DR. SEXTON: I have to report that there has been no meeting of the committee. The Association was organized after all the legislatures of the different states had closed for the year. We have a session in Connecticut every other year, and have had no session since our organization. For that reason, there has not been a meeting of the Legislative Committee.

The Chairman then called for the report of the Membership Committee, Dr. Bresnahan, Chairman.

No report.

No report from the Committee on Constitution and Rules, Dr. Dowling, Chairman.

DR. HOWLAND: The next item is the reading of a paper on "The Hospital Laundry," by Dr. Harold W. Hersey, of the New Haven Hospital.

THE HOSPITAL LAUNDRY.

BY HAROLD W. HERSEY, M.D., SUPERINTENDENT OF THE NEW HAVEN HOSPITAL.

IN no department of the hospital is adequate equipment, efficient organization and standardized routine more essential than in the hospital laundry. The various wards must be supplied at regular intervals with clean, soft fabrics, free from pathogenic bacteria and disagreeable odors. To insure the delivery of this supply, the laundry must run with clock-like precision.

This result is only possible with an efficient manager, competent employees, coöperation among the employees, definitely assigned duties, adequate wage, modern machinery, and a well-organized and standardized routine for putting through the day's work.

With the equipment now furnished by the various companies manufacturing laundry machinery, it is possible for even the smaller hospitals to conduct a laundry on an economical basis, and as some hospitals are able to install new equipment or to plan for new laundries, we will start our discussion at that point.

In planning the laundry it is desirable to construct a building detached from the main hospital. Frequently, however, the hospital plot is too small or the plans for future development are such that this type of structure is impossible.

It should be borne in mind that laundry employees work in a super-heated atmosphere, permeated with steam and the odors of various chemicals, and that every effort should be made to overcome these conditions by providing for the circulation of pure air, and the removal of the foul air.

The building should be of fireproof construction with concrete, water-proofed floors, and so placed as to allow the maximum of sunlight at all hours of the day. For this purpose the factory type of construction with abundant windows is excellent. The rooms should be high studded, at least 15 feet in height, and if possi-

ble should be provided with a monitor type of roof or skylights.

The general arrangement of the laundry should be such that the work proceeds systematically, step by step, from one point to another, care being taken that at no point do these steps cross.

There should be an ample receiving and sorting room so arranged that if goods are brought in from an infectious or contagious patient they may be given a sterilizing wash before entering the laundry proper. The average sterilizing washer is so constructed that goods may be put in at one side, and when sterilization is completed at a pressure of 15 pounds for 30 minutes, removed at the other side or the receiving room proper.

It is well to have all goods checked on entering the laundry at this point, the results compared with the accompanying laundry slip and any discrepancies noted and reported.

The goods should, after being classified, proceed through the various steps with which you are all familiar, the washers, extractors, driers and tumblers, mangles, and so on.

In the receiving room the incoming goods should be examined and properly marked. It is well on issuing new linens to have the date of issuance marked on the fabric, as it is frequently desirable to ascertain the length of wear of such material.

In arranging the laundry it must be remembered that many cumbersome laundry trucks must pass and repass each other and ample floor space must be allowed for the workers and the necessary trucks and hampers. No plant can be efficient if crowded.

There are several very excellent washers on the market and the various manufacturers of laundry equipment maintain consulting engineers who will gladly advise upon the size and number of machines required for the present needs and future development of the hospital.

Over each machine and over each area from which heat or steam arises, a hood should be placed connected with an exhaust fan. The more modern equipment is operated by individual motors, thus effecting an economy when the machines are idle and eliminating the annoyance of belt-driven machines.

The William Wirt Winchester Hospital at West Haven, now leased by the Public Health Service and known as the U. S. Veterans Hospital, No. 41, is an example of the more recently constructed hospital laundry. This laundry is approximately 60 feet square and contains:

- 2 Cascade Washers
- 2 Extractors
- 1 Tumbler
- 1 Venturi Tumbler
- 1 Hurricane Dryroom
- 1 Flat Work Ironer (4 roll Hagen type)
- 1 Bosom Press
- 2 Cuff Presses

- 2 Garment Presses
- 1 Yoke Press
- 1 Collar Ironer
- 1 Neck Band Machine
- 1 Rotary Edger
- 1 Seam Dampener
- 1 Spray Dampener
- 1 Combination Table
- 1 Starch Cooker
- 1 Shaper (hot tube)
- 1 Collar Shaper

The power-driven machines are propelled by individual motors.

Between 450 and 500 patients are cared for besides the necessary hospital personnel. 101,919 pieces of laundry were handled last month and the laundry payroll contains 18 names.

The washing machines should not empty directly into the sewers but into suitable concrete drains in the floors. This allows the wash-man to see the color of the water as it is drawn from the machine and prevents an occasional piece of goods from being washed into the sewer. The floor drain should be provided with a suitable screen.

The washing of goods depends upon the rapid agitation in warm water and suds, in a revolving cylinder, so arranged that the goods are carried through the soapy water, permeated by this solution, lifted to the top of the cylinder and dropped forcibly into the water below. The machine then reverses its action and revolves an equal number of times in the opposite direction. It is claimed that the reversal of the cylinder helps the penetration of the washing fluids and keeps the goods from becoming badly tangled.

It is interesting to note that at several of the recent conferences of State Laundry Associations, the advantages of washing the goods in nets and so adjusting the machines that the reversing action is omitted, have been discussed. The claims made for this method are that it requires less time to complete the wash; that the nets prevent the clothes from becoming entangled, and that less power is required to carry the load in one direction than to stop and start in the opposite direction.

Many laundries are replacing the liquid soap formerly considered essential, by powdered soap, and if it is carefully measured and scattered over the cylinder with the proper proportion of soda, I believe it to be efficient. The advantages are the saving of steps, a more accurate knowledge of the amount of soap used, the elimination of one cause of a slippery floor with its dangers, and a small saving in steam.

In buying chipped soap those soaps in which the fatty acids are largely from tallow are the best for laundry use. Not more than 12 per cent. of moisture should be present. It is poor economy to buy water at the price of soap. The Laundry Owners National Association recommend the following procedure to obtain

a rough estimate of the moisture content of soap:

"Weigh out on scales about five to ten pounds of soap from the center of a freshly opened barrel, and place the soap, spread out on a tray, in the dry room, and leave for several hours. Then let the soap cool to room temperature and at once weigh again. The first weight minus the last weight, divided by the first weight and multiplied by 100, is the percentage of moisture. Example: Weigh out 10 pounds of chipped soap. After drying it is found to weigh 8 pounds and 8 ounces, or $8\frac{1}{2}$ pounds. Then: $10 - 8\frac{1}{2} \div 10 \times 100 = 15.0$ per cent."

We all know that in the washing process we are aided by the action of alkali and a soap, but do we know why we use alkali in this process?

An alkali when dissolved in water gives a solution with the following properties:

1. A brackish taste.
2. A soapy feel.
3. It turns red litmus blue.
4. It neutralizes an acid.

Soap is a product formed by the reaction of any base such as sodium, potassium or ammonium, with a fat. The three alkalies mentioned are soluble in water and are therefore of interest in the laundry industry.

Experimentally it has been found that solutions of soda ash, borax and other common alkalies will not wash lamp black, rouge and similar substances through a filter paper.

Soap solutions will wash these substances through the filter paper. Any of the alkalies will increase the amount of lamp black washed through the paper, and from the above it is seen that alkalies, while not detergent, greatly increase the detergent powers of soap solutions.

The reasons for using an alkali in washing clothes are, therefore:

- (1) to increase the detergent power of the soap.
- (2) to neutralize the acid substances found in some dirt on soiled linen.
- (3) to convert the greases present in soiled fabrics into soap and aid the detergent process.
- (4) to prevent the formation of a certain per cent. of lime soap in hard water, which causes the goods to feel gritty and frequently covers them with a sticky substance, imparting a grayish cast to the fabric.

The most suitable alkali for all around purposes is sodium carbonate, Na_2CO_3 , called soda ash.

An article by Dr. A. F. Shupp, Director of Chemical Engineering of the Laundry Owners National Association, appearing in the Laundry Journal of February, 1922, gives an interesting discussion of the action of soap and alkalies.

In washing it is customary to give a five minute breakdown in cold or lukewarm water

and soda to remove albuminous deposits, such as blood and perspiration and loose dirt. These albuminous deposits would be set by hot water. Tri-sodium phosphate is of value in removing blood stains.

In the different laundries different routine for washing may be found, dependent upon the type of goods to be washed and the amount they are soiled. Usually the cold rinse is followed by a hot suds bath for fifteen minutes in three inches of water, a hot water rinse in six inches of water, for fifteen minutes; a second bath in hot water, followed by a rinse, and in many cases bleach is used at this point when necessary, followed by the sour and sufficient rinsing. Neither too much water nor too much soap should be used. The clothes are more thoroughly cleansed in a shorter period in three inches of water than in six inches. In a 36"x64" washer, for example, thirty-three more gallons of water would be required when washing with eight inches of water than in washing with three inches of water, and three pounds more soap would be used.

From experiments carried on by the government, it appears that it is seldom necessary to employ a temperature higher than 140°F. maintained for ten to fifteen minutes to destroy pathogenic non-spore bearing bacteria. For example, the thermal death point of streptococcus was found to be 131°F., maintained for 10 minutes; micrococcus was found to be 140°F., maintained for 10 minutes; bacterium diphtheriae was found to be 140°F., maintained for 10 minutes; bacterium influenzae was found to be 140°F., maintained for 15 minutes. It was found that the effect of a temperature of 158°F., maintained for 5 minutes was the equivalent of 140°F., maintained for 30 minutes. Spore-bearing bacteria require boiling temperature for varying periods. It would seem, therefore, that as far as destroying the bacteria commonly encountered it is unnecessary to exceed a temperature of 180°F., which temperature will not injure fabrics.

To ensure the best results and allow standardization of work, each washing machine should be provided with an accurate thermometer, proper valves, and there should be a clock in a conspicuous place on the wall.

Many goods coming to the laundry are badly stained and require a bleach, and while it is not necessary to use a bleach as a routine, it should be used when necessary, and does little harm if used with consideration. The most common bleach is sodium hypochlorite or Javelle water.

After a thorough rinse a sour must be used to neutralize the alkali. Acetic acid is one of the best and the least harmful.

Time does not permit a further discussion of laundry procedure. It may be of interest to state that many of the tumblers are now provided with fresh air intakes, which impart a certain amount of freshness to the dried goods.

The body ironers are being replaced to a large

extent by presses. For economical work these should be arranged tandem. A recent device now in use at the laundry of the Pennsylvania Hotel in New York, one of the largest hotel laundries in the country, and equipped to handle 20 tons of linen daily, is the Universal flat work folder, which may be attached to the regular roller ironer and used for folding flat work. The turbine-driven extractor is also of interest.

Accurate records of laundry output should be kept and not only the daily and weekly results noted, but the supplies consumed and the weekly expense should be analyzed. Some hospitals compute the earnings of the laundry in terms of the charges made by the commercial laundry, but this does not appear to be entirely satisfactory.

A careful laundry manager will find many ways in which economies may be effected. Goods should never be thrown on the floor as the fibers are easily injured by the wheels of laundry baskets passing over them, or by the heels of the employees. Leaks from water and steam pipes should be controlled. Sharp corners on baskets, broken hinges on washers and tumblers, and loose covers on the cylinders of the washers may subject the linens to damage of tearing, and should be speedily repaired. The strong arm washer should not be countenanced.

It is well to observe frequently the activities in parallel lines of work, as for example the activities of the men interested in the commercial laundries. These men are a keen and progressive group of business men, and are raising the laundry industry to a high standard of efficiency.

The following illustrations are given. In the majority of the states the laundry owners have formed the State Laundry Associations, which hold enthusiastic conventions. Anyone interested in the laundry industry is welcomed at these meetings.

There is also a Laundry Owners National Association with associate membership open to hospital representatives. This Association maintains an industrial fellowship at the Mellon Institute of Industrial Research, of the University of Pittsburgh, in order to promote investigation of laundry problems. The Association now proposes the formation of an American Institute of Laundry Industry to provide a training for laundry managers, and to promote research in laundry problems.

There are several excellent publications dealing with the laundry, and these should be available to those in charge of hospital laundries.

In Massachusetts the laundry owners have interested the manufacturers of textiles in a co-operative movement to standardize fabrics and their manufacture. This movement is of interest to us for, should it accomplish its purpose, it will guarantee to a purchaser textiles of a standard quality, thus insuring a longer life for fabrics passing through the laundry.

I wish to acknowledge the assistance of the Hospital Library and Service Bureau of Chicago in the preparation of this paper. An extensive bibliography was furnished me by the secretary, and numerous articles on hospital laundries. I especially mention articles by Walter Trimble of Chicago. I would recommend to you for careful study a pamphlet published by the Laundry Owners National Association, called "A Manual of Standard Practice for the Power Laundry Washroom."

To summarize, it may be stated that the hospital laundry presents a problem whose satisfactory solution calls for efficient organization of the laundry personnel, standardization of labor, a definite schedule, accurate records, and efficient management, thus developing maximum results and minimum expenditure.

DR. HOWLAND: Dr. Hersey's most interesting and helpful paper is open for discussion. I am sure that no more practical paper could be presented than this on the subject of the Laundry.

Question: How do you handle the clothing of patients with contagious diseases?

DR. RICHARDSON: At the Providence Hospital we have never used a sterilizing washer, and I might say that, so far as we are able to ascertain,—and we have investigated a little,—no child has ever got a contagious disease from laundry sent back. Of course, if washing is done, as it is usually done in a commercial laundry, at a low temperature, say 40° or 50°, the chance of killing organisms is not great. While they might be got rid of mechanically, they will not be killed at that temperature. But as done in most hospital laundries, I think ordinary washing is sufficient. We experimented, putting clothes in a perforated receptacle in the centre of the laundry, and we found that those organisms, streptococcus, typhoid, and staphylococcus were practically all killed. We used from 30 to 60 minutes in washing, and most of the time the water was at a pretty high temperature. I also checked up the temperature of the water, and found that it averaged from 90° to 95°. I don't think it is necessary for any hospital to have a sterilizing machine. The objections are that they are more expensive; it is more work to do the washing in this manner, and the hot sterilizing water sets the stains in the clothes. I visited a good many hospital laundries, some of them contagious hospitals, and the linen was pretty black. It can't be avoided, if such high temperatures are maintained. Our linen is white, and compares favorably with any general hospital, because we do not use a sterilizing washer. This is of particular interest to small hospitals that can ill afford expensive sterilizing washing. From our own experience, I can confidently say that if the temperature of the water

during the washing process is 90° or 95°, that for practical purposes is sufficient. The only danger is in handling the laundry from the time it leaves the ward until it is actually deposited in the wash. We have clothes chutes. There is a door in the wall in the middle of the ward, with a little contrivance with spring hinges, so that the door can be opened with the forearm; the hands don't have to touch it. The linen from the beds, or towels, or other articles, are thrown into this chute, and fall into a canvas bag at the bottom of the chute. The chute is lined with galvanized iron, which has been painted. A great many hospitals have spent a lot of money on very elaborate clothes chutes. I saw one in Chicago that cost as much as a small hospital, which I don't think is at all necessary. We have washed these clothes chutes for a certain distance,—what can be done from the door, and they are not foul. Very soiled pieces are washed before they are thrown into the chute. The laundryman collects these bags on an ordinary barrel truck. He wears a gown and a pair of washable gloves, and whenever he wants to open a door or pull the elevator rope, he slips off one of the gloves. The laundry is put in front of the washer. He takes it out of the bag and puts it into the wash box. Such pieces as colored pieces and blankets we throw into barrels. He then throws his gown and his gloves right into the washer and proceeds to wash in the usual manner. It isn't difficult to get any intelligent fellow to do it, and to do it carefully. The danger from laundry has been exaggerated, anyway. Of course, it is theoretically possible to spread disease in that way. In twelve years I think we have had one laundry-maid get scarlet fever; I think that is all we ever had.

DR. SEXTON: We have had a good deal of trouble in ventilating our laundry. When I first went there, we put in patent ventilators. Up to that time, they had depended on windows for ventilation. We put in a patent ventilator to every 500 feet of floor space, and tried it for a couple of years; but notwithstanding their guaranty that condensation would not form and fall back on the floor, it occurred with every one of those ventilators. Then we took those all out, and put in a central ventilator shaft in our wash-room and ironing-room, 10 feet square, going up through. In the wash-room we converted it into a skylight, which gave us additional light, and at the same time all the ventilation area that was necessary. In the ironing-room we had to go up through two additional floors, so that rendered the making of that particular ventilating shaft into a skylight impracticable. We find these shafts have solved our problem of ventilation. Our laundry employees suffered intensely prior to the installation of these shafts, but now they are very comfortable on the hottest days we have. An advantage of

this method over patent ventilation is that it can be built by any ordinary hospital.

MISS COLEMAN, Good Samaritan Hospital: We wash the household linen and other linen at different times. We use the same wash-room; but they are not put in together.

DR. BAKER: I suppose we are all interested in the expense of maintaining a hospital, and in keeping the running expenses down. One way is to avoid waste and to avoid destruction. Starting with the laundry, I suppose certain destruction is due to our buying poor material, poor linen. We are not careful enough in selecting linen that will stand the wear and tear. Sometimes I think we buy too good linen. For illustration, take the heavy cotton huckaback towel; the average nurse is certainly wasteful; the huckaback towel is unwieldy to handle, and she starts to use it, casts it aside and takes a lighter one; it is easier to wipe dry with a light, pliable towel than with a heavy one. That means more labor and expense. Another thing I have found that costs some money is in bleaching. If particles of free chlorine get on the clothes directly, it leaves holes. That means destruction of your fabric. This comes from not carefully stirring it up or dissolving it. Another very common way of destruction is by the strong arm, the man hauling clothes out of the washer. We ought to be careful, also, about the padding on the mangle. Sometimes the padding is put there, and not changed, and gets worn, and that often means tearing of the fabrics. Another saving that I have found is in the sewing machine. Many of us maintain just an ordinary Singer machine, run possibly by a motor, for repairing the clothing from the laundry. The Singer people put out a heavier machine, which is much faster, and has a darning attachment which is very rapid, and will darn holes of from three to five inches in less time than one can patch them. In this matter of saving, I should like to have more small points brought out.

DR. HERSEY: Part of the cause of holes in linen which are found at different times, has been discovered to be due to the medicine glasses and solution glasses, sometimes put on tables by the bedside. Sometimes antiseptic solutions and sterilizing solutions are used, and some of the acids in those solutions frequently get on to the bed, which makes a hole. Then the clothing goes to the laundry and gives way, and some of the damage done in the wards is credited to the laundry. Along the same line, it has been found that if the hinges of covers on washing machines are not kept tight, some of the clothes get through the opening in the covers, and are pulled as the laundry revolves around, and some holes are due to that cause.

MR. STEVENS: I should like to ask Dr. Hersey whether, in his opinion, the linen supply room

and the clean linen room, where the linen is brought from the laundry, should work together, or whether that room might be one room, from which all linen should be issued—whether it should be direct from the laundry, or direct from the supply room?

DR. HERSEY: For the distribution of the laundry, it would seem to be better to have a separate room. In one hospital I know the linen is all marked by the number of the ward. The routine in that hospital is to send down the linen to be sorted, and then the same amount of linen as comes down from the ward is returned to the ward, and the ward itself checks out the linen. In many hospitals, another method of distribution is used. The linen comes from the ward without any special mark; this is checked up and upon receiving the checked laundry list the person who brought the linen down goes to the linen room, and is reimbursed with new linen, issued from the central supply room. This is more satisfactory; it insures quicker delivery and prevents the head nurse from borrowing from different wards linen to make up accounts.

DR. PORTER: Does Dr. Richardson find it necessary to have a metal body washer? or is a wooden body suitable?

DR. RICHARDSON: We had wood in the beginning, and changed more as a matter of economy. The cylinder is brass, which lasts almost indefinitely.

DR. PORTER: Where you have metal inside the body, is it entirely satisfactory to have the outside wood?

DR. RICHARDSON: We had a wooden washer put in in the beginning, but the wooden cylinders gave out frequently; so as a matter of economy, we put in brass cylinders.

DR. HOWLAND: We might well take a lesson from this paper on Laundries to see whether laundries are properly lighted. Mr. Hixon made it clear that we can't have good work unless workers can see what they are doing. There is a type of reflector painted white inside that you can put inside of a high-power nitrogen lamp, which can be concealed by a little reflector that clamps on to the under side of the lamp, and gives a perfectly surprising distribution of intense light. It costs a few dollars only.

One great source of loss is not the strong arm only in washing, but in packing the extractor. The man throws in the clothes haphazardly across the extractor, and then more on top, criss-cross. Articles should be rolled up into a small mass and packed in around the edges and toward the center, so that when they are taken out they are not in a snarl. At the Brigham Hospital, when a new man is put on to the extractors, he

is given instruction by the engineer. We don't always escape torn linen, however.

DR. RICHARDSON: We have had cones put inside the extractors so that the lines won't stretch across the side. I don't know whether it has done any good or not.

DR. HOWLAND: I should like to ask if anyone has found a marking ink that can be used to mark linen—by which I mean flax, not cotton—and will be permanent. We have a National Marking Machine, and we have used all the various inks, but we can't find anything that will stay in linen. We have to use silver ink and mark by hand. The ink stays black for a long time in cottons.

No reply.

DR. FAXON: I should like to ask what results are obtained by those who use soap and water alone, and those who use soap and water and bleaches and the like. We have been trying for the last year, at the Massachusetts General, using nothing but soap and water on our clothes. Although I can't say that they are absolutely perfect, I think we get a reasonably good color, and certainly we don't incur the danger that comes with bleaches. Neither do we use any addition of soda.

DR. BAKER: Does Dr. Faxon mean soft soap?

DR. FAXON: We make our own soft soap, using grease from the kitchen, and cooking it in the usual manner. We have the chemist test it occasionally, to see that the man who is doing it is not getting careless, and is following the formula.

DR. BAKER: Will soap take out blood? Isn't it almost necessary to use a soda wash in order to get results?

DR. FAXON: After reading laundry pamphlets and talking with people, it seems as if we were doing something nobody else was doing; yet we seem to get satisfactory results. I think our linen is as good as could be expected. Of course, some clothes are stained.

DR. BAKER: Isn't that due to the fact that you add an excess of caustic in the soap solution?

DR. FAXON: No; the soap tests out what would be called neutral soap.

DR. BAKER: It is contrary to all blood chemistry.

DR. FAXON: I can't find anyone who thinks that it can be done. But the chemist makes an examination of the soap and reports a neutral soap, with no excess of alkali. The person in charge of the laundry has no soda, so that I

know no soda is used, and there is no Javelle water in the laundry. Yet we have linen that we don't get complaints about. We use quite a number of rinses, but I think no more than the ordinary laundry is using.

DR. HOWLAND: At the Brigham Hospital, we have a similar practice, but I think our soft soap has a considerable amount of alkali in it. It seems to us that our linen wears very well. I saw recently some pillow-cases stamped 1916, though I see plenty of things with a more recent date. We don't think that a soft soap, made from laundry grease and sodium hydrate, with a considerable amount of alkali, is bad. It is economy to use your kitchen greases and to make your own soap. In many hospitals it can be arranged to have the soap tank connected by an ordinary pump which will deliver close to the tubs. It is no work to step to the pump close to the tub and pump out soap. I should say that our soft soap had something like 8 per cent. free alkali. The linen certainly is white. No bleaches are used.

DR. FAXON: I believe a neutral soap is defined as containing a small amount of alkali, so that when you say "neutral soap," you have a leeway of several points.

DR. HOWLAND: Recently we have tested some hard soap for toilet purposes, and it showed about one-half of one per cent. alkali.

DR. BAKER: Is there anyone here who knows about the average life of the average piece of hospital linen, a sheet, pillow-case, or towel; how long should we expect it to live?

Ans. I think it depends on the actual use to which the linen is put. We expect to replace sheets after they have been in constant use three years.

(To be continued.)

Book Review.

Kurzer Leitfaden der Psychiatrie. By DR. PH. JOLLY. 2nd Edition. Pp. 264. Bonn: A. Marcus and E. Webers. 1922.

This small volume on general and specific psychiatry follows in the main the Kraepelinian classification. It is sufficiently condensed to be of value for the student and general practitioner and states in a brief form the recent psychiatric developments. The book is an excellent one for its purpose.