PERFORMANCE OF CONTROLLED CLOTH PRODUCED BY DIFFERENT MILLS

By

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I. INTRODUCTION

Clothing ranks second in the fundamental necessities of man. In the early days, men used the skin of animals and bark of trees for covering themselves. Slowly linen and cotton came into vogue. These were followed by the use of silk and wool. Today, due to improvement in science and technology, variety of synthetic materials are available in the market. But at the same time, cotton continues to be the king of fibres, for the main reason that, it can be worn throughout the clock. Cotton possess all desirable qualities namely versatality, durability, comfort and ease of care. As Wingate (1964) points out, cotton fabrics are made to fit all income levels from the fashion - conscious consumer in the higher income group, to the budget minded consumer in the lower income group.

Cotton can be given finisher, which makes it water proof, fire proof, moth and mildew-proof. Today synthetics are also blended with cotton. Thus cotton has become a versatile fibre found all over, starting from the house up to the industries.

Cotton is used extensively in the industries for the manufacture of insulating coils, armature, transformers and

insulating wires. Today, the cotton textile industry is the largest industry in India, which gives employment to nearly 80,0000 workers, say the Times of India Year Book (1969).

Though cotton is comparatively economical, it is still beyond the reach of an average Indian who lives in the village and whose per capita income is very low. From time immemorial, since the advent of Arian settlement, the village has been the basic unit of India, says Bajpai (1962). According to Khosla (1961), village provides the foundation for the national economy. Any problem that confronts India, is really a problem of villages, say Naidu and Sarathy (1960). Hence, any revolution for the improvement in the way of living of people has to start from the villages.

The recent galloping inflation had added to the miseries of the poorer section. Hence it become the primary duty of our government, to control the price of cotton material to suit the purse of an average Indian. Sale of cloth under controlled rate, is one important feature in the 20 point programme of our Prime Minister which is designed to uplift the down troddens.

The policy drawn against controlled cloth states that ten per cent of the total production of all mills must

be sold under specified rate. The cooperative stores and super markets of all cities have taken up the responsibility of selling these controlled cloths on the basis of membership. The varieties available include plain and printed cloth, dhoties and sarees.

Though controlled cloth is intended for the use of needy people, the extent to which consumers are aware of this cloth is a question to be investigated. Moreover, there is a feeling among the public that these materials are of poor quality. Hence the investigator has made an attempt to study the awareness of controlled cloth among the consumers. With the intention of finding out the best variety available in controlled cloth, the investigator has also tried to compare the quality of controlled cloth produced by six different mills. By doing so, she proposes to develop a basis on which the consumer can get goods worth his money.

II. REVIEW OF LITERATURE

The literature collected for the study are reviewed under the following headings:

A. Importance of cotton
B. Production of controlled cloth
C. Distribution of controlled cloth
D. Problems faced by the controlled cloth scheme
E. Role of controlled cloth in 20 point programme
F. Steps taken by the Government
and G. Studies conducted

A. Importance of cotton

Cotton is the fabric for every home and is the most widely produced of textile fabrics today, Dantiyagi(1964). Stout(1960) feels that out of the world's textile fabrics, cotton is not only most extensively produced but widely utilised. The importance of cotton and the unique place it occupies among the textile fibres has been stressed by Barve(1967). India is the acknowledged birth place of cotton and the original home of the best and finest cotton fabric produced in the world for thousands of years up to the 19th century A.D.

Indian cotton fabric due to its excellence was found as webs of woven wind, Sethi et al (1960). Cotton is a cradle to grave necessity for all, cotton quiz(1960). According to Burket (1974) it has been of service to mankind for so long that its versatibility is almost unlimited. Potter and Corbman(1954) considers cotton as the nature's most economical fibre. It is low prices as a raw material and as a finished product. The use of cotton as the textile material is by no means entirely due to its cheapness and abundance but rater to the fact that it provides material whose laundering procedure are excellent because of the great resistance to hot alkaline detergents, Mercer(1946). Linton (1948) points out that cotton is soft and comfortable next to the skin. It is very durable, cool, inexpensive and most versatile of all textile fibres. Cotton is easily cared for since it thrives on soap and water washes. According to Cowan(1969) and Hess(1956) it is stronger when wet than dry. The new weaves and finishes have set cotton up as a fashion leader. Holt(1960) opines that cotton has great tensile strength. According to Clarke(1956), it is good because the fibre is a good conductor of heat.

The advantages of cotton especially the hygienic qualities and ease in handling has been outlined by

Evans (1952). Cotton is a leading, adaptable and popular fibre because it provides apart from colours and designs, textures ranging from fine quality to coarse yarns, Indian Textile Journal(1975).

Wingate(1964) is of the opinion that cotton continues to feel the competition of the man-made fibres. The cotton textile industry is making every effort to meet this challenge through improvement of processing machinery, reduction of labour-costs, and development and promotion of resins, to make them wash and wear. Aesthetic appearance problems related to creasing, pilling and staining of certain fabrics made from manmade fibres also may contribute to consumer preferences for the use of cotton fabrics, Family Economics(1974).

B. Production of controlled cloth

A very large portion of India's population live in rural areas, the majority of whom are very poor(Year Book, 1971). According to Bandyopadhya(1975), there are about 5.5 lakhs of villages in India. Considering the vulnerable sections of the community to get cloth at reasonable price, Government has established a scheme to sell cotton goods at controlled price. Keeping the same in view, an obligation has been imposed on composite mills to manufacture certain varieties of cloth like shirting,

long cloth, drill, sari and dhoti at controlled price, Textile Control Order(1948). According to Sundaram(1975), the aim of manufacturing controlled cloth, is to meet the cloth requirements of the poorer sections of the society. It is intended for lessening the hardship of the vulnerable sections of the society (Commerce, 1975).

The production of controlled cloth by the organised sector of the textile Industry, is carried out under a voluntary understanding between the government and the industry which stipulate that the Industry will produce 400 million square metres of controlled varietiesof cloth per anjmum. Poddar(1975) says that the Indian Cotton Mills Federation, which is responsible for coordinating the production of the mills has imposed a mill wise obligation, by virtue of which, 12 per cent of their packed production has to be delivered as controlled cloth.

However, at the wholesale or retail levels, there has been considerable accumulation of controlled cloth mainly becauseof substandard quality of controlled cloth supplied by the mills. According to Bagchi(1975), the mills were not faithful in implementing the scheme as was intended by the Government of India, inspite of the

30 per cent hike in prices allowed by the Government. Prime Minister, while inaugurating the Silver Jubilee Celebration of Ahamadabad Mills (1975), sounded a note of caution against those mills, that refused to fulfil their obligation to produce controlled cloth and added that, stringent action would be taken against them.

A statement showing the figure of total production of cotton cloth at controlled rate is given in Appendix I. The Union Commerce Minister Chattopadhyaya said on All India Radio on 24th July, 1975, that the pattern of production should confirm to the consumer preferences. The Mills were asked to produce 300 million meters of controlled cloth from April 1975 against 400 million meters earlier (ICMF, 1975). The growing demand for cheaper cloth had brought pressure from the people's representatives, that the production of standard cloth, should be further increased to 1,200 million metres Indian Express(1975) and Hindu(1975).

C. Distribution of controlled cloth

From the report of the Textile Commissioner's Office, (1975), it is understood that the scheme of distribution of controlled cloth came in to force in October 1972, with National Consumer's Cooperative Federation as guaranteed broker and the State Federation as coguarantor. It has been

decided to arrange the distribution of controlled cloth, on the basis of ration card. According to Chatopadhyaya (1974), the complaints received by the government saying that a sizable portion of the rural population and people in the lower income group, in small towns were not deriving any benefit from the present public distribution, forced the government, to take the above decision.

In the present scheme, it is envisaged that the mill will produce controlled cloth, as per the obligation fixed by the Textile Commissioner. The scheme has to change in such a fashion, that the choice and preference of the State Federations, that is, of the consumers, should also be counted and the mills should manufacture that type of cloth which is required by the consumers. For this, a model scheme is proposed. The name of the States and the number of Mills situated in this scheme is given in Appendix II.

The government has declared its intention to make obligatory for the mills to raise the production of varieties, Natnagar(1975). The distribution system is supplemented by retail trades so that the common man in the remotest area will be able to procure cloth at controlled rate. Already, the National consumer cooperative Federation, the sole distributor of controlled cloth, had proved its failure in the distribution of controlled cloth

and mills were saddled with above 90,000 bale worth Rs. 30 crores. It was stated that under the existing distribution arrangement, 90% of the total was to be handled by the Federations and the rest was to be disposed off through the Mills own set up. They added that controlled cloth went through dubious ways and was being re-processed and made to enter the market as superior cloth. Thus mills have been cleared from this smear but if they were required to handle more than 10 per cent of the share in the distribution of controlled cloth, they would be put to trouble, Celourage(1975).

Today, it is felt that the strengthening of distribution agencies both at retail and wholesale level is necessary. This has to be strengthened not only with persons but also with adequate finance. The retail distribution points are multipurpose societies which cater to the needs of the people in that particular area that is, block level, taluk level or a group of villages. The retail points will have to take care of the distribution of controlled cloth along with other commodities. The value of consumer goods distributed by cooperatives during 1974-75 is estimated at about Rs. 400 crores. In rural area, cooperatives distributed consumer goods worth over Rs. 300 crores approximately.

Model Scheme:

As Trivedi (1975) points out, a model scheme of public distribution has been drawn up for, and is under implementation in Delhi. Under this scheme, the specific role of cooperatives has beenbroadly identified and action initiated to broad-base and intensify their activities. The Union Department of Civil Supplies and Cooperation, are helping in working out similar model schemes for Durgapur on West Bengal, Cochin in Kerala, Coimbatore in Tamil Nadu and Nainital in Uttar Pradesh. The objective is that these Model schemes should be rapidly multiplied to cover other vulnerable areas in the country.

D. Problems faced by the controlled cloth scheme

The New Textile Policy announced by the government recently, is aimed at restoring the health of the ailing Textile Industry. The industry suffers from numerous problems, some of which are long standing and others are of recent origin. The Problems of recent origin, are connected with the falling volume of exports, high prices for non-rationed cloth, accumulated stocks of both controlled and non-controlled varieties of cloth and the unremunerative prices fixed for the controlled cloth. The production of controlled cloth is a social obligation to the mill sector. The mills are not faithful to fulfill this obligation and as a result, the production of inferior cloth in the name of

controlled cloth is being offered to the masses. The mills say that they are losing Rs. 80 to 100 crores annually because of the present obligation. At present, loss on production of controlled cloth varies between 85 paise to Rs. 1.10 per square metre for different varieties, Bank of Baroda(1974).

The Mills are faced with large unlifted accumulation of cloth, because the right type of controlled cloth is not available to the consumers in the right varieties, in the rural and semi urban areas. From the distribution point of view also, the scheme is not running properly. There is only insufficient number of outlets in the rural areas. The cooperative agencies entrusted with the job of distribution of controlled cloth are not as sufficient as the retail outlets in the cities, Bank of Baroda(1975). Yet another lucuna in the distribution system is the absence of the effective supervision at the retail outlets. One of the major problems is the distribution of poor quality of cloth manufactured and the production was not related to the demand pattern. This has led to the accumulation of controlled cloth.

A conference held at Delhi in 1975, criticised that even after the new specification prescribed by the textile commissioner, the quality of cloth produced in some mills continued to be of poor quality. The conference

made the following recommendations for the effective running of the scheme.

1. Production of cloth must relate to the demand of the people.

2. Each state Cooperative Consumer Federation, should indicate its requirements of controlled cloth variety to facilitiate the drawing up of quarterly production programme

3. The existing specification, particularly with regard to width and size of items, like dhoties and sarees should be prescribed more precisely.

4. In the type of controlled cloth which are to be manufactured by the textile mills, certain details which are popular in some parts of the country need to be included.

5. Penal action should be taken by the Textile Commissioner, against the mills manufacturing substandard quality of cloth.

6. The scheme can succeed only when there is substantial price differential, in favour of controlled cloth. While the controlled cloth should be improved, the price should not be increased.

7. The state governments should ensure adequate financial arrangements to enable the cooperative institutions to secure adequate working capital for effectively loading the distribution of controlled cloth.

8. The cooperative and commercial banks, should be advised to provide credit for controlled cloth on a margin of 10 per cent only. The rate of interest for such credit, should not exceed two per cent over the bank rate.

9. The State Government should consider increasing the number of retail outlets particularly in rural areas, through service cooperatives, subject however to the viability of such retail outlets.

E. Role of controlled cloth in 20 point programme

As the Bank Book of Baroda(1975) states, the main thrust of the 20 points economic programme announced by the Prime Minister, is to raise the standard of living of the poor and the under previleged people of the rural areas. George(1975) points out that one of the major aim of the 20 point programme is to streamline the distribution of controlled cloth of proper quality through large number of retail outlets particularly in rural areas. Attention to the problems among people are vital importance to the economy, as the textile industry is the largest and the eldest one in the country, providing direct or indirect employment to millions. The various measures like the liquidation of rural indebtedness, implementation of and employment, oriented schemes, stress on agriculture production and others are expected to generate surplus in the hands of the poor. Such supplus would naturally go to satisfy the second most important basic necessities of life, namely cloth, controlled cloth in the case of vulnerable sections of the community.

F. Steps taken by government

The government was very keen on improving the quality of controlled cloth in order to cater to the taste of the common man and also increase the quantity.

As Chattopadhyaya(1975) points out, a panel consisting of representatives of the textile Industry and the Ministry Officials would be set up to work out a cost structure for controlled cloth. The panel would work out the production costs of the controlled cloth on a scientific basis. He further opines that the dialogue was part of the government's exercises to promote export. Government was aware that there was much to be desired in the distribution system of controlled cloth.

Chattopadhyaya(1975) has asked the textile Industry to shoulder the responsibility of distributing the remaining 30 to 46 per cent of the controlled cloth. All financially week mills have been exempted from the obligation to produce the controlled cloth. Another step was to permit mills to sell 20 per cent as against the present 10 per cent of their controlled cloth through their own retail shops or depots.

There should also be adequate publicity about the scheme in rural areas to make the rural folk conscious of the scheme. The government has taken steps to ensure that 80 crore metres of controlled cloth is prepared per year by the mill sector. Eastern Economist(1975) feel that steps were taken to dispose off the unlifted cloth in any manner the mills wish but sales cannot be at less than retail price

stamped on cloth but there is no bear on mills giving them dealers discount. Further there will be no insistence on the weight of cloth and it will not be necessary that sales should be effected only against ration cards. Thirdly, the ceiling of 10 metres per card is being dispensed with. Lastly no income limit will operate for such sales.

6. Studies conducted

Various studies have been conducted on consumer preference on controlled cloth.

The results of the survey on marketing of controlled cloth carried out by National Council of Applied Economics Research, New Delhi at instances of Indian Cotton Mills Federation, showed that only 15 per cent of such cloth reaches consumers in rural areas, of the balance, 27 per cent gets absorbed in metropolitan cities and 58 per cent in urban areas.

Another conclusion brought out by the survey is that 70 per cent of the controlled cloth buyers are of the salarised classes employed in manufacturing industries or other organisations including government cultivators, Agricultural labourers account for less than 10 per cent of the controlled cloth buyers, Colourage (1975)

Another study was conducted by the state consumer federation of Kerala, Mysore and Karnataka in 1974. This study throws light on the varieties produced by different states. The same is given in Appendix III.

III. EXPERIMENTAL PROCEDURE

The experimental procedure consists of the following steps:

A. Conducting survey

B. Experimental study

A. Conducting survey:

1. Selection of method

Interview method was selected for collecting information regarding the purchase of controlled cloth by the Consumers. As Festinger and Katz(1953) point out, interview is a device for collecting data required to test hypothesis in social research. It is often an effective means of obtaining the desired data. According to Best(1963), the interview method is an oral type of questionnaire and is considered to be superior for data collection.

2. Selection of the sample

The sample for the survey included 75 families in low, middle and high income group. They were selected at random from the different areas of Coimbatore city namely

Mettupalayam Road, Saibaba Colony, R.S.Puram and Slum area. According to Tamil Nadu Housing Board Report of 1974, families drawing an income below Rs. 750 belong to the low income group. The middle income group ranges from Rs.750 to 1250 per month and high income above Rs. 1250/ month.

3. Conducting Survey

Using the interview schedule given in Appendix IV, the investigator interviewed the families at their convenience. Information regarding the family income, expenditure on clothing per annum, awareness of controlled cloth, details of controlled cloth purchased, method of using, frequency of purchase, satisfaction dervied, problems faced and suggestions for improvement were collected. The same is discussed under results and discussion.

B. Experimental Study

1. Selection of Material

The material selected for the study was printed controlled cloth because almost all the consumers were aware of the same.

From the Textile Commissioner's Office of Coimbatore Branch, the investigator came to know about the Mills producing printed controlled cloth. Out of them, six were selected for the study. Among these six, the goods of four mills namely: New Asarwa Mills, Ahamadabad, Yamuna Mills, Baroda, Century Mills, Bombay and Mahalakshmi Mills, Rajasthan were available in the local super market. Hence all of them were selected. The products of M.S.K. Mills, Gulburga and Dawangiri Mills, Karnataka were also included for the study because of their quick response to the investigator's request. A sample material of about six metres was bought from each of the above mills for conducting the experiment. The samples were named as brand A, B, C, D, E and F. The details of the same are given in Appendix V.

2. Construction of garment

From the total six metres of material obtained from each mill, three metres were kept aside as original. With the remaining material in each sample, a long skirt was stitched.

3. Wear study

According to Skinkle(1972) 'wear' is the amount of deterioration of a fabric due to breaking, cutting or removal of fibre. For the wear study, six P.U.C. students were selected. All of them belonged to the same age group and their body built was more or less the same. These skirts were worn by them for a period of twelve hours a day, starting from 7 a.m. to 7 p.m. After each wear, the skirts were collected for washing.

4. Laundering procedure

a) Analysis of water

As a preliminary step for conducting the experiment, the water used for the study namely hard water was analysed for its salt content at the Regional Water Analysis Laboratory, under the Director of Health Service and Family Planning, Coimbatore and the details are given in Appendix VI.

b) Laundering

After each wear, the skirts were washed in hard water following the principles of suction washing. As Henry and Syett(1959) point out, suction washing is a quick method of cleansing soiled articles of any fabric or colour.

They further say that cleansing action in this method will not damage the fibre.

According to Dudkar(1967), suction washing is a practical method which saves time and labour. For washing, four litres of water was used along with four grams of detergent surf. The concentration was found to be 0.1 per cent.

Washing was carried out for ten minutes for each skirt, for the thorough removal of dirt particles. The skirts were then rinsed in four changes of four litres of water. The samples being coloured ones, the investigator dried them in the shade. After thorough drying, the samples were ironed well and given for the next wear. Similarly each skirt underwent thirty washes. The original and washed samples are shown in Appendix VII.

5. Evaluation

The proforma used for visual inspection is given in Appendix VIII. It included details regarding colour, general appearance, lustre, flaws and texture. Twelve postgraduate students and three staff members formed the panel of judges. They were requested to visually compare the test specimens with the original and evaluate the samples using the proforma.

b) Preparation of test samples

The seams were ripped out from the skirts and the materials were ironed well to remove creases. Adequate number of samples were cut out, both from the test specimens and the original for conducting laboratory tests. No test specimen was taken near the selvedge.

c) Conducting laboratory tests

The laboratory tests selected for the study included:

1. Fabric weight
2. Fabric thickness
3. Breaking strength
4. Bursting strength
5. Abrasion resistance

The above were conducted mostly using Eureka brand equipment.

Fabric weight

Fabric weight, according to Skinkle(1972) is determined by measuring the weight per unit area and weight per unit length. The cloth quadrant Balance was used (Plate I) to determine the weight of the fabric directly. Ten samples were cut from the original and test specimen using the template. The cut samples were suspended from the

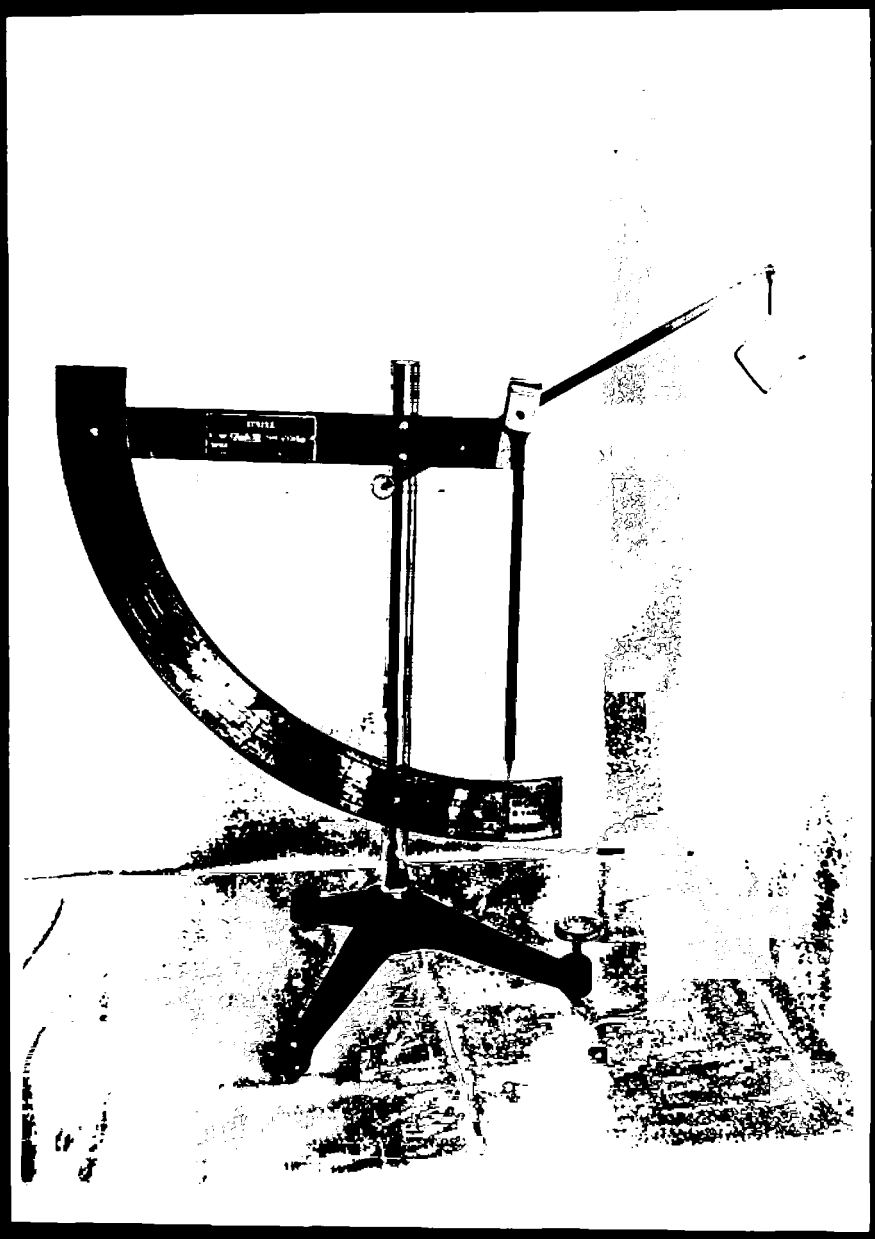

PLATE. I

CLOTH QUADRANT BALANCE

hook and the readings were noted. The mean weight of ten readings, was calculated and recorded. This was expressed in ounces per squqre yard.

Fabric thickness

Lomax (1956) feels that it is necessary to measure the thickness of a fabric, chiefly in order to find its density. The Hungerian Thickness Tester was used to measure the thickness of the fabric, Plate II. It had a broad anvil upon which a presser foot was pressed by a spring. The samples were placed on the anvil without tension. The presser foot was lowered upon the sample by gradually realising the lever and allowed to rest upon it for ten seconds at two kilograms pressure. Each division on the dial read .01 mm. The dial indicated the thickness of the material to thousands of an inch. The readings were taken from different places of the original and test specimen. The mean value was calculated and recorded.

Breaking strength

The breaking strength is a measure of the resistance of the fabric to a tensile load or stress in either warp or filling direction, Grover and Hamby(1969). Elongation is the deformation in the direction of load caused by a tensile force, Mauresberger(1947). In textile work, the strength

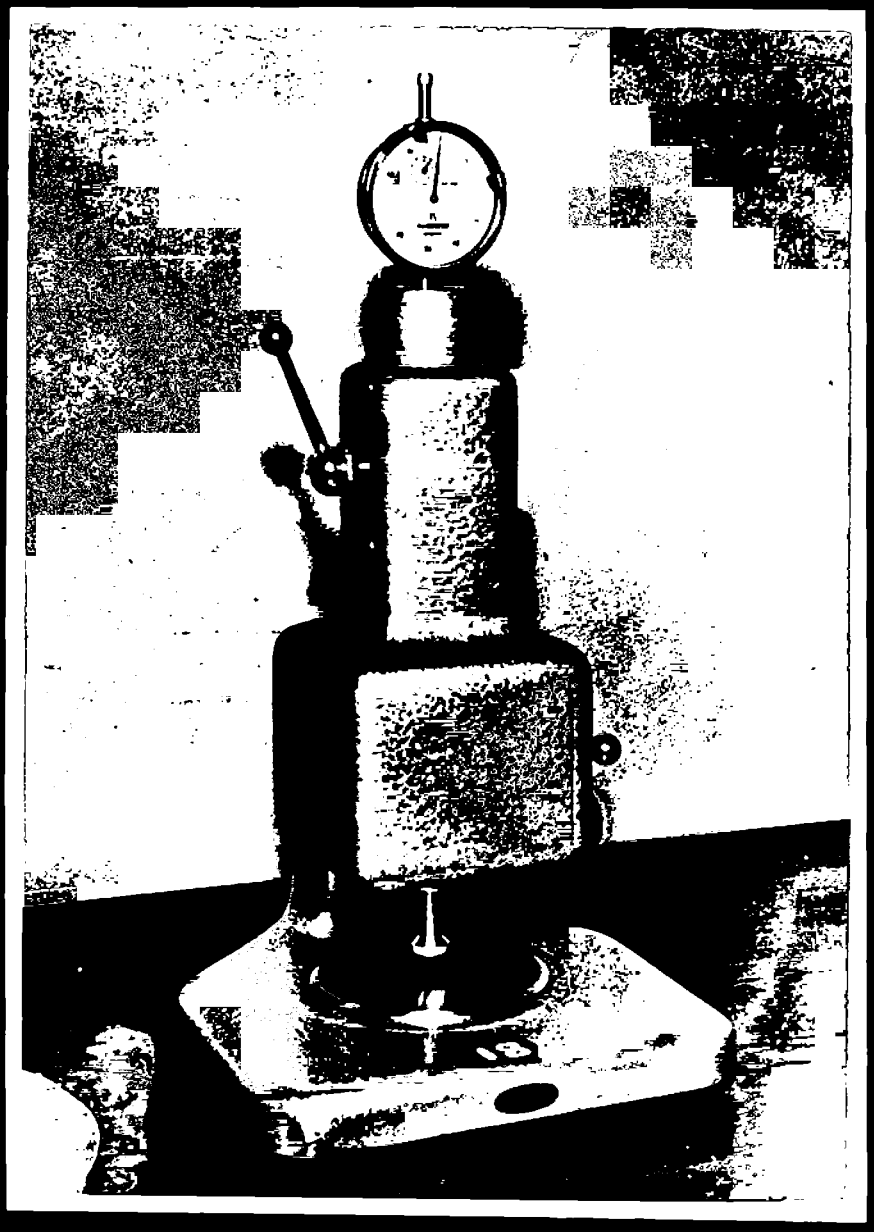

PLATE II

THICKNESS TESTER

of a fabric is taken to mean the load which is required to break it or it is a measure of the force necessary to rupture it and it is dependent upon the rate at which the load is applied(Skinkle 1949).

The test samples were cut out 1½ inch wide and 15 inches long and ravelled to 1 inch width and 12 inches length by drawing the yarns from four sides. For testing, ten samples were taken from both warp and weft directions of each specimen. The vertical pendulum type Tensile Strength Tester was used, plate III. The capacity of the machine and the rate of traverse were 200 pounds and 12 inches per un minute respectively. The guage length was kept as eight inches. The sample was clamped between the two jaws. The load was applied and the reading was recorded in pounds for load as soon as the sample was broken. The elongation of the fabric was also noted down in inches. The mean value of ten readings were taken and recorded for each specimen under test.

Bursting strength

Bursting strength is defined as the force required to rupture a fabric by distending it with a force applied at right angles to the plane of the fabric, under specified condition, A.S.T.M. Standards(1963).

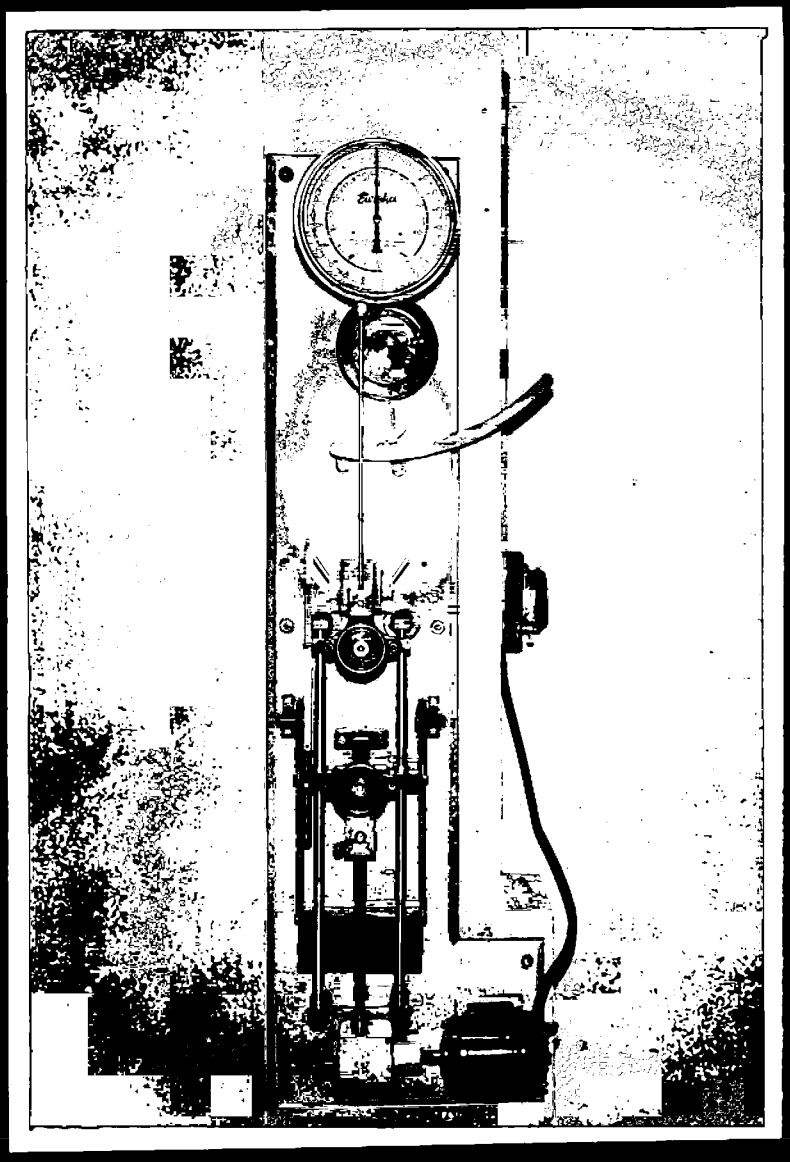

PLATE III

BREAKING STRENGTH TESTER

The Hydraulic Bursting Strength Tester was used, Plate IV. The bursting strength tester consisted of a device for holding a rubber diaphragm and a ring clamp mechanism for holding the sample. The internal diameter of the clamp ring was 1.2 inches. The dial was calibrated in pounds per inch square and kilograms per centimeter square. The load necessary to burst the fabric by means of the ball or diaphram gave the bursting strength. Four inch square samples were cut from different places of the original and tested specimen. Each sample was clamped securely and tightly. Care was taken to stop the mechanism immediately after the samples were ruptured. After each rupture, the reading was noted and the mean value of ten readings from each specimen was calculated and recorded.

Abrasion Resistance

According to Skinkle(1972) abrasion is an important factor in wear and consists of friction between the cloth and other materials. It is the rubbing away of the component fibres and yarns of the fabric, Booth(1970). The Martin - Dale Abrasion Tester was used, plate V. Ten samples were cut both from the original and test specimens using the template from the different parts of the material. The initial weight of each sample was taken. Silicon carborandum

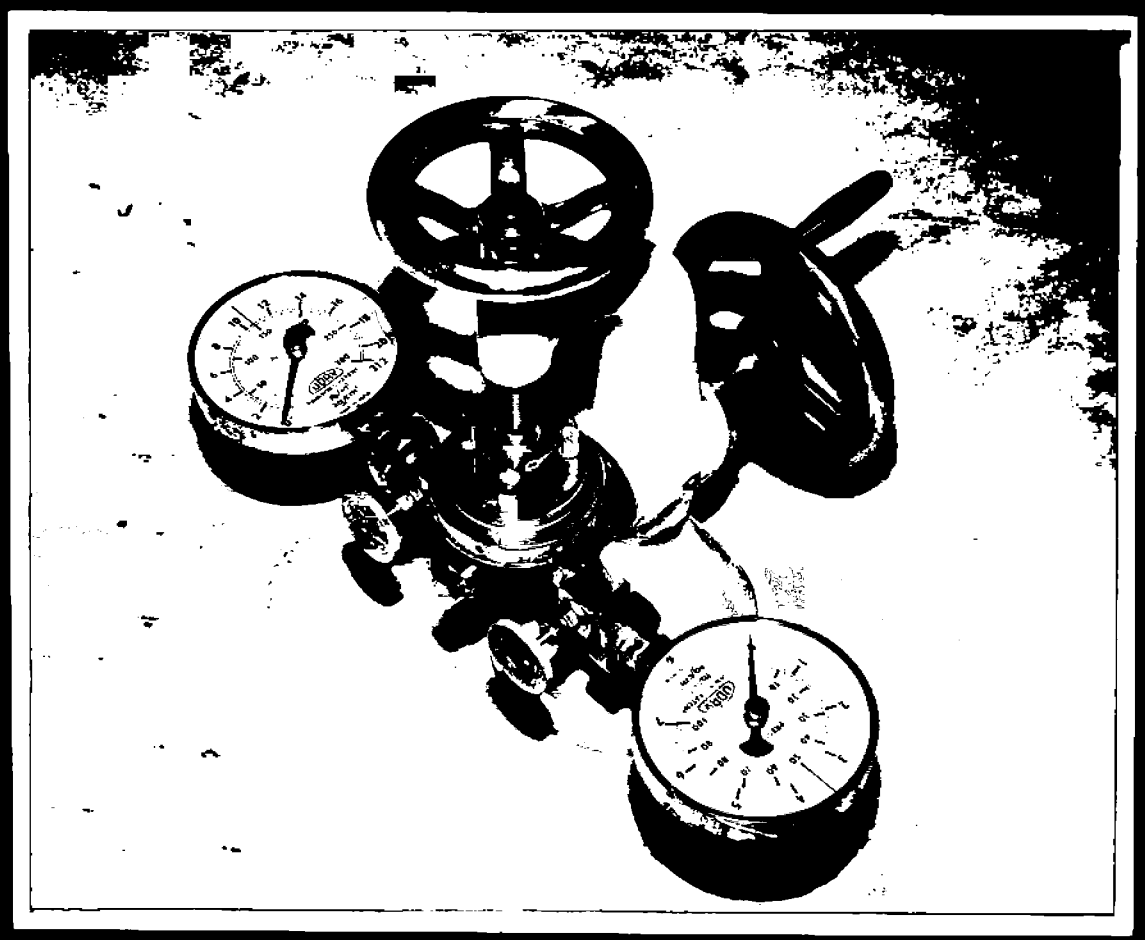

PLATE IV

BURSTING STRENGTH TESTER

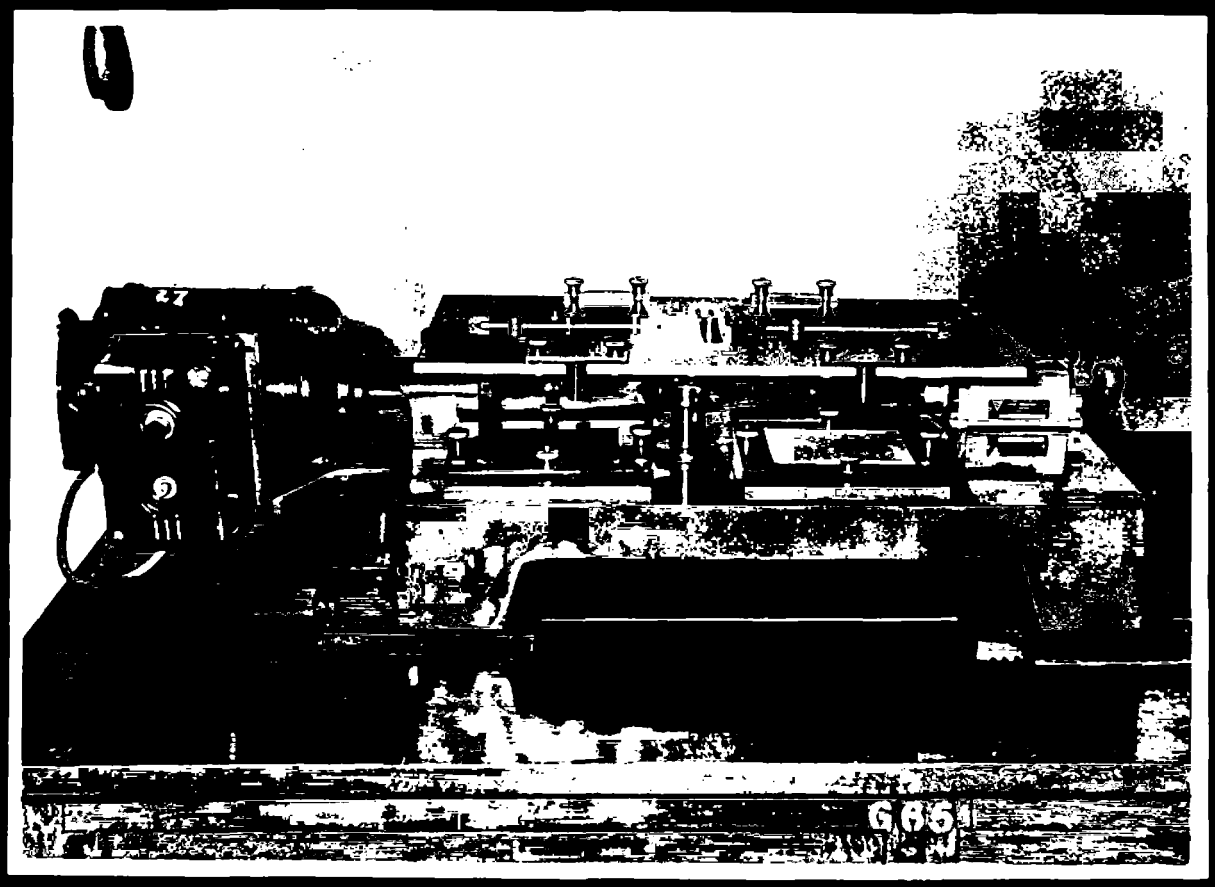

PLATE V

ABRASION TESTER

400 C was used as an abradent. First a few sample were inserted on the sample holder to standardise the number of rubs. Fifty rubs were found to be sufficient. Every time a fresh abradent was used. The final weight of the samples were taken after abrasion. The loss in weight was noted. The mean value of ten readings from each material was calculated and recorded.

IV. RESULTS AND DISCUSSION

The results of the study are discussed under the following headings:

A. Survey

B. Evaluation

1. Visual Inspection

2. Laboratory Tests

A. Survey:

The survey results are further subdivided into:

1. Family income
2. Expenditure on clothing
3. Awareness of controlled cloth
4. Purchase of controlled cloth
5. Details of controlled cloth purchased
6. Frequency of purchase
7. Method of using controlled cloth
8. Satisfactions derived
9. Suggestions for improvement

1. Family income

The income of all the low-income families was found to range between Rs. 150 to 300. The families in the middle income group had an income of Rs. 750 to 1,000. All the high income families earned more than Rs. 1250.

2. Expenditure on clothing

The money spent on clothing per annum by the different families are shown in Table I.

TABLE I

EXPENDITURE ON CLOTHING

Type of families	Expenditure in Rupees				
	100-500	500-1000	1000-1500	1500-2000	above 2000
Low income	91%	9%	—	—	—
Middle income	7%	37%	35%	16%	5%
High income	3%	21%	16%	32%	28%

From Table I, it is clear that ninety one per cent of the low income families spent Rs. 100 to 500 on clothing per annum. The rest spent Rs. 500 to 1000. In the middle income group, 37% spent Rs. 500 to 1000 and 35% spent Rs. 1000-1500. Only 5% of the families spent above Rs. 2000 on clothing. In the high income group, 32% spent Rs. 1500-2000 on clothing. While 28% spent above Rs. 2000, 21% spent Rs. 500-1000. The higher the income the higher is the percentage spent on clothing.

Awareness of controlled cloth

In the low income group, only 27% of the families were aware of controlled cloth. Eighty per cent of the families in the middle income group and fifty seven percent in high income group were aware of controlled cloth.

This reveals the fact that the availability of controlled cloth in the market is not known to most of the low income families.

4. Purchase of Controlled Cloth

Though twenty seven per cent of the low income families were aware of controlled cloth, only sixteen per cent purchased the same. In the middle and high income group almost all of them purchased controlled cloth.

This shows that instead of low income group, the middle and high income group benefitted by the controlled cloth to a great extent.

5. Frequency of purchase

As regards the frequency of purchase of controlled cloth, it was found that low income families purchased controlled cloth very rarely. Lack of money was the main reason for their inability to purchase cloth regularly. Thirteen per cent of the families in the middle income

group bought controlled cloth every month. The rest namely 67 per cent bought occasionally. In the high income group almost all of them bought occasionally.

6. Details of controlled cloth purchased

The types of controlled cloth purchased by the selected families are presented in Table II.

TABLE II

TYPES OF CONTROLLED CLOTH PURCHASED

Type of family	Varieties of Cloth				
	Printed	Muslin	Long cloth	Dhoti	Saree
Low income	12%	8%	11%	3%	
Middle income	69%	33%	37%	16%	
High income	45%	29%	28%	11%	

From Table II, it is evident that the middle income group bought different varieties of controlled cloth to the maximum. Nearly 70 per cent of them bought printed varieties. In the low and high income group, 12 and 45 per cent bought the same respectively, and 28 per cent in the high incomegroup purchased long cloth. Dhoti was

purchased by very few families namely 13, 16 and 11 per cent in the low, middle and high income group respectively. None of the families purchased controlled sarees.

The price of printed controlled cloth ranged between Rs. 25.50 to 3.50 per metre. The price of muslin was found to be between Rs. 1 to 2.50, long cloth costed Rs. 2 to 2.50 per meter. The price of dhoti ranged between Rs. 17 to 25 per pair.

7. Method of using controlled cloth

Printed controlled cloth was used as dress material by 12, 64 and 41 per cent of the families in low, middle and high income groups respectively. Three per cent of the families in the low, 29 per cent in the middle and 18 per cent of the families in the high income group used the same as furnishing material. Muslin was used for stitching pillow cases, bed covers and bags by five, 28 and 29 per cent of the families in the low, middle and high income group respectively. Long cloth was used for stitching under garments and children's uniforms by 11, 35 and 24 per cent of the families in the low, middle and high income groups respectively.

8. Satisfactions derived

The few families in the low income group, who purchased controlled cloth, were very much satisfied with the material because of its reasonable price. Fifty six per cent in the middle income group and 32 per cent in the high income group were satisfied with the material because of its colourful designs but at the same time they had suggestions for improvement.

9. Suggestions for improvement

Forty per cent of the families in the middle income group and 10 per cent in the high income group felt that controlled cloth must be produced by local mills to suit the demands of local people. Fifteen per cent in the middle income group suggested that controlled cloth must be available in all shops. Twenty per cent in the middle income group wanted improvement in the material, colour and design. Thirty five per cent in the middle income group opined that the quality ofcloth must be improved so that it can be used for any kind of wear.

B. Evaluation:

1. Visual inspection

The results of visual inspection of the tested samples, as evaluated by the judges, in comparison with the original are presented in Table III.

TABLE III

EVALUATION OF TESTED SAMPLES BY VISUAL INSPECTION

S.No.	Samples	General appearance				Colour			Lustre			Flaws			Texture	
		Excellent	Good	Fair	Poor	Bright	Medium	Dull	Very high	High	Low	Many	Few	Nil	Very smooth	Smooth	Rough
		(Percentage of judges stating)														
1.	A-Tested	—	7	47	53	—	33	67	—	—	100	33	60	7	—	40	60
2.	B-Tested	—	—	53	47	—	47	53	—	7	93	33	60	7	—	20	80
3.	C-Tested	—	20	67	13	13	60	27	—	13	87	13	40	47	—	47	53
4.	D-Tested	—	—	73	27	—	53	47	—	7	93	33	60	7	—	20	80
5.	E-Tested	—	20	53	27	—	67	33	—	27	73	7	93	—	7	53	40
6.	F-Tested	20	60	20	—	60	33	7	—	53	47	—	47	53	—	60	40

General appearance

From Table III, it is evident that brand F, ranked first in general appearance. It was rated as excellent and good by 20 and 60 per cent of the judges respectively. Brand C and E were rated as good by 20 per cent of the judges. While 67 per cent felt that brand C was fair, 53 per cent considered brand B as fair. Among the rest, brand A was poor according to 53 per cent of the judges.

Colour

The colour of brand F, was considered as bright by 60 per cent of the judges. Brand C was rated as bright and medium by 13 and 60 per cent of the judges respectively. The colour of brand E was medium according to 67 per cent. Brand D ranked next. Brands A and B were rated dull by 67 and 53 per cent of the judges respectively.

Lustre

The lustre of brand F, was rated as high by 53 per cent of the judges. Almost all the judges felt that brand A had very low lustre. Brand B and D were rated as low by 93 per cent of the judges. Brand E was stated low by 73 per cent of the judges.

Flaws

Fifty three per cent of the judges, opined that brand F was free from flaws. The number of flaws were found to be many in the case of brand A, B and D as stated by 53 per cent of the judges. According to 93 per cent of the judges, the number of flaws in brand E was few.

Texture

The texture of brand F, was rated as smooth by 60 per cent of the judges. 53 per cent of the judges considered brand E as smooth. Brands B and D were rated as rough by 80 per cent of the judges. Brand A and C were rough according to 60 and 53 per cent of the judges respectively.

2. Laboratory tests

Fabric weight

The weights of the original, as well as the tested samples are given in Table IV and Figure 1.

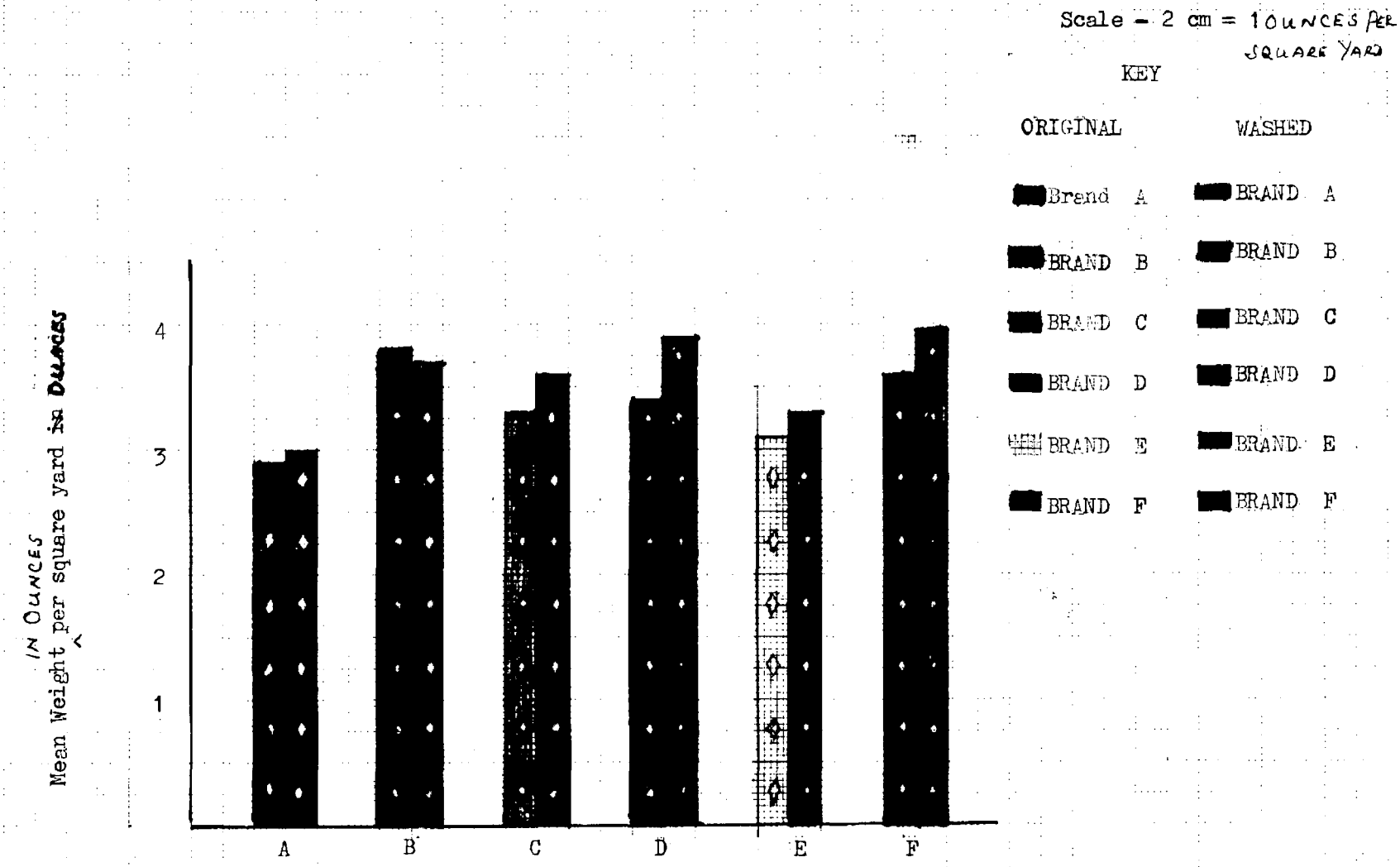

FIGURE -1

FABRIC WEIGHT

TABLE IV

FABRIC WEIGHT

Condition of the samples		Mean weight per square yard in ounces	Increase in percentage over original	Decrease in percentage over original	't' value
A.	Original	2.9			
	Tested	3	3.4	—	0.0110
B.	Original	3.8			
	Tested	3.7	—	2.6	0.005
C.	Original	3.25			
	Tested	3.6	12.3	—	0.88
D.	Original	3.42			
	Tested	3.9	10	—	0.015
E.	Original	3.12			
	Tested	3.54	13.4	—	0.007
F.	Original	3.6			
	Tested	3.95	15.4	—	0.37

From table IV, it is clear that among the original samples, brand B had the maximum weight compared to others. Brand F, ranked next followed by Brand D, and C. Instead samples, Brand F and D, were found to have the highest weight. Brand B came next, followed by C and E. The percentage increase over original was highest in the case of Brand F. Brand E ranked next followed by Brands

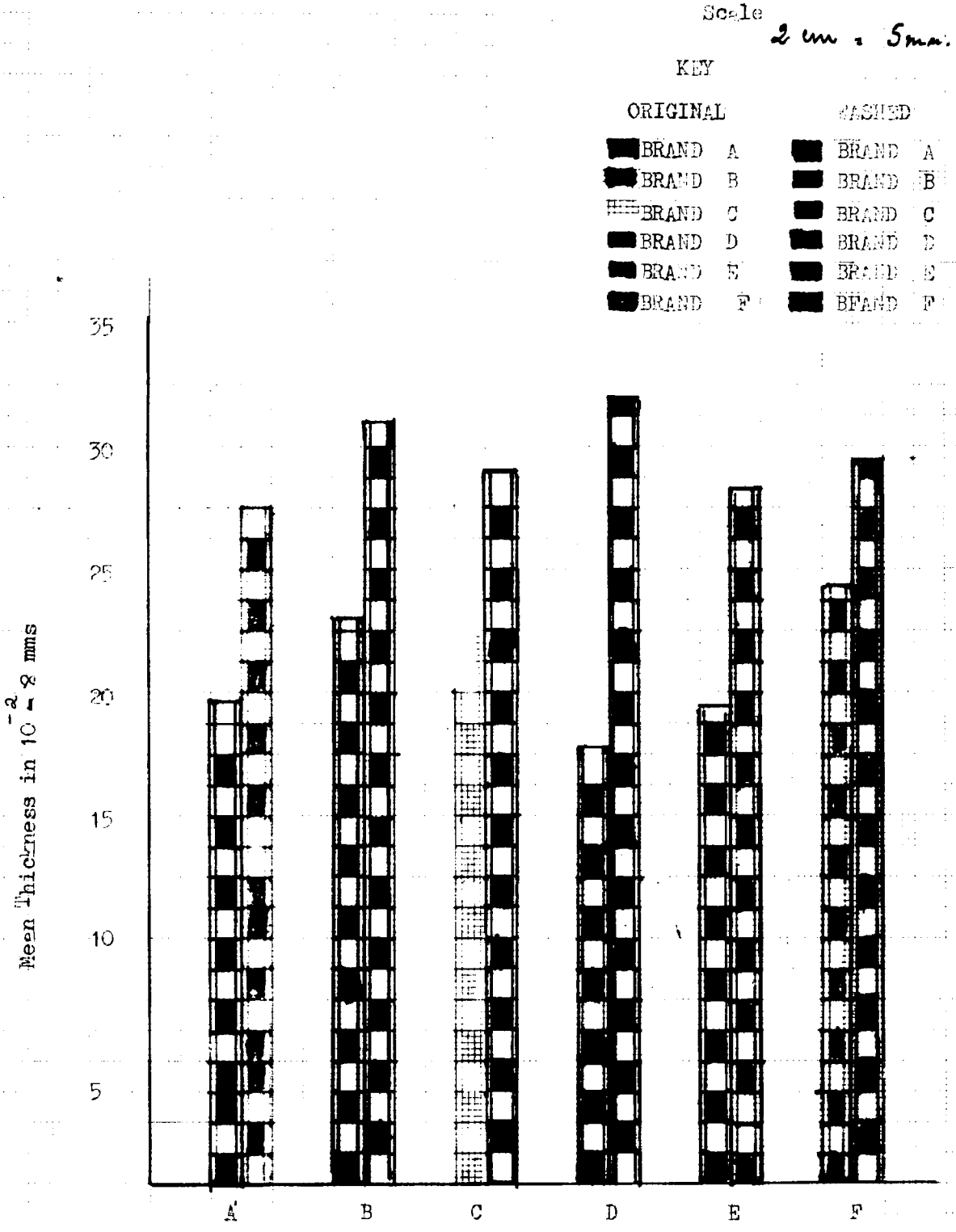

FIGURE - 2

FABRIC THICKNESS

C and D. Brand B was lost its weight in washing.

The weight of brand 'A', both original and tested was found to be the least, compared to others.

Fabric thickness

The thickness of the original and the tested samples are given in Table V and Figure 2.

TABLE V

FABRIC THICKNESS

Condition of the samples	Mean thickness in 10^{-2} mms	Increased in percentage	Decrease in percentage	't' value
A. Original	15.95			
Tested sample	25.4	6.3	--	22*
B. Original	23.3			
Tested sample	31.8	36.4	--	7.32*
C. Original	20.1			
Tested sample	29.6	47.2	--	4.5*
D. Original	20.5			
Tested sample	32	56.1	--	1.15
E. Original	19.7			
Tested sample	28.9	46.6	--	21.9*
F. Original	24.6			
Tested sample	29.6	20.3	--	2.56**

*Significant at 1 per cent level
**Significant at 5 per cent level

Table V shows the thickness of the original and the tested samples. On comparing the thickness of the original samples of the various brands, it was found that brand F, had the maximum thickness. Brand B ranked next followed by D, C and E. Among the tested samples, the thickness of sample D was found to be very high. Sample B ranked next, followed by C, F and E. The thickness of brand A, both original and tested was very low.

A comparison of the original and the tested samples of the respective brands revealed the fact that sample D had increased in its thickness to a great extent. Brand C and E ranked next. The percentage increase in the case of brand A was found to be very low. The difference between the original and the tested samples in the case of brands A, B, C and E were found to be significant at one per cent level. The difference in the case of sample F was found to be significant at five per cent level.

Breaking strength

The breaking strength of the original and the tested samples are presented in Table VI and Figure 3.

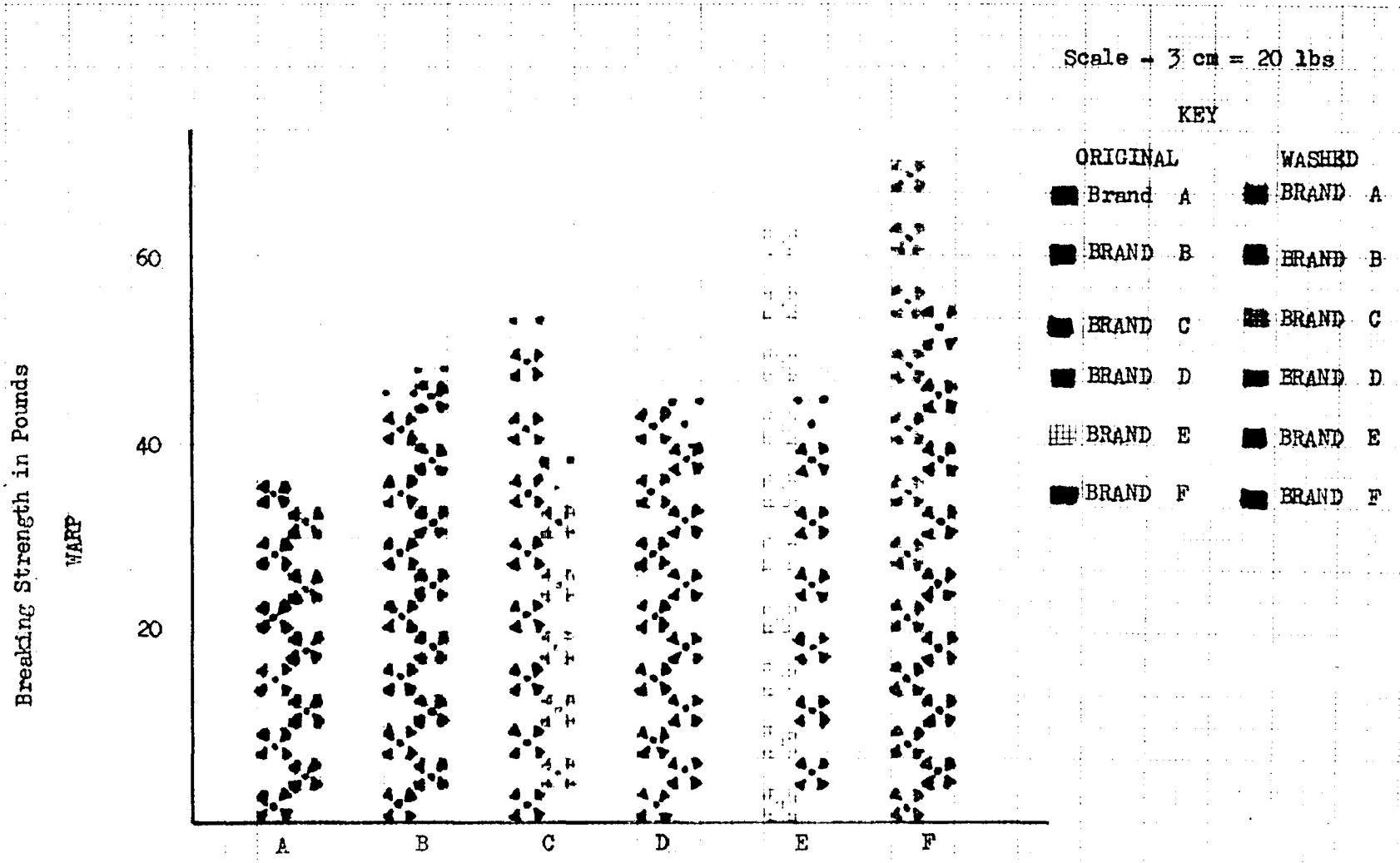

FIGURE - 3

BREAKING STRENGTH

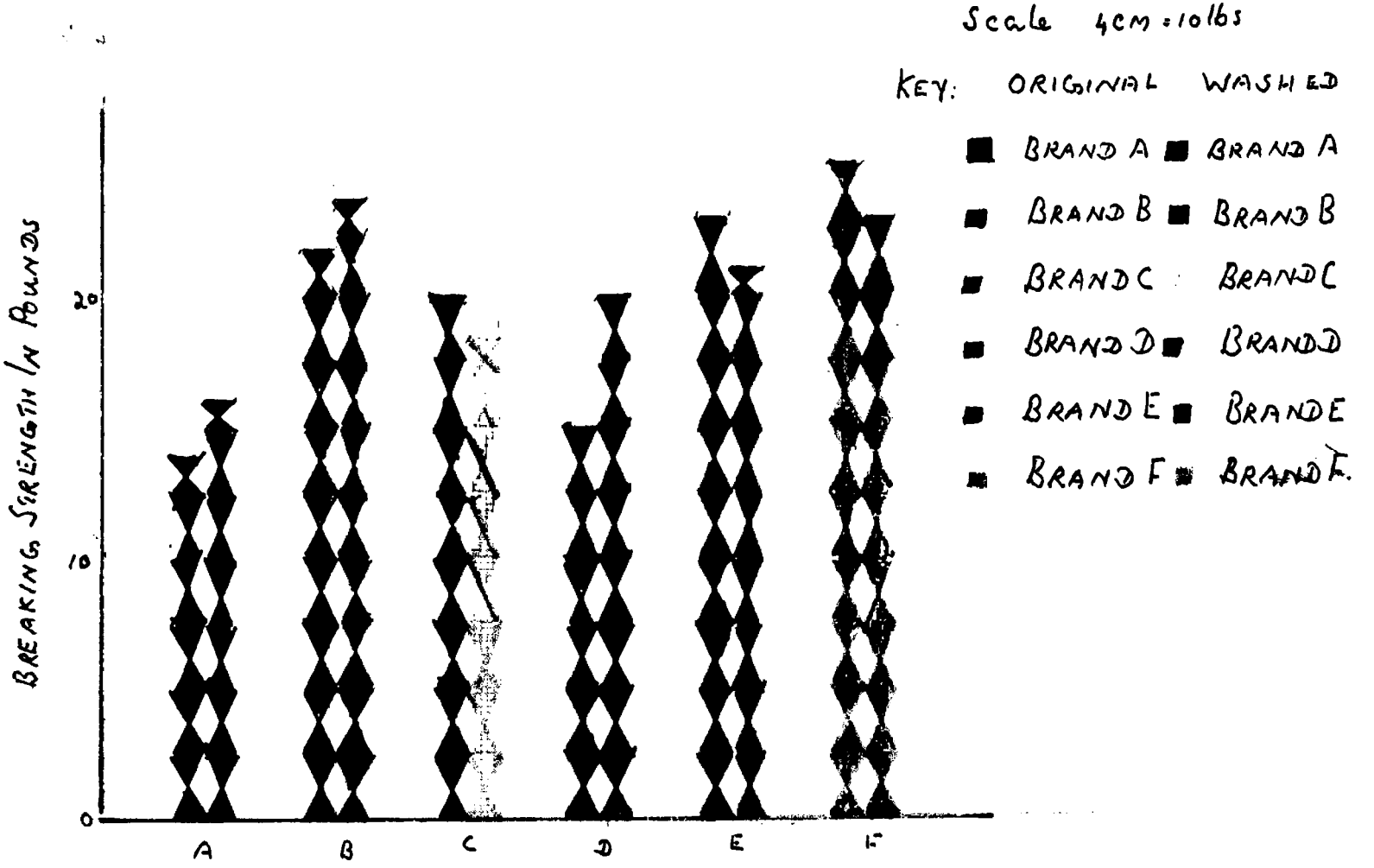

FIGURE 3a

BREAKING STRENGTH IN WEFT DIRECTION

TABLE VI

BREAKING STRENGTH

Samples		WARP				WEFT			
		Breaking strength in lbs.	Percentage loss over original	Percentage gain over original	't' value	Breaking strength in lbs.	Percentage loss over original	Percentage gain over original	't' value
A.	Original	37.9				14.1			
	Tested	35.2	7.1	—	0.46	16	—	6.3	0.36
B.	Original	45.4				21.8			
	Tested	48	—	5.7	1.3	24.5	—	13.3	1.9**
C.	Original	54.3				19.8			
	Tested	36	33.7	—	9.7*	19	1.01	—	0.12
D.	Original	45.5				15.3			
	Tested	47	—	3.2	0.53	20	—	30.7	1.51
E.	Original	63.2				24.1			
	Tested	45	28.7	—	1.5	21	12.8	—	0.7
F.	Original	70				25			
	Tested	55	21.4	—	1.7	23	8	—	1.1

As table VI reveals, among the original samples of the different brands in warp direction, the breaking strength of brand F was the highest. Brand E ranked next followed by C, D and B. In the weft direction also, sample F had the maximum breaking strength followed by sample E, A, C and D.

As regards the tested samples, brand F had the maximum breaking strength in the warp direction. In the weft, brand B ranked first followed by brand F. The breaking strength of brand A, both original and tested was very low in warp and weft directions.

The percentage loss over original was found to be highest in the case of sample C, and it was followed by sample E and F in the warp direction. On the contrary samples B and D were found to have gained strength in washing. The difference between the original and tested sample of brand C, was found to be statistically significant.

The percentage loss over original in the weft direction was found to be maximum in the case of brand E, where as there was maximum gain in the case of brand D. It was followed by brand B and A. The difference in the original and tested sample of brand B was found to be statistically significant.

Elongation

The elongation of the original and tested samples of various brands are shown in Table VII.

TABLE VII

ELONGATION

Brand	WARP				WEFT			
	Elongation in inches	Percentage loss over original	Percentage gain over original	't' value	Elongation in inches	Percentage loss over original	Percentage gain over original	't' value
A. Original	0.7				1.4			
Tested	0.8	—	14.2	12.5*	1.4	—	—	—
B. Original	0.7				1.4			
Tested	0.9	28.5	—	10*	1.2	14.2	—	20*
C. Original	0.6				0.8			
Tested	1.2	—	100	1.6	0.9	—	12.5	33.3*
D. Original	1.2	50	—	20*	1.4	—	—	—
Tested	0.6				1.4			
E. Original	0.7				2			
Tested	1.2	—	71.4	10*	1	47.3	—	9.8*
F. Original	1				1.1			
Tested	1.1	—	10	5*	1.6	—	45.4	25*

*Significant at 1 per cent level

From Table VII, it is clear that among the original samples, the elongation was highest in brand D in the warp direction, brand F ranked next. There was not much difference among the others. As regards the tested samples, brand C and E had the highest elongation. Brand F ranked next. The percentage loss over original was found to be highest in the case of sample D, whereas, there was cent per cent gain in the case of Brand C. It was followed by Brand E. The difference between the original and the tested samples of brands A, B, D, E and F were found to be statistically significant.

The elongation of the original sample of brand E was found to be maximum in weft direction. It was more or less same in the case of brands A, B and D. Among the tested samples, brand F had the maximum elongation followed by D, A, B and E. The elongation of brand C was very low. The percentage loss over original was highest in the case of brand E. But there was maximum gain in the case of brand F. The difference between the original and tested samples were found to be statistically significant in the case of brands B, C, E and F.

Bursting strength

The bursting strength of the samples are presented in Table VIII and Figure 4.

TABLE VIII

BURSTING STRENGTH

Brands	Mean bursting strength in kg/cm	Increase in percentage	Decrease in percentage	't' value
A. Original	76.5			
Tested	71.2	—	6.9	1.7
B. Original	876.2			
Tested	85.6	—	1.8	0.64
C. Original	67.8			
Tested	81	19.4	—	3.9*
D. Original	83.4			
Tested	60.2	—	27.8	7.9*
E. Original	104.1			
Tested	50.5	—	51.9	4.9*
F. Original	62.3			
Tested	83.1	33.2	—	2.62*

*Significant at 1 per cent level

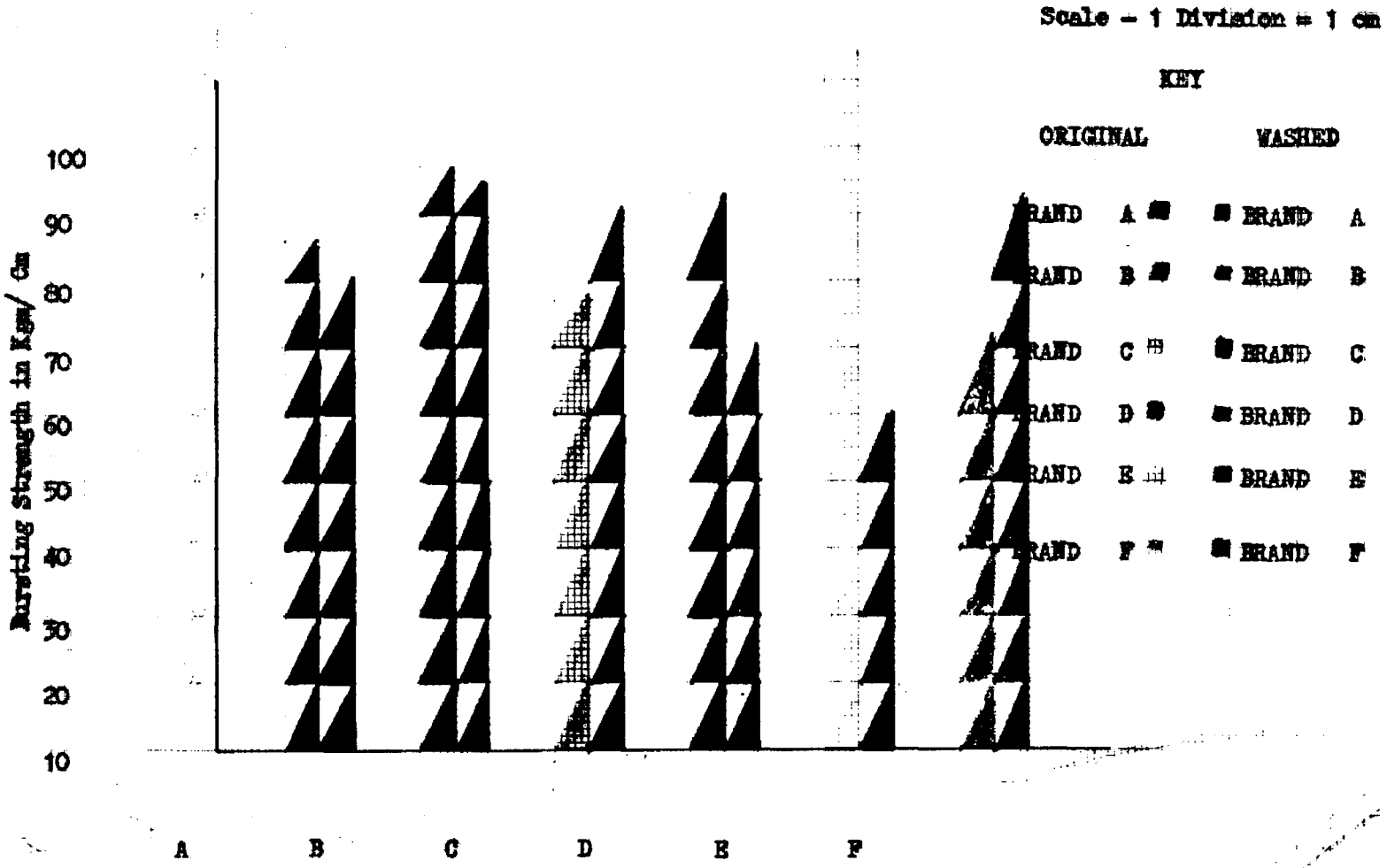

FIGURE –4

BURSTING STRENGTH

A comparison of the bursting strength of the originals, as shown in Table VIII, reveals the fact that sample E a had the highest strength. It was followed by brands B, D and A. Brand F had the lowest strength. Among the tested samples, brand B had the maximum strength followed by F and C. Minimum strength was found in brand E.

On comparing the original and tested samples, the percentage increase was found to be high in the case of sample F. Whereas, sample E, lost maximum strength. The difference between the original and the tested samples were found to be statistically significant in the case of brands C, D, E and F.

Abrasion resistance

The loss in weight of the samples due to abrasion determines their abrasion resistance. The higher the loss, the less is its abrasion resistance. The abrasion resistance of the original and test samples are given in Table IX. and Fig. VI

TABLE IX

ABRASION RESISTANCE

Condition of the samples		Mean loss of weight in mgm.	Percentage loss over original	't' value
A.	Original	2.6		
	Tested	1.8	30	0.50
B.	Original	2.6		
	Tested	1.6	38	0.70
C.	Original	2		
	Tested	1.3	35	0.21
D.	Original	1.8		
	Tested	1.5	17	0.4
E.	Original	1.4		
	Tested	1.2	14	0.26
F.	Original	1.04		
	Tested	1.2	15	0.20

From Table IX, it is clear that the loss in weight is more in the original samples compared to tested ones. Among the original and tested samples, brand F ranked first with minimum loss in weight due to abraision. Brand E ranked next. Brand A both original and tested lost the maximum weight.

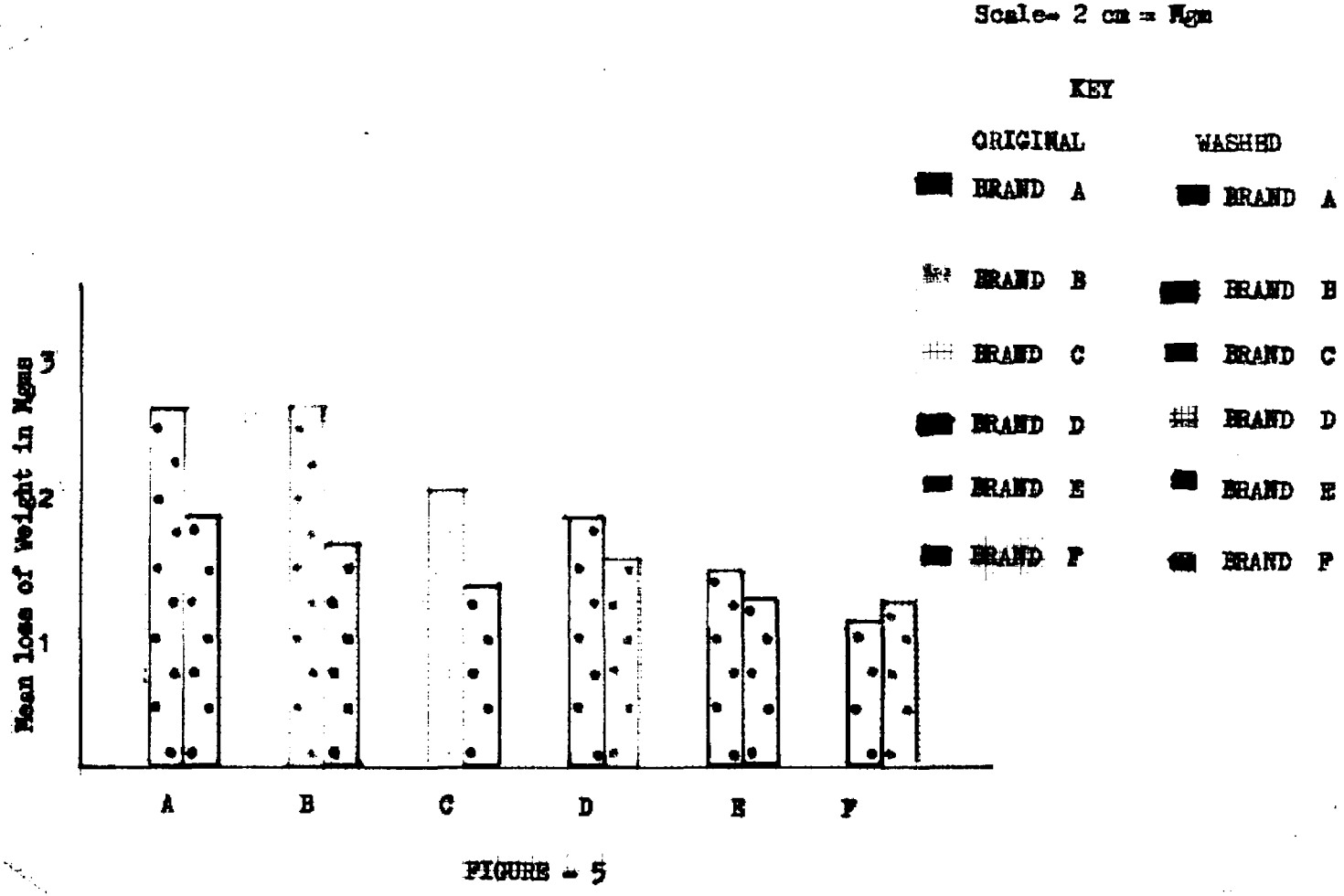

FIGURE - 5

ABRASION RESISTANCE

V. SUMMARY AND CONCLUSION

The aim of the study was to find out the awareness of consumers, in the low, middle and high income groups regarding controlled cloth and also to compare the performance of samples produced by different mills, to find out the best among them. For finding out the awareness, the investigator conducted a survey in 225 houses in Coimbatore City following interview method. Seventy five families were selected from each income level namely low, middle and high. The mills selected for comparison were named as A, B, C, D, E and F. The details are given in Appendix IV.

Six meters of material was bought from each mill and three metres were kept aside as original. With the remaining material of each sample, a long skirt was stitched. Each of the skirts were worn by a P.U.C. studen for a period of 12 hours a day. After that, the skirts were washed in 0.1 per cent of surf solution, following the principle of suction washing. The skirts under-went 25 such washes. After that, they were visually inspected by a panel of 15 judges for qualities like general appearance, colour, lustre, presence of flaws and texture.

As part of evaluation, the original as well as test samples underwent laboratory tests like fabric weight, thickness, breaking strength, bursting strength and abrasion resistance. The findings of the study both survey and experiment are as follows:

Survey

Though controlled cloth is intended for the use of downtroddens, the survey revealed the fact that only very few people in the low income group (27 per cent) were aware of controlled cloth. They purchased very rarely due to lack of adequate finance. Majority of families in the middle and high income group were aware of controlled cloth and they purchased frequently. Among the different varieties of controlled cloth, printed materials were more preferred than others. It was used both as a dress material and also as furnishing.

Suggestions for improvement included (1) local mills must produce controlled cloth to suit the local needs. (2) It should be made available in all shops (3) The quality of materials, colour and design must be improved.

Visual inspection

When visually inspected, brand F received maximum scores in general appearence, colour, lustre, flaws and texture. It was followed by brand E and C. Brand A ranked last with minimum scores.

Laboratory Tests

Fabric weight

Among the original samples, brand E had the maximum weight, Brand F and D followed the same. In the tested samples, brand F had the maximum weight followed by brand D. The weight of brand A both original and tested was very low.

Fabric thickness

The thickness of brand F original was maximum compared to others. It was followed by brands E, D and C. In the tested samples, brand D ranked first followed by brands E, F and C. Brand A both original and tested had very poor thickness.

Breaking strength

Breaking strength was greater in warp than in weft in all the samples. Brand F, both original and

tested had the highest breaking strength in warp and weft directions. The strength of brand A was poor, both in original and tested form.

Elongation

Brand F, original had the maximum elongation both in thewarp and weft directions. Among the tested samples, brand C and E had the highest elongation in warp direction. Brand F ranked next. In the weft direction, brand F had the maximum elongation followed by brands A and D. Least elongation in warp was found in the case of brand C original and brand D tested. As regards weft, brand C, both original and tested had the least elongation.

Bursting strength

Among the original E and F had the maximum bursting strength followed by brand B and D. In the tested samples brand E ranked first and F second. Brand F original and B and E tested had the lowest bursting strength.

Abrasion Resistance

The loss in weight due to abrasion was found to be very less in the case of brand F, original and tested, Brand E ranked next and brand A, the last.

In conclusion, the investigator would like to point out that majority of the low income people are not aware of controlled cloth.

The comparison of the test results revealed the fact that brand F was superior in qualities like fabric weight, breaking strength and abrasion resistance, Brand A ranked last.

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APPENDICES

APPENDIX I

CONTROLLED CLOTH PRODUCTION BY MILLS

Production of controlled cloth	In million sq. metres
December 1971 - February 1972	101
March - May 1972	97.09
June 1972	--
July - December, 1972	164
January - March, 1973	64
April - June 1973	100.04
October - December 1973	66.65
1974	112.12

APPENDIX II

STATES AND NUMBER OF MILLS INCLUDED IN CONTROLLED CLOTH SCHEME

Name of states	No. of mills	No.of N.T.C.* Mills
Andhra Pradesh	2	1
Kerala	4	1
Karnataka	8	3
Pondichery	2	1
Tamil Nadu	16	5
Ahmedabad	50	6
Rest of Gujarat	20	4
Bombay†	41	7
Rest of Maharashtra	20	9
West Bengal	13	6
Orissa	1	-
Bihar	1	1
Uttar Pradesh	11	3
Rajasthan	6	2
Madhya Pradesh	15	7
Delhi	3	1
Punjab	1	-
Haryana	2	-
Total	216	57

*National Textile Corporation

APPENDIX XII

CONSUMER PREFERENCE IN SOUTH WITH REGARD TO THE CONTROLLED CLOTH

Variety of cloth	Kerala	Tamil Nadu	Karnataka	Summary	Specification as per Textile Commissioner
Long Cloth					
(Grey)	119 cm & above	118 cms & above	—	118 cms & above	89 cm to 120cms
(Bleached)	119 cm & above	112 cms & above	107 cms & above	107 cms & above	89 cm to 120 cms
(Dyed)	89 cm & above	91 cms & above	89 cms & above	89 cms & above	89 cm to 120 cms
Shirting					
(Dyed)	99 cm & above	91 cms & above	89 cms & above	89 cms & above	74 cmsto 91 cms
(Printed)	99 cms& above	91 cms & above	89 cms & above	89 cms & above	75 cmsto 91 cms
Dhoty (Grey)	110 cm & above	122 cm & above	122 cm	119 cm & above	104 cmsto 122 cms
(Bleached)	-do-	-do-	-do-	-do-	-do-
Saree (Grey)	115 cm & above	117 cms	117 cms	115 cms & above	104 cmsto 122 cm
(Bleached)	-do-	-do-	-do-	-do-	-do-
Drill (Grey)	—	89 cms & 91 cms	—	70 cms & above	No
(Bleached)	—	-do-	70 cms & above	-do-	Width
(Dyed)	—	-do-	-do-	-do-	Restriction

APPENDIX IV

INTERVIEW SCHEDULE TO ELICIT INFORMATION REGARDING THE PURCHASE OF CONTROLLED CLOTH

Name of the investigator:

Name of the interviewee:

1. Total income of the family: Rs./month

2. How much do you spend on clothing per year?

3. Are you aware of controlled cloth?

4. Do you purchase controlled cloth?

   Yes ☐ No ☐

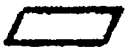
5. If yes, give the price of controlled cloth that you purchase

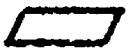
Materials purchased	Price per metre
Gada	
Long cloth	
Muslin	
Suitings	
Printed shirting	
Saree	

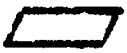
6. List the ways in which you use these controlled cloth:

7. How often do you purchase controlled cloth?

Monthly 

Once in two months 

Once in six months 

Annually 

8. Are you satisfied with the material purchased?

Yes  No 

9. State reasons in both cases

10. Give your suggestions to improve the utility of controlled cloth

APPENDIX V

DETAILS OF CONTROLLED CLOTH SELECTED

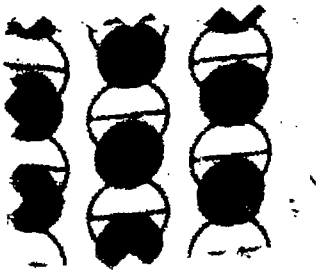
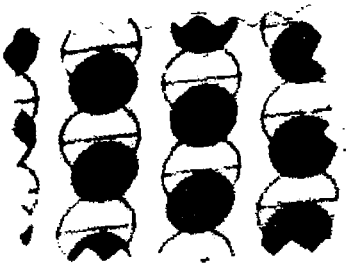
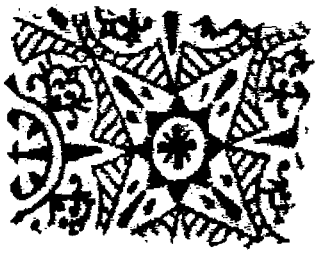
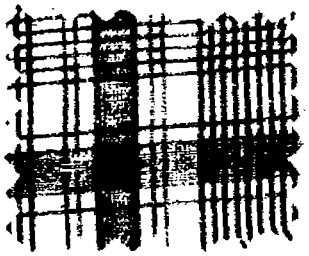
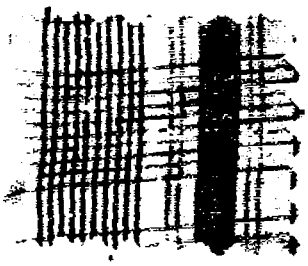
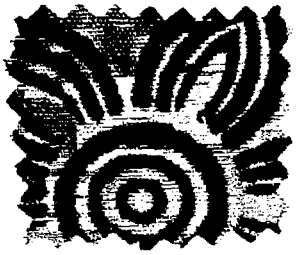
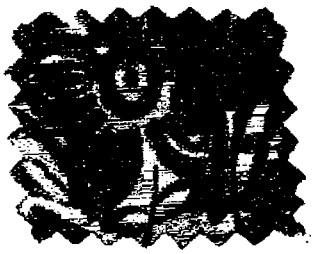
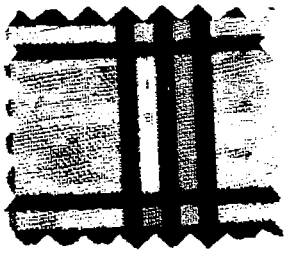
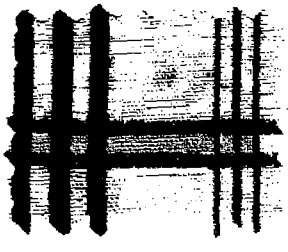
Brand	Name of the Mills	Price per metre in Rupees	Width in cms
A	M.S.K. Mills, Gulberga	1.40	62.5
B	New Anarwa Mills, Ahamadabad	2.96	90
C	Mahalakshmi Mills, Rajasthan	2.03	90
D	Yamuna Mills, Baroda	2.59	90
E	Century Mills, Bombay	2.75	90
F	Davangere Cotton Mills, Karnataka	2.58	109

APPENDIX VI

THE REPORT OF THE CHEMICAL ANALYSIS OF THE HARD WATER USED FOR LAUNDERING

Electrical conductivity	..	3.86
PH	..	8.3
Calcium Hardness	..	784 mg/litre
Magnesium Hardness	..	964 mg/litre
Carbonate Hardness	..	480 mg/litre
Non-carbonate hardness	..	1168 mg/litre
Total Hardness	..	1048 mg/litre

APPENDIX · VII
ORIGINAL AND TESTED SAMPLES

BRANDS	ORIGINAL	TESTED
A		
B		
C		
D		
E		
F		

APPENDIX VIII

PROFORMA USED TO EVALUATE TESTED SAMPLES IN COMPARISON WITH THE ORIGINAL

Samples	General appearance				Colour			Lustre			Flame			Texture		
	Excellent	Good	Fair	Poor	Bright	Medium	Dull	Very High	High	Low	Many	Few	Nil	Very smooth	Smooth	Rough
Brand A																
Brand B																
Brand C																
Brand D																
Brand E																
Brand F																

APPENDIX VI

FORMULA USED FOR THE STATISTICAL ANALYSIS OF THE DATA OBTAINED IN THIS STUDY

The statistical analysis for the laboratory test was done by the student's 't' test.

Student's 't' is a quantity which has a remarkable property(Aiyer, K.A.S., 1969). The 't' test was used to find out the difference between the original and tested samples of each brand. The mean and standard deviation of the sample groups were calculated and then the 't' value was calculated using the following formula.

$$'t' = \bar{x}_1 - \bar{x}_2 / \sqrt{(s_1^2 + s_2^2)/(n-1)}$$

where $\bar{x}_1$ and $\bar{x}_2$ were the means of the original and tested sample groups. s_1^2 and s_2^2 were the squares of the standard deviation of the two groups; n was the sample size of the two groups (10).

For instance, the 't' value of the bursting strength of the original and washed samples was calculated as follows:

$$t = 67.3 - 61 / \sqrt{(8.16)^2 + (5.98)^2/(10-1)} = 4$$

The degrees of freedom was n-1(9). The 't' value is significant. In the same way, the 't' values were calculated for all the other samples.