disability	Severity rate [4]
Total	122	40,164	87,838	1,962	(1) 6	97	1,859	1,747	112	22.3	0.1	1.1	21.1	114	1,459	25	2.5
Establishments employing full-time safety engineers	20	11,134	24,730	405	.....	38	367	348	19	16.4	.....	1.5	14.9	149	1,383	22	2.4
And with safety committees	17	8,568	19,258	336	.....	35	301	283	18	17.4	.....	1.8	15.6	170	1,439	23	3.0
Composed of supervisory workers	10	5,920	13,312	223	.....	31	192	181	11	16.8	.....	2.3	14.5	226	1,494	22	3.8
Composed of non-supervisory workers	3	1,227	2,640	37	.....	4	33	33	.....	14.0	.....	1.5	12.5	134	(5)	27	1.9
Composed of both supervisory and non supervisory workers	3	713	1,783	74	.....	.....	74	67	7	41.5	.....	.....	41.5	24	.....	24	1.0
Establishments without full-time safety engineers	102	29,030	63,108	1,557	(1) 6	59	1,492	1,399	93	24.7	.1	.9	23.7	104	1,508	25	2.6
But with safety committees	47	17,553	38,363	921	(1) 3	21	897	852	45	24.0	.1	.5	23.4	88	(5)	28	2.1
Composed of supervisory workers	26	9,794	21,459	524	(1) 2	13	509	485	24	24.4	.1	.6	23.7	86	(5)	28	2.1
Composed of non supervisory workers	10	2,566	5,909	152	1	1	150	141	9	25.7	.2	.2	25.3	84	(5)	19	2.2
Composed of both non-supervisory and supervisory workers	7	3,218	7,021	154	.....	6	148	141	7	21.9	.....	.9	21.0	127	(5)	29	2.8
And without safety committees	51	10,191	21,676	528	3	35	490	449	41	24.4	.1	1.6	22.7	134	1,194	22	3.3

[1] Totals include figures not shown separately because of insufficient data.
[2] Figures in parentheses indicate the number of permanent-total disability cases included.
[3] The frequency rate is the average number of industrial injuries for each million employee-hours worked.
[4] The severity rate is the average number of days lost for each thousand employee-hours worked.
[5] Averages not computed because of small number of cases included.

TABLE 7.—Industrial Injury Rates for 122 Textile Dyeing and Finishing Establishments, Classified by Kind of First-Aid Facilities and by Extent of Disability, 1945

First-aid facilities [1]	Number of establishments	Number of employees	Employee-hours worked (thousands)	Number of disabling injuries: Total	Resulting in—: Death or permanent-total disability [2]	Permanent-partial disability	Temporary-total disability: Total	Of known duration	Of unknown duration	Frequency rate of—[3]: All disabling injuries	Death and permanent-total disability	Permanent-partial disability	Temporary-total disability	Severity: Average number of days lost or charged per injury: All disabling injuries	Permanent-partial disability	Temporary-total disability	Severity rate [4]
Total	122	40,164	87,838	1,962	(1) 6	97	1,859	1,747	112	22.3	0.1	1.1	21.1	114	1,459	25	2.5
Establishments employing full-time safety engineers	20	11,134	24,730	405	.....	38	367	348	19	16.4	.....	1.5	14.9	149	1,383	22	2.4
And with first-aid rooms	17	9,906	22,058	350	.....	38	312	301	11	15.9	.....	1.7	14.2	169	1,383	22	2.7
With doctors or registered-nurses as attendants	12	8,522	19,252	269	.....	36	233	229	4	14.0	.....	1.9	12.1	206	1,401	21	2.9
With employees trained in first-aid as attendants	5	1,384	2,806	81	.....	2	79	72	7	28.9	.....	.7	28.2	48	(5)	22	1.4
And with only first-aid kits available	3	1,228	2,672	55	.....	.....	55	47	8	20.6	.....	.....	20.6	22	.....	22	.5
With employees trained in first-aid as attendants	2	1,053	2,246	41	.....	.....	41	41	.....	18.3	.....	.....	18.3	24	.....	24	.4
Establishments without full-time safety engineers	102	29,030	63,108	1,557	(1) 6	59	1,492	1,399	93	24.7	.1	.9	23.7	104	1,508	25	2.6
But with first-aid rooms	61	21,922	47,452	1,120	(1) 5	35	1,080	1,034	46	23.6	.1	.7	22.8	105	1,700	26	2.5
With doctors or registered-nurses as attendants	26	13,016	28,289	617	(1) 3	20	594	571	23	21.8	.1	.7	21.0	109	(5)	24	2.4
With employees trained in first-aid as attendants	27	6,624	14,089	377	2	12	363	345	18	26.8	.1	.9	25.8	120	(5)	28	3.2
With untrained employees as attendants	8	2,282	5,074	126	.....	3	123	118	5	24.8	.....	.6	24.2	42	(5)	30	1.0
And without first-aid rooms	40	6,926	15,219	432	1	21	410	363	47	28.4	.1	1.4	26.9	92	(5)	23	2.6
But with first-aid kits	31	5,044	10,974	339	1	20	318	280	38	30.9	.1	1.8	29.0	98	(5)	22	3.0
And without first-aid kits	6	1,160	2,616	56	.....	1	55	50	5	21.4	.....	.4	21.0	91	(5)	20	2.0

[1] Totals include figures not shown separately because of insufficient data.
[2] Figures in parentheses indicate the number of permanent-total disability cases included.
[3] The frequency rate is the average number of industrial injuries for each million employee-hours worked.
[4] The severity rate is the average number of days lost for each thousand employee-hours worked.
[5] Averages not computed because of small number of cases included.

TABLE 8.—Industrial Injury Rates for 446 Textile Dyeing and Finishing Establishments, Classified by Department and by Extent of Disability, 1945

Department [1]	Number of units reporting	Number of employees	Employee-hours worked (thousands)	Number of disabling injuries				Frequency rate of—[3]				Severity		
				Total	Resulting in—							Average number of days lost or charged per injury		Severity rate [4]
					Death or permanent-total disability [2]	Permanent-partial disability	Temporary-total disability	All disabling injuries	Death and permanent-total disability	Permanent-partial disability	Temporary-total disability	All disabling injuries	Temporary-total disability	
Total	446 [5]	64,276	139,460	2,876	(4) 12	125	2,739	20.6	0.1	0.9	19.6	107	23	2.2
Piece goods	1,400	34,801	76,293	1,801	(2) 5	90	1,706	23.6	.1	1.2	22.3	109	25	2.6
Receiving or gray room	162	1,883	4,156	110	.....	4	106	26.5	.....	1.0	25.5	34	20	.9
Boil-off or bleaching department	142	3,150	6,961	173	.....	10	163	24.9	.....	1.4	23.5	96	21	2.4
Drying department	130	2,118	4,726	104	.....	2	102	22.0	.....	.4	21.6	88	31	1.9
Dye room	209	6,028	13,495	460	(1) 2	19	439	34.1	.1	1.4	32.6	107	22	3.7
Dye color shop	73	519	1,146	23	.....	1	22	20.1	.....	.9	19.2	44	23	.9
Mechanical print shop	62	2,908	6,208	177	.....	16	161	28.5	.....	2.6	25.9	145	26	4.1
Screen print shop	30	867	1,927	36	1	.....	35	18.7	.5	.....	18.2	179	13	3.3
Print color shop	57	641	1,372	40	.....	1	39	29.1	.....	.7	28.4	40	26	1.2
Aging department	44	748	1,607	40	.....	.....	40	24.9	.....	.....	24.9	44	44	1.1
Finishing department	305	10,542	23,388	500	(1) 2	33	465	21.4	.1	1.4	19.9	140	27	3.0
Make-up department	174	5,248	10,975	137	.....	4	133	12.5	.....	.4	12.1	86	28	1.1
Yarn and thread	326	6,241	12,919	196	(1) 1	3	192	15.2	.1	.2	14.9	53	19	.8
Dye room	87	1,463	3,120	82	(1) 1	1	80	26.3	.3	.3	25.7	94	18	2.5
Finishing department	58	1,740	3,300	40	.....	.....	40	12.1	.....	.....	12.1	27	27	.3
Winding department	61	2,285	4,932	45	.....	2	43	9.1	.....	.4	8.7	25	12	.2
Packing department	42	386	819	9	.....	.....	9	11.0	.....	.....	11.0	15	15	.2
Service and maintenance	1,492	13,996	30,804	571	(1) 5	20	546	18.5	.2	.6	17.7	128	22	2.4
Administrative and clerical	312	4,832	10,091	26	.....	1	25	2.6	.....	.1	2.5	26	15	.1
Laboratory	98	364	792	4	.....	.....	4	5.0	.....	.....	5.0	98	98	.5
Maintenance and repair	264	3,813	8,733	301	2	10	289	34.5	.2	1.1	33.2	92	20	3.2
Power	167	1,041	2,520	48	2	3	43	19.0	.8	1.2	17.0	372	19	7.1
Shipping	241	2,274	4,996	117	(1) 1	4	112	23.4	.2	.8	22.4	148	22	3.5
Watchmen	183	620	1,468	37	.....	2	35	25.2	.....	1.4	23.8	224	37	5.7

[1] Totals include figures not shown separately because of insufficient data.
[2] Figures in parentheses indicate the number of permanent-total disability cases included.
[3] The frequency rate is the average number of industrial injuries for each million employee-hours worked.
[4] The severity rate is the average number of days lost for each thousand employee-hours worked.
[5] Number of establishments reporting.

TABLE 9.—Distribution of Industrial Injury-Frequency Rates of 446 Textile Dyeing and Finishing Establishments, Classified by Size of Establishment, 1945

Size of establishment	Total number of establishments	Number of establishments with frequency rates of—											
		0	1 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 and over
Total	446	161	35	73	66	48	28	17	2	4	2	3	7
Less than 25 employees	125	100	.....	.....	6	4	3	3	2	.....	.....	2	5
25 to 49 employees	83	41	1	20	6	4	6	3	.....	.....	.....	1	1
50 to 99 employees	69	13	9	11	15	6	6	5	.....	2	1	.....	1
100 to 249 employees	98	6	13	17	23	22	9	5	.....	2	1	.....	.....
250 to 499 employees	39	1	8	11	7	9	2	1	.....	.....	.....	.....	.....
500 to 749 employees	21	.....	3	7	8	1	2	.....	.....	.....	.....	.....	.....
750 to 999 employees	7	.....	.....	4	1	2	.....	.....	.....	.....	.....	.....	.....
1,000 employees and over	4	.....	1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 10.—Disabling Injuries in 174 Textile Dyeing and Finishing Establishments, Classified by Nature of Injury and by Extent of Disability, 1945

Nature of injury	Number of disabling injuries					Average number of days lost or charged for each	
	Total		Resulting in—				
	Number	Percent [1]	Death or permanent-total disability [2]	Permanent-partial disability	Temporary-total disability	Disabling injury	Temporary-total disability
Total	2,419	100.0	(1) 7	88	2,324	94	25
Amputations	20	.8	.....	20	.....	850	.....
Bruises, contusions	634	26.4	.....	19	615	59	19
Burns, scalds	213	8.9	1	3	209	87	24
Cuts, lacerations, punctures	292	12.2	.....	15	277	94	22
Foreign bodies in eyes	20	.8	.....	.....	20	10	10
Fractures	211	8.8	2	20	189	294	53
Hernias	121	5.0	.....	.....	121	50	50
Industrial diseases	100	4.2	(1) 1	.....	99	83	24
Strains, sprains (except hernias)	770	32.0	1	11	758	49	22
Other	21	.9	2	.....	19	594	24
Unclassified; insufficient data	17	.....	.....	.....	17	28	28

[1] Percentage of cases for which nature of injury is known.

[2] Figures in parentheses indicate the number of permanent-total disability cases included.

TABLE 11.—Disabling Injuries in 174 Textile Dyeing and Finishing Establishments, Classified by Part of Body Injured and by Extent of Disability, 1945

Part of body injured	Number of disabling injuries					Average number of days lost or charged for each	
	Total		Resulting in—				
	Number	Percent [1]	Death or permanent-total disability [2]	Permanent-partial disability	Temporary-total disability	Disabling injury	Temporary-total disability
Total	2,419	100.0	(1) 7	88	2,324	94	25
Head	177	7.4	.....	4	173	43	17
Eye (s)	92	3.8	.....	2	90	48	9
Brain or skull	33	1.4	.....	.....	33	27	27
Other	52	2.2	.....	2	50	44	25
Trunk	859	35.6	(1) 3	13	843	68	28
Chest (lungs), ribs, etc.	95	4.0	(1) 2	2	91	155	19
Back	425	17.5	.....	6	419	31	24
Abdomen	189	7.8	.....	.....	189	42	42
Hip (s) or pelvis	36	1.5	1	3	32	329	26
Shoulder	81	3.4	.....	2	79	125	27
Other	33	1.4	.....	.....	33	18	18
Upper extremities	635	26.4	.....	58	577	145	25
Arm (s)	168	7.0	.....	9	159	237	30
Hand (s) (including wrist)	218	9.1	.....	8	210	126	25
Finger (s) and/or thumb (s)	249	10.3	.....	41	208	99	21
Lower extremities	651	27.1	.....	13	638	67	24
Leg (s)	244	10.1	.....	6	238	128	30
Foot or feet (including ankle)	274	11.5	.....	2	272	30	20
Toe (s)	133	5.5	.....	5	128	33	23
General	83	3.5	4	.....	79	320	32
Unclassified; insufficient data	14	.....	.....	.....	14	31	31

[1] Percentage of cases for which nature of injury is known.

[2] Figures in parentheses indicate the number of permanent-total disability cases included.

TABLE 12.—Disabling Injuries in 174 Textile Dyeing and Finishing Establishments, Classified by Part of Body Injured and by Nature of Injury, 1945

Part of body injured	Total number of disabling injuries	Nature of injury										
		Amputations	Bruises; contusions	Burns; scalds	Cuts; lacerations; punctures	Foreign bodies in eyes	Fractures	Hernias	Industrial diseases	Strains; sprains (except hernias)	Other	Unclassified; insufficient data
Total	2,419	20	634	213	292	20	211	121	100	770	21	17
Head	177	.....	39	63	32	20	5	.....	9	3	5	1
Eye (s)	92	.....	9	51	4	20	.....	.....	3	.....	4	1
Brain or skull	33	.....	17	3	11	.....	2	.....	.....	.....	.....	.....
Other	52	.....	13	9	17	.....	3	.....	6	3	1	.....
Trunk	859	.....	107	12	8	.....	39	121	9	552	7	4
Chest (lungs), ribs, etc.	95	.....	34	1	2	.....	30	.....	9	15	4	.....
Back	425	.....	31	4	2	.....	2	.....	.....	384	1	1
Abdomen	189	.....	10	3	1	.....	.....	121	.....	52	1	1
Hip (s) or pelvis	36	.....	7	.....	1	.....	4	.....	.....	22	.....	2
Shoulder	82	.....	15	3	.....	.....	2	.....	.....	61	1	.....
Other	32	.....	10	1	2	.....	1	.....	.....	18	.....	.....
Upper extremities	635	18	166	54	191	.....	83	.....	46	72	5	.....
Arm (s)	168	1	44	24	23	.....	36	.....	16	22	2	.....
Hand (s) (including wrist)	218	.....	51	23	58	.....	16	.....	29	38	3	.....
Finger (s) and/or thumb (s)	249	17	71	7	110	.....	31	.....	1	12	.....	.....
Lower extremities	651	2	306	55	58	.....	83	.....	6	139	1	1
Leg (s)	244	1	118	25	28	.....	12	.....	3	56	1	.....
Foot or feet (including ankle)	274	.....	110	26	22	.....	30	.....	3	83	.....	.....
Toe (s)	133	1	78	4	8	.....	41	.....	.....	.....	.....	1
General	83	.....	16	29	3	.....	1	.....	29	1	3	1
Unclassified; insufficient data	14	.....	.....	.....	.....	.....	.....	.....	1	3	.....	10

TABLE 13.—Disabling and Medical Cases in 174 Textile Dyeing and Finishing Establishments, Classified by Department and by Nature of Injury, 1945

Department[1]	Total number of disabling and medical injuries[2]	Nature of injury										
		Amputations	Bruises; contusions	Burns; scalds	Cuts; lacerations; punctures	Foreign bodies in eyes	Fractures	Hernias	Industrial diseases	Strains; sprains (except hernias)	Other	Unclassified; insufficient data
Total	7,607	20	2,128	723	1,543	302	296	122	412	1,973	57	31
Piece goods	5,107	13	1,426	531	937	125	192	82	331	1,424	35	11
Receiving or gray room	335	.....	100	11	86	8	9	3	7	105	4	2
Boil-off or bleaching department	532	2	180	72	84	14	23	4	22	127	3	1
Drying department	269	.....	64	17	45	8	24	4	16	88	3	.....
Dye room	1,137	3	279	242	151	22	32	18	113	263	11	3
Dye color shop	158	.....	28	24	19	5	2	5	26	46	3	.....
Mechanical print shop	565	2	138	28	120	16	28	3	56	170	3	1
Screen print shop	79	.....	23	3	25	.....	4	1	7	16	.....	.....
Print color shop	36	.....	8	7	4	2	.....	.....	6	9	.....	.....
Aging department	94	.....	29	17	11	5	2	1	5	23	1	.....
Finishing department	1,288	4	385	98	261	31	50	30	51	369	6	3
Calendering	186	.....	62	10	35	4	11	5	8	51	.....	.....
Tentering	324	1	97	11	66	8	10	9	16	105	.....	1
Make-up department	604	2	192	10	130	13	18	12	22	203	1	1
Yarn and thread	479	2	143	56	142	10	7	8	24	86	.....	1
Dye room	148	1	38	38	29	1	3	4	13	20	.....	1
Finishing department	60	.....	19	10	17	.....	1	1	1	11	.....	.....
Winding	182	1	59	3	70	6	2	2	7	32	.....	.....
Packing	40	.....	10	1	17	1	.....	.....	2	9	.....	.....
Service and maintenance	1,791	4	488	125	407	159	95	32	43	413	20	5
Administrative and clerical	48	.....	20	2	2	2	3	.....	1	17	.....	1
Laboratory	30	.....	6	8	3	2	.....	.....	6	2	3	.....
Maintenance and repair	935	3	228	74	256	108	46	14	20	171	13	2
Power	204	.....	53	30	31	26	8	5	4	44	3	.....
Shipping	266	.....	84	1	56	6	22	6	5	85	.....	1
Watchmen	35	.....	14	1	5	1	3	2	1	7	.....	1
Yard	93	.....	32	4	15	4	6	.....	2	29	1	.....
Warehouse	143	1	41	3	30	7	7	5	3	46	.....	.....

[1] Totals include figures not shown separately because of insufficient data

[2] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.

TABLE 14.—All Industrial Injuries in 32 Textile Dyeing and Finishing Establishments, Classified by Nature of Injury, 1945

Nature of injury	Number of injuries					Number of nondisabling injuries per disabling injury		
	Total	Number of disabling injuries	Number of nondisabling injuries [1]					
			Total	Medical cases	First-aid cases	Total	Medical cases	First-aid cases
Total	13,766	612	13,154	1,584	11,570	21.5	2.6	18.9
Amputations	5	5						
Bruises, contusions	3,635	184	3,451	465	2,986	18.8	2.5	16.3
Burns, scalds	1,524	47	1,477	148	1,329	31.4	3.1	28.3
Cuts, lacerations, punctures	6,308	62	6,246	376	5,870	100.7	6.1	94.6
Foreign bodies in eyes	484	3	481	105	376	160.3	35.0	125.3
Fractures	80	53	27	25	2	.5	.5	(2)
Hernias	42	42						
Industrial diseases	258	26	232	70	162	8.9	2.7	6.2
Strains, sprains (except hernias)	1,270	186	1,084	380	704	5.8	2.0	3.8
Other	46	3	43	14	29	14.3	4.7	9.6
Unclassified; insufficient data	114	1	113	1	112	113.0	1.0	112.0

[1] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon. A first-aid case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a first-aid attendant other than a physician or surgeon.
[2] Less than 0.05.

TABLE 15.—All Industrial Injuries in 32 Textile Dyeing and Finishing Establishments, Classfied by Part of Body Injured, 1945

Part of body injured	Number of injuries					Number of nondisabling injuries per disabling injury		
	Total	Number of disabling injuries	Number of nondisabling injuries [1]					
			Total	Medical cases	First-aid cases	Total	Medical cases	First-aid cases
Total	13,766	612	13,154	1,584	11,570	21.5	2.6	18.9
Head	1,327	33	1,294	278	1,016	39.2	8.4	30.8
Eye (s)	795	15	780	187	593	52.0	12.5	39.5
Brain or skull	235	7	228	32	196	32.6	4.6	28.0
Other	297	11	286	59	227	26.0	5.4	20.6
Trunk	1,126	230	896	327	569	3.9	1.4	2.5
Chest (lungs), ribs, etc.	192	30	162	75	87	5.4	2.5	2.9
Back	491	99	392	138	254	4.0	1.4	2.6
Abdomen	152	57	95	42	53	1.7	.7	1.0
Hip (s) or pelvis	60	13	47	17	30	3.6	1.3	2.3
Shoulder	146	22	124	36	88	5.6	1.6	4.0
Other	85	9	76	19	57	8.4	2.1	6.3
Upper extremities	9,127	149	8,978	641	8,337	60.3	4.3	56.0
Arm (s)	1,142	46	1,096	126	970	23.8	2.7	21.1
Hand (s) (including wrist)	2,158	49	2,109	192	1,917	43.0	3.9	39.1
Finger (s) and/or thumb (s)	5,827	54	5,773	323	5,450	106.9	6.0	100.9
Lower extremities	1,979	179	1,800	301	1,499	10.1	1.7	8.4
Leg (s)	976	60	916	120	796	15.3	2.0	13.3
Foot or feet (including ankle)	587	78	509	97	412	6.5	1.2	5.3
Toe (s)	416	41	375	84	291	9.1	2.0	7.1
General	87	20	67	33	34	3.4	1.7	1.7
Unclassified; insufficient data	120	1	119	4	115	119.0	4.0	115.0

[1] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon. A first-aid case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a first-aid attendant other than a physician or surgeon.

TABLE 16.—Re-treatments of First-Aid Cases in 6 Textile Dyeing and Finishing Establishments, Classified by Nature of Injury, 1945

Nature of injury	Number of first-aid cases [1]						Total number of treatments	Average number of treatments per injury
	Total		Requiring re-treatments		Not requiring re-treatments			
	Number	Percent	Number	Percent	Number	Percent		
Total	4,615	100.0	750	16.3	3,865	83.7	6,452	1.4
Bruises, contusions	1,381	100.0	237	17.2	1,144	82.8	1,981	1.4
Burns, scalds	437	100.0	127	29.1	310	70.9	790	1.8
Cuts, lacerations, punctures	2,261	100.0	298	13.2	1,963	86.8	2,950	1.3
Foreign bodies in eyes	205	100.0	10	4.9	195	95.1	218	1.1
Industrial diseases	100	100.0	18	18.0	82	82.0	139	1.4
Strains, sprains	207	100.0	54	26.1	153	73.9	337	1.6
Other	11	(2)	3	(2)	8	(2)	17	(2)
Unclassified; insufficient data	13	(2)	3	(2)	10	(2)	20	(2)

[1] A first-aid case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a first-aid attendant other than a physician or surgeon.

[2] Not computed because of small number of cases included.

TABLE 17.—Re-treatments of First-Aid Cases in 6 Textile Dyeing and Finishing Establishments, Classified by Part of Body Injured, 1945

Part of body injured	Number of first-aid cases [1]						Total number of treatments	Average number of treatments per injury
	Total		Requiring re-treatments		Not requiring re-treatments			
	Number	Percent	Number	Percent	Number	Percent		
Total	4,615	100.0	750	16.3	3,865	83.7	6,452	1.4
Head	381	100.0	46	12.1	335	87.9	447	1.2
Eye (s)	256	100.0	17	6.6	239	93.4	281	1.1
Brain or skull	74	100.0	19	25.7	55	74.3	103	1.4
Other	51	100.0	10	19.6	41	80.4	63	1.2
Trunk	142	100.0	40	28.2	102	71.8	241	1.7
Chest (lungs), ribs, etc.	12	(2)	2	(2)	10	(2)	18	(2)
Back	57	100.0	18	31.6	39	68.4	92	1.6
Abdomen	11	(2)	2	(2)	9	(2)	14	(2)
Hip (s) or pelvis	6	(2)	.....	(2)	6	(2)	6	(2)
Shoulder	46	100.0	17	37.0	29	63.0	100	2.2
Other	10	(2)	1	(2)	9	(2)	11	(2)
Upper extremities	3,642	100.0	532	14.6	3,110	85.4	4,935	1.4
Arm (s)	370	100.0	89	24.1	281	75.9	610	1.6
Hand (s) (including wrist)	777	100.0	122	15.7	655	84.3	1,056	1.4
Finger (s) and/or thumb (s)	2,495	100.0	321	12.9	2,174	87.1	3,269	1.3
Lower extremities	412	100.0	128	31.1	284	68.9	785	1.9
Leg (s)	220	100.0	56	25.5	164	74.5	394	1.8
Foot or feet (including ankle)	117	100.0	38	32.5	79	67.5	218	1.9
Toe (s)	75	100.0	34	45.3	41	54.7	173	2.3
General	12	(2)	.....	(2)	12	(2)	12	(2)
Unclassified; insufficient data	26	100.0	4	15.4	22	84.6	32	1.2

[1] A first-aid case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a first-aid attendant other than a physician or surgeon.

[2] Not computed because of small number of cases included.

TABLE 18.—Disabling and Medical Injuries in 174 Textile and Dyeing Finishing Establishments, Classified by Department and by Part of Body Injured, 1945

Department[1]	Total number of disabling and medical injuries[2]	Part of body injured																			
		Head				Trunk							Upper extremities				Lower extremities				General	Unclassified; insufficient data
		Total	Eye (s)	Brain or skull	Other	Total	Chest (lungs), ribs, etc.	Back	Abdomen	Hip(s) or pelvis	Shoulder	Other	Total	Arm (s)	Hand (s) (including wrist)	Finger(s) and/or thumb (s)	Total	Leg (s)	Foot or feet (including ankle)	Toe (s)		
Total	7,607	1,008	626	142	240	1,932	305	911	333	88	210	85	2,820	628	852	1,340	1,632	660	604	368	176	39
Piece goods	5,107	593	349	90	154	1,379	207	679	234	59	151	49	1,896	443	581	872	1,101	457	383	261	118	20
Receiving or gray room	335	29	14	6	9	103	19	49	18	6	11	.....	126	30	39	57	76	34	26	16	1	.....
Boil-off or bleaching department	532	86	46	20	20	134	25	41	27	5	27	9	179	44	53	82	121	48	47	26	12	.....
Drying department	269	30	12	8	10	71	13	31	13	5	8	1	89	20	37	32	74	33	19	22	4	1
Dye room	1,137	170	124	14	32	286	48	143	43	10	28	14	402	113	121	168	227	94	89	44	49	3
Dye color shop	158	24	16	1	7	46	6	28	9	2	.....	1	50	12	23	15	31	10	14	7	3	4
Mechanical print shop	565	45	26	8	11	155	21	98	17	14	9	6	244	62	67	115	104	41	36	27	11	6
Screen print shop	79	7	3	.....	4	16	4	4	4	1	2	1	27	2	5	20	25	15	6	4	4	.....
Print color shop	36	10	8	.....	2	9	2	4	2	.....	1	.....	10	1	7	2	7	2	4	1	.....	.....
Aging department	94	14	11	1	2	28	4	16	3	1	2	2	20	3	11	6	27	7	12	8	5	.....
Finishing department	1,288	125	62	24	39	342	42	174	66	14	38	8	497	105	138	254	298	119	93	86	24	2
Calendering	186	13	5	3	5	51	9	25	10	1	5	1	79	15	20	44	40	18	7	15	3	.....
Tentering	324	25	8	7	10	85	10	40	21	3	9	2	136	28	37	71	75	35	23	17	2	1
Make-up department	604	50	24	8	18	135	23	89	30	11	25	7	251	51	80	120	109	52	37	20	5	4
Yarn and thread	479	52	27	9	16	95	21	35	18	5	8	8	235	48	62	125	84	28	37	19	9	4
Dye room	148	22	10	4	8	30	7	9	8	2	2	2	61	16	15	30	26	8	14	4	6	3
Finishing department	60	5	3	1	1	12	2	6	3	.....	.....	1	28	7	7	14	14	3	7	4	1	.....
Winding department	182	17	7	4	6	30	8	8	4	2	4	4	108	15	31	62	25	9	10	6	1	1
Packing department	40	2	1	.....	1	8	2	6	.....	.....	.....	.....	20	3	5	12	10	5	2	3	.....	.....
Service and maintenance	1,791	335	235	38	62	416	70	182	71	22	47	24	597	120	183	294	395	148	164	83	43	5
Administrative and clerical	48	4	2	1	1	14	1	6	1	3	2	1	8	3	1	4	18	9	7	2	4	.....
Laboratory	30	7	3	.....	4	4	2	2	.....	.....	.....	.....	10	1	6	3	7	4	2	1	2	.....
Maintenance and repair	935	210	158	22	30	174	35	73	29	12	16	9	347	65	92	190	184	60	81	43	18	2
Power	204	49	36	4	9	57	11	26	7	2	9	2	57	11	25	21	36	10	17	9	5	.....
Shipping	266	27	13	3	11	75	7	38	16	2	6	6	86	18	30	38	70	30	23	17	6	2
Watchmen	35	5	1	4	.....	11	3	2	3	1	2	.....	9	2	4	3	7	3	3	1	2	1
Yard	93	7	5	.....	2	22	3	10	3	.....	2	4	27	7	10	10	32	15	13	4	5	.....
Warehouse	143	18	11	3	4	48	7	21	9	2	8	1	46	11	12	23	31	12	15	4	.....	.....

[1] Totals include figures not shown separately because of insufficient data.

[2] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.

TABLE 19.—Disabling and Medical Injuries in 173 Textile Dyeing and Finishing Establishments, Classified by Department and by Agency, 1945

Department [1] [2]	Total disabling and medical injuries [3]		Agency																		
			Machines	Working surfaces	Vehicles			Cloth, rolled	Containers	Chemicals	Hand tools	Cloth, not rolled or baled	Foreign bodies, not elsewhere classified	Metal parts	Boilers and pressure vessels	Center bars, shells	Lumber stock	Stairs	Ladders	Benches, tables, chairs	Other	Unclassified; insufficient data
					Total	Hand trucks	Other															
Total	Number	7,562	1,407	828	817	738	79	763	720	502	378	216	216	206	177	118	91	89	83	76	623	252
	Percent	100.0	19.4	11.3	11.2	10.1	1.1	10.4	9.8	6.9	5.2	3.0	3.0	2.8	2.4	1.6	1.2	1.2	1.1	1.0	8.5	.....
Piece goods	Number	5,107	1,086	549	581	558	23	705	440	403	161	188	108	104	111	109	23	52	37	55	268	127
	Percent	100.0	21.8	11.0	11.7	11.2	.5	14.2	8.8	8.1	3.2	3.8	2.2	2.1	2.2	2.2	.5	1.0	.7	1.1	5.4	.....
Receiving or gray room	Number	335	39	45	46	43	3	32	84	5	13	25	9	1	4	2	1	8	.....	1	14	6
	Percent	100.0	11.9	13.7	14.0	13.1	.9	9.7	25.5	1.5	4.0	7.6	2.7	.3	1.2	.6	.3	2.4	.....	.3	4.3	.....
Boil-off or bleaching department	Number	532	111	92	63	61	2	36	27	31	19	22	11	1	34	10	3	10	9	1	35	17
	Percent	100.0	21.7	17.9	12.2	11.8	.4	7.0	5.2	6.0	3.7	4.3	2.1	.2	6.6	1.9	.6	1.9	1.7	.2	6.8	.....
Drying department	Number	269	64	31	52	51	1	43	4	14	6	11	6	4	7	7	.....	3	3	.....	10	4
	Percent	100.0	24.2	11.7	19.6	19.2	.4	16.2	1.5	5.3	2.3	4.2	2.3	1.5	2.6	2.6	.....	1.1	1.1	.....	3.8	.....
Dye room	Number	1,137	261	119	112	108	4	130	99	166	28	51	19	10	22	21	12	5	2	4	53	23
	Percent	100.0	23.2	10.7	10.1	9.7	.4	11.7	8.9	14.9	2.5	4.6	1.7	.9	2.0	1.9	1.1	.4	.2	.4	4.8	.....
Dye color shop	Number	158	7	19	8	7	1	.....	55	37	4	.....	2	1	5	.....	.....	1	2	.....	9	8
	Percent	100.0	4.7	12.7	5.3	4.6	.7	.....	36.6	24.7	2.7	.....	1.3	.7	3.3	.....	.....	.7	1.3	.....	6.0	.....
Mechanical print shop	Number	565	135	55	32	31	1	84	39	55	14	3	15	61	10	13	.....	4	9	4	20	12
	Percent	100.0	24.6	9.9	5.8	5.6	.2	15.2	7.1	9.9	2.5	.5	2.7	11.0	1.8	2.4	.....	.7	1.6	.7	3.6	.....
Screen print shop	Number	79	3	8	4	4	.....	3	4	9	3	2	.....	.....	1	.....	.....	2	.....	18	19	3
	Percent	100.0	3.9	10.5	5.3	5.3	.....	3.9	5.3	11.8	3.9	2.6	.....	.....	1.3	.....	.....	2.6	.....	23.8	25.1	.....
Print color shop	Number	36	2	4	1	1	.....	.....	13	9	1	.....	.....	.....	1	.....	.....	.....	.....	1	3	1
	Percent	100.0	5.7	11.4	2.9	2.9	.....	.....	37.0	25.7	2.9	.....	.....	.....	2.9	.....	.....	.....	.....	2.9	8.6	.....
Aging department	Number	94	17	14	13	12	1	3	7	8	2	4	5	.....	6	2	.....	3	2	2	3	3
	Percent	100.0	18.6	15.4	14.3	13.2	1.1	3.3	7.7	8.8	2.2	4.4	5.5	.....	6.6	2.2	.....	3.3	2.2	2.2	3.3	.....
Finishing department	Number	1,288	326	121	183	176	7	277	62	54	34	10	27	14	15	42	4	10	10	12	59	28
	Percent	100.0	25.9	9.6	14.5	13.9	.6	22.0	4.9	4.3	2.7	.8	2.1	1.1	1.2	3.3	.3	.8	.8	1.0	4.7	.....
Calendering	Number	186	62	13	16	16	.....	51	2	6	3	1	3	.....	1	12	.....	.....	1	4	7	4
	Percent	100.0	34.3	7.1	8.8	8.8	.....	28.1	1.1	3.3	1.6	.5	1.6	.....	.5	6.6	.....	.....	.5	2.2	3.8	.....
Tentering	Number	324	86	23	42	39	3	89	12	12	8	4	8	.....	3	13	.....	.....	4	.....	12	8
	Percent	100.0	27.2	7.3	13.3	12.4	.9	28.2	3.8	3.8	2.5	1.3	2.5	.....	.9	4.1	.....	.....	1.3	.....	3.8	.....
Make-up department	Number	604	121	41	64	61	3	95	46	15	36	59	13	12	6	12	3	6	.....	12	41	22
	Percent	100.0	20.9	7.0	11.0	10.5	.5	16.3	7.9	2.6	6.2	10.1	2.2	2.1	1.0	2.1	.5	1.0	.....	2.1	7.0	.....
Yarn and thread	Number	479	113	48	41	40	1	1	73	33	41	.....	3	13	10	4	2	3	2	4	48	40
	Percent	100.0	25.8	10.9	9.3	9.1	.2	.2	16.6	7.5	9.3	.....	.7	3.0	2.3	.9	.5	.7	.5	.9	10.9	.....
Dye room	Number	148	36	18	13	13	.....	.....	15	21	9	.....	.....	4	4	1	1	2	.....	.....	18	6
	Percent	100.0	25.3	12.7	9.2	9.2	.....	.....	10.6	14.8	6.3	.....	.....	2.8	2.8	.7	.7	1.4	.....	.....	12.7	.....
Finishing department	Number	60	16	4	5	5	.....	.....	12	3	8	.....	.....	.....	5	2	.....	.....	1	.....	3	1
	Percent	100.0	27.0	6.8	8.5	8.5	.....	.....	20.3	5.1	13.6	.....	.....	.....	8.5	3.4	.....	.....	1.7	.....	5.1	.....
Winding department	Number	182	55	19	16	16	.....	.....	21	4	18	.....	3	8	.....	.....	.....	1	1	1	17	18
	Percent	100.0	33.5	11.6	9.8	9.8	.....	.....	12.8	2.4	11.0	.....	1.8	4.9	.....	.....	.....	.6	.6	.6	10.4	.....
Packing department	Number	40	.....	2	2	2	.....	.....	16	2	5	.....	.....	.....	.....	.....	.....	.....	.....	1	3	9
	Percent	100.0	.....	6.5	6.5	6.5	.....	.....	51.5	6.5	16.1	.....	.....	.....	.....	.....	.....	.....	.....	3.2	9.7	.....
Service and maintenance	Number	1,791	188	215	175	122	53	43	194	51	160	17	100	88	54	4	65	29	40	15	285	68
	Percent	100.0	10.9	12.5	10.2	7.1	3.1	2.5	11.3	3.0	9.3	1.0	5.8	5.1	3.1	.2	3.8	1.7	2.3	.9	16.4	.....
Administrative and clerical	Number	48	1	15	5	5	.....	2	1	1	.....	.....	2	1	.....	.....	.....	6	.....	4	9	1
	Percent	100.0	2.1	32.0	10.6	10.6	.....	4.3	2.1	2.1	.....	.....	4.3	2.1	.....	.....	.....	12.8	.....	8.5	19.1	.....
Laboratory	Number	30	.....	1	1	1	.....	.....	3	10	3	.....	2	.....	2	.....	.....	2	.....	.....	6	.....
	Percent	100.0	.....	3.3	3.3	3.3	.....	.....	10.0	33.3	10.0	.....	6.7	.....	6.7	.....	.....	6.7	.....	.....	20.0	.....
Maintenance and repair	Number	935	172	94	37	30	7	4	47	26	116	6	54	67	15	3	50	9	28	6	150	51
	Percent	100.0	19.4	10.6	4.2	3.4	.8	.5	5.3	2.9	13.1	.7	6.1	7.6	1.7	.3	5.7	1.0	3.2	.7	17.0	.....
Power	Number	204	4	26	9	6	3	.....	7	4	23	1	22	7	35	.....	3	.....	9	.....	47	7
	Percent	100.0	2.0	13.2	4.6	3.1	1.5	.....	3.6	2.0	11.7	.5	11.2	3.6	17.7	.....	1.5	.....	4.6	.....	23.8	.....
Shipping	Number	266	.....	35	64	44	20	20	73	5	4	5	6	7	1	.....	6	1	2	3	29	5
	Percent	100.0	.....	13.4	24.5	16.8	7.7	7.7	28.0	1.9	1.5	1.9	2.3	2.7	.4	.....	2.3	.4	.8	1.1	11.1	.....
Watchmen	Number	35	.....	10	4	3	1	1	4	.....	.....	.....	1	1	.....	1	1	5	.....	.....	6	1
	Percent	100.0	.....	29.5	11.8	8.9	2.9	2.9	11.8	.....	.....	.....	2.9	2.9	.....	2.9	2.9	14.7	.....	.....	17.7	.....
Yard	Number	93	2	15	20	10	10	1	15	2	8	.....	3	.....	1	.....	4	3	.....	.....	17	2
	Percent	100.0	2.2	16.5	22.0	11.0	11.0	1.1	16.5	2.2	8.8	.....	3.3	.....	1.1	.....	4.4	3.3	.....	.....	18.6	.....
Warehouse	Number	143	4	14	29	18	11	13	43	2	4	5	7	3	.....	.....	1	2	1	1	13	1
	Percent	100.0	2.8	9.9	20.4	12.7	7.7	9.2	30.3	1.4	2.8	3.5	4.9	2.1	.....	.....	.7	1.4	.7	.7	9.2	.....

[1] Totals include figures not shown separately because of insufficient data.
[2] Percents are based on injuries for which agency is known.
[3] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.

TABLE 20.—Disabling and Medical Injuries in 173 Textile Dyeing and Finishing Establishments, Classified by Department and by Accident Type, 1945

Department [1] [2]		Total disabling and medical injuries [3]	Accident type											
			Striking against	Struck by	Caught in, on, or between	Falls			Slips (not falls)	Contact with extreme temperatures	Inhalation, absorption, ingestion	Over-exertion	Other	Unclassified, insufficient data
						Total	On same level	To lower level						
Total	Number	7,607	1,222	1,740	818	631	421	210	323	280	814	1,549	107	123
	Percent	100.0	16.3	23.3	10.9	8.4	5.6	2.8	4.3	3.7	10.9	20.8	1.4	.....
Piece goods	Number	5,107	756	1,031	611	400	287	113	221	198	634	1,154	61	41
	Percent	100.0	14.9	20.4	12.1	7.9	5.7	2.2	4.4	3.9	12.5	22.7	1.2	.....
Receiving or gray room	Number	335	61	85	41	32	24	8	13	3	10	81	7	2
	Percent	100.0	18.3	25.6	12.3	9.6	7.2	2.4	3.9	.9	3.0	24.3	2.1	.....
Boil-off or bleaching department	Number	532	61	106	65	83	48	35	34	19	68	79	10	7
	Percent	100.0	11.6	20.2	12.4	15.8	9.1	6.7	6.5	3.6	13.0	15.0	1.9	.....
Drying department	Number	269	39	52	35	24	16	8	15	12	21	67	3	1
	Percent	100.0	14.6	19.4	13.1	9.0	6.0	3.0	5.6	4.5	7.8	24.9	1.1	.....
Dye room	Number	1,137	113	202	127	71	65	6	44	76	275	212	10	7
	Percent	100.0	10.0	17.9	11.2	6.3	5.8	.5	3.9	6.7	24.3	18.8	.9	.....
Dye color shop	Number	158	12	24	5	14	10	4	6	6	44	42	3	2
	Percent	100.0	7.7	15.4	3.2	9.0	6.4	2.6	3.8	3.8	28.3	26.9	1.9	.....
Mechanical print shop	Number	565	97	114	58	36	29	7	27	14	70	135	8	6
	Percent	100.0	17.4	20.4	10.4	6.4	5.1	1.3	4.8	2.5	12.5	24.2	1.4	.....
Screen print shop	Number	79	28	14	1	4	3	1	5	1	9	13	2	2
	Percent	100.0	36.3	18.2	1.3	5.2	3.9	1.3	6.5	1.3	11.7	16.9	2.6	.....
Print color shop	Number	36	4	6	.....	2	2	.....	2	4	9	9	.....	.....
	Percent	100.0	11.1	16.6	.....	5.6	5.6	.....	5.6	11.1	25.0	25.0	.....	.....
Aging department	Number	94	15	18	6	16	10	6	6	5	15	13	.....	.....
	Percent	100.0	16.0	19.1	6.4	17.0	10.6	6.4	6.4	5.3	16.0	13.8	.....	.....
Finishing department	Number	1,288	221	264	196	86	54	32	50	51	86	316	9	9
	Percent	100.0	17.3	20.6	15.3	6.7	4.2	2.5	3.9	4.0	6.7	24.8	.7	.....
Calendering	Number	186	28	41	41	9	6	3	4	8	9	45	1	.....
	Percent	100.0	15.1	22.0	22.0	4.8	3.2	1.6	2.2	4.3	4.8	24.3	.5	.....
Tentering	Number	324	63	61	52	15	10	5	10	7	16	94	2	4
	Percent	100.0	19.7	19.1	16.3	4.7	3.1	1.6	3.1	2.2	5.0	29.3	.6	.....
Make-up department	Number	604	104	145	76	32	26	6	19	7	25	182	9	5
	Percent	100.0	17.4	24.2	12.7	5.3	4.3	1.0	3.2	1.2	4.2	30.3	1.5	.....
Yarn and thread	Number	479	106	104	45	34	27	7	10	18	60	61	6	35
	Percent	100.0	23.8	23.4	10.1	7.7	6.1	1.6	2.3	4.1	13.5	13.7	1.4	.....
Dye room	Number	148	19	25	16	12	9	3	6	13	37	15	1	4
	Percent	100.0	13.2	17.4	11.1	8.3	6.2	2.1	4.2	9.0	25.7	10.4	.7	.....
Finishing department	Number	60	9	21	6	2	1	1	2	4	7	8	.....	1
	Percent	100.0	15.3	35.4	10.2	3.4	1.7	1.7	3.4	6.8	11.9	13.6	.....	.....
Winding department	Number	182	54	40	19	15	14	1	1	1	9	21	5	17
	Percent	100.0	32.8	24.2	11.5	9.1	8.5	.6	.6	.6	5.5	12.7	3.0	.....
Packing department	Number	40	14	6	2	.....	.....	.....	.....	.....	2	7	.....	9
	Percent	100.0	45.0	19.4	6.5	.....	.....	.....	.....	.....	6.5	22.6	.....	.....
Service and maintenance	Number	1,791	326	546	139	171	91	80	84	61	99	295	38	32
	Percent	100.0	18.5	31.0	7.9	9.7	5.2	4.5	4.8	3.5	5.6	16.8	2.2	.....
Administrative and clerical	Number	48	5	9	3	19	16	3	3	.....	2	3	3	1
	Percent	100.0	10.6	19.1	6.4	40.4	34.0	6.4	6.4	.....	4.3	6.4	6.4	.....
Laboratory	Number	30	4	5	.....	2	1	1	1	2	13	1	2	.....
	Percent	100.0	13.3	16.7	.....	6.7	3.4	3.3	3.3	6.7	43.3	3.3	6.7	.....
Maintenance and repair	Number	935	181	316	77	61	30	31	40	30	58	124	22	26
	Percent	100.0	19.9	34.8	8.5	6.7	3.3	3.4	4.4	3.3	6.4	13.6	2.4	.....
Power	Number	204	34	54	10	20	9	11	11	25	10	33	4	3
	Percent	100.0	16.9	26.8	5.0	10.0	4.5	5.5	5.5	12.4	5.0	16.4	2.0	.....
Shipping	Number	266	51	80	20	30	16	14	13	1	5	64	2	.....
	Percent	100.0	19.2	30.0	7.5	11.3	6.0	5.3	4.9	.4	1.9	24.0	.8	.....
Watchmen	Number	35	5	4	2	13	8	5	4	.....	1	4	1	1
	Percent	100.0	14.7	11.8	5.9	38.2	23.5	14.7	11.8	.....	2.9	11.8	2.9	.....
Yard	Number	93	14	22	9	15	7	8	7	1	4	20	1	.....
	Percen	100.0	15.1	23.6	9.7	16.1	7.5	8.6	7.5	1.1	4.3	21.5	1.1	.....
Warehouse	Numbe	143	24	44	17	9	4	5	3	1	4	38	2	1
	Percent	100.0	16.9	31.0	12.0	6.3	2.8	3.5	2.1	.7	2.8	26.8	1.4	.....

[1] Totals include figures not shown separately because of insufficient data.
[2] Percents are based on injuries for which the accident type is known.
[3] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.

TABLE 21.—Disabling and Medical Injuries in 163 Textile Dyeing and Finishing Establishments, Classified by Agency and by Unsafe Working Condition, 1945

Agency and part	Total number of disabling and medical injuries [1]	Unsafe working conditions														
		Improperly guarded agencies	Defects of agencies						Hazardous arrangement or procedure					Lack of proper safety equipment	Other unsafe working conditions	No unsafe condition	Unclassified; insufficient data
			Total	Rough	Slippery	Sharp-edged	Aged, worn, cracked, etc.	Other	Total	Lack of clear walkways or working surfaces	Unsafe planning or lay-out of traffic or process operations	Lack of proper lifting equipment	Other				
Total	7,390	711	1,333	213	461	277	165	217	1,577	112	308	909	248	46	13	21	3,689
Machines	1,388	519	202	14	5	59	39	85	175	1	64	46	64	3	1	.....	488
Jig	125	59	22	.....	.....	6	4	12	16	.....	6	4	6	.....	.....	.....	28
Printing machine	115	33	17	1	.....	4	4	8	15	.....	3	5	7	.....	.....	.....	50
Other	1,148	427	163	13	5	49	31	65	144	1	55	37	51	3	1	.....	410
Working surfaces	818	29	520	36	425	26	18	15	121	86	15	4	16	.....	1	1	146
Floors	611	6	423	32	351	20	14	6	84	76	1	1	6	.....	.....	1	97
Other surfaces	207	23	97	4	74	6	4	9	37	10	14	3	10	.....	1	.....	49
Vehicles	797	1	98	32	6	16	15	29	89	17	8	22	42	.....	1	3	605
Hand trucks	719	1	81	31	.....	15	11	24	80	17	6	21	36	.....	1	2	554
Frame	206	.....	48	25	.....	11	3	9	26	10	1	3	12	.....	.....	1	131
Wheels	154	.....	9	1	.....	.....	4	4	5	3	.....	.....	2	.....	.....	1	139
Other parts	359	1	24	5	.....	4	4	11	49	4	5	18	22	.....	1	.....	284
Other vehicles	78	.....	17	1	6	1	4	5	9	.....	2	1	6	.....	.....	1	51
Cloth, rolled	764	.....	13	4	.....	6	1	2	564	2	6	542	14	.....	.....	4	183
Containers	711	37	153	26	.....	96	16	15	232	.....	28	177	27	8	.....	3	278
Chemicals	482	9	1	.....	.....	.....	.....	1	76	.....	68	.....	8	19	3	.....	374
Hand tools	375	10	35	10	.....	2	13	10	75	.....	72	.....	3	3	.....	2	250
Cloth, not rolled or baled	212	.....	3	.....	.....	2	.....	1	49	.....	18	25	6	.....	.....	.....	160
Foreign bodies, not elsewhere classified	216	.....	.....	.....	.....	.....	.....	.....	3	.....	1	.....	2	.....	.....	.....	213
Metal parts	201	.....	22	9	.....	13	.....	.....	44	1	.....	37	6	2	.....	.....	133
Boilers and pressure vessels	176	50	43	.....	2	3	24	14	19	1	10	2	6	.....	.....	6	58
Center bars, shells	113	.....	15	9	1	3	.....	2	3	.....	.....	.....	3	.....	.....	1	94
Lumber stock	90	.....	22	11	.....	11	.....	.....	12	.....	.....	3	9	3	.....	.....	53
Stairs	89	.....	26	1	21	.....	2	2	4	2	2	.....	.....	.....	1	.....	58
Ladders	83	19	13	2	.....	1	8	2	3	.....	1	1	1	.....	.....	1	47
Benches, tables, chairs, etc.	69	.....	22	17	.....	5	.....	.....	7	.....	1	2	4	.....	.....	.....	40
Other	594	35	111	21	.....	26	29	35	88	2	14	37	35	4	5	.....	351
Unclassified; insufficient data	212	2	34	21	1	8	.....	4	13	.....	.....	11	2	4	1	.....	158

[1] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.

TABLE 22.—Disabling and Medical Injuries in 162 Textile Dyeing and Finishing Establishments, Classified by Department and by Unsafe Working Condition, 1945

Department [1] [2]	Total number of disabling and medical injuries [3]		Unsafe working conditions															
				Defects of agencies						Hazardous arrangement or procedure								
			Improperly guarded agencies	Total	Rough	Slippery	Sharp-edged	Aged, worn, cracked, etc.	Other	Total	Lack of clear walkways or working surfaces	Unsafe planning or lay-out of traffic or process operations	Lack of proper lifting equipment	Other	Lack of proper safety equipment	Other unsafe working conditions	No unsafe condition	Unclassified; insufficient data
Total	Number	7,336	709	1,323	212	457	275	163	216	1,564	109	307	900	248	46	13	21	3,660
	Percent	100.0	19.4	36.2	5.8	12.5	7.5	4.5	5.9	42.7	3.0	8.4	24.5	6.8	1.3	.4	.....	.....
Piece goods	Number	5,011	540	876	133	339	157	99	148	1,179	61	237	723	158	27	9	9	2,371
	Percent	100.0	20.5	33.3	5.1	12.8	6.0	3.8	5.6	44.9	2.3	9.0	27.6	6.0	1.0	.3	.....	.....
Receiving or gray room	Number	334	25	65	10	19	30	4	2	74	5	9	51	9	1	3	3	163
	Percent	100.0	14.9	38.7	6.0	11.3	17.8	2.4	1.2	44.0	3.0	5.4	30.2	5.4	.6	1.8	.....	.....
Boil-off or bleaching department	Number	532	64	129	13	62	14	18	22	93	11	32	31	19	.....	1	.....	245
	Percent	100.0	22.3	45.0	4.5	21.6	4.9	6.3	7.7	32.4	3.8	11.2	10.8	6.6	.....	.3	.....	.....
Drying department	Number	265	25	37	4	16	9	4	4	66	3	10	41	12	1	.....	1	135
	Percent	100.0	19.4	28.7	3.1	12.4	7.0	3.1	3.1	51.1	2.3	7.8	31.7	9.3	.8	.....	.....	.....
Dye room	Number	1,115	133	196	18	89	31	26	32	262	8	99	121	34	8	2	3	511
	Percent	100.0	22.1	32.6	3.0	14.8	5.2	4.3	5.3	43.7	1.3	16.5	20.2	5.7	1.3	.3	.....	.....
Dye color shop	Number	152	9	25	3	14	3	1	4	42	1	9	26	6	2	.....	.....	74
	Percent	100.0	11.5	32.1	3.8	18.1	3.8	1.3	5.1	53.8	1.3	11.5	33.3	7.7	2.6	.....	.....	.....
Mechanical print shop	Number	559	54	97	19	45	11	8	14	126	2	12	102	10	2	.....	.....	280
	Percent	100.0	19.4	34.8	6.8	16.2	3.9	2.9	5.0	45.1	.7	4.3	36.5	3.6	.7	.....	.....	.....
Screen print shop	Number	55	.....	17	7	4	5	.....	1	5	.....	.....	5	.....	1	.....	.....	32
	Percent	[4]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Print color shop	Number	36	2	5	.....	3	1	1	.....	7	1	1	5	.....	5	.....	.....	17
	Percent	[4]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aging department	Number	90	10	14	1	7	2	1	3	21	1	9	7	4	2	.....	.....	43
	Percent	100.0	21.3	29.8	2.1	14.9	4.3	2.1	6.4	44.6	2.1	19.1	14.9	8.5	4.3	.....	.....	.....
Finishing department	Number	1,264	156	208	40	64	34	23	47	341	18	40	240	43	5	2	2	550
	Percent	100.0	21.9	29.2	5.6	9.0	4.8	3.2	6.6	47.9	2.5	5.6	33.8	6.0	.7	.3	.....	.....
Calendering	Number	181	32	23	6	5	4	2	6	45	.....	4	38	3	.....	1	1	79
	Percent	100.0	31.7	22.8	5.9	5.0	4.0	2.0	5.9	44.5	.....	4.0	37.5	3.0	1.0	.....	.....	.....
Tentering	Number	323	37	50	12	13	9	4	12	103	6	12	75	10	1	.....	.....	132
	Percent	100.0	19.4	26.2	.6.3	6.8	4.7	2.1	6.3	53.9	3.1	6.3	39.3	5.2	.5	.....	.....	.....
Make-up department	Number	599	62	81	18	16	17	13	17	140	11	16	92	21	.....	1	.....	315
	Percent	100.0	21.8	28.5	6.3	5.6	6.0	4.6	6.0	49.3	3.9	5.6	32.4	7.4	.....	.4	.....	.....
Yarn and thread	Number	421	41	98	28	23	21	13	13	78	7	38	20	13	1	.....	5	198
	Percent	100.0	18.8	44.9	12.7	10.6	9.6	6.0	6.0	35.8	3.2	17.4	9.2	6.0	.5	.....	.....	.....
Dye room	Number	129	15	31	5	11	2	4	9	22	1	13	4	4	1	.....	2	58
	Percent	100.0	21.7	45.0	7.2	16.0	2.9	5.8	13.1	31.9	1.4	18.9	5.8	5.8	1.4	.....	.....	.....
Finishing department	Number	59	5	10	1	1	3	4	1	16	.....	9	6	1	.....	.....	1	27
	Percent	100.0	16.1	32.3	3.2	3.2	9.7	13.0	3.2	51.6	.....	29.0	19.4	3.2	.....	.....	.....	.....
Winding department	Number	164	17	38	13	8	11	3	3	27	4	14	4	5	.....	.....	1	81
	Percent	100.0	20.7	46.4	15.8	9.8	13.4	3.7	3.7	32.9	4.9	17.0	4.9	6.1	.....	.....	.....	.....
Packing department	Number	25	.....	9	5	.....	3	1	.....	3	2	.....	1	.....	.....	.....	1	12
	Percent	[4]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Service and maintenance	Number	1,732	104	324	47	84	91	50	52	279	40	25	142	72	18	4	6	997
	Percent	100.0	14.3	44.4	6.4	11.5	12.5	6.9	7.1	38.3	5.5	3.4	19.5	9.9	2.5	.5	.....	.....
Administrative and clerical	Number	46	.....	12	1	6	.....	3	2	4	2	.....	1	1	.....	1	.....	29
	Percent	[4]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Laboratory	Number	26	.....	3	.....	1	1	.....	1	3	.....	1	1	1	1	.....	1	18
	Percent	[4]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maintenance and repair	Number	913	80	170	29	34	46	31	30	118	18	8	57	35	12	3	3	527
	Percent	100.0	20.9	44.4	7.6	8.9	12.0	8.1	7.8	30.8	4.7	2.1	14.9	9.1	3.1	.8	.....	.....
Power	Number	199	9	29	2	9	4	5	9	28	7	7	6	8	1	.....	.....	132
	Percent	100.0	13.4	43.3	3.0	13.4	6.0	7.5	13.4	41.8	10.4	10.4	9.1	11.9	1.5	.....	.....	.....
Shipping	Number	251	4	58	11	12	26	4	5	58	8	4	34	12	2	.....	1	128
	Percent	100.0	3.3	47.5	9.0	9.8	21.3	3.3	4.1	47.6	6.6	3.3	27.9	9.8	1.6	.....	.....	.....
Watchmen	Number	34	2	10	1	7	1	.....	1	5	1	.....	1	3	.....	.....	.....	17
	Percent	[4]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yard	Number	92	4	14	2	10	1	1	.....	17	1	1	13	2	1	.....	.....	56
	Percent	100.0	11.1	38.9	5.6	27.7	2.8	2.8	.....	47.2	2.8	2.8	36.0	5.6	2.8	.....	.....	.....
Warehouse	Number	137	5	24	1	4	11	5	3	35	2	3	23	7	1	.....	1	71
	Percent	100.0	7.7	36.9	1.5	6.2	16.9	7.7	4.6	53.9	3.1	4.6	35.4	10.8	1.5	.....	.....	.....

[1] Totals include figures not shown separately because of insufficient data.
[2] Percents are based on injuries resulting from accidents in which an unsafe working condition was known to exist.
[3] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.
[4] Not computed because of small number of injuries included.

TABLE 23.—Disabling and Medical Injuries in 168 Textile Dyeing and Finishing Establishments, Classified by Department and by Unsafe Act, 1945

Department [1] [2]	Total number of disabling and medical injuries [3]		Unsafe act																		
					Using unsafe equipment or equipment unsafely					Unsafe placing or mixing					Taking unsafe position or posture							
			Operating without authority; failure to secure or warn	Operating or working at unsafe speed	Total	Unsafe use of equipment	Gripping objects insecurely; taking wrong hold of objects	Pulling hand trucks	Other	Total	Arranging objects or materials unsafely	Mixing or combining materials unsafely	Other	Failure to use proper safety equipment	Total	Exposure on vehicular right-of-way	Inattention to footing	Lifting incorrectly or lifting too heavy loads	Other	Working on moving or dangerous equipment	Other unsafe acts	No unsafe acts	Unclassified; insufficient data
Total	Number	7,389	88	47	1,807	323	1,306	93	85	487	313	145	29	251	1,752	66	476	456	754	87	33	15	2,822
	Percent	100.0	1.9	1.0	39.8	7.1	28.8	2.0	1.9	10.7	6.9	3.2	.6	5.5	38.5	1.4	10.5	10.0	16.6	1.9	.7	.....	.....
Piece goods	Number	5,028	61	32	1,229	196	909	76	48	328	185	125	18	118	1,180	50	304	318	508	65	24	7	1,984
	Percent	100.0	2.0	1.1	40.4	6.5	29.8	2.5	1.6	10.8	6.1	4.1	.6	3.9	38.9	1.6	10.0	10.5	16.8	2.1	.8	.....	.....
Receiving or gray room	Number	332	3	1	93	13	72	7	1	19	18	1	.....	5	90	7	27	22	34	1	3	1	116
	Percent	100.0	1.4	.5	43.2	6.0	33.4	3.3	.5	8.8	8.3	.5	.....	2.3	41.9	3.3	12.6	10.2	15.8	.5	1.4	.....	.....
Boil-off or bleaching department	Number	529	8	4	122	24	82	14	2	27	13	14	.....	14	135	4	39	34	58	10	5	2	202
	Percent	100.0	2.5	1.2	37.5	7.4	25.2	4.3	.6	8.3	4.0	4.3	.....	4.3	41.6	1.2	12.0	10.5	17.9	3.1	1.5	.....	.....
Drying department	Number	267	3	3	63	7	49	6	1	13	10	3	.....	2	78	4	24	19	31	5	1	.....	99
	Percent	100.0	1.8	1.8	37.5	4.2	29.1	3.6	.6	7.7	5.9	1.8	.....	1.2	46.4	2.4	14.3	11.3	18.4	3.0	.6	.....	.....
Dye room	Number	1,124	12	13	244	46	173	14	11	120	38	68	14	49	212	13	38	74	87	6	8	1	459
	Percent	100.0	1.8	2.0	36.7	6.9	26.0	2.1	1.7	18.1	5.7	10.3	2.1	7.4	31.9	2.0	5.7	11.1	13.1	.9	1.2	.....	.....
Dye color shop	Number	152	.....	1	26	7	17	2	.....	16	4	11	1	12	32	1	9	12	10	.....	.....	.....	65
	Percent	100.0	.....	1.1	29.9	8.0	19.6	2.3	.....	18.4	4.6	12.7	1.1	13.8	36.8	1.1	10.3	13.9	11.5	.....	.....	.....	.....
Mechanical print shop	Number	545	7	2	125	12	100	6	7	24	21	3	.....	8	108	4	25	25	54	10	1	.....	260
	Percent	100.0	2.5	.7	43.8	4.2	35.0	2.1	2.5	8.4	7.3	1.1	.....	2.8	37.9	1.4	8.8	8.8	18.9	3.5	.4	.....	.....
Screen print shop	Number	79	1	.....	17	3	14	.....	.....	5	3	2	.....	2	28	.....	9	4	15	1	.....	.....	25
	Percent	100.0	1.9	.....	31.5	5.6	25.9	.....	.....	9.3	5.6	3.7	.....	3.7	51.7	.....	16.7	7.4	27.6	1.9	.....	.....	.....
Print color shop	Number	36	.....	.....	6	2	4	.....	.....	5	2	3	.....	2	7	.....	2	2	3	.....	.....	.....	16
	Percent	(4)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aging department	Number	90	1	.....	16	5	10	1	.....	6	2	4	.....	.....	34	.....	13	6	15	.....	.....	.....	33
	Percent	100.0	1.8	.....	28.1	8.8	17.5	1.8	.....	10.5	3.5	7.0	.....	.....	59.6	.....	22.8	10.5	26.3	.....	.....	.....	.....
Finishing department	Number	1,267	18	5	347	47	259	21	20	70	51	16	3	18	287	14	83	49	141	30	3	2	487
	Percent	100.0	2.3	.6	44.6	6.0	33.3	2.7	2.6	9.0	6.5	2.1	.4	2.3	36.9	1.8	10.7	6.3	18.1	3.9	.4	.....	.....
Calendering	Number	185	4	.....	62	7	53	.....	2	3	3	.....	.....	2	39	1	9	7	22	9	1	.....	65
	Percent	100.0	3.3	.....	51.7	5.8	44.2	.....	1.7	2.5	2.5	.....	.....	1.7	32.5	.8	7.5	5.8	18.4	7.5	.8	.....	.....
Tentering	Number	317	2	.....	81	6	61	7	7	9	8	1	.....	4	79	4	19	14	42	8	1	.....	133
	Percent	100.0	1.1	.....	44.1	3.3	33.2	3.8	3.8	4.9	4.4	.5	.....	2.2	42.9	2.2	10.3	7.6	22.8	4.3	.5	.....	.....
Make-up department	Number	597	8	3	169	29	129	5	6	23	23	.....	.....	4	165	3	35	68	59	2	3	1	219
	Percent	100.0	2.1	.8	44.8	7.7	34.2	1.3	1.6	6.1	6.1	.....	.....	1.1	43.8	.8	9.3	18.1	15.6	.5	.8	.....	.....
Yarn and thread	Number	430	3	2	124	20	91	6	7	30	14	14	2	4	113	4	18	24	67	9	2	1	142
	Percent	100.0	1.0	.7	43.2	7.0	31.7	2.1	2.4	10.5	4.9	4.9	.7	1.4	39.4	1.4	6.3	8.4	23.3	3.1	.7	.....	.....
Dye room	Number	132	1	2	34	8	24	.....	2	14	3	10	1	.....	35	3	5	5	22	.....	1	.....	45
	Percent	100.0	1.1	2.3	39.1	9.2	27.6	.....	2.3	16.1	3.4	11.6	1.1	.....	40.3	3.4	5.7	5.7	25.5	.....	1.1	.....	.....
Finishing department	Number	59	1	.....	16	4	9	1	2	6	4	2	.....	.....	15	.....	2	2	11	3	.....	.....	18
	Percent	100.0	2.4	.....	39.1	9.8	22.0	2.4	4.9	14.6	9.7	4.9	.....	.....	36.6	.....	4.9	4.9	26.8	7.3	.....	.....	.....
Winding department	Number	165	.....	.....	55	6	45	3	1	4	4	.....	.....	.....	47	1	8	11	27	6	1	.....	52
	Percent	100.0	.....	.....	48.7	5.3	39.8	2.7	.9	3.5	3.5	.....	.....	.....	41.6	.9	7.1	9.7	23.9	5.3	.9	.....	.....
Packing department	Number	30	1	.....	8	1	5	.....	2	2	2	.....	.....	1	7	.....	1	4	2	.....	.....	.....	11
	Percent	(4)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Service and maintenance	Number	1,760	24	13	410	101	272	11	26	121	107	5	9	128	419	11	140	107	161	11	6	6	622
	Percent	100.0	2.1	1.1	36.2	8.9	24.0	1.0	2.3	10.7	9.5	.4	.8	11.3	37.1	1.0	12.4	9.5	14.2	1.0	.5	.....	.....
Administrative and clerical	Number	48	.....	.....	6	.....	5	.....	1	5	5	.....	.....	1	24	1	14	1	8	.....	.....	.....	12
	Percent	100.0	.....	.....	16.7	.....	13.9	.....	2.8	13.9	13.9	.....	.....	2.8	66.6	2.8	38.8	2.8	22.2	.....	.....	.....	.....
Laboratory	Number	30	.....	.....	10	4	5	1	.....	3	.....	2	1	3	3	.....	3	.....	.....	1	.....	.....	10
	Percent	(4)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Maintenance and repair	Number	911	16	5	225	59	150	2	14	57	54	2	1	100	177	3	56	43	75	8	1	2	320
	Percent	100.0	2.7	.8	38.1	10.0	25.4	.3	2.4	9.7	9.2	.3	.2	17.0	30.1	.5	9.5	7.3	12.8	1.4	.2	.....	.....
Power	Number	202	.....	.....	37	12	20	.....	5	11	9	1	1	9	67	1	17	19	30	2	.....	1	75
	Percent	100.0	.....	.....	29.4	9.5	15.9	.....	4.0	8.7	7.1	.8	.8	7.1	53.2	.8	13.5	15.1	23.8	1.6	.....	.....	.....
Shipping	Number	266	5	5	66	16	41	6	3	22	20	.....	2	11	66	2	20	25	19	.....	3	.....	88
	Percent	100.0	2.8	2.8	37.1	9.0	23.0	3.4	1.7	12.4	11.3	.....	1.1	6.2	37.0	1.1	11.2	14.0	10.7	.....	1.7	.....	.....
Watchmen	Number	35	.....	.....	7	.....	6	.....	1	.....	.....	.....	.....	1	10	.....	6	.....	4	.....	1	1	15
	Percent	(4)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yard	Number	92	1	1	19	3	15	1	.....	5	3	.....	2	1	30	.....	11	6	13	.....	.....	.....	35
	Percent	100.0	1.8	1.8	33.3	5.3	26.2	1.8	.....	8.8	5.3	.....	3.5	1.8	52.5	.....	19.3	10.5	22.7	.....	.....	.....	.....
Warehouse	Number	141	1	2	32	6	26	.....	.....	14	13	.....	1	2	33	4	11	11	7	.....	1	1	55
	Percent	100.0	1.2	2.4	37.6	7.1	30.5	.....	.....	16.5	15.3	.....	1.2	2.4	38.7	4.7	12.9	12.9	8.2	.....	1.2	.....	.....

[1] Totals include figures not shown separately because of insufficient data.
[2] Percents are based on injuries resulting from accidents in which an unsafe act was committed.
[3] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.
[4] Not computed because of small number of injuries included.

TABLE 24.—Industrial-Injury-Frequency Rates for 37 Textile Dyeing and Finishing Establishments, Classified by Occupation of Injured and Extent of Disability, 1945

Occupation and department [1]	Frequency rates [2]			For establishments reporting disabling and medical cases only			For establishments reporting all injuries			
	Disabling	Medical	First-aid	Employee-hours worked	Number of injuries		Employee-hours worked	Number of injuries		
					Disabling	Medical		Disabling	Medical	First-aid
Total	27.8	62.8	370.9	12,953,218	403	848	7,600,831	168	443	2,819
Ager operator	21.1	24.1	(3)	313,765	6	8	18,112	1	.....	15
Back-end man; back tender; doffer; swing tender	47.8	61.9	376.8	238,702	14	12	116,779	3	10	44
Print color shop	45.6	54.8	(3)	87,600	5	2	21,945	.....	4	12
Finishing department	65.4	52.3	(3)	111,628	7	5	41,269	3	3	9
Back tender (printing)	62.2	145.2	(3)	227,795	17	30	61,418	1	12	28
Beamer; cloth-roll winder; winder operator; winding-machine operator; tuber	19.6	63.5	528.4	571,234	13	44	295,203	4	11	156
Receiving or gray room	33.4	92.0	(3)	73,869	4	11	45,730	.....	.....	1
Dye room	17.2	60.4	(3)	44,977	1	5	70,979	1	2	50
Finishing department	18.9	56.8	371.7	140,408	3	9	123,760	2	6	46
Make-up department	15.8	66.4	(3)	280,215	4	18	35,923	1	3	44
Boil-off machine operator; boil-off man	25.1	62.8	308.7	281,596	6	18	116,609	4	7	36
Calender operator	33.9	37.3	(3)	212,127	7	6	82,658	3	5	60
Clerk	12.6	27.7	187.1	383,805	8	19	411,447	2	3	77
Make-up department	5.5	8.2	175.9	177,225	1	3	187,639	1	.....	33
Administrative and clerical	.....	.....	224.8	.....	.....	.....	120,102	.....	.....	27
Shipping	28.9	57.9	(3)	81,614	3	6	22,069	.....	.....	3
Cloth-bale header; bale coverer; burlaper	9.6	38.3	(3)	10,842	.....	1	93,465	1	3	42
Cloth folder, hand; hand folder; folder	6.6	19.8	293.9	173,429	1	2	129,276	1	4	38
Cloth-mercerizer operator; mercerizer-machine operator; mercerizer	8.6	51.7	(3)	65,031	1	5	51,095	.....	1	29
Cloth printer; printing-machine operator	30.3	63.6	(3)	272,206	9	17	58,079	1	4	17
Cloth-washer operator; soap operator; rope-soaper operator; open-soaper operator; washing-machine tender	24.4	72.1	374.9	497,108	16	39	280,070	3	17	105
Boil-off or bleaching department	15.8	72.7	337.9	124,225	4	11	192,349	1	12	65
Dye room	37.0	74.1	(3)	65,697	3	6	69,316	2	4	33
Mechanical print shop	23.6	70.7	(3)	245,174	6	17	9,433	.....	1	2
Color mixer; dye weigher; kettleman	31.0	51.7	317.2	379,440	13	19	104,037	2	6	33
Dye color shop	28.0	50.4	(3)	126,148	5	6	52,262	.....	3	13
Print color shop	32.8	52.4	(3)	253,292	8	13	51,775	2	3	20
Continuous-dyeing-machine operator	9.8	39.2	(3)	63,603	.....	.....	38,344	1	4	10

See footnotes at end of table.

TABLE 24.—Industrial-Injury-Frequency Rates for 37 Textile Dyeing and Finishing Establishments, Classified by Occupation of Injured and Extent of Disability, 1945—Continued

Occupation and department [1]	Frequency rates [2]			For establishments reporting disabling and medical cases only			For establishments reporting all injuries			
	Disabling	Medical	First-aid	Employee-hours worked	Number of injuries		Employee-hours worked	Number of injuries		
					Disabling	Medical		Disabling	Medical	First-aid
Dry-cans operator; can-drier operator; can tender	31.2	47.4	270.6	665,353	24	28	199,565	3	13	54
Drying-machine operator, not elsewhere classified	32.1	85.5	[3]	192,914	5	17	87,795	4	7	21
Dye-reel operator; dye-beck-reel operator; dye-box operator	50.2	51.3	[3]	831,534	40	44	44,887	4	1	1
Fireman	20.3	30.5	[3]	208,994	2	6	85,863	4	3	21
Folding-machine operator; folder operator; hooker-machine operator; yarder operator	21.3	61.2	699.8	239,955	6	17	135,759	2	6	95
Foreman; supervisor	8.8	47.9	257.8	381,874	3	16	411,131	4	22	106
Dye room	.....	40.0	[3]	103,261	.....	4	71,949	.....	3	7
Finishing department	23.2	37.2	222.1	84,529	2	3	130,561	3	5	29
Make-up department	.....	38.2	[3]	45,705	.....	3	58,916	.....	1	31
Goods layer; cloth layer-out; lay-out man	14.7	66.2	[3]	177,102	2	13	94,950	2	5	35
Gray-cloth tender, printing; gray tender	71.0	76.9	[3]	286,633	18	20	51,286	6	6	45
Inspector; examiner	11.5	64.0	176.1	262,583	5	19	346,334	2	20	61
Finishing department	9.6	57.3	[3]	35,933	.....	3	68,746	1	3	22
Make-up department	14.8	59.1	79.8	180,237	5	14	225,673	1	10	18
Janitor	27.9	67.8	303.2	75,946	6	1	174,823	1	16	53
Jigger; dye-jig operator	42.0	126.1	454.3	642,092	30	90	261,919	8	24	119
Kier boiler; kier operator	26.4	114.2	[3]	60,439	2	8	53,397	1	5	19
Laborer, not elsewhere classified	62.7	107.5	[3]	50,335	4	4	61,289	3	8	40
Maintenance man	38.0	124.5	572.0	733,161	30	108	503,534	17	46	288
Carpenter	19.1	114.7	[3]	75,967	1	9	28,676	1	3	52
Machinist	43.0	158.3	598.3	419,964	18	75	230,661	10	28	138
Mangle tender, not elsewhere classified	34.3	60.0	[3]	145,123	4	6	88,357	4	8	40
Napper tender	5.2	26.2	12.7	32,819	.....	3	158,031	1	2	2
Packer	22.3	63.8	[3]	241,922	7	15	71,425	.....	5	46
Padding-machine operator; padder operator	53.5	81.5	545.4	245,865	11	18	146,673	10	14	80
Pleater; plaiter; bin plaiter; kier plaiter; cloth knocker	34.2	56.9	585.6	73,220	1	7	102,461	5	3	60
Sanforizing-machine operator	23.3	49.9	273.7	136,465	6	7	164,396	1	8	45
Sewing-machine operator; seaming-machine operator	26.6	35.5	421.1	186,354	6	6	151,987	3	6	64
Receiving or gray room	37.5	37.5	422.3	106,746	6	5	106,564	2	3	45
Singer; singeing-machine operator	30.7	85.9	[3]	76,739	1	4	86,328	4	10	32
Starch-mangle tender	35.8	53.6	[3]	103,707	3	7	64,078	3	2	19
Starch mixer; size maker	6.0	30.2	[3]	90,813	.....	1	74,639	1	4	24
Tacker	16.6	24.9	[3]	46,357	2	2	74,038	.....	1	6
Tenter-frame operator; frame operator	26.6	56.7	394.1	765,304	16	43	362,836	14	21	143
Truck driver	29.0	63.9	[3]	124,380	5	8	47,897	.....	3	24
Trucker, hand	38.4	65.1	474.4	573,043	22	32	548,106	21	41	260
Receiving or gray room	22.1	44.2	86.1	53,445	2	1	127,689	2	7	11
Finishing department	39.4	39.4	[3]	172,474	8	7	81,535	2	3	55
Make-up department	67.6	116.7	[3]	92,436	3	9	70,306	8	10	66
Warehouse	40.5	86.2	[3]	106,272	5	7	91,034	3	10	58
Watchman	10.6	7.1	87.5	167,624	1	.....	114,303	2	2	10
Wrapper	14.7	44.1	393.2	170,439	3	11	101,724	1	1	40

[1] Totals include figures not shown separately because of insufficient data.

[2] The injury-frequency rate is the number of injuries per million hours worked. The disabling-injury frequency rate is based on the number of disabling injuries, the medical-injury frequency on the number of medical injuries, and the first-aid-injury frequency rate on the number of first-aid injuries. A disabling injury is one that results in death, permanent disability, or an inability to perform a regularly established job on any day subsequent to the day of injury. A medical injury is a nondisabling injury requiring treatment by a physician or surgeon. A first-aid injury is any injury other than disabling or medical which requires first-aid treatment.

[3] Not available because of insufficient data.

TABLE 25.—Disabling and Medical Injuries in 168 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Nature of Injury, 1945

Occupation [1]		Total disabling and medical injuries [2]	Nature of injury										
			Amputations	Bruises; contusions	Burns; scalds	Cuts; lacerations; punctures	Foreign bodies in eyes	Fractures	Hernias	Industrial diseases	Strains; sprains (except hernias)	Other	Unclassified; insufficient data
Total	Number	7,252	18	2,009	708	1,472	289	287	115	392	1,883	53	26
	Percent	100.0	.2	27.8	9.8	20.4	4.0	4.0	1.6	5.4	26.1	.7	.....
Ager operator	Number	65	.....	18	13	8	6	2	1	5	11	1	.....
	Percent	100.0	.....	27.8	20.0	12.3	9.2	3.1	1.5	7.7	16.9	1.5	.....
Back-end man; back tender; doffer; swing tender	Number	55	.....	16	4	14	.....	1	1	6	13	.....	.....
	Percent	100.0	.....	29.1	7.3	25.5	.....	1.8	1.8	10.9	23.6	.....	.....
Back tender (printing)	Number	147	.....	44	4	31	2	8	1	8	49	.....	.....
	Percent	100.0	.....	29.9	2.7	21.1	1.4	5.4	.7	5.4	33.4	.....	.....
Beamer; cloth-roll winder; winder operator; winding-machine operator; tuber	Number	202	.....	71	8	29	3	8	2	6	72	2	1
	Percent	100.0	.....	35.3	4.0	14.4	1.5	4.0	1.0	3.0	35.8	1.0	.....
Boil-off-machine operator; boil-off man	Number	71	1	19	17	9	1	2	1	4	15	1	1
	Percent	100.0	1.4	27.2	24.3	12.9	1.4	2.9	1.4	5.7	21.4	1.4	.....
Calender operator	Number	98	.....	30	6	22	1	4	1	3	31	.....	.....
	Percent	100.0	.....	30.6	6.1	22.4	1.0	4.1	1.0	3.1	31.7	.....	.....
Chemist	Number	27	.....	4	10	3	2	.....	.....	5	1	2	.....
	Percent	100.0	.....	14.8	37.1	11.1	7.4	.....	.....	18.5	3.7	7.4	.....
Clerk	Number	110	.....	38	4	17	2	4	1	4	38	1	1
	Percent	100.0	.....	34.8	3.7	15.6	1.8	3.7	.9	3.7	34.9	.9	.....
Cloth-bale header; bale coverer; burlapper	Number	19	.....	4	.....	10	.....	.....	.....	.....	5	.....	.....
	Percent	[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cloth folder, hand; hand folder; folder	Number	65	.....	21	2	16	1	.....	3	1	21	.....	.....
	Percent	100.0	.....	32.4	3.1	24.6	1.5	.....	4.6	1.5	32.3	.....	.....
Cloth-mercerizer operator; mercerizer-machine operator; mercerizer	Number	51	1	14	13	6	2	3	.....	1	11	.....	.....
	Percent	100.0	2.0	27.4	25.4	11.8	3.9	5.9	.....	2.0	21.6	.....	.....
Cloth printer; printing-machine operator	Number	147	1	24	3	45	5	8	1	18	42	.....	.....
	Percent	100.0	.7	16.3	2.0	30.7	3.4	5.4	.7	12.2	28.6	.....	.....
Cloth-washer operator; soaper operator; rope-soaper operator; open-soaper operator; washing-machine tender	Number	178	1	57	23	28	2	8	1	13	41	2	2
	Percent	100.0	.6	32.4	13.1	15.9	1.1	4.5	.6	7.4	23.3	1.1	.....
Color mixer; dye weigher; kettleman	Number	207	.....	32	44	23	10	3	4	30	58	3	.....
	Percent	100.0	.....	15.5	21.3	11.1	4.8	1.4	1.9	14.5	28.1	1.4	.....
Continuous-dyeing-machine operator	Number	41	.....	11	11	5	.....	1	.....	3	10	.....	.....
	Percent	100.0	.....	26.9	26.8	12.2	.....	2.4	.....	7.3	24.4	.....	.....
Dry-cans operator; can-drier operator; can tender	Number	94	.....	27	4	16	5	5	3	10	23	1	.....
	Percent	100.0	.....	28.7	4.3	17.0	5.3	5.3	3.2	10.6	24.5	1.1	.....
Drying-machine operator, not elsewhere classified	Number	152	.....	29	11	26	2	18	2	9	53	2	.....
	Percent	100.0	.....	19.1	7.2	17.1	1.3	11.8	1.3	5.9	35.0	1.3	.....
Dye-reel operator; dye-beck-reel operator; dye-box operator	Number	236	1	56	50	32	1	5	2	16	70	3	.....
	Percent	100.0	.4	23.7	21.2	13.6	.4	2.1	.8	6.8	29.7	1.3	.....
Fireman	Number	142	.....	39	22	21	14	7	2	2	33	2	.....
	Percent	100.0	.....	27.5	15.5	14.8	9.9	4.9	1.4	1.4	23.2	1.4	.....
Folding-machine operator; folder operator; hooker-machine operator; yarder operator	Number	86	1	43	1	15	.....	5	.....	2	19	.....	.....
	Percent	100.0	1.2	50.0	1.2	17.4	.....	5.8	.....	2.3	22.1	.....	.....
Foreman; supervisor	Number	278	1	80	33	51	13	10	8	12	68	2	.....
	Percent	100.0	.4	28.7	11.9	18.3	4.7	3.6	2.9	4.3	24.5	.7	.....
Goods layer; cloth layer-out; lay-out man	Number	65	.....	12	1	20	3	2	2	1	24	.....	.....
	Percent	100.0	.....	18.5	1.5	30.8	4.6	3.1	3.1	1.5	36.9	.....	.....
Gray-cloth tender, printing; gray tender	Number	97	.....	28	6	16	2	5	.....	7	32	1	.....
	Percent	100.0	.....	28.9	6.2	16.5	2.1	5.2	.....	7.2	32.9	1.0	.....
Inspector; examiner	Number	108	.....	34	6	24	5	4	.....	7	26	1	1
	Percent	100.0	.....	31.9	5.6	22.4	4.7	3.7	.....	6.5	24.3	.9	.....

See footnotes at end of table.

TABLE 25.—Disabling and Medical Injuries in 168 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Nature of Injury, 1945—Continued

Occupation [1]		Total disabling and medical injuries [2]	Nature of injury										
			Amputations	Bruises; contusions	Burns; scalds	Cuts; lacerations; punctures	Foreign bodies in eyes	Fractures	Hernias	Industrial diseases	Strains; sprains (except hernias)	Other	Unclassified; insufficient data
Janitor	Number	68	1	17	7	17	1	1	3	5	15	1	.....
	Percent	100.0	1.5	24.9	10.3	24.9	1.5	1.5	4.4	7.4	22.1	1.5	.....
Jigger; dye-jig operator	Number	365	1	81	96	38	9	12	5	43	78	.....	2
	Percent	100.0	.3	22.3	26.4	10.5	2.5	3.3	1.4	11.8	21.5	.....	.....
Kier boiler; kier operator	Number	40	.....	9	10	8	1	1	.....	.....	11	.....	.....
	Percent	100.0	.....	22.5	25.0	20.0	2.5	2.5	.....	.....	27.5	.....	.....
Laborer, not elsewhere classified	Number	350	.....	104	30	73	11	15	4	18	91	3	1
	Percent	100.0	.....	29.7	8.6	20.9	3.2	4.3	1.1	5.2	26.1	.9	.....
Maintenance man	Number	814	2	190	68	220	111	41	11	17	141	11	2
	Percent	100.0	.2	23.4	8.4	27.0	13.7	5.0	1.4	2.1	17.4	1.4	.....
Mangle tender, not elsewhere classified	Number	183	1	55	16	36	8	3	2	12	49	1	.....
	Percent	100.0	.5	30.1	8.7	19.7	4.4	1.6	1.1	6.6	26.8	.5	.....
Packer	Number	111	.....	28	.....	28	3	4	1	2	44	.....	1
	Percent	100.0	.....	25.5	.....	25.5	2.7	3.6	.9	1.8	40.0	.....	.....
Padding-machine operator; padder operator	Number	110	.....	24	23	16	2	4	3	10	27	1	.....
	Percent	100.0	.....	21.9	20.9	14.5	1.8	3.6	2.7	9.1	24.6	.9	.....
Pleater; plaiter; bin plaiter; kier plaiter; cloth knocker	Number	70	.....	29	6	16	1	1	1	2	13	1	.....
	Percent	100.0	.....	41.4	8.6	22.9	1.4	1.4	1.4	2.9	18.6	1.4	.....
Sanforizing-machine operator	Number	43	.....	12	6	12	2	1	2	1	7	.....	.....
	Percent	100.0	.....	27.8	14.0	27.9	4.7	2.3	4.7	2.3	16.3	.....	.....
Sewing-machine operator; seaming-machine operator	Number	85	.....	28	.....	29	.....	2	.....	4	21	1	.....
	Percent	100.0	.....	32.9	.....	34.1	.....	2.4	.....	4.7	24.7	1.2	.....
Singer; singeing-machine operator	Number	37	1	10	1	7	1	1	.....	4	11	1	.....
	Percent	100.0	2.7	27.0	2.7	18.9	2.7	2.7	.....	10.8	29.8	2.7	.....
Starch mixer; size maker	Number	50	.....	7	20	7	.....	1	.....	3	12	.....	.....
	Percent	100.0	.....	14.0	40.0	14.0	.....	2.0	.....	6.0	24.0	.....	.....
Tenter-frame operator; frame operator	Number	274	1	79	10	58	8	9	9	11	88	.....	1
	Percent	100.0	.4	28.9	3.7	21.2	2.9	3.3	3.3	4.0	32.3	.....	.....
Truck driver	Number	70	.....	18	2	16	7	5	.....	.....	22	.....	.....
	Percent	100.0	.....	25.7	2.9	22.9	10.0	7.1	.....	.....	31.4	.....	.....
Trucker, hand	Number	683	2	238	13	132	8	29	14	24	221	.....	2
	Percent	100.0	.3	34.8	1.9	19.4	1.2	4.3	2.1	3.5	32.5	.....	.....
Watchman	Number	35	.....	15	1	3	.....	3	2	1	9	.....	1
	Percent	100.0	.....	44.2	2.9	8.8	.....	8.8	5.9	2.9	26.5	.....	.....
Wrapper	Number	49	.....	16	2	10	1	1	.....	4	14	.....	1
	Percent	100.0	.....	33.3	4.2	20.8	2.1	2.1	.....	8.3	29.2	.....	.....
Yarn dyer	Number	77	.....	20	21	11	1	4	2	7	11	.....	.....
	Percent	100.0	.....	26.0	27.2	14.3	1.3	5.2	2.6	9.1	14.3	.....	.....
Yarn winder	Number	114	1	39	4	43	3	.....	1	6	17	.....	.....
	Percent	100.0	.9	34.2	3.5	37.7	2.6	.....	.9	5.3	14.9	.....	.....
Other	Number	560	1	148	44	126	17	28	12	30	150	4	.....
	Percent	100.0	.2	26.4	7.9	22.5	3.0	5.0	2.1	5.4	26.8	.7	.....
Unclassified; insufficient data	Number	323	.....	91	32	79	12	8	7	15	65	5	9
	Percent	100.0	.....	29.0	10.2	25.2	3.8	2.5	2.2	4.8	20.7	1.6	.....

[1] Percents are based on injuries for which the nature of injury is known.
[2] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.
[3] Not computed because of small number of injuries reported.

TABLE 26.—Disabling and Medical Injuries in 168 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Part of Body Injured, 1945

Occupation [1]	Total disabling and medical injuries [2]		Part of body injured																			
			Head				Trunk							Upper extremities				Lower extremities				General	Unclassified; insufficient data
			Total	Eye (s)	Brain or skull	Other	Total	Chest (lungs), ribs, etc.	Back	Abdomen	Hip (s) or pelvis	Shoulder	Other	Total	Arm (s)	Hand (s) (including wrist)	Finger (s) and/or thumb (s)	Total	Leg (s)	Foot or feet (including ankle)	Toe (s)		
Total	Number	7,252	975	609	135	231	1,824	277	879	312	85	194	77	2,695	612	807	1,276	1,551	627	574	350	169	38
	Percent	100.0	13.5	8.4	1.9	3.2	25.3	3.8	12.2	4.3	1.2	2.7	1.1	37.4	8.5	11.2	17.7	21.5	8.6	8.0	4.9	2.3	.....
Ager operator	Number	65	15	12	1	2	9	2	3	1	1	2	.....	18	3	9	6	17	3	8	6	6	.....
	Percent	100.0	23.1	18.5	1.5	3.1	13.8	3.1	4.6	1.5	1.5	3.1	.....	27.7	4.6	13.9	9.2	26.2	4.6	12.4	9.2	9.2	.....
Back-end man; back tender; doffer; swing tender	Number	55	7	4	2	1	15	1	9	4	.....	1	.....	25	5	5	15	7	4	2	1	1	.....
	Percent	100.0	12.7	7.3	3.6	1.8	27.3	1.8	16.4	7.3	.....	1.8	.....	45.5	9.1	9.1	27.3	12.7	7.3	3.6	1.8	1.8	.....
Back tender (printing)	Number	147	7	3	3	1	39	4	26	6	1	1	1	69	13	17	39	29	16	10	3	1	2
	Percent	100.0	4.8	2.0	2.1	.7	26.9	2.8	17.9	4.1	.7	.7	.7	47.6	9.0	11.7	26.9	20.0	11.0	6.9	2.1	.7	.....
Beamer; cloth-roll winder; winder operator; winding-machine operator; tuber	Number	202	12	7	4	1	66	7	39	11	3	4	2	75	21	21	33	48	17	16	15	1	.....
	Percent	100.0	5.9	3.4	2.0	.5	32.7	3.5	19.3	5.4	1.5	2.0	1.0	37.1	10.4	10.4	16.3	23.8	8.5	7.9	7.4	.5	.....
Boil-off-machine operator; boil-off man	Number	71	13	10	1	2	20	4	8	4	2	1	1	29	8	9	12	7	3	4	.....	2	.....
	Percent	100.0	18.3	14.1	1.4	2.8	28.2	5.6	11.4	5.6	2.8	1.4	1.4	40.8	11.3	12.7	16.8	9.9	4.2	5.7	.....	2.8	.....
Calender operator	Number	98	4	1	1	2	26	2	17	5	.....	2	.....	47	9	11	27	19	9	3	7	2	.....
	Percent	100.0	4.1	1.0	1.0	2.1	26.5	2.0	17.4	5.1	.....	2.0	.....	48.0	9.2	11.2	27.6	19.4	9.2	3.1	7.1	2.0	.....
Chemist	Number	27	10	4	1	5	2	2	.....	.....	.....	.....	.....	9	1	5	3	5	3	1	1	1	.....
	Percent	100.0	37.1	14.8	3.7	18.6	7.4	7.4	.....	.....	.....	.....	.....	33.3	3.7	18.5	11.1	18.5	11.1	3.7	3.7	3.7	.....
Clerk	Number	110	14	6	3	5	31	2	17	3	3	5	1	26	4	9	13	35	18	12	5	4	.....
	Percent	100.0	12.7	5.5	2.7	4.5	28.2	1.8	15.6	2.7	2.7	4.5	.9	23.6	3.6	8.2	11.8	31.9	16.5	10.9	4.5	3.6	.....
Cloth-bale header; bale coverer; burlapper	Number	19	2	1	.....	1	5	3	1	.....	.....	1	.....	8	.....	2	6	4	2	1	1	.....	.....
	Percent	(*)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cloth folder, hand; hand folder; folder	Number	65	7	3	1	3	19	.....	9	5	.....	3	2	30	6	5	19	9	4	3	2	.....	.....
	Percent	100.0	10.8	4.7	1.5	4.6	29.2	.....	13.8	7.7	.....	4.6	3.1	46.2	9.2	7.7	29.3	13.8	6.1	4.6	3.1	.....	.....
Cloth-mercerizer operator; mercerizer-machine operator; mercerizer	Number	51	12	10	1	1	14	2	4	3	.....	3	2	13	2	2	9	12	3	7	2	.....	.....
	Percent	100.0	23.5	19.5	2.0	2.0	27.5	3.9	7.9	5.9	.....	5.9	3.9	25.5	3.9	3.9	17.7	23.5	5.9	13.7	3.9	.....	.....
Cloth printer; printing-machine operator	Number	147	11	6	.....	5	39	8	19	5	.....	4	3	58	10	15	33	30	16	12	2	8	1
	Percent	100.0	7.5	4.1	.....	3.4	26.7	5.5	13.0	3.4	.....	2.7	2.1	39.8	6.8	10.3	22.7	20.5	10.9	8.2	1.4	5.5	.....
Cloth-washer operator; soaper operator; rope-soaper operator; open-soaper operator; washing-machine tender	Number	178	31	16	3	12	47	8	18	10	.....	8	3	61	18	20	23	34	14	13	7	5	.....
	Percent	100.0	17.4	9.0	1.7	6.7	26.4	4.5	10.1	5.6	.....	4.5	1.7	34.3	10.1	11.2	13.0	19.1	7.9	7.3	3.9	2.8	.....
Color mixer; dye weigher; kettle man	Number	207	46	35	4	7	60	9	38	11	1	.....	1	63	13	31	19	33	14	13	6	3	2
	Percent	100.0	22.4	17.0	2.0	3.4	29.3	4.4	18.5	5.4	.5	.....	.5	30.7	6.3	15.1	9.3	16.1	6.9	6.3	2.9	1.5	.....
Continuous-dyeing-machine operator	Number	41	7	3	2	2	9	3	3	.....	1	2	.....	10	1	4	5	11	4	3	4	4	.....
	Percent	100.0	17.1	7.3	4.9	4.9	22.0	7.4	7.3	.....	2.4	4.9	.....	24.4	2.4	9.8	12.2	26.7	9.7	7.3	9.7	9.8	.....
Dry-cans operator; can-drier operator; can tender	Number	94	13	6	4	3	26	5	8	7	1	2	3	39	9	17	13	14	7	5	2	2	.....
	Percent	100.0	13.8	6.3	4.3	3.2	27.7	5.3	8.6	7.4	1.1	2.1	3.2	41.5	9.6	18.1	13.8	14.9	7.5	5.3	2.1	2.1	.....
Drying-machine operator, not elsewhere classified	Number	152	14	6	2	6	38	6	21	6	2	3	.....	52	8	24	20	44	16	14	14	4	.....
	Percent	100.0	9.2	4.0	1.3	3.9	25.0	3.9	13.9	3.9	1.3	2.0	.....	34.3	5.3	15.8	13.2	28.9	10.5	9.2	9.2	2.6	.....
Dye-reel operator; dye-beck-reel operator; dye-box operator	Number	236	21	14	3	4	79	12	42	10	5	10	.....	82	21	29	32	48	19	23	6	5	1
	Percent	100.0	8.9	5.9	1.3	1.7	33.6	5.1	17.8	4.3	2.1	4.3	.....	35.0	8.9	12.4	13.7	20.4	8.1	9.7	2.6	2.1	.....
Fireman	Number	142	32	21	2	9	42	8	20	3	2	7	2	37	5	15	17	28	7	14	7	3	.....
	Percent	100.0	22.5	14.8	1.4	6.3	29.6	5.6	14.2	2.1	1.4	4.9	1.4	26.1	3.5	10.6	12.0	19.7	4.9	9.9	4.9	2.1	.....
Folding-machine operator; folder operator; hooker-machine operator; yarder operator	Number	86	8	1	1	6	14	1	6	1	1	3	2	50	9	17	24	14	6	8	.....	.....	.....
	Percent	100.0	9.3	1.2	1.2	6.9	16.3	1.2	6.9	1.2	1.2	3.5	2.3	58.1	10.5	19.8	27.8	16.3	7.0	9.3	.....	.....	.....
Foreman; supervisor	Number	278	40	24	5	11	75	16	24	17	7	11	.....	90	27	25	38	66	33	22	11	6	1
	Percent	100.0	14.4	8.6	1.8	4.0	27.1	5.8	8.7	6.1	2.5	4.0	.....	32.5	9.7	9.0	13.8	23.8	11.9	7.9	4.0	2.2	.....

See footnotes at end of table.

TABLE 26.—Disabling and Medical Injuries in 168 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Part of Body Injured, 1945—Continued

Occupation[1]		Total disabling and medical injuries[2]	Part of body injured																		
			Head				Trunk							Upper extremities				Lower extremities				General	Unclassified; insufficient data
			Total	Eye (s)	Brain or skull	Other	Total	Chest (lungs), ribs, etc.	Back	Abdomen	Hip (s) or pelvis	Shoulder	Other	Total	Arm (s)	Hand (s) (including wrist)	Finger (s) and/or thumb (s)	Total	Leg (s)	Foot or feet (including ankle)	Toe (s)		
Goods layer; cloth layer-out; lay-out man	Number	65	6	3	1	2	24	5	8	8	2	1	.....	24	4	8	12	10	5	3	2	1	.....
	Percent	100.0	9.2	4.6	1.5	3.1	36.9	7.7	12.3	12.3	3.1	1.5	.....	37.0	6.2	12.3	18.5	15.4	7.7	4.6	3.1	1.5	.....
Gray-cloth tender, printing; gray tender	Number	97	6	2	2	2	32	4	23	1	2	1	1	42	9	12	21	14	5	5	4	1	2
	Percent	100.0	6.3	2.1	2.1	2.1	33.7	4.2	24.1	1.1	2.1	1.1	1.1	44.2	9.5	12.6	22.1	14.7	5.2	5.3	4.2	1.1	.....
Inspector; examiner	Number	108	11	8	.....	3	20	4	10	1	1	4	.....	49	4	21	24	21	5	9	7	5	2
	Percent	100.0	10.4	7.6	.....	2.8	18.9	3.8	9.5	.9	.9	3.8	.....	46.2	3.8	19.8	22.6	19.8	4.7	8.5	6.6	4.7	.....
Janitor	Number	68	8	6	1	1	17	4	4	6	1	1	1	28	5	13	10	14	5	6	3	1	.....
	Percent	100.0	11.8	8.8	1.5	1.5	25.0	5.9	5.9	8.7	1.5	1.5	1.5	41.1	7.4	19.0	14.7	20.6	7.4	8.8	4.4	1.5	.....
Jigger; dye-jig operator	Number	365	68	56	2	10	69	9	38	8	1	11	2	148	56	35	57	64	26	27	11	14	2
	Percent	100.0	18.7	15.3	.6	2.8	19.0	2.5	10.4	2.2	.3	3.0	.6	40.8	15.4	9.6	15.8	17.6	7.2	7.4	3.0	3.9	.....
Kier boiler; kier operator	Number	40	6	3	2	1	7	2	1	.....	.....	3	1	19	3	6	10	8	3	4	1	.....	.....
	Percent	100.0	15.0	7.5	5.0	2.5	17.5	5.0	2.5	.....	.....	7.5	2.5	47.5	7.5	15.0	25.0	20.0	7.5	10.0	2.5	.....	.....
Laborer, not elsewhere classified	Number	350	42	26	6	10	93	13	38	15	5	13	9	119	28	36	55	90	28	41	21	4	2
	Percent	100.0	12.1	7.5	1.7	2.9	26.7	3.7	11.0	4.3	1.4	3.7	2.6	34.2	8.0	10.3	15.9	25.9	8.0	11.9	6.0	1.1	.....
Maintenance man	Number	814	200	156	19	25	143	28	64	21	9	15	6	301	64	77	160	152	53	64	35	16	2
	Percent	100.0	24.6	19.2	2.3	3.1	17.6	3.4	8.0	2.6	1.1	1.8	.7	37.1	7.9	9.5	19.7	18.7	6.5	7.9	4.3	2.0	.....
Mangle tender, not elsewhere classified	Number	183	25	16	1	8	49	2	31	6	5	5	.....	62	14	13	35	41	20	14	7	6	.....
	Percent	100.0	13.7	8.8	.5	4.4	26.8	1.1	17.0	3.3	2.7	2.7	.....	33.8	7.7	7.1	19.0	22.4	10.9	7.7	3.8	3.3	.....
Packer	Number	111	10	6	1	3	39	8	21	4	2	3	1	35	6	12	17	27	13	7	7	.....	.....
	Percent	100.0	9.0	5.4	.9	2.7	35.2	7.2	19.0	3.6	1.8	2.7	.9	31.5	5.4	10.8	15.3	24.3	11.7	6.3	6.3	.....	.....
Padding-machine operator; padder operator	Number	110	18	16	.....	2	29	4	13	5	2	2	3	38	11	13	14	21	12	2	7	4	.....
	Percent	100.0	16.4	14.6	.....	1.8	26.4	3.6	12.0	4.5	1.8	1.8	2.7	34.5	10.0	11.8	12.7	19.1	10.9	1.8	6.4	3.6	.....
Pleater; plaiter; bin plaiter; kier plaiter; cloth knocker	Number	70	12	3	7	2	13	3	2	3	.....	4	1	24	8	6	10	16	7	7	2	5	.....
	Percent	100.0	17.1	4.3	9.9	2.9	18.6	4.3	2.9	4.3	.....	5.7	1.4	34.3	11.4	8.6	14.3	22.9	10.0	10.0	2.9	7.1	.....
Sanforizing-machine operator	Number	43	2	2	.....	.....	8	.....	3	3	.....	2	.....	24	4	8	12	8	3	1	4	1	.....
	Percent	100.0	4.7	4.7	.....	.....	18.6	.....	6.9	7.0	.....	4.7	.....	55.8	9.3	18.6	27.9	18.6	7.0	2.3	9.3	2.3	.....
Sewing-machine operator; seaming-machine operator	Number	85	2	.....	1	1	14	2	8	1	.....	2	1	44	6	13	25	25	9	8	8	.....	.....
	Percent	100.0	2.4	.....	1.2	1.2	16.5	2.4	9.3	1.2	.....	2.4	1.2	51.7	7.1	15.3	29.3	29.4	10.6	9.4	9.4	.....	.....
Singer; singeing-machine operator	Number	37	2	1	.....	1	9	2	4	.....	2	1	.....	17	6	4	7	9	5	2	2	.....	.....
	Percent	100.0	5.4	2.7	.....	2.7	24.3	5.4	10.8	.....	5.4	2.7	.....	46.0	16.2	10.8	19.0	24.3	13.5	5.4	5.4	.....	.....
Starch-mixer; size maker	Number	50	5	5	.....	.....	12	1	5	1	3	1	1	19	8	6	5	9	2	5	2	5	.....
	Percent	100.0	10.0	10.0	.....	.....	24.0	2.0	10.0	2.0	6.0	2.0	2.0	38.0	16.0	12.0	10.0	18.0	4.0	10.0	4.0	10.0	.....
Tenter-frame operator; frame operator	Number	274	17	8	5	4	71	11	34	16	3	5	2	122	28	28	66	63	32	20	11	1	.....
	Percent	100.0	6.2	2.9	1.8	1.5	25.9	4.0	12.5	5.8	1.1	1.8	.7	44.5	10.2	10.2	24.1	23.0	11.7	7.3	4.0	.4	.....
Truck driver	Number	70	11	7	2	2	16	1	14	1	.....	.....	.....	19	4	7	8	20	9	7	4	3	1
	Percent	100.0	15.9	10.1	2.9	2.9	23.2	1.4	20.4	1.4	.....	.....	.....	27.5	5.8	10.1	11.6	29.1	13.2	10.1	5.8	4.3	.....
Trucker, hand	Number	683	54	15	15	24	208	28	98	44	10	22	6	216	46	58	112	188	66	70	52	14	3
	Percent	100.0	7.9	2.2	2.2	3.5	30.6	4.1	14.4	6.5	1.5	3.2	.9	31.8	6.8	8.5	16.5	27.6	9.7	10.3	7.6	2.1	.....
Watchman	Number	35	3	.....	3	.....	14	4	3	3	1	2	1	7	3	3	1	8	5	2	1	2	1
	Percent	100.0	8.8	.....	8.8	.....	41.2	11.9	8.8	8.8	2.9	5.9	2.9	20.6	8.9	8.8	2.9	23.5	14.7	5.9	2.9	5.9	.....
Wrapper	Number	49	7	3	1	3	11	.....	5	3	1	2	.....	21	6	5	10	9	4	4	1	1	.....
	Percent	100.0	14.3	6.2	2.0	6.1	22.4	.....	10.2	6.1	2.0	4.1	.....	42.9	12.2	10.2	20.5	18.4	8.2	8.2	2.0	2.0	.....
Yarn dyer	Number	77	10	5	1	4	20	6	8	3	1	1	1	30	10	10	10	12	5	6	1	4	1
	Percent	100.0	13.2	6.6	1.3	5.3	26.3	7.9	10.6	3.9	1.3	1.3	1.3	39.4	13.2	13.1	13.1	15.8	6.6	7.9	1.3	5.3	.....
Yarn winder	Number	114	10	4	2	4	11	2	6	1	.....	.....	2	75	9	22	44	16	6	5	5	1	1
	Percent	100.0	8.8	3.5	1.8	3.5	9.7	1.8	5.2	.9	.....	.....	1.8	66.4	8.0	19.5	38.9	14.2	5.4	4.4	4.4	.9	.....
Other	Number	560	70	38	13	19	154	22	73	30	4	15	10	200	46	67	87	121	52	42	27	11	4
	Percent	100.0	12.6	6.9	2.3	3.4	27.7	4.0	13.1	5.4	.7	2.7	1.8	35.9	8.3	12.1	15.5	21.8	9.3	7.6	4.9	2.0	.....
Unclassified; insufficient data	Number	323	44	27	6	11	66	7	33	16	.....	5	5	121	31	32	58	71	29	19	23	11	10
	Percent	100.0	14.1	8.7	1.9	3.5	21.1	2.2	10.6	5.1	.....	1.6	1.6	38.6	9.9	10.2	18.5	22.7	9.3	6.1	7.3	3.5	.....

[1] Percents are based on injuries for which the part of body injured is known.

[2] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.

[3] Not computed because of small number of injuries reported.

TABLE 27.—Disabling and Medical Injuries in 168 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Agency, 1945

Occupation [1]		Total disabling and medical injuries [2]	Agency																			
			Machines	Working surfaces	Vehicles			Cloth, rolled	Containers	Chemicals	Hand tools	Cloth, not rolled or baled	Foreign bodies, not elsewhere classified	Metal parts	Boilers and pressure vessels	Center bars, shells	Lumber stock	Stairs	Ladders	Benches, tables, chairs	Other	Unclassified; insufficient data
					Total	Hand trucks	Other															
Total	Number	7,252	1,363	800	781	704	77	738	705	485	362	200	209	201	172	114	86	87	82	73	603	191
	Percent	100.0	19.4	11.3	11.1	10.0	1.1	10.5	10.0	6.9	5.1	2.8	3.0	2.8	2.4	1.6	1.2	1.2	1.2	1.0	8.5	.....
Ager operator	Number	65	13	12	8	7	1	2	3	6	1	2	6	.....	4	.....	.....	2	2	1	2	1
	Percent	100.0	20.2	18.8	12.5	10.9	1.6	3.1	4.7	9.4	1.6	3.1	9.4	.....	6.3	.....	.....	3.1	3.1	1.6	3.1	.....
Back-end man; back tender; doffer; swing tender	Number	55	12	4	12	12	.....	9	4	3	.....	1	.....	5	1	1	.....	.....	.....	.....	3	.....
	Percent	100.0	21.7	7.3	21.8	21.8	.....	16.4	7.3	5.5	.....	1.8	.....	9.1	1.8	1.8	.....	.....	.....	.....	5.5	.....
Back tender (printing)	Number	147	39	17	5	5	.....	25	7	8	8	.....	3	17	2	6	.....	.....	4	.....	3	3
	Percent	100.0	26.9	11.8	3.5	3.5	.....	17.3	4.9	5.6	5.6	.....	2.1	11.8	1.4	4.2	.....	.....	2.8	.....	2.1	.....
Beamer; cloth-roll winder; winder operator; winding-machine operator; tuber	Number	202	57	10	21	21	.....	63	8	4	11	3	3	1	.....	6	.....	1	.....	1	10	3
	Percent	100.0	28.6	5.0	10.6	10.6	.....	31.8	4.0	2.0	5.5	1.5	1.5	.5	.....	3.0	.....	.5	.....	.5	5.0	.....
Boil-off-machine operator; boil-off man	Number	71	20	12	6	6	.....	3	5	3	4	5	1	.....	4	2	.....	.....	1	.....	3	2
	Percent	100.0	29.3	17.4	8.7	8.7	.....	4.3	7.2	4.3	5.8	7.2	1.4	.....	5.8	2.9	.....	.....	1.4	.....	4.3	.....
Calender operator	Number	98	33	7	6	6	.....	29	.....	1	3	1	.....	.....	1	6	.....	.....	1	4	5	1
	Percent	100.0	34.1	7.2	6.2	6.2	.....	29.9	.....	1.0	3.1	1.0	.....	.....	1.0	6.2	.....	.....	1.0	4.1	5.2	.....
Chemist	Number	27	.....	1	1	1	.....	.....	1	11	3	.....	2	.....	2	.....	.....	2	.....	.....	4	.....
	Percent	100.0	.....	3.7	3.7	3.7	.....	.....	3.7	40.8	11.1	.....	7.4	.....	7.4	.....	.....	7.4	.....	.....	14.8	.....
Clerk	Number	110	1	19	15	11	4	11	24	2	4	4	2	2	.....	.....	.....	5	.....	4	15	2
	Percent	100.0	.9	17.6	13.9	10.2	3.7	10.2	22.1	1.9	3.7	3.7	1.9	1.9	.....	.....	.....	4.6	.....	3.7	13.9	.....
Cloth-bale header; bale coverer; burlapper	Number	19	3	2	3	2	1	.....	7	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2
	Percent	(3)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cloth folder, hand; hand folder; folder	Number	65	6	4	8	7	1	6	2	2	7	11	1	2	2	2	1	.....	.....	4	5	2
	Percent	100.0	9.5	6.3	12.7	11.1	1.6	9.5	3.2	3.2	11.1	17.5	1.6	3.2	3.2	3.2	1.6	.....	.....	6.3	7.9	.....
Cloth-mercerizer operator; mercerizer-machine operator; mercerizer	Number	51	18	10	5	5	.....	1	2	4	1	1	1	.....	2	1	.....	.....	3	.....	2	.....
	Percent	100.0	35.2	19.6	9.8	9.8	.....	2.0	3.9	7.8	2.0	2.0	2.0	.....	3.9	2.0	.....	.....	5.9	.....	3.9	.....
Cloth printer; printing-machine operator	Number	147	36	15	2	2	.....	11	12	14	4	2	6	11	.....	1	.....	2	3	13	11	4
	Percent	100.0	25.1	10.5	1.4	1.4	.....	7.7	8.4	9.8	2.8	1.4	4.2	7.7	.....	.7	.....	1.4	2.1	9.1	7.7	.....
Cloth-washer operator; soaper operator; rope-soaper operator; open-soaper operator; washing-machine tender	Number	178	55	30	18	18	.....	8	11	17	4	3	1	.....	8	4	.....	3	1	.....	7	8
	Percent	100.0	32.2	17.6	10.6	10.6	.....	4.7	6.5	10.0	2.4	1.8	.6	.....	4.7	2.4	.....	1.8	.6	.....	4.1	.....
Color mixer; dye weigher; kettleman	Number	207	12	19	7	7	.....	2	66	55	6	.....	3	.....	9	1	.....	5	2	1	13	6
	Percent	100.0	6.0	9.5	3.5	3.5	.....	1.0	32.6	27.4	3.0	.....	1.5	.....	4.5	.5	.....	2.5	1.0	.5	6.5	.....
Continuous-dyeing-machine operator	Number	41	8	3	5	5	.....	3	5	6	1	2	.....	2	1	1	1	.....	.....	.....	3	.....
	Percent	100.0	19.6	7.3	12.2	12.2	.....	7.3	12.2	14.7	2.4	4.9	.....	4.9	2.4	2.4	2.4	.....	.....	.....	7.3	.....
Dry-cans operator; can-drier operator; can tender	Number	94	23	9	17	16	1	13	1	8	3	2	4	2	.....	1	.....	2	1	2	4	2
	Percent	100.0	24.9	9.8	18.5	17.4	1.1	14.1	1.1	8.7	3.3	2.2	4.3	2.2	.....	1.1	.....	2.2	1.1	2.2	4.3	.....
Drying-machine operator, not elsewhere classified	Number	152	42	11	25	25	.....	28	3	9	2	8	1	4	2	5	.....	1	2	.....	7	2
	Percent	100.0	28.0	7.3	16.7	16.7	.....	18.7	2.0	6.0	1.3	5.3	.7	2.7	1.3	3.3	.....	.7	1.3	.....	4.7	.....
Dye-reel operator; dye-beck-reel operator; dye-box operator	Number	236	55	43	17	17	.....	11	26	26	8	26	2	1	3	.....	6	2	.....	.....	6	4
	Percent	100.0	23.8	18.5	7.3	7.3	.....	4.7	11.2	11.2	3.4	11.2	.9	.4	1.3	.....	2.6	.9	.....	.....	2.6	.....
Fireman	Number	142	3	18	7	5	2	.....	6	1	15	1	12	5	29	.....	2	.....	7	.....	33	3
	Percent	100.0	2.2	12.9	5.0	3.6	1.4	.....	4.3	.7	10.8	.7	8.6	3.6	20.9	.....	1.4	.....	5.0	.....	23.9	.....
Folding-machine operator; folder operators; hooker-machine operator; yarder operator	Number	86	55	4	2	2	.....	7	1	2	1	5	.....	.....	1	.....	.....	3	.....	1	3	1
	Percent	100.0	64.6	4.7	2.4	2.4	.....	8.2	1.2	2.4	1.2	5.9	.....	.....	1.2	.....	.....	3.5	.....	1.2	3.5	.....
Foreman; supervisor	Number	278	49	35	31	25	6	21	28	16	12	6	12	2	11	.....	3	4	4	6	30	8
	Percent	100.0	18.2	13.0	11.5	9.3	2.2	7.8	10.4	5.9	4.4	2.2	4.4	.7	4.1	.....	1.1	1.5	1.5	2.2	11.1	.....
Goods layer; cloth layer-out; lay-out man	Number	65	2	7	10	10	.....	.....	21	1	3	14	3	.....	.....	1	.....	.....	.....	.....	3	.....
	Percent	100.0	3.1	10.8	15.4	15.4	.....	.....	32.4	1.5	4.6	21.5	4.6	.....	.....	1.5	.....	.....	.....	.....	4.6	.....
Gray-cloth tender, printing; gray tender	Number	97	20	10	6	6	.....	19	4	7	3	1	1	16	2	2	.....	.....	1	.....	2	3
	Percent	100.0	21.3	10.6	6.4	6.4	.....	20.2	4.3	7.4	3.2	1.1	1.1	17.0	2.1	2.1	.....	.....	1.1	.....	2.1	.....
Inspector; examiner	Number	108	21	6	11	10	1	17	6	5	7	8	6	2	3	3	1	3	.....	4	5	.....
	Percent	100.0	19.3	5.6	10.2	9.3	.9	15.7	5.6	4.6	6.5	7.4	5.6	1.9	2.8	2.8	.9	2.8	.....	3.7	4.6	.....

See footnotes at end of table.

TABLE 27.—Disabling and Medical Injuries in 168 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Agency, 1945—Continued

Occupation [1]		Total disabling and medical injuries [2]	Agency																				
			Machines	Working surfaces	Vehicles			Cloth, rolled	Containers	Chemicals	Hand tools	Cloth, not rolled or baled	Foreign bodies, not elsewhere classified	Metal parts	Boilers and pressure vessels	Center bars, shells	Lumber stock	Stairs	Ladders	Benches, tables, chairs	Other	Unclassified; insufficient data
					Total	Hand trucks	Other																
Janitor	Number	68	5	8	7	7		1	16	7	3	4	2	2	1	1		2		2	7	
	Percent	100.0	7.4	11.8	10.3	10.3		1.5	23.5	10.3	4.4	5.9	2.9	2.9	1.5	1.5		2.9		2.9	10.3	
Jigger; dye-jig operator	Number	365	123	25	15	15		47	20	71	7	7	6	2	9	10	2	1		2	15	3
	Percent	100.0	33.9	6.9	4.1	4.1		13.0	5.5	19.6	1.9	1.9	1.7	.6	2.5	2.8	.6	.3		.6	4.1	
Kier boiler; kier operator	Number	40	6	5				1	3	3	2				10		2	1	1		5	1
	Percent	100.0	15.4	12.8				2.6	7.7	7.7	5.1				25.6		5.1	2.6	2.6		12.8	
Laborer, not elsewhere classified	Number	350	16	59	48	38	10	23	66	25	15	4	10	8	5	1	9	7	4		43	7
	Percent	100.0	4.7	17.2	14.0	11.1	2.9	6.7	19.2	7.3	4.4	1.2	2.9	2.3	1.5	.3	2.6	2.0	1.2		12.5	
Maintenance man	Number	814	162	77	18	14	4	3	27	21	110	2	56	65	18	2	43	8	28	3	132	39
	Percent	100.0	21.0	9.9	2.3	1.8	.5	.4	3.5	2.7	14.2	.3	7.2	8.4	2.3	.3	5.5	1.0	3.6	.4	17.0	
Mangle tender, not elsewhere classified	Number	183	38	24	28	28		31	13	11	6	4	7		2	3				2	9	5
	Percent	100.0	21.4	13.5	15.7	15.7		17.4	7.3	6.2	3.4	2.2	3.9		1.1	1.7				1.1	5.1	
Packer	Number	111	2	8	11	11		9	37	2	5	11	3	4		2		1	1		11	4
	Percent	100.0	1.9	7.5	10.3	10.3		8.4	34.5	1.9	4.7	10.3	2.8	3.7		1.9		.9	.9		10.3	
Padding-machine operator; padder operator	Number	110	26	4	11	11		24	7	15	3	1	4	1	2	3		1			3	5
	Percent	100.0	24.6	3.8	10.5	10.5		22.7	6.7	14.3	2.9	1.0	3.8	1.0	1.9	2.9		1.0			2.9	
Pleater; plaiter; bin plaiter; kier plaiter; cloth knocker	Number	70	15	9	6	6		3	3	1	3	2	1		8		1	3	1		13	1
	Percent	100.0	22.0	13.0	8.7	8.7		4.3	4.3	1.4	4.3	2.9	1.4		11.6		1.4	4.3	1.4		19.0	
Sanforizing-machine operator	Number	43	22	4	4	4		8		1	1		1			1					1	
	Percent	100.0	51.3	9.3	9.3	9.3		18.6		2.3	2.3		2.3			2.3					2.3	
Sewing-machine operator; seaming-machine operator	Number	85	25	5	11	11		8	4	1	4	8		2	1	3	1	3		2	3	4
	Percent	100.0	30.9	6.2	13.6	13.6		9.9	4.9	1.2	4.9	9.9		2.5	1.2	3.7	1.2	3.7		2.5	3.7	
Singer; singeing-machine operator	Number	37	11	4	6	5	1	3		1	1	3	1			1		1	2		2	1
	Percent	100.0	30.4	11.1	16.7	13.9	2.8	8.3		2.8	2.8	8.3	2.8			2.8		2.8	5.6		5.6	
Starch mixer; size maker	Number	50	6	6	2	2		2	17	6	2			1	3			1			3	1
	Percent	100.0	12.2	12.2	4.1	4.1		4.1	34.9	12.2	4.1			2.0	6.1			2.0			6.1	
Tenter-frame operator; frame operator	Number	274	81	18	31	29	2	77	6	7	7	3	8		4	11			4		10	7
	Percent	100.0	30.5	6.7	11.6	10.9	.7	28.9	2.2	2.6	2.6	1.1	3.0		1.5	4.1			1.5		3.7	
Truck driver	Number	70		10	24	7	17	1	12	1	1	1	6	2		1	2				7	2
	Percent	100.0		14.7	35.3	10.3	25.0	1.5	17.6	1.5	1.5	1.5	8.8	2.9		1.5	2.9				10.3	
Trucker, hand	Number	683	27	96	193	179	14	104	108	21	14	11	8	7	4	10	2	6	1	3	58	10
	Percent	100.0	4.0	14.3	28.8	26.7	2.1	15.5	16.0	3.1	2.1	1.6	1.2	1.0	.6	1.5	.3	.9	.1	.4	8.6	
Watchman	Number	35		14	4	3	1	2	1		1			1			1	5			5	1
	Percent	100.0		41.3	11.8	8.9	2.9	5.9	2.9		2.9			2.9			2.9	14.7			14.7	
Wrapper	Number	49	3	7	2	2		8		3	4	7	1		1	2		2		1	3	5
	Percent	100.0	6.8	15.9	4.5	4.5		18.3		6.8	9.1	15.9	2.3		2.3	4.5		4.5		2.3	6.8	
Yarn dyer	Number	77	19	12	4	4		1	8	14	5			1	3			1			8	1
	Percent	100.0	25.1	15.8	5.3	5.3		1.3	10.5	18.4	6.6			1.3	3.9			1.3			10.5	
Yarn winder	Number	114	43	14	7	7		1	7	4	14		2	5		1		1		1	12	2
	Percent	100.0	38.2	12.5	6.3	6.3		.9	6.3	3.6	12.5		1.8	4.5		.9		.9		.9	10.7	
Other	Number	560	109	53	71	62	9	51	68	35	25	20	14	20	6	6	5	7	3	14	42	11
	Percent	100.0	19.7	9.7	12.9	11.3	1.6	9.3	12.4	6.4	4.6	3.6	2.6	3.6	1.1	1.1	.9	1.3	.5	2.6	7.7	
Unclassified; insufficient data	Number	323	41	30	30	28	2	41	29	24	17	6	9	8	8	13	4	3	4	1	31	24
	Percent	100.0	13.8	10.0	10.0	9.3	.7	13.8	9.7	8.0	5.7	2.0	3.0	2.7	2.7	4.3	1.3	1.0	1.3	.3	10.4	

[1] Percents are based on injuries for which the agency of accident is known.
[2] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.
[3] Not computed because of small number of injuries reported.

TABLE 28.—Disabling and Medical Injuries in 168 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Accident Type, 1945

Occupation[1]	Total disabling and medical injuries[2]		Accident type											
			Striking against	Struck by	Caught in, on, or between	Falls			Slips (not falls)	Contact with extreme temperatures	Inhalation, absorption, ingestion	Overexertion	Other	Unclassified; insufficient data
						Total	On same level	To lower level						
Total	Number	7,252	1,174	1,659	788	600	398	202	315	275	788	1,477	105	71
	Percent	100.0	16.3	23.0	11.0	8.4	5.6	2.8	4.4	3.8	11.0	20.6	1.5	.....
Ager operator	Number	65	10	13	5	12	6	6	5	2	13	5	.....	.....
	Percent	100.0	15.4	20.0	7.7	18.4	9.2	9.2	7.7	3.1	20.0	7.7	.....	.....
Back-end man; back tender; doffer; swing tender	Number	55	15	10	3	2	1	1	.....	1	9	13	2	.....
	Percent	100.0	27.3	18.2	5.5	3.6	1.8	1.8	.....	1.8	16.4	23.6	3.6	.....
Back tender (printing)	Number	147	28	29	22	10	8	2	9	2	10	36	1	.....
	Percent	100.0	19.0	19.7	15.0	6.8	5.4	1.4	6.1	1.4	6.8	24.5	.7	.....
Beamer; cloth-roll winder; winder operator; winding-machine operator; tuber	Number	202	21	58	33	8	7	1	5	1	7	64	4	1
	Percent	100.0	10.4	28.9	16.4	4.0	3.5	.5	2.5	.5	3.5	31.8	2.0	.....
Boil-off-machine operator; boil-off man	Number	71	9	9	9	6	6	.....	4	6	15	13	.....	.....
	Percent	100.0	12.7	12.7	12.7	8.5	8.5	.....	5.6	8.5	21.0	18.3	.....	.....
Calender operator	Number	98	15	16	24	7	5	2	.....	5	3	27	1	.....
	Percent	100.0	15.3	16.3	24.5	7.1	5.1	2.0	.....	5.1	3.1	27.6	1.0	.....
Chemist	Number	27	3	5	.....	3	2	1	.....	2	13	.....	1	.....
	Percent	100.0	11.1	18.5	.....	11.1	7.4	3.7	.....	7.4	48.2	.....	3.7	.....
Clerk	Number	110	19	23	7	23	19	4	3	1	6	22	4	2
	Percent	100.0	17.6	21.3	6.5	21.3	17.6	3.7	2.8	.9	5.6	20.3	3.7	.....
Cloth-bale header; bale coverer; burlapper	Number	19	5	5	1	2	1	1	.....	.....	.....	5	.....	1
	Percent	(3)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cloth folder, hand; hand folder; folder	Number	65	14	17	5	2	2	.....	1	.....	3	21	2	.....
	Percent	100.0	21.5	26.2	7.7	3.1	3.1	.....	1.5	.....	4.6	32.3	3.1	.....
Cloth-mercerizer operator; mercerizer-machine operator; mercerizer	Number	51	7	7	4	5	3	2	7	2	13	6	.....	.....
	Percent	100.0	13.7	13.7	7.8	9.8	5.9	3.9	13.7	3.9	25.6	11.8	.....	.....
Cloth printer; printing-machine operator	Number	147	39	25	10	7	4	3	12	1	19	27	4	3
	Percent	100.0	27.1	17.4	6.9	4.9	2.8	2.1	8.3	.7	13.2	18.7	2.8	.....
Cloth-washer operator; soaper operator; rope-soaper operator; open-soaper operator; washing-machine tender	Number	178	16	33	28	23	15	8	12	9	25	24	6	2
	Percent	100.0	9.1	18.8	15.9	13.1	8.6	4.5	6.8	5.1	14.2	13.6	3.4	.....
Color mixer; dye weigher; kettleman	Number	207	18	25	7	16	12	4	7	7	70	54	2	1
	Percent	100.0	8.7	12.1	3.4	7.8	5.9	1.9	3.4	3.4	34.0	26.2	1.0	.....
Continuous-dyeing-machine operator	Number	41	5	6	4	3	2	1	1	3	11	8	.....	.....
	Percent	100.0	12.2	14.6	9.8	7.3	4.9	2.4	2.4	7.3	26.9	19.5	.....	.....
Dry-cans operator; can-drier operator; can tender	Number	94	13	18	14	12	8	4	4	3	12	17	1	.....
	Percent	100.0	13.8	19.0	14.9	12.8	8.5	4.3	4.3	3.2	12.8	18.1	1.1	.....
Drying-machine operator, not elsewhere classified	Number	152	20	30	21	8	4	4	8	6	15	41	2	1
	Percent	100.0	13.2	19.9	13.9	5.3	2.7	2.6	5.3	4.0	9.9	27.2	1.3	.....
Dye-reel operator; dye-beck-reel operator; dye-box operator	Number	236	19	34	18	24	23	1	17	23	43	54	2	2
	Percent	100.0	8.1	14.5	7.7	10.3	9.9	.4	7.3	9.8	18.4	23.0	.9	.....
Fireman	Number	142	25	34	6	16	5	11	9	19	7	21	4	1
	Percent	100.0	17.7	24.1	4.3	11.3	3.5	7.8	6.4	13.5	5.0	14.9	2.8	.....
Folding-machine operator; folder operator; hooker-machine operator; yarder operator	Number	86	13	12	36	3	3	.....	5	1	2	11	2	1
	Percent	100.0	15.3	14.1	42.3	3.5	3.5	.....	5.9	1.2	2.4	12.9	2.4	....
Foreman; supervisor	Number	278	48	55	29	30	18	12	11	12	29	57	4	3
	Percent	100.0	17.5	20.0	10.5	10.9	6.5	4.4	4.0	4.4	10.5	20.7	1.5	.....
Goods layer; cloth layer-out; lay-out man	Number	65	12	16	3	7	6	1	2	1	1	22	1	.....
	Percent	100.0	18.5	24.6	4.6	10.8	9.3	1.5	3.1	1.5	1.5	33.9	1.5	.....
Gray-cloth tender, printing; gray tender	Number	97	16	16	10	8	7	1	2	4	9	29	1	2
	Percent	100.0	16.8	16.8	10.5	8.4	7.3	1.1	2.1	4.2	9.5	30.6	1.1	.....

See footnotes at end of table.

TABLE 28.—Disabling and Medical Injuries in 168 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Accident Type, 1945—Continued

Occupation [1]	Total disabling and medical injuries [2]		Accident type											
			Striking against	Struck by	Caught in, on, or between	Falls			Slips (not falls)	Contact with extreme temperatures	Inhalation, absorption, ingestion	Overexertion	Other	Unclassified; insufficient data
						Total	On same level	To lower level						
Inspector; examiner	Number	108	19	25	19	8	4	4	1	4	9	22	1	.....
	Percent	100.0	17.6	23.2	17.6	7.4	3.7	3.7	.9	3.7	8.3	20.4	.9	.....
Janitor	Number	68	17	9	8	5	3	2	3	2	11	12	1	.....
	Percent	100.0	25.0	13.2	11.8	7.4	4.5	2.9	4.4	2.9	16.2	17.6	1.5	.....
Jigger; dye-jig operator	Number	365	22	69	59	14	14	.....	9	25	112	54	1	.....
	Percent	100.0	6.0	18.9	16.2	3.8	3.8	.....	2.5	6.8	30.7	14.8	.3	.....
Kier boiler; kier operator	Number	40	6	5	6	7	4	3	3	3	6	4	.....	.....
	Percent	100.0	15.0	12.5	15.0	17.5	10.0	7.5	7.5	7.5	15.0	10.0	.....	.....
Laborer, not elsewhere classified	Number	350	54	89	27	41	23	18	22	6	41	64	3	3
	Percent	100.0	15.6	25.7	7.8	11.8	6.6	5.2	6.3	1.7	11.8	18.4	.9	.....
Maintenance man	Number	814	153	292	62	54	24	30	34	31	46	105	21	16
	Percent	100.0	19.2	36.4	7.8	6.8	3.0	3.8	4.3	3.9	5.8	13.2	2.6	.....
Mangle tender, not elsewhere classified	Number	183	27	34	27	18	12	6	9	8	19	39	1	1
	Percent	100.0	14.8	18.7	14.8	9.9	6.6	3.3	4.9	4.4	10.4	21.6	.5	.....
Packer	Number	111	29	27	2	5	4	1	5	.....	3	37	2	1
	Percent	100.0	26.4	24.5	1.8	4.5	3.6	.9	4.5	.....	2.7	33.8	1.8	.....
Padding-machine operator; padder operator	Number	110	9	21	12	4	3	1	3	7	22	30	1	1
	Percent	100.0	8.3	19.3	11.0	3.7	2.8	.9	2.8	6.4	20.2	27.4	.9	.....
Pleater; plaiter; bin plaiter; kier plaiter; cloth knocker	Number	70	13	15	8	17	5	12	2	1	6	3	4	1
	Percent	100.0	18.8	21.8	11.6	24.7	7.2	17.5	2.9	1.4	8.7	4.3	5.8	.....
Sanforizing-machine operator	Number	43	6	7	12	3	3	.....	2	4	1	8	.....	.....
	Percent	100.0	14.0	16.3	27.8	7.0	7.0	.....	4.7	9.3	2.3	18.6	.....	.....
Sewing-machine operator; seaming-machine operator	Number	85	18	29	11	6	4	2	1	.....	4	14	2	.....
	Percent	100.0	21.2	34.0	12.9	7.1	4.7	2.4	1.2	.....	4.7	16.5	2.4	.....
Singer; singeing-machine operator	Number	37	7	7	3	3	2	1	2	1	4	8	1	1
	Percent	100.0	19.4	19.4	8.3	8.3	5.5	2.8	5.6	2.8	11.1	22.3	2.8	.....
Starch mixer; size maker	Number	50	4	5	1	5	4	1	2	13	9	10	1	.....
	Percent	100.0	8.0	10.0	2.0	10.0	8.0	2.0	4.0	26.0	18.0	20.0	2.0	.....
Tenter-frame operator; frame operator	Number	274	55	50	42	10	7	3	11	8	11	81	2	4
	Percent	100.0	20.4	18.5	15.6	3.7	2.6	1.1	4.1	3.0	4.1	29.9	.7	.....
Truck driver	Number	70	13	26	7	8	2	6	3	.....	2	11	.....	.....
	Percent	100.0	18.6	37.1	10.0	11.4	2.9	8.5	4.3	.....	2.9	15.7	.....	.....
Trucker, hand	Number	683	100	204	77	49	36	13	36	6	29	175	3	4
	Percent	100.0	14.7	30.1	11.3	7.2	5.3	1.9	5.3	.9	4.3	25.8	.4	.....
Watchman	Number	35	2	3	2	17	12	5	5	.....	1	3	1	1
	Percent	100.0	5.9	8.8	5.9	50.1	35.4	14.7	14.7	.....	2.9	8.8	2.9	.....
Wrapper	Number	49	9	13	1	6	4	2	3	1	4	11	.....	1
	Percent	100.0	18.7	27.2	2.1	12.5	8.3	4.2	6.2	2.1	8.3	22.9	.....	.....
Yarn dyer	Number	77	10	12	5	8	7	1	2	7	22	11	.....	.....
	Percent	100.0	13.0	15.6	6.5	10.4	9.1	1.3	2.6	9.1	28.5	14.3	.....	.....
Yarn winder	Number	114	39	25	15	10	9	1	.....	1	8	12	3	1
	Percent	100.0	34.5	22.1	13.3	8.8	7.9	.9	.....	.9	7.1	10.6	2.7	.....
Other	Number	560	112	118	57	39	26	13	21	19	52	130	8	4
	Percent	100.0	20.1	21.2	10.3	7.0	4.7	2.3	3.8	3.4	9.4	23.4	1.4	.....
Unclassified; insufficient data	Number	323	60	78	26	26	19	7	12	17	31	56	5	12
	Percent	100.0	19.3	24.9	8.4	8.4	6.1	2.3	3.9	5.5	10.0	18.0	1.6	.....

[1] Percents are based on injuries for which accident type is known.
[2] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.
[3] Not computed because of small number of injuries reported.

TABLE 29.—Disabling and Medical Injuries in 152 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Unsafe Working Condition, 1945

Occupation [1]	Total disabling and medical injuries [2]		Unsafe working conditions														
				Defects of agencies						Hazardous arrangement or procedure							
			Improperly guarded agencies	Total	Rough	Slippery	Sharp-edged	Aged, worn, cracked, etc.	Other	Total	Lack of clear walkways or working surfaces	Unsafe planning or lay-out of traffic or process operations	Lack of proper lifting equipment	Other	Lack of proper safety equipment	Other unsafe working conditions	No unsafe condition	Unclassified; insufficient data
Total	Number	7,084	686	1,275	209	436	263	160	207	1,523	108	296	876	243	46	13	21	3,520
	Percent	100.0	19.4	36.0	5.9	12.4	7.4	4.5	5.8	42.9	3.0	8.4	24.6	6.9	1.3	.4	.....	.....
Ager operator	Number	60	7	13	1	7	2	1	2	10	2	5	2	1	1	.....	.....	29
	Percent	100.0	22.6	41.9	3.2	22.5	6.5	3.2	6.5	32.3	6.5	16.1	6.5	3.2	3.2	.....	.....	.....
Back-end man; back tender; doffer; swing tender	Number	55	3	13	5	1	4	2	1	14	.....	6	7	1	1	.....	.....	24
	Percent	100.0	9.7	41.9	16.1	3.2	12.9	6.5	3.2	45.2	.....	19.4	22.6	3.2	3.2	.....	.....	.....
Back tender (printing)	Number	145	17	24	5	13	3	2	1	35	.....	4	28	3	2	.....	.....	67
	Percent	100.0	21.8	30.8	6.4	16.7	3.8	2.6	1.3	44.8	.....	5.1	35.9	3.8	2.6	.....	.....	.....
Beamer; cloth-roll winder; winder operator; winding-machine operator; tuber	Number	201	24	19	3	5	4	1	6	73	.....	6	63	4	.....	1	1	83
	Percent	100.0	20.5	16.2	2.6	4.3	3.4	.9	5.0	62.4	.....	5.1	53.9	3.4	.....	.9	.....	.....
Boil-off-machine operator; boil-off man	Number	71	17	15	2	10	2	1	.....	16	2	8	5	1	.....	.....	.....	23
	Percent	100.0	35.5	31.2	4.2	20.7	4.2	2.1	.....	33.3	4.2	16.6	10.4	2.1	.....	.....	.....	.....
Calender operator	Number	93	15	14	4	3	2	3	2	29	.....	3	24	2	.....	.....	.....	35
	Percent	100.0	25.9	24.1	6.9	5.2	3.4	5.2	3.4	50.0	.....	5.2	41.4	3.4	.....	.....	.....	.....
Chemist	Number	23	.....	3	.....	1	1	.....	1	2	.....	1	.....	1	1	.....	1	16
	Percent	[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clerk	Number	105	2	22	2	8	6	5	1	23	3	1	16	3	.....	1	.....	57
	Percent	100.0	4.2	45.8	4.2	16.6	12.5	10.4	2.1	47.9	6.3	2.1	33.2	6.3	.....	2.1	.....	.....
Cloth-bale header; bale coverer; burlapper	Number	16	.....	4	1	1	1	1	.....	4	.....	1	1	2	1	.....	.....	7
	Percent	[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cloth folder, hand; hand folder; folder	Number	65	4	10	4	.....	1	1	4	14	2	1	9	2	.....	.....	.....	37
	Percent	100.0	14.3	35.7	14.2	.....	3.6	3.6	14.3	50.0	7.1	3.6	32.2	7.1	.....	.....	.....	.....
Cloth-mercerizer operator; mercerizer-machine operator; mercerizer	Number	51	6	13	.....	7	1	4	1	8	1	5	1	1	1	.....	1	22
	Percent	100.0	21.4	46.4	.....	24.9	3.6	14.3	3.6	28.6	3.6	17.8	3.6	3.6	3.6	.....	.....	.....
Cloth printer; printing-machine operator	Number	137	12	31	12	10	2	3	4	18	.....	4	12	2	1	.....	.....	75
	Percent	100.0	19.4	50.0	19.4	16.1	3.2	4.8	6.5	29.0	.....	6.5	19.3	3.2	1.6	.....	.....	.....
Cloth-washer operator; soaper operator; rope-soaper operator; open soaper operator; washing-machine tender	Number	177	25	41	2	23	4	4	8	30	1	8	14	7	1	.....	.....	80
	Percent	100.0	25.8	42.3	2.1	23.8	4.1	4.1	8.2	30.9	1.0	8.2	14.5	7.2	1.0	.....	.....	.....
Color mixer; dye weigher; kettleman	Number	203	12	30	2	15	5	3	5	55	2	11	33	9	7	.....	.....	99
	Percent	100.0	11.5	28.8	1.9	14.4	4.8	2.9	4.8	53.0	1.9	10.6	31.8	8.7	6.7	.....	.....	.....
Continuous-dyeing-machine operator	Number	41	2	7	1	3	1	2	.....	8	.....	3	4	1	1	.....	.....	23
	Percent	[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dry-cans operator; can-drier operator; can tender	Number	90	7	11	1	4	2	2	2	21	1	5	11	4	.....	.....	.....	51
	Percent	100.0	17.9	28.2	2.6	10.3	5.1	5.1	5.1	53.9	2.6	12.8	28.2	10.3	.....	.....	.....	.....
Drying-machine operator, not elsewhere classified	Number	150	15	21	3	7	4	3	4	41	1	6	28	6	1	.....	1	71
	Percent	100.0	19.2	26.9	3.8	9.1	5.1	3.8	5.1	52.6	1.3	7.7	35.9	7.7	1.3	.....	.....	.....
Dye-reel operator; dye-beck-reel operator; dye-box operator	Number	233	29	54	6	33	6	3	6	51	3	24	17	7	3	.....	.....	96
	Percent	100.0	21.2	39.4	4.4	24.0	4.4	2.2	4.4	37.2	2.2	17.5	12.4	5.1	2.2	.....	.....	.....
Fireman	Number	139	10	18	1	6	3	3	5	18	5	5	4	4	1	.....	1	91
	Percent	100.0	21.3	38.3	2.1	12.8	6.4	6.4	10.6	38.3	10.7	10.6	8.5	8.5	2.1	.....	.....	.....
Folding-machine operator; folder operator; hooker-machine operator; yarder operator	Number	86	36	9	.....	4	1	3	1	12	1	1	8	2	.....	.....	.....	29
	Percent	100.0	63.1	15.8	.....	6.9	1.8	5.3	1.8	21.1	1.8	1.8	14.0	3.5	.....	.....	.....	.....

See footnotes at end of table.

TABLE 29.—Disabling and Medical Injuries in 152 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Unsafe Working Condition, 1945—Continued

Occupation [1]		Total disabling and medical injuries [2]	Unsafe working conditions														
				Defects of agencies						Hazardous arrangement of procedure							
			Improperly guarded agencies	Total	Rough	Slippery	Sharp-edged	Aged, worn, cracked, etc.	Other	Total	Lack of clear walkways or working surfaces	Unsafe planning or lay-out of traffic or process operations	Lack of proper lifting equipment	Other	Lack of proper safety equipment	Other unsafe working conditions	No unsafe condition	Unclassified; insufficient data
Foreman; supervisor	Number	268	28	45	8	17	6	8	6	62	3	15	27	17	.....	1	2	130
	Percent	100.0	20.6	33.1	5.9	12.5	4.4	5.9	4.4	45.6	2.2	11.0	19.9	12.5	.....	.7	.....	.....
Goods layer; cloth layer-out; lay-out man	Number	65	2	13	.....	3	9	1	.....	13	1	2	9	1	1	.....	.....	36
	Percent	100.0	6.9	44.8	.....	10.3	31.1	3.4	.....	44.9	3.4	6.9	31.2	3.4	3.4	.....	.....	.....
Gray-cloth tender, printing; gray tender	Number	97	7	14	1	8	2	1	2	29	1	.....	26	2	.....	.....	.....	47
	Percent	100.0	14.0	28.0	2.0	16.0	4.0	2.0	4.0	58.0	2.0	.....	52.0	4.0	.....	.....	.....	.....
Inspector; examiner	Number	108	13	18	3	3	6	3	3	23	1	4	14	4	.....	.....	1	53
	Percent	100.0	24.1	33.3	5.6	5.6	10.9	5.6	5.6	42.6	1.9	7.4	25.9	7.4	.....	.....	.....	.....
Janitor	Number	68	7	13	3	3	4	.....	3	7	.....	.....	6	1	1	.....	.....	40
	Percent	100.0	25.0	46.4	10.7	10.7	14.3	.....	10.7	25.0	.....	.....	21.4	3.6	3.6	.....	.....	.....
Jigger; dye-jig operator	Number	364	65	53	3	17	6	11	16	81	4	28	38	11	.....	1	1	163
	Percent	100.0	32.5	26.5	1.5	8.5	3.0	5.5	8.0	40.5	2.0	14.0	19.0	5.5	.....	.5	.....	.....
Kier boiler; kier operator	Number	40	3	10	2	3	2	1	2	11	1	4	3	3	.....	.....	.....	16
	Percent	[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Laborer, not elsewhere classified	Number	334	13	73	6	30	23	4	10	64	5	14	37	8	5	.....	3	176
	Percent	100.0	8.4	47.1	3.9	19.3	14.8	2.6	6.5	41.3	3.2	9.0	23.9	5.2	3.2	.....	.....	.....
Maintenance man	Number	801	70	145	25	28	34	29	29	104	17	8	46	33	11	3	2	466
	Percent	100.0	21.0	43.6	7.5	8.4	10.3	8.7	8.7	31.2	5.1	2.4	13.8	9.9	3.3	.9	.....	.....
Mangle tender, not elsewhere classified	Number	178	18	35	5	16	6	3	5	48	3	5	33	7	1	.....	.....	76
	Percent	100.0	17.6	34.3	4.9	15.7	5.9	2.9	4.9	47.1	2.9	4.9	32.4	6.9	1.0	.....	.....	.....
Packer	Number	108	1	21	6	2	8	4	1	19	2	2	10	5	.....	.....	.....	67
	Percent	100.0	2.4	51.3	14.6	4.9	19.6	9.8	2.4	46.3	4.9	4.9	24.3	12.2	.....	.....	.....	.....
Padding-machine operator; padder operator	Number	110	13	11	3	4	2	2	.....	35	.....	10	22	3	1	.....	.....	50
	Percent	100.0	21.7	18.3	5.0	6.7	3.3	3.3	.....	58.3	.....	16.7	36.6	5.0	1.7	.....	.....	.....
Pleater; plaiter; bin plaiter; kier plaiter; cloth knocker	Number	70	12	17	.....	7	5	3	2	14	1	7	3	3	.....	.....	2	25
	Percent	100.0	27.9	39.5	.....	16.2	11.6	7.0	4.7	32.6	2.3	16.3	7.0	7.0	.....	.....	.....	.....
Sanforizing-machine operator	Number	43	12	6	1	3	1	.....	1	12	.....	3	6	3	.....	.....	.....	13
	Percent	100.0	40.0	20.0	3.3	10.1	3.3	.....	3.3	40.0	.....	10.0	20.0	10.0	.....	.....	.....	.....
Sewing-machine operator; seaming-machine operator	Number	85	12	14	3	1	4	1	5	11	1	1	6	3	.....	2	.....	46
	Percent	100.0	30.8	35.9	7.7	2.6	10.3	2.6	12.7	28.2	2.6	2.6	15.3	7.7	.....	5.1	.....	.....
Singer; singeing-machine operator	Number	37	4	7	1	2	3	.....	1	4	1	.....	1	2	.....	.....	.....	22
	Percent	[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Starch mixer; size maker	Number	50	10	12	.....	6	.....	3	3	10	.....	2	7	1	1	.....	.....	17
	Percent	100.0	30.3	36.4	.....	18.2	.....	9.1	9.1	30.3	.....	6.1	21.2	3.0	3.0	.....	.....	.....
Tenter-frame operator; frame operator	Number	273	31	43	13	9	7	3	11	89	2	11	67	9	1	.....	.....	109
	Percent	100.0	18.9	26.2	7.9	5.5	4.3	1.8	6.7	54.3	1.2	6.7	40.9	5.5	.6	.....	.....	.....
Truck driver	Number	64	.....	12	2	5	5	.....	.....	12	4	2	4	2	.....	.....	.....	40
	Percent	[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Trucker, hand	Number	662	19	130	27	41	31	15	16	167	17	21	104	25	2	.....	.....	344
	Percent	100.0	6.0	40.9	8.5	13.0	9.7	4.7	5.0	52.5	5.3	6.6	32.7	7.9	.6	.....	.....	.....
Watchman	Number	34	2	14	2	11	.....	.....	1	5	.....	.....	1	4	.....	.....	.....	13
	Percent	[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wrapper	Number	49	2	4	2	1	.....	1	.....	14	3	1	8	2	.....	.....	.....	29
	Percent	[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yarn dyer	Number	73	9	15	1	8	1	2	3	11	.....	8	3	.....	.....	.....	2	36
	Percent	100.0	25.7	42.9	2.9	22.8	2.9	5.7	8.6	31.4	.....	22.8	8.6	.....	.....	.....	.....	.....
Yarn winder	Number	114	10	28	10	5	8	2	3	22	4	9	4	5	.....	.....	.....	54
	Percent	100.0	16.7	46.6	16.7	8.3	13.3	3.3	5.0	36.7	6.7	15.0	6.7	8.3	.....	.....	.....	.....
Other	Number	543	50	97	16	26	24	11	20	116	10	19	69	18	.....	3	1	276
	Percent	100.0	18.8	36.5	6.0	9.9	9.0	4.1	7.5	43.6	3.8	7.1	25.9	6.8	.....	1.1	.....	.....
Unclassified; insufficient data	Number	305	30	53	11	16	11	5	10	58	3	12	35	8	.....	1	2	161
	Percent	100.0	21.1	37.3	7.7	11.4	7.7	3.5	7.0	40.9	2.1	8.5	24.7	5.6	.....	.7	.....	.....

[1] Percents are based on injuries resulting from accidents for which the unsafe working conditions are known.

[2] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.

[3] Not computed because of small number of injuries resulting from unsafe working conditions.

TABLE 30.—Disabling and Medical Injuries in 160 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Unsafe Act, 1945

Occupation [1]	Total disabling and medical injuries [2]		Unsafe act																			
			Operating without authority; failure to secure or warn	Operating or working at unsafe speed	Using unsafe equipment or equipment unsafely					Unsafe placing or mixing				Failure to use proper safety equipment	Taking unsafe position or posture					Working on moving or dangerous equipment	Other unsafe acts	No unsafe acts	Unclassified; insufficient data
					Total	Unsafe use of equipment	Gripping objects insecurely; taking wrong hold of objects	Pulling hand trucks	Other	Total	Arranging objects or materials unsafely	Mixing or combining materials unsafely	Other		Total	Exposure on vehicular right-of-way	Inattention to footing	Lifting incorrectly or lifting too heavy loads	Other				
Total	Number	7,140	88	46	1,744	313	1,260	88	83	477	304	144	29	251	1,689	60	457	441	731	84	31	15	2,715
	Percent	100.0	2.0	1.0	39.6	7.1	28.6	2.0	1.9	10.8	6.8	3.3	.7	5.7	38.3	1.4	10.4	10.0	16.5	1.9	.7	.....	.....
Ager operator	Number	64	1	.....	12	4	8	.....	.....	2	.....	2	.....	.....	21	.....	10	3	8	.....	.....	.....	28
	Percent	100.0	2.8	.....	33.3	11.1	22.2	.....	.....	5.6	.....	5.6	.....	.....	58.3	.....	27.8	8.3	22.2	.....	.....	.....	.....
Back-end man; back tender; doffer; swing tender	Number	53	2	1	14	3	9	2	.....	1	1	.....	.....	2	10	.....	1	5	4	.....	.....	.....	23
	Percent	100.0	6.7	3.3	46.7	10.0	30.0	6.7	.....	3.3	3.3	.....	.....	6.7	33.3	.....	3.3	16.7	13.3	.....	.....	.....	.....
Back tender (printing)	Number	138	.....	1	39	4	31	.....	4	7	7	.....	.....	.....	30	.....	8	6	16	3	.....	.....	58
	Percent	100.0	.....	1.3	48.7	5.0	38.7	.....	5.0	8.8	8.8	.....	.....	.....	37.4	.....	10.0	7.5	19.9	3.8	.....	.....	.....
Beamer; cloth-roll winder; winder operator; winding machine operator; tuber	Number	199	2	1	63	12	49	.....	2	9	9	.....	.....	1	33	1	7	6	19	5	1	.....	84
	Percent	100.0	1.7	.9	54.8	10.4	42.7	.....	1.7	7.8	7.8	.....	.....	.9	28.7	.9	6.1	5.2	16.5	4.3	.9	.....	.....
Boil-off-machine operator; boil-off man	Number	68	.....	.....	17	.....	17	.....	.....	2	.....	2	.....	6	13	.....	2	5	6	2	.....	.....	28
	Percent	100.0	.....	.....	42.5	.....	42.5	.....	.....	5.0	.....	5.0	.....	15.0	32.5	.....	5.0	12.5	15.0	5.0	.....	.....	.....
Calender operator	Number	97	4	.....	32	4	27	.....	1	1	1	.....	.....	1	19	.....	4	3	12	7	1	1	31
	Percent	100.0	6.2	.....	49.3	6.2	41.6	.....	1.5	1.5	1.5	.....	.....	1.5	29.2	.....	6.2	4.6	18.4	10.8	1.5	.....	.....
Chemist	Number	27	.....	.....	8	4	3	1	.....	4	1	2	1	3	3	.....	3	.....	.....	.....	.....	.....	9
	Percent	(3)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clerk	Number	110	.....	.....	24	8	14	1	1	6	5	.....	1	3	38	1	21	4	12	.....	1	1	37
	Percent	100.0	.....	.....	33.3	11.1	19.4	1.4	1.4	8.3	6.9	.....	1.4	4.2	52.8	1.4	29.1	5.6	16.7	.....	1.4	.....	.....
Cloth-bale header; bale coverer; burlapper	Number	19	.....	.....	6	1	5	.....	.....	1	1	.....	.....	.....	5	.....	2	2	1	.....	.....	.....	7
	Percent	(3)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cloth folder, hand; hand folder; folder	Number	65	1	1	22	1	19	1	1	3	3	.....	.....	.....	13	.....	1	8	4	.....	2	.....	23
	Percent	100.0	2.4	2.4	52.3	2.4	45.1	2.4	2.4	7.1	7.1	.....	.....	.....	31.0	.....	2.4	19.1	9.5	.....	4.8	.....	.....
Cloth-mercerizer operator; mercerizer-machine operator; mercerizer	Number	51	.....	.....	8	3	4	1	.....	4	1	3	.....	3	15	.....	3	4	8	1	.....	.....	20
	Percent	100.0	.....	.....	25.8	9.7	12.9	3.2	.....	12.9	3.2	9.7	.....	9.7	48.4	.....	9.7	12.9	25.8	3.2	.....	.....	.....
Cloth printer; printing-machine operator	Number	145	1	.....	26	1	25	.....	.....	5	5	.....	.....	5	47	.....	14	9	24	3	.....	.....	58
	Percent	100.0	1.1	.....	29.9	1.1	28.8	.....	.....	5.7	5.7	.....	.....	5.7	54.2	.....	16.1	10.3	27.8	3.4	.....	.....	.....
Cloth-washer operator; soaper operator; rope-soaper operator; open-soaper operator; washing-machine tender	Number	175	3	2	41	9	24	6	2	8	3	5	.....	4	36	1	10	6	19	2	.....	.....	79
	Percent	100.0	3.1	2.1	42.7	9.4	24.9	6.3	2.1	8.3	3.1	5.2	.....	4.2	37.5	1.0	10.4	6.3	19.8	2.1	.....	.....	.....
Color mixer; dye weigher; kettleman	Number	199	.....	1	29	6	22	1	.....	31	7	23	1	16	39	1	8	16	14	1	.....	.....	82
	Percent	100.0	.....	.9	24.8	5.1	18.8	.9	.....	26.5	6.0	19.6	.9	13.7	33.2	.9	6.8	13.6	11.9	.9	.....	.....	.....
Continuous-dyeing-machine operator	Number	41	1	.....	12	3	7	1	1	4	.....	4	.....	1	12	.....	3	3	6	.....	.....	.....	11
	Percent	100.0	3.3	.....	40.0	10.0	23.4	3.3	3.3	13.3	.....	13.3	.....	3.3	40.1	.....	10.0	10.0	20.1	.....	.....	.....	.....

See footnotes at end of table.

TABLE 30.—Disabling and Medical Injuries in 160 Textile Dyeing and Finishing Establishments, Classified by Occupation and by Unsafe Act, 1945—Continued

Occupation [1]		Total disabling and medical injuries [2]	Unsafe act																			
			Operating without authority; failure to secure or warn	Operating or working at unsafe speed	Using unsafe equipment or equipment unsafely					Unsafe placing or mixing				Failure to use proper safety equipment	Taking unsafe position or posture					Working on moving or dangerous equipment	Other unsafe acts	No unsafe acts	Unclassified; insufficient data
					Total	Unsafe use of equipment	Gripping objects insecurely; taking wrong hold of objects	Pulling hand trucks	Other	Total	Arranging objects or material unsafely	Mixing or combining materials unsafely	Other		Total	Exposure on vehicular right-of-way	Inattention to footing	Lifting incorrectly or lifting too heavy loads	Other				
Dry-cans operator; can-drier operator; can tender	Number	94	2	1	26	4	19	3	.....	4	3	1	.....	2	24	2	5	4	13	3	1	1	30
	Percent	100.0	3.2	1.6	41.2	6.3	30.1	4.8	.....	6.3	4.7	1.6	.....	3.2	38.1	3.2	7.9	6.3	20.7	4.8	1.6	.....	.....
Drying-machine operator, not elsewhere classified	Number	151	.....	2	34	5	27	2	.....	9	6	3	.....	.....	40	3	9	12	16	2	1	.....	63
	Percent	100.0	.....	2.3	38.6	5.7	30.6	2.3	.....	10.2	6.8	3.4	.....	.....	45.5	3.4	10.2	13.6	18.3	2.3	1.1	.....	.....
Dye-reel operator; dye-beck-reel operator; dye-box operator	Number	228	3	2	43	10	31	1	1	24	4	15	5	4	58	4	7	31	16	1	.....	.....	93
	Percent	100.0	2.2	1.5	31.9	7.4	23.1	.7	.7	17.8	3.0	11.1	3.7	3.0	42.9	3.0	5.2	22.8	11.9	.7	.....	.....	.....
Fireman	Number	141	.....	.....	28	10	14	.....	4	9	8	.....	1	5	49	.....	12	13	24	1	.....	1	48
	Percent	100.0	.....	.....	30.4	10.9	15.2	.....	4.3	9.8	8.7	.....	1.1	5.4	53.3	.....	13.0	14.1	26.2	1.1	.....	.....	.....
Folding-machine operator; folder operator; hooker-machine operator; yarder operator	Number	86	1	1	31	8	23	.....	.....	2	2	.....	.....	.....	26	.....	9	4	13	1	1	1	22
	Percent	100.0	1.6	1.6	49.2	12.7	36.5	.....	.....	3.2	3.2	.....	.....	.....	41.2	.....	14.3	6.3	20.6	1.6	1.6	.....	.....
Foreman; supervisor	Number	269	6	.....	54	15	31	3	5	14	10	4	.....	9	85	3	23	22	37	6	.....	.....	95
	Percent	100.0	3.4	.....	31.0	8.6	17.8	1.7	2.9	8.0	5.7	2.3	.....	5.2	49.0	1.7	13.2	12.6	21.5	3.4	.....	.....	.....
Goods layer; cloth layer-out; lay-out man	Number	65	.....	.....	21	4	16	1	.....	.....	.....	.....	.....	2	22	2	6	12	2	.....	.....	.....	20
	Percent	100.0	.....	.....	46.7	8.9	35.6	2.2	.....	.....	.....	.....	.....	4.4	48.9	4.4	13.3	26.8	4.4	.....	.....	.....	.....
Gray-cloth tender, printing; gray tender	Number	96	3	.....	26	3	19	1	3	3	3	.....	.....	.....	13	.....	.....	4	9	.....	.....	.....	51
	Percent	100.0	6.7	.....	57.7	6.7	42.1	2.2	6.7	6.7	6.7	.....	.....	.....	28.9	.....	.....	8.9	20.0	.....	.....	.....	.....
Inspector; examiner	Number	106	1	1	29	1	26	2	.....	8	8	.....	.....	.....	24	.....	9	6	9	1	.....	.....	42
	Percent	100.0	1.6	1.6	45.2	1.6	40.5	3.1	.....	12.5	12.5	.....	.....	.....	37.5	.....	14.1	9.4	14.0	1.6	.....	.....	.....
Janitor	Number	64	1	.....	17	6	11	.....	.....	.....	.....	.....	.....	5	21	1	8	5	7	.....	.....	1	19
	Percent	100.0	2.3	.....	38.6	13.6	25.0	.....	.....	.....	.....	.....	.....	11.4	47.7	2.3	18.1	11.4	15.9	.....	.....	.....	.....
Jigger; dye-jig operator	Number	364	2	8	76	9	61	2	4	53	17	33	3	24	49	1	8	13	27	5	4	.....	143
	Percent	100.0	.9	3.6	34.3	4.1	27.5	.9	1.8	24.0	7.7	14.9	1.4	10.9	22.2	.5	3.6	5.9	12.2	2.3	1.8	.....	.....
Kier boiler; kier operator	Number	40	.....	.....	10	4	6	.....	.....	4	1	2	1	1	13	.....	6	2	5	.....	.....	.....	12
	Percent	100.0	.....	.....	35.7	14.3	21.4	.....	.....	14.3	3.6	7.1	3.6	3.6	46.4	.....	4.4	7.1	17.9	.....	.....	.....	.....
Laborer, not elsewhere classified	Number	337	4	.....	77	13	61	1	2	26	20	4	2	13	79	6	25	21	27	1	.....	2	135
	Percent	100.0	2.0	.....	38.5	6.5	30.5	.5	1.0	13.0	10.0	2.0	1.0	6.5	39.5	3.0	12.5	10.5	13.5	.5	.....	.....	.....
Maintenance man	Number	803	14	5	194	51	129	1	13	47	44	2	1	96	148	.....	43	36	69	7	1	.....	291
	Percent	100.0	2.7	1.0	37.8	10.0	25.1	.2	2.5	9.2	8.6	.4	.2	18.8	28.9	.....	8.4	7.0	13.5	1.4	.2	.....	.....
Mangle tender, not elsewhere classified	Number	180	3	1	41	5	32	4	.....	16	14	2	.....	1	33	2	11	4	16	1	1	.....	83
	Percent	100.0	3.1	1.0	42.4	5.2	33.1	4.1	.....	16.5	14.4	2.1	.....	1.0	34.0	2.1	11.3	4.1	16.5	1.0	1.0	.....	.....
Packer	Number	111	2	.....	29	5	18	4	2	5	4	.....	1	3	39	2	5	19	13	.....	1	.....	32
	Percent	100.0	2.5	.....	36.7	6.3	22.8	5.1	2.5	6.3	5.0	.....	1.3	3.8	49.4	2.5	6.3	24.1	16.5	.....	1.3	.....	.....
Padding-machine operator; padder operator	Number	107	.....	1	28	6	18	2	2	8	3	4	1	4	22	2	4	6	10	1	.....	.....	43
	Percent	100.0	.....	1.6	43.7	9.4	28.1	3.1	3.1	12.5	4.7	6.2	1.6	6.3	34.3	3.1	6.3	9.4	15.5	1.6	.....	.....	.....

See footnotes at end of table.

Pleater; plaiter; bin plaiter; kier plaiter; cloth knocker	Number	70	1	.....	11	3	6	2	.....	1
	Percent	100.0	2.3	.....	25.6	7.0	13.9	4.7	.....	2.3
Sanforizing-machine operator	Number	43	.....	.....	14	.....	12	1	1	.....
	Percent	100.0	.....	.....	48.3	.....	41.5	3.4	3.4	.....
Sewing-machine operator; seaming-machine operator	Number	85	2	.....	31	2	24	3	2	3
	Percent	100.0	3.1	.....	48.4	3.1	37.5	4.7	3.1	4.7
Singer; singeing-machine operator	Number	37	.....	1	10	2	6	1	1	1
	Percent	100.0	.....	3.7	37.0	7.4	22.2	3.7	3.7	3.7
Starch mixer; size maker	Number	50	.....	.....	11	5	5	.....	1	11
	Percent	100.0	.....	.....	35.5	16.2	16.1	.....	3.2	35.5
Tenter-frame operator; frame operator	Number	268	1	.....	67	5	52	2	8	7
	Percent	100.0	.6	.....	43.6	3.2	33.9	1.3	5.2	4.5
Truck driver	Number	69	2	3	14	2	12	.....	.....	4
	Percent	100.0	4.4	6.7	31.1	4.4	26.7	.....	.....	8.9
Trucker, hand	Number	679	13	5	200	36	127	29	8	56
	Percent	100.0	3.0	1.1	45.5	8.2	28.9	6.6	1.8	12.7
Watchman	Number	35	.....	.....	3	.....	2	.....	1	.....
	Percent	(*)	.....	.....	.....	.....	.....	.....	.....	.....
Wrapper	Number	49	.....	.....	13	3	9	.....	1	3
	Percent	100.0	.....	.....	44.8	10.3	31.0	.....	3.4	10.3
Yarn dyer	Number	76	1	2	15	2	11	.....	2	12
	Percent	100.0	2.0	4.0	30.0	4.0	22.0	.....	4.0	24.0
Yarn winder	Number	113	1	.....	39	4	31	1	3	2
	Percent	100.0	1.4	.....	52.6	5.4	41.7	1.4	4.1	2.7
Other	Number	552	5	4	136	18	106	6	6	28
	Percent	100.0	1.4	1.1	39.1	5.2	30.5	1.7	1.7	8.0
Unclassified; insufficient data	Number	321	5	2	63	9	51	2	1	29
	Percent	100.0	2.9	1.1	36.0	5.1	29.2	1.1	.6	16.6

[1] Percents are based on injuries resulting from accidents in which unsafe acts were known to have been committed.

1			3	23	1	10	1	11	1	3	2	25
2.3			7.0	53.5	2.3	23.3	2.3	25.6	2.3	7.0		
				10		2	2	6	5			14
				34.5		6.9	6.9	20.7	17.2			
3			1	26	3	8	2	13		1		21
4.7			1.6	40.6	4.7	12.5	3.1	20.3		1.6		
1			1	14		2	5	7				10
3.7			3.7	51.9		7.4	18.5	26.0				
1	7	3		9		2	2	5				19
3.2	22.6	9.7		29.0		6.5	6.5	16.0				
7			4	66	3	17	12	34	8	1		114
4.5			2.6	42.9	1.9	11.0	7.8	22.2	5.2	.6		
4			2	20	1	4	5	10				24
8.9			4.4	44.5	2.2	8.9	11.1	22.3				
52	2	2	8	154	12	41	58	43		4		239
11.7	.5	.5	1.8	35.0	2.7	9.3	13.2	9.8		.9		
			1	11		7	1	3		1	1	18
3				13		8	1	4				20
10.3				44.9		27.7	3.4	13.8				
2	9	1		20		4	3	13				26
4.0	18.0	2.0		40.0		8.0	6.0	26.0				
2				27		5	5	17	5			39
2.7				36.5		6.8	6.8	22.9	6.8			
18	8	2	10	151	5	40	41	65	10	4	2	202
5.1	2.3	.6	2.9	43.5	1.4	11.5	11.8	18.8	2.9	1.1		
19	7	3	7	66	3	20	9	34	1	2	2	144
10.9	4.0	1.7	4.0	37.7	1.7	11.4	5.1	19.5	.6	1.1		

[2] A medical case is an industrial injury which does not result in death, permanent impairment, or temporary disability but requires treatment by a physician or surgeon.
[3] Not computed because of small number of injuries resulting from unsafe act.

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TABLE 31.—Operations, Hazards, Injuries, and Accident Causes in Selected Occupations of the Textile Dyeing and Finishing Industry, 1945—Con.

Gray-cloth tender, printing; gray tender: Tends back-gray cloth, which is run under the white cloth being printed in a printing machine to act as a foundation for the white cloth and to absorb any color penetrating the white cloth. Assists printer in placing printing rollers, doctor blades, color trays, and color pastes into place on the printing machine; assists the back tender to thread both the gray and white cloth through the printing machine; places rolls of gray cloth on the printing machine; sews, by machine, lengths of gray cloth to form a continuous strip for processing.

Major hazards: Handling rolls of cloth, center bars, shells, doctor blades, printing rollers, and color trays; belts and gears; slippery floors; hand trucking.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 71.0 Medical 76.9 Total—disabling and medical 147.9 First aid (5) Total—all injuries (5)	Strains and sprains 33 Bruises and contusions 29 Cuts and lacerations 17	Trunk 34 Finger 22 Hand 13 Arm 10	Machines 21 Rolls of cloth 20 Metal parts 17 Working surfaces 11	Overexertion 31 Struck by moving objects 17 Striking against or bumping into objects 17 Caught in, on, or between moving objects 11 Absorption of printing colors 10	Lack of proper lifting equipment 52 Slippery floors, etc. 16 Improperly guarded agencies 14	Gripping objects insecurely, or taking wrong hold of objects 42 Assuming unsafe positions or postures 29

Inspector; examiner: A cloth winder who rewinds finished cloth from large rolls into smaller rolls, inspects the cloth, and cuts out imperfections, preparatory to shipping. Places rolls of cloth on unwinding jack; threads winding machine; prepares winding axle for receiving cloth; inspects cloth and cuts out defective cloth; removes completed rolls of cloth from winder.

Major hazards: Handling rolls of cloth, shells, and center bars; hand trucking; gears and belts; knives and scissors.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 11.5 Medical 64.0 Total—disabling and medical 75.5 First aid 176.1 Total—all injuries 251.6	Bruises and contusions 32 Strains and sprains 21 Cuts and lacerations 22	Finger 23 Hand 20 Trunk 19 Head 10 Foot 9	Machines 19 Rolls of cloth 16 Hand trucks 9 Cloth, not rolled or baled 7	Struck by moving objects 23 Overexertion 20 Striking against or bumping into objects 18 Caught in, on, or between moving objects 18	Lack of proper lifting equipment 26 Improperly guarded agencies 24 Sharp-edged center bars, shells, etc. 11	Gripping objects insecurely, or taking wrong hold of objects 41 Assuming unsafe positions or postures 24 Inattention to footing 14 Arranging or placing objects unsafely 13

Janitor: Keeps buildings or parts of buildings clean and orderly. Sweeps and scrubs floors and stairways; removes trash from buildings.

Major hazards: Handling waste containers; slippery floors and stairways; hand trucking.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 27.9 Medical 67.8 Total—disabling and medical 95.7 First aid 303.2 Total—all injuries 398.9	Strains and sprains 27 Bruises and contusions 25 Cuts and lacerations 25 Burns and scalds 10	Trunk 25 Hand 19 Finger 15 Head 12 Foot 9	Containers 24 Working surfaces 12 Hand trucks 10 Chemicals 10	Striking against or bumping into objects 25 Overexertion 18 Absorption of chemicals 16 Struck by moving objects 13 Caught in, on, or between moving objects 12	Improperly guarded agencies 25 Lack of proper lifting equipment 21 Sharp-edged agencies 14 Rough agencies 11 Slippery floors, stairs, etc. 11	Gripping objects insecurely, or taking wrong hold of objects 25 Assuming unsafe positions or postures 19 Inattention to footing 18 Unsafe use of equipment 14 Failure to use personal safety equipment 11 Unsafe lifting 11

Jigger; dye-jig operator: Dyes cloth by operating machine (jig) equipped with rollers and tank or vat. Places rolls of cloth on jig and threads machine; opens valve to admit water and steam into tank; pours specified quantities of dyes into tank; runs cloth through tank, reverses motion of cloth and reruns the cloth back through tank, repeating the operation until cloth has been run through dyeing mixture a specified number of times; replaces dye liquid with water and chemicals and rinses the cloth; removes roll of cloth from machine.

Major hazards: Steam lines and live steam; belts and gears; handling rolls of cloth, shells, and center bars; slippery floors; hand trucking.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 42.0 Medical 126.1 Total—disabling and medical 168.1 First aid 454.3 Total—all injuries 622.4	Burns and scalds 26 Strains and sprains 23 Bruises and contusions 22 Industrial diseases 12 Cuts and lacerations 11	Trunk 19 Finger 16 Eye 15 Arm 15 Hand 10	Machines 34 Chemicals 20 Rolls of cloth 13 Working surfaces 7	Absorption of dyes and chemicals 31 Struck by moving objects 19 Caught in, on, or between moving objects 16 Overexertion 15	Improperly guarded agencies 33 Defective agencies 27 Lack of proper lifting equipment 19 Unsafe planning or unsafe processes 14	Gripping objects insecurely, or taking wrong hold of objects 28 Assuming unsafe positions or postures 22 Mixing or combining unsafely 15 Failure to wear personal safety equipment 11

Kier boiler; kier operator: Boils gray cloth in lye or alkali solution in kiers as one of the preliminary bleaching operations. Threads cloth through pot-eyes and into kier boilers; attaches automatic plaiter on kier boiler; turns valve to admit solution to kier boiler; places and removes cover of kier; removes cloth from kier.

Major hazards: Hot surfaces of kier boilers, steam pipes, etc.; moving automatic plaiters and kier covers; handling chemicals; ladders.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 26.4 Medical 114.2 Total—disabling and medical 140.6 First aid (5) Total—all injuries (5)	Strains and sprains 28 Burns and scalds 25 Bruises and contusions 23 Cuts and lacerations 20	Finger 25 Trunk 18 Head 15 Hand 15 Foot 10	Boilers and pressure vessels 26 Machines 15 Working surfaces 13	Falls 18 Striking against or bumping into objects 15 Absorption of chemicals 15 Struck by moving objects 13 Overexertion 10	Defective agencies except slippery floors 29 Unsafe planning or unsafe processes 17 Slippery floors 13 Improperly guarded agencies 13 Lack of proper lifting equipment 13	Assuming unsafe positions or postures 25 Inattention to footing 21 Gripping objects insecurely, or taking wrong hold of objects 21 Unsafe use of equipment 14 Unsafe loading, placing, or mixing 14

Laborer, n. e. c.: A worker who performs miscellaneous unskilled tasks as assigned.

Major hazards: Generally, the hazards are similar to those of the department in which employee is working.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 62.7 Medical 107.5 Total—disabling and medical 170.2 First aid (5) Total—all injuries (5)	Bruises and contusions 30 Strains and sprains 27 Cuts and lacerations 21 Burns and scalds 9	Trunk 27 Finger 16 Head 12 Foot 12 Hand 10	Containers 19 Working surfaces 17 Hand trucks 11 Chemicals 7	Struck by moving objects 26 Overexertion 18 Striking against or bumping into objects 16 Falls 12 Absorption of chemicals 12	Lack of proper lifting equipment 24 Slippery floors 20 Sharp-edged agencies 15	Gripping objects insecurely, or taking wrong hold of objects 31 Assuming unsafe positions or postures 16 Inattention to footing 13 Unsafe lifting 11 Arranging or placing objects unsafely 10

Maintenance man: A worker who keeps machinery, equipment, or the structure of an establishment in good repair.

Major hazards: Moving parts of machines; hand tools; handling parts of machines and other equipment; slippery floors.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 38.0 Medical 124.5 Total—disabling and medical 162.5 First aid 572.0 Total—all injuries 734.5	Cuts and lacerations 27 Bruises and contusions 23 Strains and sprains 19 Foreign bodies in eyes 14	Finger 20 Eye 19 Trunk 18 Hand 10	Machines 21 Hand tools 14 Working surfaces 10 Metal parts 8	Struck by moving objects 36 Striking against or bumping into objects 19 Overexertion 13	Defective agencies 44 Improperly guarded agencies 21 Lack of proper lifting equipment 14	Assuming unsafe positions or postures 29 Gripping objects insecurely, or taking wrong hold of objects 25 Failure to wear personal safety equipment 19 Unsafe use of equipment 10

Mangle tender, n. e. c.: Operates any one of several types of machines called mangles which impart desired finishes to cloth. Places roll of cloth on unwinding jack; threads mangle; places required chemicals in mangle; sews, by machine, lengths of cloth to form a continuous strip for processing; removes finished cloth from machine.

Major hazards: Squeeze rollers, gears, belts, etc.; handling rolls of cloth, chemicals, shells, and center bars; steam pipes and live steam; hand trucking.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 34.3 Medical 60.0 Total—disabling and medical 94.3 First aid (5) Total—all injuries (5)	Bruises and contusions 30 Strains and sprains 28 Cuts and lacerations 20 Burns and scalds 9	Trunk 27 Finger 19 Head 14 Leg 11	Machines 21 Rolls of cloth 17 Hand tools 16 Working surfaces 14 Containers 7	Overexertion 22 Struck by moving objects 19 Striking against or bumping into objects 15 Caught in, on, or between moving objects 15 Falls 10 Absorption of chemicals 10	Lack of proper lifting equipment 32 Improperly guarded agencies 18 Slippery floors 16	Gripping objects insecurely, or taking wrong hold of objects 33 Assuming unsafe positions or postures 23 Arranging or placing objects unsafely 14 Inattention to footing 11

Packer: Packs finished and wrapped fabrics in cardboard or wooden boxes or cartons. Arranges or packs wrapped fabrics in boxes or cartons; closes cartons or boxes and fastens them; places cartons or boxes on hand truck for delivery to shipping department.

Major hazards: Handling wooden boxes or crates; hand trucking; hand tools.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 22.3 Medical 63.8 Total—disabling and medical 86.1 First aid (5) Total—all injuries (5)	Strains and sprains 41 Bruises and contusions 26 Cuts and lacerations 26	Trunk 35 Finger 15 Leg 12 Hand 11 Head 9	Containers 35 Hand trucks 10 Cloth, not rolled or baled 10 Working surfaces 8 Rolls of cloth 8	Overexertion 34 Striking against or bumping into objects 26 Struck by moving objects 25	Lack of proper lifting equipment 24 Sharp-edged agencies 20 Rough agencies 15 Aged, worn, or cracked agencies 10	Assuming unsafe positions or postures 25 Unsafe lifting 24 Gripping objects insecurely, or taking the wrong hold of objects 23

Padding-machine operator; padder operator: Operates a padding machine which imparts to the cloth a light, preliminary coat of dye or which treats printed cloth with chemicals to remove printing flaws. Places roll of cloth on unwinding jack; mixes and places the necessary dyes or chemicals in machine; threads cloth through padding machine; sews, by machine, lengths of cloth to form a continuous strip for processing; removes finished roll of cloth from machine.

Major hazards: Handling rolls of cloth, center bars, and shells; squeeze rollers, gears, belts, etc.; slippery floors; hand trucking; dyes and chemicals; steam pipes and live steam.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 53.5 Medical 81.5 Total—disabling and medical 135.0 First aid 545.4 Total—all injuries 680.4	Strains and sprains 27 Bruises and contusions 22 Burns and scalds 21 Cuts and lacerations 15	Trunk 26 Eye 15 Finger 13 Hand 12 Leg 11 Arm 10	Machines 25 Rolls of cloth 23 Chemicals 14 Hand trucks 11	Overexertion 27 Absorption of dyes and chemicals 20 Struck by moving objects 19 Caught in, on, or between moving objects 11	Lack of proper lifting equipment 37 Improperly guarded agencies 22 Defective agencies 18 Unsafe planning or unsafe processes 17	Assuming unsafe positions or postures 34 Gripping objects insecurely, or taking wrong hold of objects 28 Unsafe loading, placing, or mixing 13

Pleater; plaiter; bin plaiter; kier plaiter; cloth knocker: Guides rope-like strands of cloth into kier boiler or into cloth-storage bins. Guides, with wooden stick, cloth falling from pulley or pot-eye into kier or storage bin, making sure that the pile builds up evenly; threads pot-eyes.

Major hazards: Wet and slippery floors; steam pipes; hand trucking; handling cloth containing chemicals or water; cloth-storage bins; ladders.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 34.2 Medical 56.9 Total—disabling and medical 91.1 First aid 585.6 Total—all injuries 676.7	Bruises and contusions 41 Cuts and lacerations 23 Strains and sprains 20 Burns and scalds 9	Trunk 19 Head 17 Finger 14 Arm 11 Leg 10 Foot 10	Machines 22 Working surfaces 13 Boilers and pressure vessels 12 Hand trucks 9	Falls 25 Struck by moving objects 22 Striking against or bumping into objects 19 Caught in, on, or between moving equipment 12 Absorption of chemicals 9	Improperly guarded agencies 28 Slippery floors 16 Unsafe planning or unsafe processes 16 Sharp-edged agencies 12	Inattention to footing 23 Assuming unsafe positions or postures 21 Gripping objects insecurely, or taking wrong hold of objects 14

Sanforizing-machine operator: Operates a sanforizing machine which shrinks fabric. Places roll of cloth on unwinding jack; threads cloth through machine; places heating-shoes in place on machine; opens steam valve to drying cylinders; regulates roller and conveyor speeds of various machine sections according to predetermined shrinkage of cloth; removes rolls of cloth from machine.

Major hazards: Belts, gears, and other moving machine parts; handling rolls of cloth, center bars, shells, and heating-shoes for sanforizing machine; hand trucking; steam pipes and hot cylinders.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 23.3 Medical 49.9 Total—disabling and medical 73.2 First aid 273.7 Total—all injuries 346.9	Bruises and contusions 28 Cuts and lacerations 28 Strains and sprains 21 Burns and scalds 14	Finger 28 Trunk 19 Hand 19 Arm 9 Toe 9	Machines 51 Rolls of cloth 19 Working surfaces 9 Hand trucks 9	Caught in, on, or between moving objects 28 Overexertion 19 Struck by moving objects 16 Striking against or bumping into moving objects 14 Contact with extreme temperatures 9	Improperly guarded agencies 40 Lack of proper lifting equipment 20 Slippery floors 10 Unsafe planning or unsafe processes 10	Gripping objects insecurely, or taking wrong hold of objects 42 Assuming unsafe positions or postures 35 Working on moving or dangerous equipment 17

Sewing-machine operator; seaming-machine operator: Operates a sewing or seaming machine by which pieces or cuts of cloth are formed into a continuous strip. Places squared ends of two pieces of cloth together and inserts them under sewing needle or on pins which convey the cloth under the needle; presses pedal to operate machine; clips or breaks thread when seam is completed.

Major hazards: Belts, sewing needles, and pins on feeding mechanism of sewing machine; scissors and knives; hand trucking; lifting rolls of cloth.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 26.6 Medical 35.5 Total—disabling and medical 62.1 First aid 421.1 Total—all injuries 483.2	Cuts and lacerations 34 Bruises and contusions 33 Strains and sprains 25	Finger 29 Trunk 17 Hand 15 Leg 11 Foot 9 Toe 9	Machines 31 Hand trucks 14 Rolls of cloth 10 Cloth, not rolled or baled 10	Struck by moving objects 34 Striking against or bumping into objects 21 Overexertion 17 Caught in, on, or between moving objects 13	Defective agencies 36 Improperly guarded agencies 31 Lack of proper lifting equipment 16	Gripping objects insecurely, or taking wrong hold of objects 38 Assuming unsafe positions or postures 28 Inattention to footing 13

Singer; singeing-machine operator: Tends singeing machine which burns the nap from the cloth. Threads cloth through machine; ignites flame on singeing machine; mixes desizing solution and places it in machine; regulates speed of cloth through singer.

Major hazards: Hot surfaces and open flames; wet floors; steam lines; belts and gears; desizing chemicals; hand trucking; handling rolls of cloth and cloth containing desizing chemicals.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 30.7 Medical 85.9 Total—disabling and medical 116.6 First aid (5) Total—all injuries (5)	Strains and sprains 30 Bruises and contusions 27 Cuts and lacerations 19 Industrial diseases 11	Trunk 24 Finger 19 Arm 16 Leg 14 Hand 11	Machines 30 Hand trucks 14 Working surfaces 11 Rolls of cloth 8 Cloth, not rolled or baled 8	Overexertion 22 Striking against or bumping into objects 19 Struck by moving objects 19 Absorption of chemicals 11	(5)	Assuming unsafe positions or postures 22 Gripping objects insecurely, or taking wrong hold of objects 22 Unsafe lifting 19

Starch mixer; size maker: Mixes starch solutions for use in starch mangle. Weighs out specified amounts of materials and places them in mixing tank; opens steam valve to heat mixture; operates power-driven agitator which mixes the starch solution; delivers mixture to starch mangles.

Major hazards: Handling barrels, kegs, and bags of ingredients; chemicals; slippery floors; hot starch; steam lines and live steam; hand trucking; belts and gears on agitator.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 6.0 Medical 30.2 Total—disabling and medical 36.2 First aid (5) Total—all injuries (5)	Burns and scalds 40 Strains and sprains 24 Bruises and contusions 14 Cuts and lacerations 14	Trunk 24 Arm 16 Hand 12 Eye 10 Finger 10 Foot 10	Containers 35 Machines 12 Working surfaces 12 Chemicals 12	Contact with extreme temperature 26 Overexertion 20 Absorption of chemicals 18 Struck by moving objects 10 Falls 10	Improperly guarded agencies 30 Lack of proper lifting equipment 21 Slippery working surfaces 18	Assuming unsafe positions or postures 29 Unsafe mixing or combining 23 Unsafe use of equipment 16 Gripping objects insecurely, or taking wrong hold of objects 16

Tenter-frame operator; frame operator: Operates a machine called a tenter frame which dries the cloth, stretches the cloth to its full width, and straightens the thread in the cloth. Adjusts width of frame according to specifications; places roll of cloth on unwinding jack; threads machine; sews, by machine, lengths of cloth to form a continuous strip for processing; removes completed rolls of cloth from machine.

Major hazards: Clips and belts on tenter frame; handling rolls of cloth, center bars, and shells; steam lines; knives and scissors.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 26.6 Medical 56.7 Total—disabling and medical 83.3 First aid 394.1 Total—all injuries 477.4	Strains and sprains 36 Bruises and contusions 29 Cuts and lacerations 21	Trunk 26 Finger 24 Leg 12 Arm 10 Hand 10	Machines 31 Rolls of cloth 29 Hand tools 11 Working surfaces 7	Overexertion 30 Striking against or bumping into objects 20 Struck by moving objects 19 Caught in, on, or between moving objects 16	Lack of proper lifting equipment 41 Defective agencies 26 Improperly guarded agencies 19	Gripping objects insecurely, or taking the wrong hold of objects 34 Assuming unsafe positions or postures 32 Inattention to footing 11

Truck driver: Operates a motor vehicle for the purpose of transporting supplies and finished materials; may assist in loading and unloading vehicle.

Major hazards: Handling bales, cartons, boxes, etc.; roadway traffic; hand trucking.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 29.0 Medical 63.9 Total—disabling and medical 92.9 First aid (5) Total—all injuries (5)	Strains and sprains 31 Bruises and contusions 26 Cuts and lacerations 23 Foreign bodies in eyes 10	Trunk 23 Leg 13 Finger 12 Eye 10 Hand 10 Foot 10	Vehicles, except hand trucks 25 Containers 18 Working surfaces 15 Hand trucks 10 Foreign bodies in eyes 9	Struck by moving objects 37 Striking against or bumping into objects 19 Overexertion 16 Falls 11 Caught in, on, or between moving objects 10	(5)	Assuming unsafe positions or postures 35 Gripping objects insecurely, or taking wrong hold of objects 27 Unsafe lifting 11

Trucker, hand: Transports materials and supplies from one department to another by hand truck. Places materials or supplies to be moved on hand trucks; pushes hand truck to delivery point; unloads hand truck.

Major hazards: Hand trucking; handling bales, cartons, drums, kegs, and other containers, and rolls of cloth; slippery floors.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 38.4 Medical 65.1 Total—disabling and medical 103.5 First aid 474.4 Total—all injuries 577.9	Strains and sprains 38 Bruises and contusions 35 Cuts and lacerations 19	Trunk 23 Head 16 Leg 13 Finger 12 Hand 10 Foot 10	Hand trucks 27 Rolls of cloth 16 Containers 16 Working surfaces 14	Struck by moving objects 30 Overexertion 26 Striking against or bumping into objects 15 Caught in, on, or between moving objects 11	Lack of proper lifting equipment 33 Defective agencies, n.e.c. 18 Slippery floors, etc. 13 Sharp-edged agencies 10	Gripping objects insecurely, or taking wrong hold of objects 29 Assuming unsafe positions or postures 22 Unsafe lifting 13 Arranging or placing objects unsafely 12

Watchman: Guards the plant against fire, theft, or illegal entry; makes periodic inspection trips about building or grounds to watch for irregularities.

Major hazards: Slippery floors and stairways.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 10.6 Medical 7.1 Total—disabling and medical 17.7 First aid 87.5 Total—all injuries 105.2	Bruises and contusions 44 Strains and sprains 32 Cuts and lacerations 9 Fractures 9	Trunk 41 Leg 15 Head 9 Arm 9 Hand 9	Working surfaces 41 Stairways 15 Hand trucks 9	Falls 50 Slips (not falls) 15 Overexertion 9	(5)	(5)

Wrapper: Wraps bolts or rolls of cloth in paper. Wraps paper around bolts or rolls of cloth and seals it; places wrapped cloth on skid or hand truck for delivery to packer.

Major hazards: Handling paper and cloth; hand trucking; knives and scissors.

Injury-frequency rates.[1]	Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)	Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)	Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)	Most common accident types. (Percentage of injuries for which the type of accident was known.)	Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)	Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)
Disabling 14.7 Medical 44.1 Total—disabling and medical 58.8 First aid 393.2 Total—all injuries 452.0	Bruises and contusions 33 Strains and sprains 29 Cuts and lacerations 21	Trunk 22 Finger 21 Head 14 Arm 12 Hand 10	Rolls of cloth 18 Working surfaces 16 Cloth, not rolled or baled 16 Hand tools 9	Struck by moving objects 27 Overexertion 23 Striking against or bumping into objects 19 Falls 13	(5)	Gripping objects insecurely, or taking wrong hold of objects 31 Inattention to footing 28 Assuming unsafe positions or postures 17 Unsafe use of equipment 10 Arranging or placing objects unsafely 10

[1] The injury-frequency rate is the number of injuries per million hours worked. The disabling-injury frequency rate is based on the number of disabling injuries, the medical-injury frequency on the number of medical injuries, and the first-aid-injury frequency rate on the number of first-aid injuries.
A disabling injury is one that results in death, permanent disability, or an inability to perform a regularly established job on any day subsequent to the day of injury.
A medical injury is a nondisabling injury requiring treatment by a physician or surgeon.
A first-aid injury is any injury other than disabling or medical which requires first-aid treatment.

[2] The agency is the object, substance, or exposure which is most closely associated with the injury and which, in general, could have been guarded or corrected.
[3] The unsafe working condition is the condition of the selected agency which could and should have been guarded or corrected.
[4] The unsafe act is that violation of a commonly accepted safe procedure which resulted in the selected accident type.
[5] Figures not available because of insufficient data.

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TABLE 31.—Operations, Hazards, Injuries, and Accident Causes in Selected Occupations of the Textile Dyeing and Finishing Industry, 1945

Injury-frequency rates.[1]	*Most common kinds of injuries. (Percentage of all injuries for which the nature of injury was known.)*	*Most common parts of body injured. (Percentage of all injuries in which the part of body injured was known.)*	*Most common agencies.[2] (Percentage of injuries for which the agency of accident was known.)*	*Most common accident types. (Percentage of injuries for which the type of accident was known.)*	*Most common unsafe working conditions.[3] (Percentage of injuries resulting from unsafe working conditions.)*	*Most common unsafe acts.[4] (Percentage of injuries resulting from unsafe acts.)*

Ager operator: Operates a machine (ager) which develops and fixes the colors in dyed and printed cloth. Places or regulates flow of ammonia and other chemicals into ager; threads cloth through ager; moves hand trucks loaded with cloth to and from ager; sews, by machine, lengths of cloth to form a continuous strip for processing; maintains proper temperature in ager by controlling the flow of steam.

Major hazards: Ammonia and other chemicals; steam pipes and live steam; hand trucking; belts and gears; wet floors.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 21.1 Medical 24.1 Total—disabling and medical 45.2 First aid (5) Total—all injuries (5)	Bruises and contusions 28 Burns and scalds 20 Strains and sprains 18 Cuts and lacerations 12	Eye 19 Trunk 14 Hand 14 Foot 12	Machines 20 Working surfaces 19 Hand trucks 11 Chemicals 9 Foreign bodies (eye injuries) 9	Struck by moving objects 20 Absorption of chemicals; inhalation of fumes 20 Falls 18 Striking against or bumping into objects 15	Slippery floors, etc. 23 Improperly guarded agencies 23 Defective agencies, not elsewhere classified 19 Unsafe planning or unsafe processes 16	Assuming an unsafe position or posture 30 Inattention to footing 28 Gripping objects insecurely, or taking wrong hold of objects 22 Unsafe use of equipment 11

Back-end man; back tender; doffer; swing tender: Tends cloth being delivered from any one of a number of machines to make sure that the cloth flows smoothly and folds or rolls evenly. Moves empty hand trucks into position to receive cloth as it is delivered from machine and removes trucks as they are filled; moves rolls of cloth from machine to trucks; cuts or tears cloth at seams when hand trucks are filled or when rolls are complete; inspects cloth as it leaves machine for flaws in cloth or in processing.

Major hazards: Handling rolls of cloth, center bars, and shells; hand trucking; belts and gears; handling dyed, printed, or chemically treated cloth.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 47.8 Medical 61.9 Total—disabling and medical 109.7 First aid 376.8 Total—all injuries 486.5	Bruises and contusions 29 Cuts and lacerations 26 Strains and sprains 25 Industrial diseases 11	Trunk 27 Finger 27 Head 13 Arm 9 Hand 9	Machines 22 Hand trucks 22 Rolls of cloth 16 Metal parts 9	Striking against or bumping into objects 27 Overexertion 24 Struck by moving objects 18 Absorption of chemicals and dyes 16	Lack of proper lifting equipment 23 Unsafe planning or unsafe processes 19 Rough shells, center bars, and other objects 16 Sharp-edged shells, center bars and other objects 13 Improperly guarded agencies 10	Gripping objects insecurely, or taking the wrong hold of objects 30 Unsafe lifting 17 Assuming an unsafe position or posture 17 Unsafe use of equipment 10

Back tender (printing): Tends the back part of the printing machine and assists the printer in setting up the machine for operation. Assists printer in placing printing rollers, doctor blades, color trays, and color pastes into place on the printing machine; assists the gray-cloth tender to thread both the gray and white cloth through the printing machine; places rolls of white cloth on the printing machine; sews, by machine, lengths of white cloth to form a continuous strip for processing.

Major hazards: Handling rolls of cloth, center bars, shells, doctor blades, printing rollers, and color trays; belts and gears; slippery floors; hand trucking.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 62.2 Medical 145.2 Total—disabling and medical 207.4 First aid (5) Total—all injuries (5)	Strains and sprains 34 Bruises and contusions 30 Cuts and lacerations 21	Trunk 27 Finger 27 Hand 12 Leg 11	Machines 27 Rolls of cloth 17 Working surfaces 12 Metal parts 12	Overexertion 25 Struck by moving objects 20 Striking against or bumping into objects 19 Caught in, on, or between moving objects 15	Lack of proper lifting equipment 36 Improperly guarded agencies 22 Slippery floors, etc. 17	Gripping objects insecurely, or taking wrong hold of objects 39 Assuming an unsafe position or posture 27 Inattention to footing 10

Beamer; cloth-roll winder; winder operator; winding machine operator; tuber: Operates a machine (winder) which winds the cloth into rolls. Places truck loads of cloth into position behind machine or places rolls of cloth on unwinding jack; threads winder; prepares winding axle for receiving cloth; tears cloth at seam when roll has been completed; removes completed rolls of cloth from winder.

Major hazards: Handling rolls of cloth, shells, and center bars; hand trucking; gears and belts.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 19.6 Medical 63.5 Total—disabling and medical 83.1 First aid 528.4 Total—all injuries 611.5	Strains and sprains 37 Bruises and contusions 35 Cuts and lacerations 14	Trunk 33 Finger 16 Arm 10 Hand 10	Rolls of cloth 32 Machines 29 Hand trucks 11	Overexertion 32 Struck by moving objects 29 Caught in, on, or between moving objects 16 Striking against or bumping into objects 10	Lack of proper lifting equipment 54 Improperly guarded agencies 21 Defective agencies 16	Gripping objects insecurely, or taking wrong hold of objects 43 Assuming unsafe positions or postures 29 Unsafe use of equipment 10

Boil-off machine operator; boil-off man: Boils gray cloth in a lye or alkali solution in a boil-off machine, as one of the preliminary bleaching operations in which impurities such as dirt, gum, and resin are removed. Places rolls of cloth on unwinding jack; threads boil-off machine; places required chemicals in boil-off machine; maintains proper temperature of chemicals in machine by adjusting steam valve; sews, by machine, lengths of cloth to form a continuous strip for processing.

Major hazards: Hand trucking; wet floors; steam pipes and live steam; rolls of cloth; chemicals; handling center bars and shells; gears and belts.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 25.1 Medical 62.8 Total—disabling and medical 87.9 First aid 308.7 Total—all injuries 396.6	Bruises and contusions 27 Burns and scalds 24 Strains and sprains 23 Cuts and lacerations 13	Trunk 28 Finger 17 Eye 14 Hand 13 Arm 11	Machines 29 Working surfaces 17 Hand trucks 9	Absorption of chemicals 21 Overexertion 18 Striking against or bumping into objects 13 Struck by moving objects 13 Caught in, on, or between moving objects 13	Improperly guarded agencies 36 Slippery floors, etc. 21 Unsafe planning or unsafe processes 17 Lack of proper lifting equipment 10	Gripping objects insecurely, or taking wrong hold of objects 43 Assuming an unsafe position or posture 20 Failure to wear personal safety equipment 15 Unsafe lifting 13

Calender operator: Tends machine (calender) which, by means of heated and processed rolls, presses the fabric and imparts luster to it. Places rolls of cloth on unwinding jack; threads cloth through calender; regulates steam pressure in calender rolls; sews, by machine, lengths of cloth to form a continuous strip for processing; removes completed rolls of cloth from calender.

Major hazards: Handling rolls of cloth, shells, and center bars; squeeze rollers, gears and belts; steam pipes and cylinders; hand-trucking operations.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 33.9 Medical 37.3 Total—disabling and medical 71.2 First aid (5) Total—all injuries (5)	Strains and sprains 33 Bruises and contusions 31 Cuts and lacerations 22	Finger 28 Trunk 27 Hand 11 Arm 9 Leg 9	Machines 34 Rolls of cloth 30 Working surfaces 7 Hand trucks 6	Overexertion 28 Caught in, on, or between moving objects 25 Struck by moving objects 16 Striking against or bumping into objects 15	Lack of proper lifting equipment 41 Improperly guarded agencies 26 Defective agencies 24	Gripping objects insecurely, or taking wrong hold of objects 42 Assuming an unsafe position or posture 29 Working on moving or dangerous equipment 11

Clerk: Performs routine clerical duties in any one of several departments.

Major hazards: General hazards of the department in which employee is working.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 12.6 Medical 27.7 Total—disabling and medical 40.3 First aid 187.1 Total—all injuries 227.4	Strains and sprains 36 Bruises and contusions 35 Cuts and lacerations 16	Trunk 28 Leg 17 Hand 13 Finger 12 Foot 11	Containers 22 Working surfaces 18 Hand trucks 10 Rolls of cloth 10	Struck by moving objects 21 Falls 21 Overexertion 20 Striking against or bumping into objects 18	Lack of proper lifting equipment 33 Wet floors 17 Sharp-edged shells, center bars, containers, etc. 13 Aged, worn, or cracked equipment 10	Inattention to footing 29 Assuming an unsafe position or posture 23 Gripping objects insecurely, or taking wrong hold of objects 19 Unsafe use of equipment 11

Cloth folder, hand; hand folder; folder: Folds cloth by hand two or three times, making a neat package, after the cloth has been folded by machine. Inspects defects in cloth as tagged by folding-machine operator; cuts out, with scissors or a knife, defective pieces of cloth; counts number of folds in piece of cloth and records the yardage; folds cloth received from folding-machine operator two or three times.

Major hazards: Rough tables; handling folded cloth; hand trucking; knives and scissors.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 6.6 Medical 19.8 Total—disabling and medical 26.4 First aid 293.9 Total—all injuries 320.3	Strains and sprains 37 Bruises and contusions 32 Cuts and lacerations 25	Trunk 29 Finger 29 Hand 11 Arm 9	Cloth, folded 18 Hand trucks 11 Hand tools 11	Overexertion 32 Struck by moving objects 26 Striking against or bumping into objects 22	Lack of sufficient help in lifting heavy objects 32 Rough tables, trucks, etc. 14 Improperly guarded agencies 14	Gripping objects insecurely, or taking the wrong hold of objects 45 Unsafe lifting 19 Assuming an unsafe position or posture 12

Cloth-mercerizer operator; mercerizer-machine operator; mercerizer: Operates a series of machines (mercerizers) which gives cotton cloth a silk-like luster. Places rolls of cloth on unwinding box or moves truck load of folded cloth into position at mercerizer; mixes solutions for mercerizer; tests for, and maintains, required strength of solutions in machine; sews, by machine, lengths of cloth to form a continuous strip for processing.

Major hazards: Handling rolls of cloth, center bars, shells, and chemicals; belts, chains, and other moving machine parts; wet floors; hand trucking; steam pipes.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 8.6 Medical 51.7 Total—disabling and medical 60.3 First aid (5) Total—all injuries (5)	Bruises and contusions 27 Burns and scalds 25 Strains and sprains 22 Cuts and lacerations 12	Trunk 28 Eye 20 Finger 18 Foot 14	Machines 35 Working surfaces 20 Hand trucks 10 Chemicals 8	Absorption of chemicals 26 Slips (not falls) 14 Struck by moving objects 14 Striking against or bumping into objects 14 Falls 10	Slippery floors 25 Improperly guarded agencies 21 Unsafe planning or unsafe processes 18 Aged, worn, or cracked equipment 14	Assuming unsafe positions or postures 48 Unsafe use of equipment or using equipment unsafely 26 Unsafe loading, placing, or mixing 13

Cloth printer; printing-machine operator: Operates machine (printing machine) which prints patterns of various designs and colors on cloth. Supervises work of back tender, gray-tender and back-end man; assists in placing printing rollers on machine; adjusts machine to keep pattern in correct position; inspects printed cloth for defects; files doctor blades.

Major hazards: Gears and belts; handling shells, center bars, trays, doctor blades, printing rollers, and printed cloth; hand trucking; slippery floors; steam pipes.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 30.3 Medical 63.6 Total—disabling and medical 93.9 First aid (5) Total—all injuries (5)	Cuts and lacerations 31 Strains and sprains 29 Bruises and contusions 16 Industrial diseases 12	Trunk 27 Finger 23 Leg 11 Hand 10	Machines 25 Working surfaces 11 Chemicals 10 Benches, tables, chairs 9	Striking against or bumping into objects 27 Overexertion 19 Struck by moving objects 17 Absorption of printing colors 13	Improperly guarded agencies 19 Rough shells, center bars, etc. 19 Lack of proper lifting equipment 19 Slippery floors 16	Gripping objects insecurely, or taking wrong hold of objects 29 Assuming unsafe positions or postures 28 Inattention to footing 16 Unsafe lifting 10

Cloth-washer operator; soaper operator; rope-soaper operator; open-soaper operator; washing-machine tender: Operates a washing or soaping machine to prepare cloth for bleaching or to treat it after any one of various processes. Fills soaping and rinsing tanks with water; adds caustic solution and soap chips in soaping tank and may add other chemicals in other tanks; maintains required temperature in tanks by adjusting steam valves; threads machines and pot-eyes; sews, by machine, lengths of cloth to form a continuous strip for processing.

Major hazards: Squeeze rollers, gears, belts, etc; hand trucking; wet floors; steam lines and live steam; handling rolls of cloth.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 24.4 Medical 72.1 Total—disabling and medical 96.5 First aid 374.9 Total—all injuries 471.4	Bruises and contusions 32 Strains and sprains 24 Cuts and lacerations 16 Burns and scalds 13	Trunk 26 Head 17 Finger 13 Hand 11 Arm 10	Machines 32 Working surfaces 18 Hand trucks 11 Chemicals 10	Struck by moving objects 19 Caught in, on, or between moving objects 16 Absorption of chemicals or dyes 14 Overexertion 14 Falls 13	Improperly guarded agencies 26 Slippery floors 24 Lack of proper lifting equipment 15	Assuming unsafe positions or postures 27 Gripping objects insecurely, or taking wrong hold of objects 25 Inattention to footing 10

Color mixer; dye weigher; kettleman: One who weighs and blends into uniform mixture by hand or machine, various color ingredients such as dyestuffs for cloth or color for cloth printing or coating. Measures out prescribed quantities of materials into mixing tubs; places mixing tubs under power-driven agitators which mix contents thoroughly; adjusts steam valves to heat mixtures; delivers mixtures to dye and print rooms; cleans mixing kettles, tubs, floors, etc.

Major hazards: Handling heavy tubs of color mixtures, containers of raw materials, and chemicals including dyes and printing colors; wet and slippery floors; belts and gears on agitator; hand trucking; steam pipes and live steam.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 31.0 Medical 51.7 Total—disabling and medical 82.7 First aid 317.2 Total—all injuries 399.9	Strains and sprains 30 Burns and scalds 21 Bruises and contusions 16 Industrial diseases 15 Cuts and lacerations 11	Trunk 29 Eye 17 Hand 15 Finger 9	Containers 33 Chemicals 27 Working surfaces 10	Absorption of chemicals, including dyestuffs and colors 34 Overexertion 26 Struck by moving objects 12	Lack of proper lifting equipment or of sufficient help in lifting 32 Slippery floors, etc. 11 Improperly guarded agencies 12 Unsafe planning or unsafe processes 11	Mixing or combining unsafely 20 Gripping objects insecurely, or taking wrong hold of objects 19 Assuming unsafe positions or postures 19 Unsafe lifting 14 Failure to wear personal safety equipment 14

Continuous-dyeing-machine operator: Operates a continuous dye machine in which cloth is dyed and washed and the colors fixed in one continuous operation. Places rolls of cloth on unwinding jacks; threads dyeing machine; fills tanks with necessary dyes and chemical solutions; maintains proper temperature in each tank by adjusting steam valves; sews, by machine, lengths of cloth to form a continuous strip for processing.

Major hazards: Squeeze rollers, belts and gears; handling rolls of cloth, center bars, shells, and chemicals; steam lines and live steam; wet floors; hand trucking.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 9.8 Medical 39.2 Total—disabling and medical 49.0 First aid (5) Total—all injuries (5)	Bruises and contusions 27 Burns and scalds 27 Strains and sprains 24 Cuts and lacerations 12	Trunk 22 Head 17 Finger 12 Hand 10 Leg 10 Toe 10	Machines 20 Chemicals 15 Hand trucks 12 Containers 12	Absorption of chemicals including dyes 27 Overexertion 20 Struck by moving objects 15 Striking against or bumping into objects 12 Caught in, on, or between moving objects 10	(5)	Gripping objects insecurely, or taking the wrong hold of objects 23 Assuming an unsafe position or posture 20 Mixing or combining unsafely 13 Inattention to footing 10 Unsafe lifting 10 Unsafe use of equipment 10

Dry-cans operator; can-drier operator; can tender: Operates a machine (dry cans) consisting of a number of hollow cylinders arranged horizontally in tiers, geared to turn together and filled with steam by which cloth is dried. Threads cloth through the dry cans; opens valve to admit steam to the cylinders and maintains proper temperatures within the cylinders; sews, by machine, lengths of cloth to form a continuous strip for processing; removes completed rolls of cloth from delivery end of dry cans.

Major hazards: Steam heated cylinders and steam lines; gears; hand trucking; handling rolls of cloth, center bars, and shells.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 31.2 Medical 47.1 Total—disabling and medical 78.6 First aid 270.6 Total—all injuries 349.2	Bruises and contusions 29 Strains and sprains 28 Cuts and lacerations 17 Industrial diseases 11	Trunk 28 Hand 18 Head 14 Finger 14 Arm 10	Machines 25 Hand trucks 17 Rolls of cloth 14 Working surfaces 10	Struck by moving objects 19 Overexertion 18 Caught in, on, or between moving objects 15 Striking against or bumping into objects 14 Falls 13 Absorption of chemicals 13	Lack of proper lifting equipment 28 Improperly guarded agencies 18 Unsafe planning or unsafe processes 13 Slippery floors 10	Assuming an unsafe position or posture 38 Gripping objects insecurely, or taking the wrong hold of objects 30

Drying-machine operator, n. e. c.: Operates any one of a number of machines, such as loop driers, extractors, and net driers, which dry cloth. Moves truck loads of cloth into position; threads, or loads, drying machine with cloth; removes cloth from drying machine.

Major hazards: Gears and belts; steam lines; handling rolls of cloth, center bars, and shells; hand trucking.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 32.1 Medical 85.5 Total—disabling and medical 117.6 First aid (5) Total—all injuries (5)	Strains and sprains 36 Bruises and contusions 19 Cuts and lacerations 17 Fractures 12	Trunk 25 Hand 16 Finger 13 Leg 11	Machines 28 Rolls of cloth 19 Hand trucks 17 Working surfaces 7	Overexertion 27 Struck by moving objects 20 Caught in, on, or between moving objects 14 Striking against or bumping into objects 13 Absorption of chemicals including dyes 10	Lack of proper lifting equipment 36 Defective agencies 27 Improperly guarded agencies 19	Gripping objects insecurely, or taking wrong hold of objects 31 Assuming unsafe positions or postures 21 Unsafe lifting 14 Inattention to footing 10 Unsafe placing, loading, or mixing 10

Dye-reel operator; dye-beck-reel operator; dye-box operator: Dyes cloth in rope form by running cloth over a revolving wheel and through a beck (tub) containing dye. Opens valves and admits steam and water to beck; mixes and adds dye to water according to specifications; hangs several pieces of cloth over reel and sews ends of each piece together to make several loops hanging in dye liquor below; starts machine and allows cloth to be immersed a specified number of times; rinses cloth by draining dye from beck and replacing it with water; removes cloth from beck and places it in hand truck.

Major hazards: Handling pieces of cloth, wet or dry, and dyed; dyestuffs and other chemicals; wet floors; belts, pulleys, and gears; steam pipes and live steam; hand trucking.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 50.2 Medical 51.3 Total—disabling and medical 101.5 First aid (5) Total—all injuries (5)	Strains and sprains 31 Bruises and contusions 24 Burns and scalds 21 Cuts and lacerations 14	Trunk 34 Finger 14 Hand 12 Foot 10	Machines 21 Working surfaces 19 Containers 11 Chemicals 11 Cloth, not rolled or baled 11	Overexertion 23 Absorption of dyes 18 Struck by moving objects 15 Falls 10 Contact with extreme temperature 10	Slippery floors 24 Improperly guarded agencies 21 Unsafe planning or unsafe processes 18 Lack of sufficient help in lifting operations 12	Gripping objects insecurely, or taking wrong hold of objects 23 Unsafe lifting 23 Assuming unsafe positions or postures 19 Unsafe mixing or combining 11

Fireman: Tends a boiler used for supplying heat or steam to a building or to powered equipment; fires one or more furnaces to maintain required steam pressures.

Major hazards: Furnaces and steam lines; slippery floors; coal dust; shoveling or otherwise moving coal.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 20.3 Medical 30.5 Total—disabling and medical 50.8 First aid (5) Total—all injuries (5)	Bruises and contusions 28 Strains and sprains 25 Burns and scalds 16 Cuts and lacerations 15 Foreign bodies in eyes 10	Trunk 30 Eye 15 Finger 12 Hand 11 Foot 10	Boilers and pressure vessels 21 Working surfaces 13 Hand tools 11	Struck by moving objects 24 Striking against or bumping into objects 17 Overexertion 15 Contact with extreme temperature 14 Falls 11	Defective agencies except slippery floors 25 Improperly guarded agencies 21 Slippery floors 13 Lack of clear walkways or working surfaces 11 Unsafe planning or unsafe processes 11	Assuming unsafe positions or postures 26 Gripping objects insecurely, or taking wrong hold of objects 15 Unsafe lifting 14 Inattention to footing 13 Unsafe use of equipment 11

Folding-machine operator; folder operator; hooker-machine operator; yarder operator: Operates a machine (folding machine or hooker) which folds cloth in pleats 1 yard wide. Places rolls of cloth on unwinding jack; threads cloth through hooker; inspects cloth for defects as it passes through machine and marks defects by placing string or tape in the fold; stops machine, tears or cuts cloth, and removes folded cloth from table of machine.

Major hazards: Blade of hooker; handling rolls of cloth, pieces of folded cloth, center bars, and shells; belts and other power-transmission attachments on hooker; hand trucking.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 21.3 Medical 61.2 Total—disabling and medical 82.5 First aid 699.8 Total—all injuries 782.3	Bruises and contusions 50 Strains and sprains 22 Cuts and lacerations 17	Finger 28 Hand 20 Trunk 16 Arm 11	Machines 65 Rolls of cloth 8	Caught in, on, or between moving objects 42 Striking against or bumping into objects 15 Struck by moving objects 14 Overexertion 13	Improperly guarded agencies 63 Defective agencies 16 Lack of proper lifting equipment 14	Gripping objects insecurely, or taking the wrong hold of objects 37 Assuming unsafe positions or postures 27 Inattention to footing 14 Unsafe use of equipment 13

Foreman; supervisor: Supervises a group of workers engaged in similar or related work.

Major harzards: Similar to those of workmen under his supervision.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 8.8 Medical 47.9 Total—disabling and medical 56.7 First aid 257.8 Total—all injuries 314.5	Bruises and contusions 29 Strains and sprains 27 Cuts and lacerations 18 Burns and scalds 12	Trunk 27 Head 14 Finger 14 Leg 12 Arm 10	Machines 18 Working surfaces 13 Containers 10 Hand trucks 9	Overexertion 21 Struck by moving objects 20 Striking against or bumping into objects 18 Caught in, on, or between moving objects 11 Falls 11 Absorption of dyes and chemicals 11	Improperly guarded agencies 21 Lack of proper lifting equipment 20 Defective agencies except slippery floors 20 Slippery floors, etc. 13 Unsafe planning or unsafe processes 11	Assuming unsafe positions or postures 22 Gripping objects insecurely, or taking wrong hold of objects 18 Inattention to footing 13 Unsafe lifting 13

Goods layer; cloth layer-out; lay-out man: Opens bales of cloth and lays out cuts of cloth in order that the ends may be sewn together to form a continuous strip. Cuts metal tie bands from bales and strips off burlap; lifts cuts of cloth from opened bales and re-piles it on skids, hand trucks, or on floors; pulls lead and tail ends of each piece of cloth and hangs them over the side of the pile; removes tie bands and burlap from floor.

Major hazards: Handling pieces and bales of cloth; hand trucking; loose burlap.

	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Disabling 14.7 Medical 66.2 Total—disabling and medical 80.9 First aid (5) Total—all injuries (5)	Strains and sprains 40 Cuts and lacerations 31 Bruises and contusions 19	Trunk 37 Finger 19 Hand 12 Head 9	Containers 32 Cloth, not rolled or baled 22 Hand trucks 15 Working surfaces 11	Overexertion 34 Struck by moving objects 25 Striking against or bumping into objects 10 Falls 11	Lack of sufficient help in lifting operations 31 Sharp-edged bales, hand trucks, etc. 31 Slippery floors, etc. 10	Gripping objects insecurely, or taking wrong hold of objects 36 Unsafe lifting 27 Inattention to footing 13

[1] The injury-frequency rate is the number of injuries per million hours worked. The disabling-injury frequency rate is based on the number of disabling injuries, the medical-injury frequency on the number of medical injuries, and the first-aid-injury frequency rate on the number of first-aid injuries.
A disabling injury is one that results in death, permanent disability, or an inability to perform a regularly established job on any day subsequent to the day of injury.
A medical injury is a nondisabling injury requiring treatment by a physician or surgeon.
A first-aid injury is any injury other than disabling or medical which requires first-aid treatment.

[2] The agency is the object, substance, or exposure which is most closely associated with the injury and which, in general, could have been guarded or corrected.
[3] The unsafe working condition is the condition of the selected agency which could and should have been guarded or corrected.
[4] The unsafe act is that violation of a commonly accepted safe procedure which resulted in the selected accident type.
[5] Figures not available because of insufficient data.

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