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CLOTHING FOR THE HANDICAPPED AND DISABLED
IN HOSPITAL OR IN THE COMMUNITY

A REVIEW OF WORLD LITERATURE 1937-1970

prepared for

King Edward's Hospital Fund

by

Joan Lord

THE COTTON SILK AND MAN-MADE FIBRES RESEARCH ASSOCIATION
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ABBREVIATIONS

A.M.A.	= American Medical Association
B.S.I.	= British Standards Institution
B.L.R.A.	= BRITISH LAUNDERERS' RESEARCH ASSOCIATION
DLAG of CCD	= Disabled Living Activities Group of the Central Council for the Disabled (Now, the DLF)
D.L.F.	= Disabled Living Foundation
I.C.T.A.	= ISRD Committee on Technical Aids, Housing and Transportation
Inst. of Phys. Med. & Rehab.	= Institute of Physical Medicine and Rehabilitation, New York Medical Center
ISRD	= International Society for the Rehabilitation of the Disabled
J.A.H.A.	= Journal of the American Hospitals' Association
S.I.S.	= Swedish Standards Institute

1. GENERAL

During the last thirty years with advances in medicine enabling patients to survive previously fatal diseases and accidents, interest has gradually been aroused in the provision of specialized or adapted clothing. It has been realized that such clothing could promote the greater comfort, easier dressing and improved appearance of handicapped and disabled people. Awareness that conforming as closely as possible to the clothing mores of the general population can lead to psychological and therapeutic advantages for the patient has been awakened (1, 2, 3, 4, 5). Although one paper (6) refers to clothing for the handicapped over the span 1937 to 1962, the first publications that have been traced appeared in the U.S.A. in 1947 (7) and 1948 (8, 9). These were concerned with clothing in which children could dress themselves with little or no assistance. Special clothing or adaptions seem then to have been developed, generally by individuals, to meet a specific need or for a particular disability (10, 11, 12, 13). Although often suitable for a much wider range of disabilities, this clothing found little or no application outside the specific field for which it was designed. This was possibly because medical and nursing staff specializing in particular disabilities would be unlikely to have easy access to the information and might not realize its applicability to their patients' problems.

The fact that the various aspects of the problem could be categorized (14) led other authors to emphasize the advantages of categorizing according to the physical problem with which the special clothing could cope (4, 15). It then became more obvious that wider use of special developments was possible and this led to the publication of catalogues and general articles on clothing and adaptions. (16, 17, 18, 19, 20).

Progress continued in the field in the U.S.A. and publications associated with the New York University Medical Center indicated, among other aspects, that besides designing for greater ease in dressing and greater social acceptance, thought was being given to the selection of fabrics (21, 24, 16).

Properties such as minimum care, ease of cleaning, crease resistance and strength of fabric were considered necessary if garments of real use to the disabled were to be produced (22, 23, 24, 25).

During the early nineteen sixties, the clothing problems of the disabled were exercising workers in Sweden (26) and Denmark. Specific investigation of the enormous toll of dressing and undressing on the severely disabled was being carried out by Professor T.J. Nugent at the University of Illinois. Knowledge of these activities inspired Lady Hamilton of the Central Council for the Disabled in the United Kingdom to instigate, in 1962, the development of the Disabled Living Activities Group which, in 1970, became the Disabled Living Foundation. A Clothing Panel was established in 1963 which promoted a survey that was probably the earliest to deal with all aspects of the clothing problems of the handicapped in residential homes and in the community. The results of this survey were published in 1966 (27). Other publications have followed which deal with clothing fastenings (28) and the difficulties produced by the problem of incontinence (29).

A pioneering approach to the problems of clothing in hospitals was made in 1960-62 by Norton, McLaren and Exton-Smith (30) during an investigation of geriatric nursing. Their report is a serious appreciation of the problem which affects not only the handicapped and disabled, whether living in hospital or in the community, on every day of their lives, but also the people who look after them. Very detailed examination of clothing led, in particular, to the development of specialized nightwear. The problems of manufacture, maintenance and sizing were not forgotten. The authors expressed the view that the need for further research was clearly shown and that it should be pursued with the aims of (a) permitting greater ease of dressing and undressing, (b) enhancing the patient's appearance, (c) reducing the work of the nursing staff, and (d) effecting economies by reducing the incidence of repairs and replacements. Clothing research by a consultative panel of various hospital professions working together with experts on textiles, laundry processes and

clothing design was recommended and the necessity for trials of garments so produced in the hospital context was also stressed.

Another book was published by Norton in 1967 (31) which dealt with the problems of hospitals of the long-stay patient. In chapters dealing with clothing and laundry, further evidence was produced which amply reinforces her earlier recommendations.

Gradually, knowledge is spreading that comfortable attractive clothing can be provided for the handicapped and that it need differ little from the socially acceptable standards of the more fortunate members of the community (32, 33, 34, 35). Despite sterling efforts, however, such knowledge diffuses very slowly and lack of technical information at the right place at the right time is the greatest bar to progress in the field (27, 30, 31).

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2. MAJOR PROBLEMS WITH CLOTHING

The first comprehensive statement was made by Cookman and Zimmerman in 1961 (1) based upon the experience of the Institute of Physical Medicine and Rehabilitation at the New York Medical Center. They defined the problems as

- (1) design to permit greater ease in putting on and removing garments
- (2) design to permit greater social acceptance and individual self-esteem
- (3) Fabric choice to resist undue wear caused by movement of the patients or the use of appliances and wheelchairs
- (4) Laundering and related care.

Analysis of problems suggested that 33% of patients had difficulties with all the types of clothing they wore, 30% with footwear, 15% with fastenings, 10% with trousers, dresses and skirts, 6% with protective garments, 4% with underwear of all types, while 2% specifically mentioned wear and tear. They analysed the data into problem, disability and suggested solution. An example is "Trousers and Slacks": problem "Incontinence", disability "paraplegia"; suggested solution: male: zipper sides, $\frac{1}{2}$ belt; female (a) zipper sides, (b) long zipper in side front.

Work with 500 physically handicapped children from 3 to 17 in America led other workers (2, 3) to report that 89% required assistance in dressing. The greatest difficulties were found with trousers, footwear and shirts. The ease of manipulation of fasteners and openings of different types was analysed. 20% needed protective pants, 42% needed clothing adaptions and 50% had to have their clothing reinforced.

The clothing of elderly patients in hospital was considered in 1962 by Norton, McLaren and Exton-Smith (4). Although restricted to nightwear, bedjackets and dressing gowns, certain conclusions appear to be equally applicable to

day wear. From their very thorough investigation, it appears that the most frequent difficulty was negotiation of arms through the sleeves of both closed garments and jackets. The upper part of the back needed to be wider and the circumference of the armhole to be larger. Front openings were found to be too small, sleeves too narrow and fasteners, including buttons and tapes, were too often missing or damaged. The base of the front opening of pyjama trousers was the most common site of damage and, although reinforcement can be made with tape, the authors concluded that research into improved design is indicated.

Desirable features are listed in detail. While it is admitted that incorporation of these would increase the initial cost of the garments, less would be required for repairs and improved comfort and ease of dressing and undressing would contribute to the patients' morale.

Gamwell & Joyce (5) published a book in 1966 which surveyed the problems of clothing the sick and disabled more widely than any of the previous authors. They considered people living both in hospital and in the community and included the elderly and mentally disordered. They divided the discussion into sections dealing with specific garments.

Foundation garments: Brassieres are difficult to put on and fasten, and front fastening styles in other than average sizes difficult to obtain; the design of available corsets appears to be unsuitable for people sitting for long periods, or all the time.

Shirts, blouses, jackets, coats: Set-in sleeves caused the most problems and contributed to tearing of linings. Wheelchair users were unable to find suitably designed short coats that were not bulky.

Pullovers and sweaters: Wear at elbows and cuffs, and shrinkage or stretching were greatest problems.

Trousers: Both males and females encounter difficulties with ready-mades. The garments are too long in front and too

short at the back to be comfortable for people sitting all the time. V-shaped crotches can be very awkward. Putting on and pulling up presents difficulties, and fastenings were not satisfactory: most adaptions to fly fastenings were said to be unsatisfactory. Self support garments can be a nuisance and braces also gave trouble.

Dresses and skirts: As for trousers, the garments were often too long at front, too short at back, and with insufficient waist expansion; necklines tended to gape. Particularly with the mentally sub-normal, too tight a waist or neck made for discomfort and led to the garments being torn.

Stockings and socks: Bad fit, difficulty in putting them on and holding them up were cited as the worst problems.

Nightwear: Tight sleeves, riding up and twisting of garments. Size and shape of pyjama trousers raise similar problems to trousers.

Outerwear: The problems with coats applied here but it was felt that no suitable rainwear for the wheelchair user has been manufactured.

In general, the authors conclude that less trouble would be found with garments with raglan rather than set-in sleeves. When patients were able to dress themselves, front openings were preferable to back openings. If not independent, back openings gave greater comfort and ease in dressing. Users of wheelchairs and surgical supports complained of wear and tear on under and outer clothing due to sharp edges and catching. Reinforcement or wearing garments of stronger material incurred considerable trouble and expense. Sizing was also a problem because of the unusual shapes and sizes of some patients.

Their summary included the following:-

- (1) Standards of comfort and appearance need study
- (2) All garments give rise to acute problems for the physically handicapped, mentally subnormal and elderly
- (3) Appliances give rise to avoidable clothing problems.

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4. PAMPHLETS AND CATALOGUES DESCRIBING CLOTHING AND ADAPTIONS

Although by no means always exhaustive, collected information in the form of specialized pamphlets and catalogues has been published in several countries. Some of the pamphlets are illustrated and, therefore, most useful in conveying the concepts embodied in the Special Clothing or adaptions. Some commercial catalogues, mainly from the U.S., are also listed in this section for they admirably demonstrate the functions of the clothing the firms have available.

In the USA Scott (1) published an illustrated pamphlet which deals solely with women's clothing. She discusses the principles on which the designs are based, explains their features with special emphasis on safety. The designs include 3 dresses, 3 blouses, 3 skirts, a bolero, slacks and shorts in both woven and stretch fabrics. Action photographs illustrate the special features of each design, e.g. one dress has an elasticated back to a beltless waistline and includes hidden pleats which open when the arm is raised, close when it is lowered; sleeveless blouses with pleats at the side of the back prevent restraint when reaching, while extra length to tails prevents them riding out of the skirt or trousers; wrap around, back lapped or side front fastening to skirts; raglan sleeves, roll collars, surplice cuffs are other features. Long back and short front are features of the trousers and small pleats which close when standing provide knee comfort.

The Greenhouse catalogue of clothes for handicapped children (2) features dresses designed by Betty Brett. These incorporated a "magic button" fastener suitable for limited hand use. Self help clothing suitable for children from 3 to 16 was discussed in a pamphlet (3) published by the National Society for Crippled Children and Adults.

Two pamphlets (4) were produced by the Clothing Research and Development Foundation in 1964, while men's wear is well illustrated in catalogues produced by Leinenweber Inc. (5) and Solve Garments Inc. (6). The Leinenweber garments are made

by custom tailoring techniques. Solve Garments include seatless trousers, a back fastening sweater and a "keep-on" suit for hyperactive subnormals which incorporates an ingenious zippered fastening across the back and sleeves. Examples of garments produced by the latter two firms are also illustrated in the Report on "Functionally Designed Clothing and Aids" published by the Vocational Guidance and Rehabilitation Services in 1966 (14).

Similar types of clothing and adaptions to those described above are illustrated by photographs or drawings in various Danish and Swedish publications (7, 8, 9). An Index in the form of loose-leaf folders entitled "Equipment for the Disabled" was published in London in 1967; Section 11 of Vol.3 (10) includes similar material to the other publications; names and addresses of suppliers and the prices of the articles are listed. Although entitled "Clothing Fastenings for the Handicapped and Disabled" a publication, produced in London in 1968 (11) by the DLAG of the CCD, uses drawings which not only clearly show the function of the fastenings recommended but also demonstrate the manner in which adaptions may be made. Most useful lists of supplies and services which include names and addresses of suppliers of garments, foundation garments, fastenings etc. are produced by Elphick (12) and published by the DLAG of the CCD.

One of the most recent American catalogues deals with women's underwear and foundation garments (13) developed by Fashion-Able Inc. A useful garment is a combination waist length petticoat and pants made from nylon tricot. This firm runs a mail order service. A similar mail order service is run by the Vocational Guidance and Rehabilitation Services Center in Cleveland, Ohio (14). This organization supplies dresses in several styles, trousers, blouses, mix/match separates and photographs are used to illustrate the designs. The service is effectively "made-to-measure" and the order form includes a carefully planned measurement chart.

Only limited mail order facilities exist in the U.K. at present. "Bibette" dresses, each of which has 2 reversible

removable panels which button into the centre front, in sizes suitable for girls up to six years are available from the Spastics Society (15). Some of the clothing, including open backed nightwear, recommended by the DLAG of the CCD (11) is described in a list of items which are available from the Army & Navy Stores (16).

PAMPHLETS AND CATALOGUES DESCRIBING CLOTHING AND ADAPTIONS - REFERENCES

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3. BIBLIOGRAPHIES AND REVIEWS

The greatest assistance has been afforded to the present Survey by earlier bibliographies and reviews. This is most gratefully acknowledged.

(1) The first exhaustive review of research and resources was published in the U.S.A. in 1966 by Hallenbeck (1) and contained 39 references to the literature. It discussed fully the problems most frequently encountered, the research done on them and the availability of special clothing for the handicapped. The review is mainly concerned with American experience but reference is made to the work of the Disabled Living Activities Group in Great Britain. The author draws seven conclusions:

- (1) The basic assumption underlying design of special clothing is that it must solve the problems of the disabled person
- (2) The physical disability and not the cause is the essential factor affecting design and production
- (3) Garments may be so designed that they are useful for many types of disability
- (4) The range of sizes, styles, fabrics, colours would appear to rule out mass production other than for underwear and shirts.
- (5) Basic adapted clothing will best serve the disabled if it is further modified for individual needs
- (6) There are many ideas and general designs available but few patterns or detailed instructions for making or modifying garments
- (7) It is possible for disabled people, particularly adults, to obtain special clothing without having to make or adapt it.

Reference to fabric requirements is made only in general terms such as minimum shrinkage, wrinkle resistance, easy care, colour fastness, use of stretch fabrics. The problem of incontinence is

not dealt with in any detail, the development of commercially available protective garments being only briefly mentioned.

(2) In November 1966, a National Seminar was held at Cleveland, Ohio, by the Vocational Guidance and Rehabilitation Services (2). Its objectives were to assess problems, to assess resources, to determine gaps between needs and resources, to make recommendations. The difficulty of making reliable prediction of potential users because of lack of information on needs, lack of uniformity of design and production of special clothing, lack of medium of communication was a basic assumption. The Seminar made the assessment that requirements cut across the entire range of disabilities but that problems of design and production were just as numerous as the individual needs. The needs of particular disabilities are listed but the necessity for as normal appearance as possible is stressed. The common characteristics of all clothing are that it must be put on and taken off, fastened and unfastened, allow freedom of movement and be durable.

Technological problems of production and distribution are manifold, including range of sizes and special features; more accurate simpler measurement charts need to be devised; development of commercial patterns is necessary because adaption of existing patterns is too difficult; information is lacking about special features, availability, sources of clothing. The preparation and distribution of such information is expensive. It was considered that the health professions can all contribute to the dissemination of knowledge, that there is insufficient communication between designers and producers of special clothing and the health professions. More items are produced for women and children than for men, the severely handicapped and the mentally disordered and they are produced primarily by small profit-making distributors not in touch with rehabilitation facilities.

Apathy to the rehabilitative value of specially designed clothing results in inadequate production and distribution. Some of the reasons for this are given and include the lack of professional and technical training, the need for research, new developments in design and production and the need for promotion.

The Seminar recommended

- (1) the establishment of a central information centre and annual forum
- (2) development of training courses
- (3) support for research
- (4) Government subsidy of clothing centres
- (5) recruitment and training of designers
- (6) development of facilities for production and distribution
- (7) promotion of information about special clothing.

Various items of clothing available from commercial suppliers and the Vocational Guidance and Rehabilitation Services are illustrated. The bibliography contains 31 references, including 2 which refer to the work of the Disabled Living Activities Group, Great Britain.

- (3) An exhaustive bibliography containing 93 references was produced in America in July 1968 by the New York University Medical Center, (3). It is not claimed to be a selective listing as it is intended for study and research as well as clinical usage. Some of the articles are out of print and must be sought in libraries or private collections.
- (4) In 1970, the Swedish Handikappinstutet produced a bibliography in English containing 25 references (4). Apart from American and British sources, references are given to articles, pamphlets and catalogues published in Sweden, Denmark and Germany.

Reference to articles listed in the bibliographies described in this section is made in the appropriate sections. Except for some articles specifically concerned with the aesthetic and historical aspects of normal dress, all have been included.

BIBLIOGRAPHIES AND REVIEWS - REFERENCES

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5. DEVELOPMENT OF SPECIAL CLOTHING AND ADAPTIONS

A very great deal has been written about special clothing and adaptions for specific handicaps. Some of the articles listed are out of print and must, therefore, be sought for in libraries or private collections but they are presently included for completeness.

Of the 75 references appended to this section, 30 refer solely to children's clothing and 14 solely to women's clothing. Much of the early work for children was concerned with those afflicted with Cerebral palsy (3, 7) but the need for some children to learn to dress themselves at an early stage because their mothers suffered from physical handicaps led to the design of self-help clothes and fasteners (1, 2, 14, 16). Much of the work of Boettke was aimed at this field (17, 18, 20), and many of the adaptions overlapped and proved to be helpful also to handicapped children (36). The emphasis was on easy-on, easy-off; ease of fastening; comfort and convenience; disguising the disability.

Hall and Vignos (40) working with muscular dystrophy patients produced similar adaption features to previous researchers, e.g. opening side seams in trousers to allow width for leg braces, substitution of large hooks or Velcro for buttons and snap fasteners. Zimmerman (30, 35, 66), and her co-workers working with all ages and both sexes introduced two-way zippers into the side seams of trousers and worked out a most comprehensive series of clothing adaptions (66) based on a carefully thought out rationale.

Scott (23) specialized in the field of the handicapped homemaker and stressed the advantages of back lapped, wrap-around skirts and two piece outfits. She developed 20 designs, with the emphasis on comfort, convenience in dressing, safety, serviceability and attractiveness.

In 1962 Mrs D.A. Behrens of the Vocational Guidance and Rehabilitation Services was asked to design a dress to replace hospital gowns for elderly women patients and she produced a

back wrapped dress which proved most satisfactory. A back opening launderable slip was next requested and a logical sequence of garments eventually emerged. By late 1963, 17 garments had been designed (34) and most proved suitable for more than one disability. The back opening dress first designed proved equally suitable for the wheel chair-bound woman. One especially creative design was that for a reversible shoulder shrug which creates the illusion of sleeves while providing a good fit across the shoulders, and it is also a very much easier garment to put on than a cardigan.

Another simple but extremely practical idea has been proposed in W. Germany by the Deutschen Multiple Sklerose Gesellschaft (60). This is a separate plastron front incorporated into the design of a dress and attached by buttons or Velcro at the shoulders and waist; it may be of similar or contrasting material and is easily detached for washing. This idea has been used for dresses for small girls (74). A design for a kaftan with a long front skirt but short back suitable for wheelchair wear appeared in the U.K. (58).

Male patients were catered for by Cookman and Zimmerman (66), trousers with a shorter front and longer back rise and shorter jackets being designed as well as the two way zippers referred to above.

Not much information has been published on the topic of undergarments for adults. Adoptions were discussed by Cookman and Zimmerman (66) who also gave directions for adoptions. A range of such garments was produced by Van Davis Odell (72).

Many of these tried and tested ideas were collected together and published in a booklet by the Clothing Panel of the DLAG (65). Clothing adapted in accordance with these ideas has been demonstrated (63) and the collections of clothing may be borrowed for demonstration and lecture purposes.

Similar pamphlets describing the various ideas for adaptions and fastenings have appeared in Sweden (67, 68) and Denmark (69).

While pertinent details, photographs or drawings of the construction of adapted clothing have often been given (e.g. 23, 65), few patterns have become available. Therp (64) attempted to find commercial patterns which could be combined or modified to satisfy individual requirements. This attitude has been encouraged by the Division of Home Economics, U.S. Dept of Agriculture (70). Three commercial patterns, based on the designs of C.L. Scott, have been made available in the U.S.A. (71) and several have been recommended in Sweden (67). Few papers have described pattern adaptions and the dressmaking techniques involved in any detail (49, 67, 75). Rogers and Stevens (49) give very detailed instructions for their suggested modifications including, e.g., asymmetric hips, narrow chest with large low bust. The Swedish paper (67) also gives detailed instructions for producing a tailor's dummy on which clothing may be fitted. It has been pointed out that the problems cannot be solved by beginners in clothing production. Most people are unaware of the cost and other difficulties, including distribution, involved in making patterns generally available (64). Gamwell and Joyce (73) found little enthusiasm for making or altering their own clothes among the disabled people they interviewed. They preferred professional alteration or suitable ready-mades. Mothers of handicapped children were more interested and would welcome a greater variety of suitable patterns. These authors recommended a study of the types of garments for which patterns might be useful.

DEVELOPMENT OF SPECIAL CLOTHING AND ADAPTIONS - REFERENCES

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6. EXPERIENCES AND EXPERIMENTS IN HOSPITALS

The pioneering study undertaken in the UK in 1962 by Norton et al (1) clearly revealed the problems of clothing geriatric patients in hospital. Although the investigation was specifically concerned with night wear, the authors make it evident that their findings apply to all types of clothing. They concluded that research into the design of garments was necessary for four main reasons:

- (a) to permit greater ease of dressing and undressing, thereby sparing patients pain and discomfort
- (b) to enhance appearance
- (c) to reduce the work of nurses in both time and effort
- (d) to effect economies by reducing incidence of repairs and replacements of garments and fasteners.

As a corollary, the performance of fabrics and fasteners when subjected to hospital laundering would require investigation.

Experimental closed and open backed nightgowns were produced in collaboration with a manufacturer and have since become widely accepted. Pyjamas, bedjackets and dressing gowns were also investigated. A section of the book is devoted to reports on clothing specially designed for specific needs.

The contrast in 1965 between modern hospital accommodation in America and the appearance of aged patients sitting draped in blankets or dressing gowns with the knees - and sometimes more - exposed encouraged Smith (2) to design special seatless trousers which open as an apron. The author established a manufacturing outlet for these garments, for specially designed sweater tops and for 'keep-on' suits for hyperactive sub-normals.

An article published in 1967, by Bliss, McLaren and Exton-Smith (3) describes an experiment carried out at Whittington Hospital, London. The situation in the geriatric wards was similar to that remarked in American hospitals when a rehabilitation unit was established for progressive patient care and

re-education in the practices of daily living. It was decided to encourage patients to dress themselves and to investigate types of clothing which might be supplied, laundered and maintained by the hospital. The patients could be classified into three types (a) alert and capable, (b) relatively helpless, and (c) severely incapacitated. Practical suggestions based on experience were made together with a list of suppliers of the items found to be suitable. Briefly, the garments found suitable for each type were as follows:

(a) Women. Fully opening wrap-round dresses or skirts with generous overlap; cotton jumpers or Orlon cardigans being worn with the skirts. Knee-length wool/nylon socks.
Normal underclothes.
Men. 65/35 Wool/Terylene suits, through buttoning shirts.

(b) Women. As for (a) but split back dresses or dressing-gowns, with generous overlap, plastic half petticoat, short vests, plastic shoes with tubular socks. Nylon overalls or plastic pinafores were found useful to cope with spillage.
Men. Denim trousers with elasticized waist and small fly without buttons were tried, but many patients objected.
For these the type used for (a) could be used.

(c) Women and men. Open back, closed front dressing-gown in terry or candlewick worn over the nightwear. Bedsocks.

The authors state that they were unable to discover a really satisfactory incontinence pad. The importance of adequate laundering facilities and clearly identifiable marking of garments is stressed.

Also in 1967, Norton published a book concerned with many aspects of hospitals of the long-stay patient (4). She recommends that hospitals be given the authority and means to provide clothing for the chronic sick who are other than bed-fast and unable to provide clothing themselves. She considers that suitable clothing has probably been designed if it can only be obtained. Details of difficulties with laundering, marking and maintenance are given. The author also makes recommendations for specific items such as capes in place of bedjackets or cardigans; short length nightwear; the use of large armholes and magyar sleeves to promote easier dressing; Terylene suits; sailor-type trousers for the severely crippled; towelling ponchos in place of bibs.

In November 1967, the Hospital Centre held a Conference on 'Clothing for Hospital Patients' (5, 6). It was emphasized that the subject could not be considered in isolation from clothing for the sick and disabled generally. In the hospital field, three types of people, geriatric patients, physically handicapped and mentally handicapped, all share five major difficulties which were specified as: getting garments of suitable design, identifying, storing and cleaning and finally dressing. One speaker stated that smart clothes not only say something, they do something: the use of degrading clothing when brainwashing political prisoners has been shown to effectively cause mental deterioration. Clothes are a therapeutic weapon and a positive approach by every branch of the hospital team was called for. Experiences with better quality clothes in brighter colours at Summerfield Hospital, Birmingham, were described by the Matron, who also stressed the urgent need for constructive co-operative action by textile manufacturers, supplies officers and laundry managers. Lady Hamilton of the Disabled Living Activities Group, Central Council for the Disabled, concentrated on economic aspects: no-one could give any idea of the costing except prime cost, which excluded maintenance. She reiterated the question in how many hospitals were all the staff concerned consulted. Slides of attractive practical clothing were shown. The views of supplies officers, laundry managers and manufacturers yielded a remarkable consensus. Each cared about doing his best, but no-one could solve the problems alone. The better the teamwork the better the achievements. Hospital Groups were moving to regional buying, but this ought to be superseded by national buying to a firm specification. Trade and Research Associations could help with the technical aspects. Lack of knowledge about the breakdown of costs was a drawback, since cost was a ruling consideration. No ideal method of marking and fastening garments had been found, and laundry equipment was often antiquated and unsuitable for modern fabrics.

A Conference was held in 1968 at Hollymoor Hospital, Birmingham, at which representatives of all types of hospital staffs, manufacturers and local authority welfare departments exchanged views on clothing for hospital patients (7). Medical staff discussed the therapeutic value of clothing and expressed the view

that sufficient clothing of the right type gave the patient the dignity of his individuality. Miss Elphick, of the DLAG of the CCD, showed samples and slides which included American functional fashions. After discussing fastenings, she stressed the fact that lack of proper specifications when inviting tenders could result in the supply of poor merchandise. Speakers on laundry and textile aspects accepted the need for co-operation. The launderers thought that materials capable of being processed with present equipment should be chosen; garments should be designed for easy finishing; effective marking should be available and sufficient stock to allow for processing should be available. A mannequin parade of clothing from the turn of the century illustrated the manufacturer's view that hospital clothing can be compatible with modern trends. The Conference called for greater communication between those concerned and a willingness to publicize findings.

The maintenance of clothing was the topic of a conference at the Hospital Centre in March 1969 (8). The general conclusions were that lack of communications in hospitals was all too apparent, that research into fabrics, design of clothing and the types of machinery needed to cope with them in hospital laundries is also required. The general lack of costing studies was referred to, but an experiment suggested that 40-50% of the original cost of the garment could be added for repairs.

Clothing and the Long Stay Patient were discussed at a Conference held at the Hospital Centre in April 1969 (9). Lady Hamilton said that there seemed to be no proper costings and, therefore, nothing to prevent totally unsuitable clothing being purchased simply because it was cheap: it was likely to prove short-lived or expensive to maintain. Not enough attention was paid to fabric or design, and further work on identifying, storing and distributing clothing was necessary. The Matron of Whittington Hospital, London, described a survey inside her hospital and found that getting a patient up and dressed cost £24. Pleas for consultation were made by laundry managers and administrators; team work was needed.

Work study by the East Anglian RHB indicated that recorded stock levels were no true guide to clothing available for use. The total value of garments per patient was about £24, while annual renewal of some 24-27 garments cost £14. Productivity in many sewing rooms was low, and a garment could be out of use for 2-6 weeks while being repaired. If it was condemned, from $4\frac{1}{2}$ to 15 weeks could elapse before a replacement reached the ward. It was suggested that, to keep clothing in use, a simplified range of articles and sizes should be agreed while marking and condemning procedures should be frequent.

The future of fabrics, finishes, and methods of laundering was reviewed by Mr. Hill of the BLRA. A great deal of help could be given by his organization and he thought more attractive garments, which were more resistant to repeated laundering, could be produced, but cost would always be a snag.

A clothing scheme was introduced at Rosslynlee Hospital, Roslin, Midlothian, for geriatric and long-stay patients (10). The effects are described as remarkable, raising patients' morale to a very high degree. A proportion of the patient's income is set aside each week for the purchase of clothing, and this is the responsibility of the ward sister under the supervision of a senior administrator in close co-operation with the finance department of the Board of Management. Purchases were made through local shops, which were visited by or which visited the patients. Receipts for all purchases are recorded and regular statements sent by the Board to the ward sister permit budgeting without overspending. After marking, special clothing cards are used to control and check the patient's wardrobe, and these accompany the patient during any inter-ward transfer. Clothes are either dry cleaned or washed, and washing machines in several wards enable patients capable of the work to do their own personal laundry.

A system of regional joint contracting by the Fountain and Carshalton Group HMC has helped to improve the standard of clothing for patients in mental hospitals (11). The operation of the system is described and depends on the supplies officer of each hospital becoming responsible for a range of clothing, such as knitwear,

shirts, underwear: the scope of the Scheme excluded outerwear. Nineteen groups participated initially in 1967, and when the Scheme was reviewed in 1968 they decided to continue in order to consolidate achievements, to extend the variety of garments and improve their quality. It was generally accepted that one of the most important qualities was the ability to withstand repeated hospital laundering. The aim was to obtain the highest standard at the best price and compliance with detailed purchasing descriptions was found to be essential.

It was confirmed that garments should be selected from standard ranges where possible because it is unrealistic at the present stage to expect manufacturers to produce relatively small quantities to specifications outside their normal range.

The Scheme is still regarded as experimental, but future aims include the extension of the present range. It was not possible for the supplies officers to spare the time needed to build upon the experience gained. If the Scheme is to be a success within a reasonable time, additional support is regarded as essential.

In 1964, a clothing sub-committee was set up in the Fountain and Carshalton Group to maintain and improve the clothing of about 1,600 handicapped patients of all ages. In 1967 a Clothing Co-ordinator was appointed to supervise the central linen store and allied departments and be responsible for clothing and linen throughout the hospital (12). A marked improvement in the circulation of linen and clothing has taken place, specially designed articles have been introduced and patients needing special clothing receive individual care. The financial implications have not been assessed.

Recently, Trott (13) discussed experiences as clothing manager in a psychiatric hospital. When appointed, in November 1968, her duties entailed overall responsibility for patients' clothing, staff uniforms, protective clothing, hospital linen. This entailed responsibility for stores, records and supervision of staff and advising the supplies department on clothing. The clothing department embraces a sorting bay, office, fitting and store rooms, tailoring department and shoe repair room. Using a Natmer Markmaster, each item of clothing is marked with the

individual user's name and ward. Soiled laundry is despatched directly from the wards to the central laundry, and clean laundry is returned in bulk three days later to the clothing department. Inspection for repairs is followed by sorting into individual bundles, which are packed in polythene bags. All the bags for each ward are then packed in a distinctive nylon bag. If articles are beyond repair, they are condemned and replaced immediately.

Suits and dresses may, however, be dry-cleaned. They are sent to the clothing department, which has a contract with a local dry-cleaning service. This provides for twice-weekly collection with return in three days. After clearing, inspection, etc., the garments are returned to the wards.

A basic standard quantity of personal clothing has been agreed and consists of: Female: 4 vests, 4 knickers, 3 pairs stockings, 3 nightdresses, 3 petticoats, 4 dresses, 2 bras, 2 girdles. Male: 1 working suit, 1 best suit, 1 sports coat and trousers, 4 pants, 4 vests, 4 pairs socks, 4 shirts, 3 pairs pyjamas. Arrangements are made for patients to shop outside the hospital when possible, but representatives from shops visit the patients and it is hoped eventually to provide a shopping area in the hospital.

Incontinence is a problem and opinion is against waterproof garments. Patients are changed as soon as their clothes become wet or soiled and only the most intractable are provided with clothing from a central pool.

The author considers that, though initial costs may be high, greater care is taken of personal clothing and costs will tend to flatten out as scheme proceeds.

It is considered that combining all clothing aspects under one responsible professionally-trained officer improves quality and appearance of clothing, improves communications and relieves nursing staff.

EXPERIENCES AND EXPERIMENTS IN HOSPITALS - REFERENCES

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FINAL REPORT TO NATIONAL ADVISORY COUNCIL ON VOCATIONAL
REHABILITATION. RD-381.'Design, Testing and Development of Special Clothing for the
Physically Handicapped'.Department of Physical Medicine and Rehabilitation, New York
University Medical Center, 15 Sept. 1961.

- (1) Problems:
 - (1) Design for greater ease in dressing.
 - (2) Design for greater social acceptance.
 - (3) Fabric chosen for purpose.
- (2) Until 1956, individuals designed and developed clothing for a particular patient's need as part-time service.
- (3) In 1958, Mrs. Helen Cookman started pilot study: she designed Basic garments - 2 suits for women
2 suits for men
2 dresses
2 blouses
1 evening skirt
Slacks for both sexes
Man's sport shirt
Wheelchair robe and cape
Fabrics - investigated and made-up by various companies, including J. C. Penny Co. and Sears Roebuck Co.
Garments - given 6 months' field test by various individuals.
- (4) This work led to creation of non-profit 'Clothing Research Inc.'. It was planned that design, development and testing of special clothing would be carried out by the Institute of Physical Medicine and Rehabilitation. After field-testing, garments would be commercially produced in standard range of sizes on non-profit basis. It was also planned to extend the range to all basic garments for children of all ages, winter outerwear, rainwear, night and underwear, etc., for men, women and children.

(5) 1958-1959. Activities focussed on design, testing and development. Information from 'several hundred' letters following 600 newspaper articles published in U.S., Canada and Europe.

Principal areas: (a) Development of underclothing.
Men's shorts, long pants, socks.
Lady's bras., girdles, stockings, garters.
Rubber pants.
(b) Rainwear
(c) Analysis of children's problems from observations
(d) Studies on suitable fabrics
(e) Development and study of closures

(6) Clothing Res. Inc. conducted market survey. Two retailers offered to distribute if market warranted. Six articles in range of sizes were manufactured; 20,000 copies of an illustrative catalogue distributed to professional persons, rehabilitation centers, individuals as result of articles, conferences and dress shows. Garments sold subject to return (returns were 13%).

(7) Experience showed:

(a) Not such a large market as expected.
(b) Not possible to ensure information reached patients in need of clothing - perhaps because of confidentiality of information on disabled.
(c) Not enough doctors co-operated - articles in Journal A.M.A. and N.Y. State J. of Med. only prompted 100 enquiries.

(8) Director and Staff of Clothing Res. Inc. satisfied no mass market exists, but book of illustrations, ideas, experience proposed* and remaining stock of clothing used as demonstration aid.

(* Functional Fashions for the Physically Handicapped by Helen Cookman and Muriel Zimmerman.)

(9) Clothing Research Inc. now inactive, but new non-profit organization for research, development and promotion of special clothing chartered, to be known as 'Clothing Research & Development Foundation'.

Clothing Research and Development Foundation

A brochure, received in June 1970, describes the accomplishments of the Clothing Research & Development Foundation to date. A firm beginning has been made with demonstrations of Functional Fashions, enlisting the co-operation of manufacturers, designers and retailers. The active interest of individuals and companies is being attracted and their contributions provide the main source of the Foundation's support.

The Foundation's objectives are to develop and trial test special clothing, to establish clothing clinics, to serve as a clearing house for information on clothing for the handicapped and to develop an educational programme directed to the general public as well as to the handicapped.

A letter written by Miss M. E. Zimmerman in June 1970 states that the Foundation would like to include the development of special clothing, but that funds have not so far become available to enable progress to be made on any of its objectives. The present work is with designer/manufacturers and is concerned with adapting regular garments so that they become suitable for the moderately disabled person.

DENMARK

IN DANISH

HENSIGTSMAESSIGT TØJ TIL HANDICAPPEDE, 1966

Ortopaedisk Hospital, Copenhagen.

Suitable Clothes for the Handicapped

is a booklet which describes and illustrates clothing, adaptions, fasteners and aids. Many of the adaptions are based on those developed in the U.S.A., and sources acknowledged are Inst. of Phys. Med. and Rehab.; School of Home Economics, University of Connecticut; Functional Fashions. They include jackets, blouses, skirts, trousers, overcoats, nightwear, underwear.

Desirable properties fabrics require to be suitable are listed and include light weight, warmth, permeability, crease resistance, minimum care, washability. Personal taste is acknowledged to influence the choice of underclothing, for example, but cotton is suggested as generally most comfortable and convenient because of washability and absorbency.

Reinforcements, fasteners and aids are referred to in some detail, but the section on protective clothing for incontinent is somewhat sketchy. There is little reference to the use of disposable pads, protective pants with liners are mentioned and a washable pilch described.

SWEDEN

IN SWEDISH

A most comprehensive series of specifications for hospital clothing was prepared in 1969 by SPRI, the SWEDISH Planning and Rationalization Institute of the Health and Social Services, Box 1109, S111 81 Stockholm, Sweden (3). Examples are listed below of specifications which were kindly supplied by Mr C.E. Engblom of SPRI and by Mr P. Österlin of the Handikappinstitutet, Fack, 16103 Bromma 3, Sweden.

Detailed specification of the garments, their sizes, methods to be employed in making-up and of the fabrics to be used have been worked out. Examples of woven fabrics are:

SPRI 35300. Cotton fabric clothing: Patients' jackets.

Material: Twill to SIS 255208. Dyed and shrunk.

N.B. SIS standards are of comparable status to the standards published by the BSI.

SPRI 35320 Polyester/cotton fabric Clothing: Patients' jackets

Material: Twill to SPRI 36126 dyed.

SPRI 35400. Cotton fabric Clothing: Patients' dresses

Material: Plain weave to SIS 255202.

Dyed or printed and shrunk.

Examples of knitted fabrics are:

SPRI 35608. Cotton tricot: knickers.

These are of the Directoire type: besides specifying dimensions, the fabric must be single jersey in 1:1 rib, weighing 175 g/m^2 with 14-15 wales and 140 courses per 10 cm, made from yarn of linear density 25 tex. The type of elastic is specified.

For all garments, details of the sewing thread and its performance, e.g. strength, shrinkage, suitability for given fabric weight, are given. Types of seam, stitches per cm, type of stitch etc. are specified. Buttons and the methods to be used to apply them are included. Details are given of the marking system and the appropriate places in which the marking is to be made

SPRI publishes an informative news sheet which includes articles on hospital clothing among other topics. In issue 7 of 1969 photographs and descriptions of clothing for nursing and

medical staff are cited as examples of the SPRI specifications. These garments are made from 65% polyester/35% cotton blends. The article lists other specifications, including those for patients' clothing, and describes the laundry processes suitable for the fabrics.

The Swedish Central Committee for Rehabilitation publish a Booklet 'Clothing Information for the Handicapped' (4). This demonstrates methods of adapting paper patterns for various handicaps and explains how to fit the clothing and fasteners so adapted.

Adults: Patterns laid out on squared paper also include advice on suitable fabrics. They include (a) protective pants to hold an incontinence pad, e.g. made from cotton or thin terry, (b) skirt suitable for wheelchair wear, for Summer Terylene, Tricel or cotton; for Winter wool, Terylene or tweed, (c) easily adjusted nightdresses, including back-wrap design, Cotton crepe. Drawings of commercially available clothing, e.g. a catsuit with zipped front and legs in terry, ribbed velvet or fustian, a front wrap dress in Tricel or cotton crepe, front and sleeve zipped dresses and coat dresses in terry, fustian or ribbed velvet. Adoptions, reinforcements, fasteners, aids to dressing illustrations and references to printed paper patterns are listed in manner similar to those produced in U.S.A. and U.K.

Children: Similar adaptions

INTERNATIONAL SOCIETY FOR REHABILITATION OF DISABLED
ICTA = ISRD Committee on Technical Aids, Housing and Transportation
(In English)

As one of its main purposes, ICTA has to collect material concerning technical aids for the disabled and present it for international publication. In April 1969, ICTA Information Centre

Fack 5-16103, Bromma 3, Sweden, published a booklet entitled 'List of Technical Aids for Physically Handicapped Children' (5) which was compiled by representatives of different fields within Swedish rehabilitation. The list is intended to serve as a basis for an international inventory of aids for children with physical handicaps (excepting blindness and hard of hearing).

The booklet includes a section on clothes and aids for dressing. These are listed under 'Clothes designed to fit different types of handicap', 'Clothes designed to facilitate dressing and undressing', 'Fasteners', 'Stockings', 'Shoes', 'Accessories' and an Appendix gives details.

WEST GERMANY

KLEIDER MACHEN LEUTE 1969 (6)

IN GERMAN

Dr. Anne-Maria Wagner-Fischer

Deutschen Multiple Sklerose Gessellschaft, Frankfurt/Main

Clothing and adaptions for women are clearly illustrated.
Suggestions for suitable washable fabrics include Diolen-Loft
(textured polyester).

It is proposed to publish a booklet of 25 models with patterns
in 1970.

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Early references to the properties of fabrics which are essential for clothing for handicapped people are very general. Frequently listed is "careful selection for easy-care" (1, 2). Information in general terms, including wearing quality, care, shrinkage, soil resistance, water and oil repellency, colour fastness, was given by other authors (3, 16). Cookman and Zimmerman (4) also gave basic information about fibres, fabrics and finishes together with trade names. Reference to the comfort of clothing was made in connection with the comparison of natural with man-made fibres (5). The importance of applying available knowledge about the properties of fabrics in relation to comfort was emphasized by Renbourn (6). In a most useful article, the importance of the wicking properties of textiles in the dissipation of sweat as well as the fallacious relation of heavy weight to warmth and light weight to coolness are discussed.

Generalizations about the selection of fabrics led Hentgen (7) to point out that the final choice will vary depending very much on the individual. The properties of the "newer synthetic blends" which make them desirable are discussed and include lightweight, wrinkle-free, easy launder, minimum iron. Soil and stain resistance and the necessity for fabrics to be capable of absorbing sweat are mentioned. The author recommends wool, wool blends and, although expensive, silk.

Advice to patients in West Germany was given in 1966 by Dr Wagner-Fischer (8). Nylon fabrics are recommended for dresses, blouses and shirts. The suitability of bulked polyester (Diolen) for dresses and of polyester/wool blends for outer and winter wear are mentioned. Cotton underwear is recommended. The disadvantages of nylon and bulked polyester fabrics for geriatric patients are stated to be that the old think them too light and that they can burn if the patients smoke. The need for a suitable fabric for jackets and trousers is stressed; the author considers that such a fabric should be normal in appearance as well as washable and easily maintained.

In Denmark, a pamphlet (9) describing suitable clothing for the handicapped was also published in 1966. Fabric

properties considered to be desirable include light weight, warmth, permeability, crease resistance, washability and minimum care. The use of cotton for underwear is recommended for comfort and absorbency.

Experiments in Whittington Hospital with clothing for geriatric patients led Bliss, McLaren and Exton-Smith in 1967 (10) to instance the fabrics which proved satisfactory for their patients. These included Tricel fabrics for dresses and shirts, all-cotton jumpers and jerseys, Orlon cardigans, polyester/wool blends for suits and cotton denim for trousers. Terry towelling and candlewick proved suitable for dressing gowns and wool/nylon blends for socks.

The authors state that care was taken to ensure that all the clothing they describe could resist repeated washing, at least in a domestic washing machine.

Norton (11) records that brushed nylon proved suitable for nightgowns and bedjackets, and refers to the use of Terylene in place of grey flannel.

Explicit recommendations were made by the Swedish Central Committee for Rehabilitation (12). For skirts for summer, Terylene, Tricel or cotton are suggested, while for winter suitable fabrics are wool or Terylene/wool blends. For nightdresses, cotton crepe is suggested. For a boiler or cat suit garment or for a coat dress, terry or ribbed velvet are proposed.

The Clothing Panel of the DLAG of the CCD has been responsible for a set of Demonstration Clothing for handicapped adults (13). The use of flannelette, winceyette, brushed nylon for nightwear and of terry towelling and candlewick for dressing gowns has proved satisfactory. Wrap back or split back dresses in "Bush Baby" and tricel jersey for women and washable polyester/wool suits for men are also recommended.

Recently, Swedish Government agencies have issued specifications for fabrics for patients' clothing (14). These include woven fabrics in different weights made from all-cotton and polyester/cotton blends for shirts, dresses, jackets and trousers. Underwear is made from cotton interlock.

Garnwell and Joyce (15) in their recommendations said that much valuable information is withheld unwittingly, partly because people who have worthwhile information are often too busy to publish it, do not realize how valuable it is, or think it is common knowledge. This summing-up is most pertinent in respect of fabrics.

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9. LAUNDERING, DRY CLEANING AND MAINTENANCE

The earlier papers dealing with clothing for the handicapped which appeared in America refer to laundering and other cleaning processes and maintenance in very general terms only (1, 2, 3). This is probably because their concern was mainly with the handicapped living in the community. The problem of keeping garments clean in hospitals in the UK was referred to by Norton McLaren and Exton-Smith (4) in 1962 when they recommended that fabrics required to be easily laundered and that the effects of hospital laundry processes on size, shape, appearance and life of the garment needed to be examined.

Gawell and Joyce (5) referred to the difficulties encountered with laundering certain fabrics, in particular, knitted fabrics, and to the increased variety of materials which were becoming available. They recommended that information on the properties of fabrics in relation to laundering should be made available and that studies of the problems should be undertaken.

Norton (6) pursued the subject in 1967 and discussed the difficulties: problems included shrinkage, finish and appearance, damage to knitted fabrics. Maintenance of clean linen stocks was a considerable problem involving larger stocks being held because of frequency of delivery which in turn posed problems of storage. She concluded that the laundries had not achieved the standard of service demanded of them.

Other authors (7) stated that the importance of adequate laundry facilities particularly in connection with geriatric nursing, cannot be sufficiently stressed. In the same year at a conference held at the Hospital Centre (8), the views of laundry managers were expressed. Poor quality laundering was blamed partly on inferior quality fabrics and without suitable equipment and staff, little could be done. Co-operation and advice from manufacturers, supplies officers and nursing staff was needed. Other speakers stressed the lack of information on costs

At a conference held in Birmingham in 1968, the same comments were reiterated. Reference was also made to the problems afforded by lack of suitable equipment for dealing with man-made fibres and the possible future necessity of using dry cleaning techniques. It was suggested that materials should be chosen which could be processed by the presently available laundry equipment and that garment design should facilitate laundering.

An exposition of the problem from the laundry manager's view point was given by Floyd (10) who dealt separately with the problems of feeble, incontinent patients and those of the more mobile and active type. While the arguments referred to above are again used, the author also includes suggestions for identity sizing by colour of garment. He emphasizes the difficulties experienced with obtaining suitable fabrics for washable trousers and suits for men and opines that a minimum of 5 sets of clothing is required. Foundation garments posed difficulties. Dry cleaning facilities could often be used to advantage and the author suggests consideration of a specialized valet service which could vastly improve the appearance of clothing generally. He stresses that old fashioned materials, designs and equipment cannot meet modern needs and methods and that laundry managers must assist in developing improved techniques. Costs are briefly mentioned, the author's hospital expending approximately £12,000 per annum on clothing and £5000 on maintenance and laundry charges.

Some idea of the life expectancy of fabrics in an American hospital was obtained during the course of an investigation of the properties of flame retardant fabric for use in hyperbaric chambers (11). Flame retardant light weight cotton sheeting deteriorated rapidly after 50 washes, heavy weight survived for 110-130 cycles. 4oz pyjama fabric was found to wear out in 58-60 cycles while fabric of the same weight made from Nomex nylon survived 350 cycles. Trials are still in progress to examine the effect of blending Nomex with flame retardant cotton in order both to reduce the cost and the generation of static charges. The authors state that however expensive such fabrics may be, they will be used in the USA where hospitals can be sued for

negligence if materials more suitable for the purpose exist and are not used.

The maintenance of the clothing of long-stay patients was discussed at a conference held in March 1969 at the Hospital Centre (12, 13). Insufficient attention to the suitability of fabrics and design and lack of consultation with the laundry were stressed. It was considered that considerable savings could be made. The general summing up indicates that research into fabrics, the design of clothing and the type of machinery needed to clean them is essential to progress.

In December 1969, the Scottish Hospital Centre held a conference on the theme of 'Laundries and the Long-Stay Patient' (14) at which the levels of service were reviewed, the laundering requirements highlighted and existing deficiencies discussed. The need for close co-operation and planning were emphasized. One of the speakers, Farndale (15), previously published two studies on the organization and management of laundry services for hospital and local authorities. His third study published in 1969 (16) gives a complete picture of the present position including organization, management, developments and costing. Experiences in British, Australian, American and Canadian laundries are discussed. Reference is made to the work of Norton (6) and Smith (17) among others.

Perusal of the communications listed in the Bibliography of this section revealed that too little use has been made of the reservoir of knowledge available, e.g. at the ELRA.

A textbook on the technology of washing (18) published in 1961 contains detailed information about washing all types of fibre, gives the reasons for the use of particular methods and causes of failure. A leaflet on suitable laundry procedures for garments treated with Proban flame resistant finish is also available (19). Articles in trade journals, such as that by Tippet (20) on recent textile developments, can be of great assistance in suggesting suitable methods for cleaning garments in the hospital field.

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Any discussion in depth of the problems posed by incontinence is quite outside the scope of this review. Only some of the solutions posed for coping with the practical difficulties it causes with clothing are therefore considered.

References to clothing adaptions suitable for simplifying the changing of protective padding were made by Cookman and Zimmerman (1) in the USA. in 1961 but no recommendations about suitable padding were put forward.

Also in the USA Lawton (2) discussed briefly, in 1963, the sort of provisions required. Fully opening protective pants made from rubberized cotton with elastic at waist and thighs and provided with a snap fastening flap so that padding could be changed are suggested: a front pocket to contain extra wadding is suggested for males. This garment is very similar indeed to some produced in the U.K. (14, 21). Lawton suggested however a simple device for males. This consists of a seamless beret type plastic shower cap which is lined with 1 sq. yd. of $\frac{1}{2}$ " thick wadding. The wadding is tightly tucked around the entire circumference to provide a raised edge to prevent overflow: a thin layer of wadding covered with gauze is placed in the hollow. When necessary, the wadding is changed and the cap washed with soap and water. The wadding is referred to as 'Cellucotton'. Also in the USA. Smith (3) devised seatless trousers which open completely like an apron, and the patient is then seated on a pad of unspecified type. Hallenbeck (4) refers to the 'development of commercial moisture-proof protective products: some are pants of plastic or treated nylon, others are flannel-lined plastic garments that open out flat'.

In West Germany (5), clothing adaptions for easy toileetting are mentioned in connection with plastic linings and absorbent pads made from viscose rayon, but no details are given. Plastic pants lined with absorbent fabric or washable diapers made from several layers of absorbent materials, including terry towelling, have been recommended in Denmark (6). Similar flat opening pants are described in Sweden (7, 8) as well as commercially available plastic protective pants. A pattern is given to enable the home dressmaker to make up the former (7) from plastic lined with cotton fabric.

In the U.K. in 1962, Norton, McLaren and Exton-Smith (9) described the results of fairly extensive hospital trials of various makes and sizes of incontinence pads and Norton (10) continued the discussion with an article on disposable incontinence bed pads in 1965. Her estimate of usage at that time was of consumption of the order of 40 million pads per annum. Her experience strongly emphasizes that the use of disposable pads is not simply desirable but a necessity in modern society. This practical trial produced concrete suggestions and evaluated a surface layer capable of providing a dry barrier between the patient's skin and the wet pad. In another book (11) the same author deplores the fact that disposable incontinence pads are often regarded as emergency measures or linen supplements but not as sufficient or satisfactory alternatives to the soiling of linen.

Gamwell & Joyce (12) discussed protective garments and considered few to be completely satisfactory. Plastic pants are 'hard on the skin, do not launder well and split after a short time, while although rubber pants last longer, they are too bulky'. Hospitals and disabled persons were found to make up their own liners because commercially available ones were often insufficiently absorbent or disintegrated when wet. They mention the extra difficulties menstruating women encounter. Among other recommendations, they suggest that incontinence and sanitary wear might beneficially be investigated in terms of the initiation development and marketing of suitable items.

Bliss et al (13), referring to clothing and adaptions, stated that in 1967 no available pad was capable of dealing with the volume of urine produced by their elderly patients. They recommended plastic waist slips as being more helpful for female patients than plastic pants, short vests and plastic sandals with heelless tubular socks were found to be suitable for both sexes, while cotton denim or washable Terylene/wool trousers were recommended for male patients.

An index in the form of loose-leaf folders entitled 'Equipment for the Disabled' was published in London in 1967 (14). Section 10 of Vol. 3, 'Personal Toilet', illustrated with photographs or drawings, lists suitable protective garments and pads, polypropylene Drisheet and one-way napkins and gives the names and addresses of suppliers together with the then-current prices.

Dr Willington (15) presented a very full discussion of the problem, giving details of the wetting process and indicating that capacities of not less than 10 fluid ozs were required from a pad which should also remain waterproof for several hours and not disintegrate. He describes the use of polypropylene one-way material and Kodel pile pads. He experimented further and devised protective garments, described as 'marsupial' pants, which incorporate pouches made from PVC to contain the wadding liners.

At conferences held by the Hospital Centre in 1969 (16, 17) speakers commented on the lack of knowledge, the insufficient use made of advances in modern materials and the fact that there was too little co-operation between medical and nursing staff with technologists. While the use of washable pads with protective garments was deplored, the need for user discussions was explored, e.g. were protective garments used?, if not, why not?, if they were, were they effective? Limitations of available devices were demonstrated and the possibilities of developing jelly-like colloids which could hold liquid in position without odour discussed.

The DLF has published information sheets (18, 19) giving very full notes on various products, including information on design, fastening, material, suitability for different types of incontinence, names and addresses of suppliers and prices. This was followed in 1970 by a most comprehensive book by Elphick (20) which discusses the subject in detail and gives full descriptions of clothing, clothing adaptions, protective garments and pads. A chapter deals with the disposal of disposables.

Examples of the garments were demonstrated at the Hospital Centre in April 1970 (21).

The National Health Service, Scotland, produced a Scottish Drug Tariff Specification (10) for incontinence pads, dividing them into two categories, thick and thin.

The Ministry of Health issued a specification for a disposable incontinence underpad (22) in May 1966, which specifies the dimensions and performance of the pad and provides acceptance test methods. The latter include a waterproofness test for the backing material, a determination of water retention capacity and a test of efficiency of absorbency.

Individual manufacturers, too, have prepared detailed specifications for both pads and underpads (23). These can be very

detailed, giving, for example, data for the test methods required by the Ministry of Health specification.

A booklet published by the Hospital Centre (24) illustrates some of the good ideas introduced, or being planned for, in the provision of services for the elderly in hospital or in the community. In the chapter on incontinence, the experience of various local authorities and hospitals is reported. For example, reference 6.4 cites the County Council of the West Riding of Yorkshire which provides pads to all geriatric cases requiring them and pads and liners for the ambulant incontinent. The Kent County Council, the London Boroughs of Barnet & Tower Hamlets, the Cities of Kingston-upon-Hull and Leicester all provide services of a similar type. Some also provide laundry services capable of dealing with bedding and clothes.

Problems of a very similar nature affect other types of disability, for example, the Colostomy Welfare Group (25) publish a Welfare Services brochure to assist patients. This lists appliances etc., and gives names and addresses of suppliers.

The technical difficulties encountered in coping with the problems of incontinence pale when the difficulties encountered by the individual are considered. Not only is the patient in hospital or a disabled person in the community afflicted by the incapacity, but the latter certainly finds it extremely hard to obtain information and assistance. The provision of incontinence pads was commended in 1963 by the Ministry of Health (26) as part of the arrangements for the care of patients by local authorities but, as discussed above (24), such provision is by no means universal. Wilmott (27), writing in 1970, states that the ordinary consumer often has little idea of what services exist in his area or how to set about getting them when he needs them. The commonest criticisms were about the difficulty of finding out about services and their complexity. The dilemma is that, unless one needs such services, one is blind to publicity. Detailed knowledge about local health and welfare services is at present difficult, sometimes almost impossible, to get. Some local authorities publish handbooks (28), but these may be difficult to obtain and equally difficult to understand once obtained. Since the provision of certain welfare services has been until recently permissive, even

general practitioners are not always aware of the available community services (29). All too often, useful articles which could be read much more widely, such as that by Cullinan (30), appear only in the professional journals.

One excellent development in very recent years has been the more enlightened attitude which permits fuller discussion of the topic as has occurred at conferences at the Hospital Centre (31) and this gives hope that more rapid advances may be possible.

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