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TEXTILE INSTITUTE

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PROCEEDINGS

ANNUAL GENERAL MEETING, 1944

There was a large and enthusiastic attendance of members at the Annual General Meeting, followed by a luncheon and the Mather Lecture in Manchester on 19th April.

After the notice convening the meeting had been read, and the minutes of the previous meeting approved, the Council's Report for 1943 as circulated was put before the meeting and unanimously accepted. The Auditors' Report was then read and the Revenue Account and Balance Sheet for 1943 were approved and adopted.

At this point Mr. H. L. Johnson, the retiring President, addressed the meeting. He said that he had derived much pleasure from his office during the past two years, and he expressed his sincere thanks to the Council, Honorary Officials and staff for the great support which they had given him. Mr. Johnson then proposed that Mr. T. H. McLaren, who had been nominated by Council, be elected as President of the Institute, for the coming year. The proposal was ably seconded by Dr. A. W. Stevenson and Mr. McLaren was unanimously elected. He was then invested with the badge of office and took over the chair from the retiring President. In his reply Mr. McLaren expressed his sensibility of the honour which had been conferred upon him, and hoped that he could live up to the high standards which had been set by previous holders of the office. On behalf of the Council and members he warmly thanked Mr. Johnson for all that he had done for the Institute during his term as President. Mr. McLaren's reply follows this report.

Three Vice-Presidents were elected for a period of three years, the members elected being:

Mr. F. W. Barwick of Manchester, Mr. F. Kendall of Shipley, and Dr. J. C. Withers of Manchester.

The result of the ballot for election to Council was then read to the meeting and the Chairman declared the following members elected:

For a period of three years:

A. W. Bayes (Hyde)
C. H. Colton (Manchester)
H. G. Greg (Stockport)
F. Pickles (Leeds)
E. J. Poole (Bradford)
R. J. Smith (Manchester)
J. B. Speakman (Leeds)
A. J. Turner (Belfast)
H. A. Turton (Nuneaton)
F. C. Wood (Manchester)

For two years: R. Lord (Manchester).

For one year: T. Ashurst (Manchester).

Messrs. A. E. Piggott, Son & Co., incorporated accountants, were re-elected as auditors of the Institute for a further year.

The Chairman declared the business meeting closed, and members retired for lunch, when four guests were entertained: Mr. G. D. H. Cole, Mr. T. Boyd, Mr. H. S. Butterworth and Mr. E. Mercer. After the toast of "The King," Mr. H. L. Johnson proposed the toast of "Our President," and Mr. H. G. Greg the toast of "Our Guests." Mr. T. Boyd, immediate past Chairman of the British Launderers Research Association, replied on behalf of the guests, and while so doing expressed a hope for additional co-operation between the textile manufacturer and the launderer. His points were well stressed by two stories from his native land of Scotland.

After the luncheon Mr. G. D. H. Cole, the well-known economist, gave the Mather Lecture, his subject being "Educational Reconstruction with some special reference to the Textile Industries." The full lecture is given on pp. P51-P60 of this *Journal*.

PRESIDENT, 1944

At the Annual General Meeting in Manchester on Wednesday, 19th April, Mr. T. H. McLaren, of Dundee, was elected as President of the Institute for the ensuing year.

Mr. McLaren comes from an old Fifeshire family which has been associated with textiles for generations. After leaving Dollar Academy he joined his father in the linen and cotton manufacturing firm of Thomas McLaren & Son, where he had a thorough training in the managerial, financial and practical sides of the textile industry.

T. H. McLAREN
PRESIDENT, 1944-1945

During the last war he served in the Royal Artillery. He joined his own battery on its formation, and commanded it with the rank of Major in both France and Italy.

After the war years he returned to the textile industry and in 1927 he became managing director of Baxter Bros. & Co. Ltd., one of the largest flax and hemp spinning, weaving, bleaching, dyeing and finishing concerns in the country. This position he retained until the outbreak of the present war when he undertook the office of Deputy Flax Controller, which office he still fills.

PRESIDENTIAL ADDRESS

Ladies and Gentlemen,—You have elected me to be your President for the ensuing year and I accept office.

In doing so I wish to thank the retiring President and his seconder for the kind words he has used and for the manner in which you have responded. I am very conscious of the honour which you have conferred upon me, more especially as I am the first representative of the flax industry to occupy this important position. It will be my constant aim during my term of office to do all I possibly can to further the interests of the Institute in all directions and, if desired, to visit district sections from time to time.

Despite the difficulties of the present time, membership of the Institute continues to expand—the pace of expansion has accelerated under Mr. Johnson's Presidency and I am hopeful that the yearly increase will not shrink during 1944/45.

There is much to commend membership of the Institute to all far seeing and energetic firms and individuals in the textile industry. It is always difficult to arouse the interest of the unconverted and it inevitably rests largely upon you members to take every opportunity of bringing to the notice of your friends and neighbours the benefits which the Institute offers, and the activities which it pursues for the benefit of the industry in general.

What are its activities? I will remind you of some and I am sure you will agree that it should be more widely supported, especially if you consider this in connection with post-war problems—which we all do in moments of relaxation from the arduous essential war-time duties imposed upon us.

First, the Institute brings together all branches of the textile industry. In these enlightened days we cannot hope to be successful in our particular textile if we do not give some heed to developments taking place in what may well be competing branches of the industry. The Institute is neutral ground on which we meet, discuss and plan—the more we meet and know each other the better for all concerned. These are the occasions when petty jealousies are driven away, friendships formed and mutual aid freely offered and taken.

Secondly, I should like to mention the attitude of industry to research. Our individual industries have research associations which are supported by Government grants and by contributions from firms in the industry. The days of industries running along on their own volition by the skill and impetus derived from previous generations no longer exist. Modern conditions demand the application of science at all stages of production—progressive firms recognise this and an increasing number employ research staffs who work closely with the research establishments supported by the industry. Many firms, who are members of research organisations, but who do not employ research technologists, cannot possibly benefit to the same extent as the firms who have this scientific assistance. We all know that the research scientist couches his papers and solutions to problems in language which is very often beyond the ordinary business man, and it follows that the firm with a scientifically trained research technologist can have these papers readily interpreted and thus utilise the findings if suitable to their particular business.

To those who have no scientific assistance the Textile Institute provides the link between research and industry. The *Journal* published each month contains scientific papers and abstracts of publications from all over the world. These abstracts are understandable by the ordinary man and, therefore, all members are enabled, through its medium, to take a lively interest in and appreciate what is going on in the world of textiles. At the same time the Abstracts Section of the *Journal* is of great service to the research technologist and scientist saving him much time and providing a comprehensive reference to textile developments. The Transactions papers place before him original work of a high order.

Thirdly, there is the question of standardisation, which gains in importance as the years pass. In pre-war days the Institute was very active in this sphere —war conditions interrupted the normal programme of this important function, but emergency work has been undertaken. Standardisation is an activity which must be kept well to the fore and negotiations are proceeding at present with the British Standards Institution which I hope will be concluded shortly on lines satisfactory to all parties concerned.

My fourth point is on education and training. Unhappily, the ravages of war have removed from our midst many promising executives, managers and foremen. Furthermore, recruitment has of necessity been at a low level and there will be a shortage of these essential types of employees unless strenuous efforts are made. If our industries are to be efficient again it is vital to employ the most highly trained personnel it is possible to find. To-day, the old-fashioned system of engaging a likely lad and supervising his training in our mills and factories is not good enough.

The prospects of an attractive career in textiles must be made known to students in our Secondary Schools and Universities, and this the Textile

Institute does in large measure. Satisfactory arrangements have been made whereby Universities and Technical Colleges throughout the country co-operate closely with the Institute. Courses of study are so arranged that on a certain standard of knowledge being attained the student qualifies for the Institute's diploma, either as an Associate or as a Fellow of the Textile Institute. The possession of a diploma guarantees to the prospective employer that the candidate has attained a definite standard of knowledge of textiles and has held a position of responsibility within the industry for a minimum period. Thus the diploma is in itself a recommendation to an employer requiring the services of highly trained personnel.

Employers are coming more and more to recognise the value of these diplomas as the guarantee of attainment and of skill as a textile technologist. To those who are not yet fully acquainted with the standing of these qualifications I would say, " Look at them carefully," for the diplomas ensure the flow of the right type of personnel to the industry. They save the industrialist much valuable time when considering applications to fill important posts in their organisations.

The importance of this sphere of the Institute's activities cannot be overstressed, and each member should make himself acquainted with the various schemes and scholarships in existence so that he may guide young men presently employed by him or students who may appeal to him for assistance.

Modern industry is team work highly specialised and the Institute Diploma the hall mark of knowledge and skill. By its educational schemes, its competitions for textile design, its accumulation and dissemination of knowledge, and its encouragement to all those interested in textiles, the Institute is furthering the productive power of the Textile Industry; and by producing a flow of suitably qualified textile technologists it ensures the continuity of this productive power at a high level.

The tempo of affairs increases, post-war export markets will be fiercely contested—it remains for the industrialists to take full advantage of what is offered and so regain and maintain the world-wide reputation for textiles of the highest quality.

You all know I hope how membership of the Institute will assist. It must be supported by all interested in textiles, owners and directors must be encouraged to give time to their executives to assist the Council in their deliberations.

To sum up, therefore, we have, through the medium of the Institute:

(*a*) The opportunity of contact, one branch of the Industry with another.
(*b*) Contact with research workers.
(*c*) Control of standardisation.

Lastly, but tremendously important, guidance can be given in the education, training and the granting of the Institute's Diplomas which guarantee a standard of knowledge and skill of entrants to industry.

I could talk much longer on the points I have made, but that would simply bore you—I have tried to be concise and fervently trust my remarks are not misunderstood.

In conclusion, I should like, on your behalf, to thank the retiring President, Mr. Johnson, for the very great help he has given the Institute during his two years of office. The knowledge of his energy and drive has been an inspiration to all, and we are very much indebted to him for the services he has rendered.

COUNCIL'S ANNUAL REPORT, BALANCE SHEET AND ACCOUNTS FOR 1943

Presented to the Annual General Meeting at Manchester, Wednesday, 19th April, 1944

The Council has much pleasure in presenting the following Report, Balance Sheet and Accounts for the year ending 31st December, 1943.

Balance Sheet and Accounts

The financial position of the Institute has been further consolidated during the year, all accounts showing a healthy state. An increase in membership has resulted in an addition to the total of subscriptions received. Under present conditions the general situation is quite satisfactory.

Annual Meeting

A large number of members were present at the Annual Meeting in Manchester to take advantage of the opportunity to meet together. Such opportunities are few at present but the interest is still maintained and augurs well for the future. Mr. H. L. Johnson was re-elected as President, and presided at the luncheon which followed the meeting.

Mather Lecture

Sir Robert H. Pickard delivered the Mather Lecture, his subject being "Textile Research and Development." The lecture was held in conjunction with the Annual Meeting.

Institute Honours

During the year the Service Medal was awarded to Mr. T. A. Part, in recognition of his valuable services to the Institute over a long period, as Honorary Secretary of the Midlands Section.

Publications Committee and the "Journal"

Reductions in the supplies of paper restricted the size of the Journal, but a number of changes were made in order to alleviate the position. The chief alteration was the substitution of a lighter weight paper so that more pages could be included in each edition. In spite of these difficulties the three sections of Proceedings, Transactions and Abstracts have been maintained.

The policy of giving full reports of most Section meetings has been continued. Although in the early part of the year there was a shortage of papers for the Transactions the position improved later. It is hoped that the improvement will continue, as it is an essential part of industrial progress that there should be as much publication as possible of textile investigations. The number of Abstracts is still limited by the decrease in the number of foreign journals received.

The Committee again records its appreciation of the services of Dr. F. C. Wood, Honorary Editor of the Proceedings Section, and of others, particularly the staffs of research associations.

Diplomas Committee and Institute Diplomas

The Institute's Examinations for the Associateship Diplomas were held as usual in 1943. The Preliminary Examination was held on 24th March, 1943 and the Examination in General Textile Technology was held on 26th May at Belfast, Glasgow, Manchester and Nottingham. In the Preliminary Examination there was one successful candidate from a total of twelve. In the Examination in General Textile Technology, 10 candidates were successful out of a total of 17.

Applications for the Institute's Diplomas during 1943 totalled 53 (12 Fellowship and 41 Associateship), as against 45 in the previous year (12 Fellowship and 33 Associateship). During the year 8 Fellowship and 16 Associateship Diplomas were awarded. The total number of applications since the Charter was granted in 1925, reached 1,370 (395 Fellowship and 975 Associateship) of which 299 for the Fellowship and 632 for the Associateship were successful.

National Certificates in Textiles

In 1943 there were 44 (61) candidates for the Ordinary and Higher Certificates, 36 (55) Certificates being awarded, 1 (3) with Distinction; (the figures in brackets are for 1942). Seventy-one courses are now recognised at 27 Colleges and Schools.

Textiles and Designs Committee: Institute Competitions

The Committee, realising that the time which students can devote to preparing entries is strictly limited, instituted a War-time Competition in place of the former Crompton Competition. There was a gratifying response and some of the patterns were of a high standard. Sections were also held for worsted cloths, and for printed designs. The latter competition attracts more candidates each year, especially from the art schools. It is felt that the interest maintained in the competitions is quite satisfactory during present conditions, and that a beneficial stimulation is given to textile design by this section of the Institute's work. The total number of entries in 1943 was 69 as compared with 87 in the previous year.

The Committee prepared its 24th Reference Collection Album of fabrics which is used to give students a direct contact with modern trends in design and structure. Assistance was also given with the adjudication of entries to the two textile design competitions organised by the Education Department of the Lancashire County Council.

Library

The Library facilities are used by many members, but there are still those who do not appreciate that they can borrow publications either by calling at the Institute or through the post. The loan of current trade and professional journals, in conjunction with the Abstracts Sections of the Journal, is much appreciated by those members who take advantage of the opportunities available. The creation of a film library is under consideration.

Scholarships

No scholarship awards were made, although a grant for research work was allowed to a member. The Council, however, has started an enquiry into the funds and awards which are available for textile scholarships and it is anticipated that useful information will be available in the future.

Industrial Recruitment and Development Committee

This Committee was newly constituted during the year by merging the Industrial Development Committee and the Committee for Recruitment, Selection and Training for the Textile Industry. It continued to investigate the various problems related to recruitment for and development of the textile industry and is acquiring some useful information which should be of service to the industry, in due course. During the year the Cotton Board set up a Recruitment and Training Department, and the Institute has three representatives on the Advisory Committee for this department.

Textile Terms and Definitions Committee

Further publications of terms were made in the Journal and comments both for and against the committee's decisions were received. This can be taken as certain evidence that the work undertaken is necessary and that it is making some progress. Any standardisation of terms is bound to cut across some of the previously accepted but ambiguous usages, and although the work is relatively slow and certainly difficult, the Committee hopes to make a valuable contribution to the textile industry.

Standardisation in Textiles

A reorganisation of the Institute's Scheme for Standardisation is taking place. Apart from this, however, the Institute has started on the preparation of standard tests for narrow fabrics on behalf of the Narrow Fabrics Directorate of the Ministry of Supply. In addition papers are still being prepared on strength testing, and also in connection with the Bundesmann Test for Water Repellency.

Council and Committee Meetings

The following is a record of meetings held during 1943:—Council, 9; Finance and General Purposes, 11; Publications, 12; Diplomas, 11; Joint Committee re National Certificates, 2; Textiles and Designs, 1; Unification of Testing Methods, 2; Industrial Recruitment and Development, 7; Textile Terms and Definitions, 10; Library, 1; Lancashire Section, 3; London Section, 1; Midlands Section, 2; Yorkshire Section, 3; In addition 7 sub-committees met on 17 occasions for the consideration of special matters.

The total number of meetings for 1943 was 92 as against 98 in the previous year.

Section Activities

Some of the most successful lectures and discussions since the commencement of the war were held by Sections during the past year. The following functions give a healthy picture of Section activities. Irish Section, five lectures, two visits; Lancashire Section, fifteen meetings; London Section, three meetings; Midlands Section, five meetings; Scottish Section, three meetings; Yorkshire Section, four meetings and one visit.

Membership

The membership list at the end of 1943—to be carried forward to 1944—was made up as follows:—Honorary Life Members, 15; Life Members, 63; Ordinary Members, 1,664; Junior Members, 98; total 1,840 as against 1,764 at the end of 1942. Of the numbers at 31st December last, 213 had been admitted to the Fellowship and 488 to the Associateship.

The Institute suffered a particularly heavy loss through the deaths of J. H. Lester, who was a Vice-President and one of the hardest workers in the foundation of the Institute; J. W. Nasmith, an Honorary Fellow; and F. C. Porter, a Vice-President.

The Council regrets to announce the loss by death, during 1943, of the following members:—J. S. Addison (Braintree), C. Barker (Manchester), J. W. Baron (Blackburn), A. L. Forster (Glasgow), A. E. Hall (Daventry), R. Geigy (Basle), J. S. Hall (Totnes), J. M. Hey (Manchester), A. H. Holden (St. Annes on Sea), N. Kemp (Galashiels) Sir James Morton (Carlisle), D. O. Moss (Morley), R. E. Oldroyd (Rochdale), C. Padgett, (Bradford), A. Preston (Nelson), W. H. Ross (Leeds), Sir Michael Sadler (Oxford), E. Salt (Leek), J. C. Williams (Manchester).

15th March, 1944.

Dr. **The Textile Institute—Balance Sheet as on 31st December, 1943** **Cr.**

1942 £ s. d.	LIABILITIES	£ s. d.	£ s. d.
	Foundation Fund—		
10935 1 4	General Account	12764 16 7	
5500 0 0	Cotton Reconstruction Board Grant	5500 0 0	
3500 0 0	Crompton & Beanland Fund	3500 0 0	
1039 15 3	Life Membership Reserve Account	—	
—	Life Membership Subscriptions	180 12 0	
1000 0 0	Frank Wright Memorial Fund	1000 0 0	
—	Research Studentships Account	100 0 0	
			23045 8 7
	Scholarship Scheme Reserve Account—		
	Balance as on 31st December, 1942	1034 2 1	
1034 2 1	*Add* Surplus Income for year	214 18 0	
			1249 0 1
	Crompton and Beanland Prize Fund Scheme Reserve—Account—		
	Balance as on 31st December, 1942	188 4 10	
88 4 10	*Add* Surplus Income for year	93 17 11	
			282 2 9
	National Certificates Scheme—		
	Balance as on 31st December, 1942	109 0 6	
109 0 6	*Add* Surplus Income for year	7 5 5	
			116 5 11
	Frank Wright Memorial Fund Reserve Account—		
	Balance as on 31st December, 1942	89 1 4	
89 1 4	*Add* Interest on War Stock	36 12 1	
			125 13 5
80 2 7	Subscriptions paid in advance		98 9 8
819 6 6	Sundry Creditors and Reserves		979 3 11
	Revenue Account—		
	Balance as on 31st December, 1942	1314 9 0	
	Less Transfer to Foundation Fund	1000 0 0	
		314 9 0	
1314 9 0	*Add* Surplus Income over Expenditure for year 1943	524 4 4	
			838 13 4
£25609 3 5			£26734 17 8

1942 £ s. d.	ASSETS	£ s. d.	£ s. d.
	Furniture, Fittings and Library Account—		
28 10 7	Balance on 31st December, 1942		28 10 7
	Investments Account—		
11513 0 9	Foundation Fund	12765 10 9	
5502 13 3	Scholarships Scheme	5502 13 3	
3515 1 0	Crompton and Beanland Prize Fund	3515 1 0	
752 10 0	Life Membership Account	—	
1000 0 0	Frank Wright Memorial Fund	1000 0 0	
			22783 5 0
45 16 4	Sundry Debtors	17 17 6	
243 7 0	Journal Account—Advertisements...	216 9 6	
148 15 5	,, Outstanding Sales and Subscriptions	130 4 8	
162 14 10	Standardisation Account	16 12 4	
			381 4 0
9 15 6	Pension Fund—Unexpired Premiums		9 15 6
99 11 3	Stock of Textile Technology Handbooks		97 10 0
9 10 0	Gas and Electricity Deposits		9 10 0
	Cash on Deposit—		
1293 6 8	York County Savings Bank...	1326 19 0	
905 4 2	Manchester and Salford Trustee Savings Bank ...	926 3 4	
—	Woolwich Equitable Building Society	501 13 3	
			2754 15 7
	Cash at Bank—		
267 10 1	General Account	171 10 0	
98 5 6	Special Schemes	493 17 5	
			665 7 5
13 11 1	Cash in Hand		4 19 7
£25609 3 5			£26734 17 8

AUDITORS' REPORT TO THE MEMBERS.

We report to the members that we have examined the above Balance Sheet, together with the books and vouchers of the Institute, and that we have obtained all the information and explanations we have required. We further report that in our opinion the Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Institute's affairs according to the best of our information and the explanations given to us, and as shown by the books of the Institute.

70 Spring Gardens, Manchester, 2.
22nd March, 1944.

Signed H. JAQUES, *Chairman of Finance and General Purposes Committee.*
W. HOWARTH, *Hon. Treasurer.*

ARTHUR E. PIGGOTT, SON & CO.,
Incorporated Accountants, Auditors.

Dr. **The Textile Institute—Revenue Account for the Year ended 31st December, 1943** **Cr.**

1942 £ s. d.	EXPENDITURE	£ s. d.	£ s. d.
	To Rent and Rates	323 2 0	
181 5 0	*Less* to Journal Account	107 14 0	
			215 8 0
	,, Heating, Lighting and Cleaning	177 10 4	
88 5 3	*Less* to Journal Account	59 9 1	
			118 1 3
	,, Salaries	572 15 4	
193 11 0	*Less* to Journal Account	250 0 0	
			322 15 4
	,, Wages	598 0 7	
409 11 9	*Less* to Journal Account	85 8 4	
			512 12 3
46 13 7	,, Pension Fund Contributions		46 13 8
36 15 0	,, Savings Association Contributions		46 7 6
154 15 6	,, General Expenses		123 9 7
140 19 1	,, General Printing and Stationery		158 7 4
93 14 7	,, Postages, Telegrams and Telephone		82 17 6
41 7 0	,, Insurances		24 16 6
56 11 0	,, Audit and Legal Expenses		66 4 3
3 3 0	,, Subscriptions to Institutions		5 5 0
421 0 0	,, Income Tax		472 10 0
90 0 2	,, Section Expenses		140 5 8
12 18 6	,, Annual Conference Expenses		8 17 9
39 9 3	,, Meetings and Travelling Expenses		39 2 11
26 0 7	,, Library Account		117 15 3
—	,, Editorial Board		1 2 5
5 19 5	,, Recruitment Committee		3 10 9
72 2 3	,, Diplomas Account Expenses		73 16 10
—	,, Medal Account		1 5 9
58 11 7	,, A.R.P. Expenses		59 4 8
100 0 0	,, Grant to Standardisation Account		50 0 0
75 0 0	,, Education Grant		75 0 0
2347 13 6			2765 4 2
620 15 3	,, Surplus Income over Expenditure for year ...		524 4 4
£2968 8 9			£3289 8 6

1942 £ s. d.	INCOME	£ s. d.	£ s. d.
2880 17 0	By Membership Subscriptions (1943)	3013 12 0	
66 8 11	,, Paid in advance in 1942	80 2 7	
174 3 1	,, Arrears paid	149 10 11	
—	,, Transfer from Life Membership Subscription Account	71 8 0	
21 0 0	,, Special Subscription—The Weavers Co.	21 0 0	
15 18 11	,, Interest on Life Membership Investments	– – –	
29 11 0	,, Interest on Diploma Investments	– – –	
133 7 7	,, Diploma Fees	138 13 3	
3321 6 6		3474 6 9	
794 5 2	,, *Less* Amount transferred to Journal Account ...	700 19 3	
			2773 7 6
2527 1 4			
65 0 0	,, National Certificates, Competitions, and Standardisation—Administration Expenses		100 0 0
13 0 6	,, Bank Interest *less* charges		18 10 10
360 13 10	,, Foundation Fund Income from Investments ...		392 19 2
2 13 1	,, Editorial Board		
£2968 8 9			£3289 8 6

NOTE.—The Market Value of Securities as on 31st December, 1943, was approximately £23,421 1s. 8d. In order to save paper the following have not been printed, but copies may be seen at the Institute: the Schedule of Investments and the Journal, Foundation Fund, Competitions, Scholarship and Frank Wright Memorial Fund Accounts.

The Institute has entered into a new arrangement for the assessment of Life Membership subscriptions for tax purposes. This has necessitated the transfer of old balances from Life Membership Accounts to Foundation Fund Accounts.

THE MATHER LECTURE*

EDUCATIONAL RECONSTRUCTION WITH SOME SPECIAL REFERENCE TO THE TEXTILE INDUSTRIES

By G. D. H. Cole

Let me make it clear at the outset that any claim I have to speak on this subject is that of a teacher and of a student of Economics, and not that of a textile expert. I have no special knowledge of the textile industries—no knowledge at all beyond what an economist with a bias towards the study of industry may be expected to pick up as part of his general equipment. It is therefore primarily of education generally, rather than of any education peculiarly appropriate to the textile trades, that I propose to speak; and it is natural to begin with the Education Bill which has recently been passing through its prolonged committee stage in the House of Commons.

Under the Bill it is proposed, at a date which still unhappily remains unsettled, to raise the school-leaving age to 16; and well before that is done, it is intended to introduce a universal system of secondary education up to the age of 15. These changes are to be brought about at a period when the number of juvenile entrants to employment will be in any case falling off, owing to the decline in the birth-rate; and they will evidently confront manufacturers in many industries with considerable problems of readjustment in the labour force. Moreover, it is proposed to introduce as soon as possible a system of day-time release for work in Young People's Colleges between the ages of 15 and 18—beginning with one day a week, but, it is to be expected, with the intention of advancing gradually to a system of half-time schooling and half-time employment. This will further diminish the juvenile labour supply, and will besides involve a good many complicated problems for the managements of the establishments in which these young people are employed.

Why are these changes being made or contemplated? Is it because we are coming to set a higher value on our young people now that they are getting scarce? Is it because industry demands higher standards of knowledge and trained intelligence from those whom it employs? Is it because we want better educated citizens, rather than better trained workers? Or is it merely that the educationists are persistent people, and have managed to force their ideas upon the rest of us, without our knowing very well whether we really agree with them or not? I can think of four possible reasons for wishing to extend the duration of school life for the mass of the people—that it will make them better, or happier, men and women; that it will make them better workers; that it will make them better citizens; and that, whether it makes them better or not in any respect, it is at any rate worth while to keep them out of "gainful employment" somewhat longer. Three possible positive reasons, and one negative reason; and we may, of course, be moved at once by all four.

Now, how much difference will it make to what we set out to do practically which of these reasons moves us most? Some will answer that, if our primary aim is to make better workers, we shall incline to give any additional education we provide a marked vocational or technical bias. I doubt, however, if this is really so. Not long ago, I had the privilege of presiding over a conference including employers from a good many industries, including textiles, who all seemed to agree that they did not want the schools, even if the age were raised, to teach their pupils to follow a particular trade. They could do that themselves, they said, when the young people came into the factories. What they wanted was that the new entrants to industry should be as lively, as quick-witted, and as adaptable as possible, with a good basis of general knowledge,

*Delivered on the occasion of the Annual General Meeting of the Textile Institute, held in Manchester on 19th April, 1944.

including some mathematics and some elementary science and a power to understand, speak and, if possible, write good plain English. Young persons possessed of these attributes, they said, would be the right material for making into good workers; and I was very glad to hear them say it as if they had no doubt about its truth. For these are precisely the attributes that are likeliest to make the young person an intelligent citizen; and they should also help to make him, or her, a better and a happier person. Thus, if this view is endorsed, our three positive reasons for extending educational opportunities march together, and are not in conflict, as they have often been supposed to be.

Please observe that I said "an intelligent citizen"—not "a good citizen"—and that I qualified my expectation that more of the sort of education I spoke of would make better, or happier, men. An intelligent citizen is not, alas, necessarily a good citizen; nor is a well educated person necessarily better, or happier, than an ignoramus. More education, even of the best sort, may make men bad citizens and bad and unhappy persons if the mental attainments achieved come into sharp conflict with the facts of contemporary life. If mass-unemployment prevails, and there are few opportunities in employment for the use of the higher faculties, the better the quality of our education is, the more discontent and mental disharmony will it provoke. That's how Nazis are bred—out of thwarted capacity for better things and the sense of moral futility which is the psychological counterpart of disorder in economic affairs. Men and women will not be better citizens, or better or happier persons, if we prepare them for higher forms of production and service, and then confront them with a "No Hands Wanted" notice when they ask for the opportunity of putting their capacities to practical use. No educational system will make for greater happiness or goodness or better citizenship unless the community can find good uses for all the capacity which it sends forth from its schools into the labour market. Full employment and educational advance must go together; even if we educate men and women in the art of living, rather than for production, we must see to it that they have the means of living by useful service, or we cannot expect them to live happily, or well.

The entrants to gainful employment divide themselves—and will continue so to do under the system of to-morrow—into four main streams. Some enter unskilled, or relatively unskilled, jobs, as learners—not apprentices—at or near the minimum school-leaving age. Some, then or a little later, enter skilled trades, as apprentices or under some less formal arrangement for graduation into a skilled craft. Some stay on longer at full-time schooling, and enter gainful occupation somewhere between 16 and 19, as clerical or administrative workers, or as premium apprentices, or in some other way rather higher up the hierarchy of jobs. Some go on to a University or to higher full-time technical courses, and become employed only as adults—at 20, or 21, or even 22 or 23. A few protract their education even beyond this point, and become doctors or professional or research workers in some calling which demands an exceptionally long training; but for my present purpose I can group this fifth stream—numerically no more than a trickle—with the fourth.

At present, these four groups are much too sharply distinct—not merely at the moment of entry to "gainful employment" but, in most cases, for life. It is very much harder than it ought to be for a "late developer," or for a boy or girl who has to leave school early and then shows high capacity needing special training, to get the opportunity to develop to the full. The difficulty of moving from one group to another is inconsistent both with democracy and with getting the best out of our people in productive service. It is inconsistent with the aim of sorting people out to the fullest possible extent into the jobs they will do best, and enjoy most. We must not, therefore, be content to regard our four streams of entrants to employment as flowing for ever apart. There must be plenty of channels leading from one stream to another, not simply near the point of entry, but through adult life as well.

As long as we bear this well in mind, we can conveniently discuss the four streams one by one In future, we are told, every normal boy and girl will have, from eleven to at least fifteen, not less than four years of secondary education. What will this mean in practice ? It will mean, first, that boys and girls for whom the literary education of a Grammar School is regarded as the most suitable will not be prevented from getting that type of education—up to fifteen—by the parents' lack of means. But merely to put this point is to reveal a real difficulty. The Grammar Schools are not designed to receive boys and girls who will leave at fifteen. They must keep their pupils at least to sixteen in order to do them justice. This involves the provision of scholarships and maintenance allowances on a generous scale—not merely to keep in the Grammar School for at least a year beyond 15 those who have got to them in the first instance, but to ensure that the right boys and girls do get to them at 11 and are not shut out because of the parents' uncertainty of being able to see them through.

I do not, however, anticipate a very great growth of Grammar School education as a consequence of the new Bill. Indeed, I should be sorry if the main stress were laid on the Grammar Schools. There is much more risk of things going wrong with the two other types of secondary schools which, with the Grammar Schools, will constitute the new provision of secondary education for all. We have at present far too few Junior Technical Schools ; and we must clearly plan for an increase in this field. What Junior Technical Schools we have are, I believe, mostly pretty good, and on the whole well-equipped. They are good and well-equipped partly because they are few, and it has been possible to spend money on them without raising cries about extravagance. The great danger now is that a rapid increase in their number may lead to a deterioration in quality. It will not be easy, however hard we try, to staff them really well ; for there will be many competitors for the services of really good teachers. Equipment is bound to be expensive ; and it is of the greatest importance that it should not be stinted. But equipment, though important, is not the greatest need, which is that the new Junior Technical Schools shall be places in which the pupils will get a real grounding in the knowledge that is vital for the mastery of the modern world and its problems, and not a merely vocational preparation for a particular trade. Basic science and mathematics, rather than trade subjects, are the elements in the curriculum upon which the chief stress must be laid ; and with science and mathematics must go a training in the ability to speak, write and appreciate good, clear English and some understanding of the essential institutions of the society into which the pupils will go forth to live and work.

In the world into which we are moving, I believe it will become necessary for most of us to be much more mobile between job and job than in the past. No one, I hold, ought to be so specialised as to be good for nothing but a single trade. I look forward, indeed, to the time when no one will work most of his life continuously at a single type of work ; but in relation to school, including the Technical School, what I am urging is that school ought to be a place in which young people learn, not trades, but basic techniques and a basic sense of realities that will make it easy for them to turn their hands to any of a wide variety of jobs. The need of our age is for intelligent adaptable people, who will be ready to turn their hands to this or that in accordance with changing needs and opportunities. We shall want quite a large proportion of our young people to have, as the basis of this adaptability, an understanding of the essentials of modern science and a capacity to use elementary mathematics in a practical way. This is, above all else, the task of the Technical School ; and it is right, for this purpose, that to the extent to which it is inclined towards a particular technique, the bias should be in the direction of general engineering—for that is the natural bias for a predominantly mechanical age.

Very much more difficult is the problem that confronts us in the making of what is to be called the " Modern School " ; for the easiest, and the worst,

way of thinking of the "Modern School" is to regard it as a "dump" for the boys and girls who are not deemed suitable either for the Grammar School or for the "Junior Tech.". In a sense, no doubt, that is what it must be; for, as every normal child must go to one of the three, it follows that those who go to neither of the others must go to the Modern School, which is therefore bound to have on its roll the less promising children in an intellectual sense. This is unavoidable; but we must on no account allow it to induce us to act as if the Modern School matters least, and can be put off with the worst. The temptation so to behave will be considerable. The Grammar Schools and the Technical Schools will both start with higher prestige in their several ways than the Modern Schools. There will be a tendency for the better teachers to prefer teaching in them, and for Local Education Authorities to pick the better teachers for them. The Modern Schools will be inevitably taking over in the first instance many of the buildings hitherto used as elementary schools and many of the teachers from such schools; and there will be a temptation to regard them as merely elementary schools for the older children under a new-fangled name.

This is what we have to prevent. Do not think I am casting stones at the elementary schools. I am well aware that, particularly in some of the newer Senior Schools, very fine work is being done—the finer for being untrammelled by the examinations which beset the existing secondary schools. I know there are fine Central Schools under the elementary code. But there are also very bad elementary schools and "higher tops" for the older children, and there are areas in which almost the whole of the provision is bad. Moreover, if secondary education for all is really to mean something different from what has existed hitherto, there must be both a great improvement in standards of staffing and accommodation and a large infusion of new blood drawn from teachers whose traditions are those of secondary education. We must mix our teachers up, in order to make the most of the limited supply of really good ones; we must not allow the Modern Schools to be put off with the leavings after the other types have taken what they want.

In order to give the Modern Schools the right start, we must make up our minds as clearly as we can what we want them to do. They will be dealing with the main body of children who enter gainful employment at the school leaving age, and especially with those who do not proceed to an apprenticeship, formal or informal, to a recognised skilled trade. What qualities do we require of them, either as producers or as citizens? That we want them to be as intelligent as possible goes, I hope, without saying; and it should also be evident that we need teach them practically nothing of a specifically vocational sort. They can pick up what they need of that sort after they enter employment; and they will pick it up much better if we send them forth from school as intelligent as we can help them to be.

The question then is, how can we best set about developing their intelligence? The answer, I think, is that we must appeal to them largely on practical lines and help them to learn through doing, rather than by ordinary classroom tasks. There has been too much tendency in the past to confuse manual with vocational education, and to suppose that setting a boy to carpentering is the same thing as training him to be a carpenter. It is nothing of the sort. Every boy ought to be a tolerable carpenter—or at any rate ninety-nine out of every hundred ought to be—and so ought a good few of the girls. Every normal man and woman ought to be reasonably handy at a wide range of everyday jobs, so as to be able to keep a home decent and in good order without having to send for a builder every time something goes wrong. And most boys and girls who have no special literary bent will, I am convinced, learn to be intelligent much more easily if the learning is linked up with doing real, practical jobs than if it is inculcated as something only remotely and theoretically connected with the ordinary business of everyday life.

It follows that a Modern School should not be just a building with classrooms in it, and a playing-field attached. It should be, as far as we can make

it, a place where there is scope for doing a great many different things from cultivating soil or trees to building sheds and making furniture, laying roads, cooking, cobbling, painting scenery for a theatre, making costumes, playing in brass-bands or orchestras, handling a lathe or an electrical gadget—and all the while learning to do sums, to make a report in decent, plain English, to behave in a businesslike way on a committee, in close relation to the doing of these practical jobs. The Modern School ought to have many of the features usually associated with a Camp School, and it ought to be a social centre as well as a school, in close contact with the parents as well as the children.

If the Modern School is to be this sort of place, it will need teachers who can teach in the appropriate way—by doing things with the children, and not merely telling about them. We shall need to revise fundamentally our methods of training teachers, and also our ideas about the sources from which teachers are to be recruited. We shall need a good, even mixture of men and women—including married women—among the teachers, and a goodly number of them must know how to use their hands as well as their books. The Modern School must be neither the old elementary school under a new name, nor a pale imitation of the existing type of secondary school. It must be something essentially different and novel—something foreshadowed in the best Senior Schools that have been founded in recent years, especially in villages—something that will attract the practically minded man or woman who has an itch to teach, but is repelled by the conditions of the ordinary elementary curriculum and perhaps quite unsuitable for the Grammar School or the Technical School.

Of course, I do not mean that the Modern School must not trouble to teach its pupils the so-called "cultural" subjects. It must teach these subjects, but must teach them in such a way as to reach the imaginations of children whose bias is not literary, and who will learn them best if they are related to doing things, and not to books alone. If secondary education is to become universal, it must be broken away from its bookish tradition, which is appropriate to it only as long as it is meant to rest on a selective basis. It must be broken away, not because it is desirable for fewer people to read books, but because more people will read them of their own free will if they can be helped to see how the books are related to real things.

The school-leavers from our Modern Schools will constitute the first and the largest stream of entrants to employment. There must be plenty of room at any point for a Modern School pupil who shows a literary or a scientific or technical bent to transfer to a Grammar School or a Junior Technical School, or to proceed to one of the two at the leaving age instead of entering employment at once. But when this has been allowed for, there will remain the largest flow into employment at the school-leaving age, whatever it may come to be. Those who leave at this age will, however, in future not have their education stopped short, except for night school, when they enter employment. They will go on to a Young People's College, and will remain in attendance until they reach eighteen. Our next question, then, must be, What do we propose to make of these new Young People's Colleges that we are pledged to set up? Once more, it is important here to distinguish between the practical and the vocational; but the distinction has not quite the same bearing as it had in connection with the Modern School. The boy or girl who has entered an industry and been put to a job which makes some call for skill and intelligence will probably in most cases be keenest on a type of continued education that has some relation to that job. This is the experience with those who attend night schools or day classes for which they are released. But outside the recognised skilled trades, of which I am not now speaking, the proportion of jobs in industry, that makes this call for skill and intelligence is not high; and for the majority of boys and girls employed in fairly easy or mechanical jobs there is no such call to vocational training and education related to them as there is for the minority doing more exacting and interesting work. Accordingly, we cannot profitably think of the Young People's Colleges as largely engaged in teaching their

students to do or to understand their daily work better in any direct way. Where the job does need vocational training, by all means let it be given, either in a Technical School or College or in a special Works School, or wherever it can be given best; but such vocational training will have to be distinct from the ordinary work of the Young People's College, and to be provided for by extra time off, at any rate as long as attendance at the Young People's College is only for the equivalent of one day a week.

The Young People's Colleges will be of value in proportion as they achieve two ends—to make their students better citizens, and to equip them better to use and enjoy their leisure, both individually and together. It follows, I think, that in the Young People's Colleges a high place should be given to the arts, and there should be a very wide freedom of choice. The Young People's College will need to combine many of the qualities of the Polytechnic and the Art School with the features of a Club or Settlement. It will need to afford the maximum of opportunity for the spontaneous formation of groups and for the self-government that is the natural expression of vigorous group life. It will have to be a Youth Centre, for both sexes, as well as a school; and it will have to be wide open to the participation of voluntary bodies of every sort and kind—especially to all sorts of Youth Movements and to the agencies concerned with voluntary adolescent and adult education. It will need a good library, and a good stock of periodicals and magazines; a good theatre, equipped for film shows as well as for straight acting; good facilities for music, including a gramophone library as well as a concert hall; good shows of pictures and other interesting exhibits, frequently changed; plenty of visiting lecturers and speakers, especially those who can talk about everyday affairs in a practical way; craft rooms, laboratories, talking rooms where societies and committees can meet—and, above all else, a Principal and a staff ready to help in whatever turns up, rather than to insist on adherence to any fixed pattern of what ought to be done.

Here again there faces us a problem of right staffing; but it ought not to be a very difficult problem to solve. There will be plenty of youngish people of both sexes coming out of the services with just the qualities that will be needed in the Young People's Colleges—including former teachers who have been away from teaching and will feel like teaching differently when they get back. There will also be plenty of scope for part-time teachers engaged in other jobs, and for specialist teachers dividing their time between a number of Colleges, or perhaps between the Colleges and the Modern or Technical Schools.

I come now to the second stream of school-leavers—those who enter employment at or near the minimum school-leaving age, but proceed not to mainly unskilled work, but to the learning of a recognised skilled trade, whether or not it be one to which the entry is by way of formal apprenticeship. This stream will come, increasingly, from the Junior Technical Schools, though some of it will of course come from the Modern Schools—especially where there are skilled manual trades open to women as well as men. Now, we shall all agree that for the most part the best way of learning a skilled trade is by practising it in a good workshop (or on the job, as in the building industry) under proper supervision, and that courses in Technical Institutions are highly useful in supplementing this learning on the job, but much more so in some trades than in others. In general, the importance of the institutional side of the training is greatest in the mechanical trades; it is not, I believe (or am I wrong?) of equal importance in most branches of textile work. Junior Technical Schools will probably continue, even under the new system, to be for some time to come mainly boys' schools; and women will continue to come into the Technical Schools and Colleges mainly on the commercial side. In the case of boys, the great question that arises is that of the future of industrial apprenticeship: Will it continue to decay, as it has been decaying in so many trades, in face of developing mechanisation; or will there be a revival of it, as there seems some likelihood there will be in the building crafts? To the extent to which apprenticeship decays, the function of the Technical Schools and Colleges

becomes more essential in maintaining the supply of craft skill—for mechanisation does not remove the need for such skill, but as a rule demands higher skill from a smaller proportion of the total working force, and also, quite often, creates a demand for new skills for which no sort of apprenticeship exists.

The Junior Technical School, which will have to adapt its curriculum and conditions of entry to the new break at 11 *plus*, will tend to attract those boys who are intended to enter a skilled manual trade at the school-leaving age, together with others who will continue their full-time schooling until later. It is of the greatest importance that it shall be conceived, not in any sense as a Trade School specialised for a particular group of occupations—11, or even 13, is much too early for such specialisation to begin—but as a school with a mathematical and scientific bias related to the problems of the modern world. It should be linked up with a Senior Technical School, to which pupils can proceed easily without any sharp break, and should have its strongly marked civic and cultural side, using science as the gate to culture. Its standards, though different, should be intellectually quite as high as those of the Grammar School; and there is much to be said in favour of experiments in "multilateral" schools, linking together Grammar, Technical and Modern Schools on a common campus, with considerable common activities, especially on the civic and recreational side. It has to be recognised that under modern conditions the distinction between skilled and less skilled workers will tend to be less sharply drawn. There will be relatively fewer skilled tradesmen who have been regularly apprenticed to a craft at the one extreme, and fewer merely unskilled labourers at the other. The highly skilled will tend to differentiate themselves more, not as belonging to distinct crafts, but as possessing individually higher qualities and qualifications than their fellow-members of the same trade groups. These higher qualifications will be sought largely in the Senior Technical School or College; and the task of the Junior Technical School will be both to prepare the way for work in these institutions and to turn out a large body of highly adaptable young people who will be well fitted to turn their hands to new trades and processes, and ready to attach themselves now to one industry and now to another as the currents of demand change. They will differ from the products of the Modern Schools in that their education will have been based more largely on scientific and mathematical foundations, and that they will naturally gravitate more towards trades and occupations in which this sort of educational foundation is of special value.

I come back now to the third stream of entrants to employment—those who stay at school—Grammar or Technical, or perhaps in due course Modern, too—at least until they are 16, and when the school-leaving age goes to 16, to 17 at least or to 18. This is the stream from which at present are mainly recruited the clerical grades; and it includes also a substantial number from the Public and Grammar Schools and from Technical Institutions who enter the industrial system with better prospects than the general run of entrants and serve some sort of apprenticeship to the higher grades of administrative and technical work. For the cleverer and more enterprising of this third group, it is of the greatest importance to make fuller provision for continued education than has been made hitherto. For those who leave school at 16 or 17, we shall have to think out how we mean them to fit in to the system of the Young People's Colleges. Those of them whose bent is largely technical will probably want to carry on with day-time courses at a Technical College rather than attend a Young People's College; and many of the entrants to clerical and commercial occupations will also want to busy themselves mainly with vocational courses leading up to some special certificate or diploma. Their connection with the Young People's College will tend to be recreational and clubbish, rather than formally educational; and where they have a Technical or Commercial College to serve them as a social centre, they will probably not go at all to the Young People's College. But there is likely to remain a substantial body of late school-leavers for whom the Young People's Colleges will need to provide. This, I think, is where the voluntary

bodies providing adolescent and adult education ought to come in strongly, with forms of activity which will induce these young people to go on after they are 18 and especially with forms of civic education which will prepare for active citizenship a group at present apt to be singularly devoid of the sense of community.

For all this group that goes on at school beyond the minimum leaving age but stops short of a full-time University or Technical College education, the great thing is to provide ample chances for further education, full-time as well as part-time, at a later stage. There are plenty of people who leave school at 16, 17 or 18, and either feel at the time no strong urge towards further education, finding for the time being enough to do with mastering their jobs and living their private lives, or are for some years fully enough taken up with vocational courses for National Certificates or the like, but come in their twenties or even in their thirties to the point at which they know just what they want in the way of higher education, and will profit very greatly by getting what they want. There ought to be generous provision for releasing such persons and for financing them, not only to attend short "refresher courses," which can as a rule do no more than whet the appetite, but also for longer periods of full-time study at a University or Technical College, or perhaps, where suitable provision can be made, in the Research Association of the industry in which they work. Provision of this sort should not be confined to vocational work or to research; it should be equally open to those whose developing interests are in the arts or in any branch of culture. Much more use could be made of Universities and Colleges for *long* summer courses extending over several months, or for courses repeated for a month or two in the summer or perhaps at other times of the year over two or three years. The regular University and College staffs could not, of course, take on this additional work, which would have largely to be undertaken by teachers engaged in the forms of adult education that are for the most part shut down in summer, with such aid as could be rendered by the regular internal teachers and research staffs. There are administrative difficulties, I know; but it would take me too far afield from my main subject were I to attempt to discuss them now.

I must pass on to the fourth stream, or rather the trickle, that enters employment from the Universities or from the higher branches of the Technical College system. It is only a trickle; for I am not dealing with those who go on to the learned professions or to the Civil Service or to teaching or academic research, but only with those who enter gainful employment in industry or in services of an essentially economic sort. One important group comes in on the technical side, for research work in industry or for the higher technical posts in civil engineering, chemistry, metallurgy, electrical engineering, and so on. Another group, with or without scientific training, comes in to take up a position in the family business. A third, the smallest, comes in on the commercial or administrative side, usually of big firms with foreign as well as home business, and often to serve for at least part of the formative years abroad. These are the three groups of entrants by whom industry judges the achievement of the Universities; but they have only to be mentioned for it to be plain that they do not form at all a homogeneous unit. The boy (it is so seldom a girl that I can pass the girls over) who comes to a University in the expectation of succeeding to a position in a family business very often fails to make the best use of his time at the University, and that he so fails is quite often partly the parents' fault. It is also partly the result of an absence of connection in his own mind between the work he does at the University and the work which he will be doing afterwards, at any rate where he is not following a scientific course closely related to the basic problems of the industry he is to enter. The Universities, I think, do not put themselves about greatly to help him to see this connection, or to choose his studies with any regard to it. If he is naturally keen and clever, all is well; if, as so often happens, he is but mediocre in intelligence, he is apt to leave the University no better educated for life than he entered it, and perhaps with a bad attitude to work as well.

This does not apply to those who go out into industry from the Universities and higher Technical Colleges, not to succeed their fathers, but to make their own way. The trouble in this field—if it is one—is that, on the whole, the cleverest graduates would sooner do professional work or academic research work than enter industry, unless they can enter under exceptionally favourable conditions. Industry does not get the pick of either scientific or economist graduates, and is apt to complain of this fact. The plain truth, however, is that the number of first-class men is limited, and that if we are to increase the output we shall need many more first-class men as teachers, not only in the Universities and Technical Colleges, but also in the schools. There is, I feel sure, no dearth of natural ability, if not of the absolute first-class at any rate of a high second-class quality. Much of this is now stifled by defective educational opportunity and by social insecurity in the home. If we set out to end these conditions, and to actualise a much higher proportion of the potential supply of ability, we shall have to face, in the early stages, a bottleneck, in the form of a conflict of claims between industry and education for the services of the best men. It takes ability to develop ability; and it would be very short-sighted economy to starve the schools and Universities of able teachers just when they are to be given a better chance of having more of the right pupils to teach.

A part of the way round this difficulty is easier interchange. I am sure nobody ought to go straight from school and University as pupil to school or University as teacher and then stay at teaching for the rest of his life. This is worst of all in the case of the elementary school-teachers, who often go straight to a life's job in elementary teaching from a Training College to which they have come straight from school—a disastrously segregated way of living. But it is bad enough when a University graduate goes straight to teaching and thereafter teaches continuously until he retires. Those who teach ought to know life as well as books. They ought to have mixed, in work as well as in leisure, with people who are not teachers, but doers. They ought to have done, as well as taught. The vice I am speaking of is, of course, only one aspect of the vice of life-specialisation on a single job that pervades our social system. I made up my mind quite early that, though I wanted to teach, nothing should induce me to teach full-time. I have always been able to dovetail teaching with other jobs; and I am sure I have taught the better for it. We ought to make it as easy as we can for able persons to shift to and fro between industry and teaching, or between industry and research, or even to change jobs altogether for a few years in order to gain freshness and experience, without finding themselves shut out or heavily penalised by loss of pension for their refusal to sink into a rut.

You have probably been saying to yourselves for a long time past: What has all this to do with the textile industries? It has, I hope, a great deal to do with them. The textile trades have been in the past sharply differentiated from such industries as building and engineering in that they have employed very little unskilled adult labour and have consisted mainly of skilled workers, who have not however learnt their skill by any system of apprenticeship in the ordinary sense. In the cotton industry, the mule spinner, no doubt, has begun as a piecer, and the conditions in mule-spinning are not unlike those of apprenticeship in many respects. Weaving, on the other hand, has had no system analogous to apprenticeship since the decay of the handloom system; and there is nothing like apprenticeship in the preparing branches of the cotton industry. In the woollen and worsted trades spinning and weaving are alike trades without apprenticeship; and though there exist forms of apprenticeship in some branches of the lesser textile industries, the tendency is for them to decline. Moreover, as we look forward to the future of textile manufacture, it seems pretty safe to prophesy that the degree of skill required of the general run of operatives will decline. Ring spinning and the automatic or semi-automatic loom will gain further ground: rayon, staple fibres, and other substitutes will reduce the employment in the spinning of cotton and wool. Mechanisation will advance further in most branches; and the main demand of the industry, except in a few branches, will

be rather for adaptable machine-dexterity than for high and diversified kinds of skill taking a long time to learn. On the other hand, a high quality of skill will be demanded in those who maintain the machines and supervise the work; and there will be a considerable increase in the demand for skilled chemists, technicians, research workers, and designers.

What changes will these conditions call for in the structure of education in the textile areas? At the top end, they will call for a greatly increased provision in Universities and Technical Colleges and in Art Schools specialising in industrial design. They will call for better provision for picking out the promising worker, through whatever channel he has entered the industry, and at whatever age, and affording him (or her) the opportunity of study, part-time or full-time, in order to become capable of higher types of work. They will call for more research-minded directors and managers and supervisors in every branch of the industry, and for higher scientific qualifications, without which the bearing of advances in the research field cannot be understood or the lessons applied. So much is obvious; but it is much less obvious what the textile industries will require of the main body of entrants who come into employment at or near the minimum school-leaving age. They will in fact require little that is not the common requirement of most types of industry. Their main needs will be for general intelligence, for keenness based on good physical and mental health, and for adaptability and a willingness to try new things and to look forward rather than back. They will, if their leaders are wise, want their operatives to have the widest possible range of outside interests and concerns, in the knowledge that work will be best done if the lives of those who do it are full and happy. In effect, the requirements of the textile industries from the general system of public education are, unless I am greatly mistaken, that the schools shall be as good as they can be made, and shall provide, not any form of vocational preparation, but the best possible mind-widening and the most forward-looking preparation for the arts of life.

Let me end on a more general reflection. We are moving forward towards a new educational system which is meant to embody, and to foster, democracy. This means that our education must be closely related, not for a few but for all, to the pressing problems of our own age and must be directed primarily to the understanding of the foundations of modern living. That is a very different ideal from any that we have pursued hitherto, except for a very few. Our teachers and educational propagandists have, no doubt, laid great stress on the understanding of the child mind, and the greatest advances in teaching method have, I think, been made in dealing with the younger children. Our better Primary Schools understand their job, I fancy, a good deal better than the general run of our Senior and Secondary Schools; for there has been much less practical progress in the study of the adolescent, and the higher age ranges of our school system are much more hampered by traditionalism and by examinations which are a reflection of it than the junior ranges. The classical tradition is still too much on top of our secondary education; and the selective entry to the secondary school has made havoc of the work done in the middle ranges of the elementary system. Some excellent work, as I have said, has been done in Senior Schools; but only here and there. We have failed to realise that education as a whole needs re-casting in the mould of modern discovery and of modern ways of living, and that the democratisation of the educational process must be something very different from an extension to more and more children of a tradition which is basically aristocratic and increasingly out of touch with modern reality. What, however, we must above all avoid is a confusion—so often made—between the modernisation of our schools—their adaptation to the key problems of modern living—and their vocationalisation. Modern industrial society calls, on the whole, not for more but for much less specialised vocational training of the great majority of those employed in it. The need is for greater power to apply the intelligence, for more versatility, for more liveliness of mind, and for a keener sense of responsibility and of social function. These, primarily, are the ends we ought to pursue; and I see no reason to believe that the textile industries will profit less by them than the community as a whole.

Reviews

Review of the Annual Reports of the Society of the Chemical Industry on "The Progress of Applied Chemistry," 1942.

On reading through the Annual Reports for 1942 of the Society of Chemical Industry, section by section, page by page, the textile technologist cannot fail to realise that his own field of activity is rapidly and continually widening, and impinges on every section of applied chemistry covered by the reports, and from which he can glean much useful information.

If the Annual Reports had been compiled primarily for the textile man, then the arrangement of the information would naturally have been very different, and much of it would have been extended and much deleted. All this is obvious, but points to the potential value of annual progress reports written specifically for the textile man. This comment is not intended as a criticism of the present format of the S.C.I. Annual reports, which are written for the industrial chemist, and not specifically for the textile technologist.

The section dealing with glass contains much information of interest. It is gratifying to note that intensive research work is proceeding on a substance of such vital importance in the laboratory and works. There are references to glass fibres and cords on pages 187, 188, and 191, and it is considered that this aspect of glass technology is worthy of a subheading, even though reported for industrial chemists and not specially for textile technologists.

Analogously it is considered that the information given in the Plastics section on pages 289, 299, 301, 302, and 308, on laminated fabrics could with advantage be collated under one sub-heading.

Amongst other miscellaneous references relevant to textiles technology, are the following :—the use of a multi-effect " weatherometer " for testing rubber (page 356), boiler feed treatment (page 23), water-softening by means of synthetic resins (page 471), filtration of water (page 473), and other liquids (pages 18, 19), the examination of fluid flow through textile fibres (page 5).

In the section on " Intermediates and Colouring Matters," Dr. Fraser Thompson has adopted a new procedure by not reviewing dyestuff intermediates *per se* in a separate section, but includes some of them in the appropriate sub-sections on dyestuffs. This is considered to be an improvement as it facilitates the reading of progress in this field, especially by chemists not directly concerned with the dyestuffs industry.

" Fibres, Textiles and Cellulose " is naturally the most interesting section to Textile Chemists, and with one or two exceptions is a comprehensive review of the papers published during 1942. The sub-sections on " Protein rayons and related Fibres " (page 117), and on " Chemical Constitution," (page 113) (Cellulose Textile Chemistry) are particularly able and succinct accounts of the present knowledge in these fields. It is obvious that the protein rayons are receiving considerable attention at the present time, particularly relating to attempts to improve wet strength. It is suggested that a more appropriate title for " Cellulose Textile Chemistry " is " Cellulose Textile Technology," since a number of non-chemical subjects are dealt with, such as the physical properties of fibres and fabrics, including thermal properties (page 122).

The use of acetone in the xanthation of alkali cellulose, described on page 126, is reminiscent of its successful use as a medium in the simultaneous deacetylation and methylation of cellulose acetate. Incidentally, it is interesting to note that the chemical tools of methylation and methylenation successfully employed on the cellulose problem are now being applied in the elucidation of a still more intractable problem, namely, the chemical constitution of keratin (pages 109, 110).

In the cellulose " Dyeing " sub-section, the use of synthetic resins in pigmented emulsions for dyeing and printing is very properly stressed, and also the use of a lacquer phase to prevent migration of pigment during dyeing. There are two notable omissions, however, from this sub-section, namely, the work of Usher and Wahbi, on the role of salts in the dyeing of cellulose (a discussion on electrostatic effects in the dyeing process (*J. Soc. Dyers & Colourists*, 1942, page 122), and C. M. Whittaker's paper in the *J. Soc. Dyers & Colourists*, 1942, page 253, in which direct dyestuffs are classified according to their salt sensitivity and levelling properties.

It is gratifying to note that many references are made to the Textile Institute Standardisation work, viz., measurement of shrinkage (page 113), waterproofing

(page 115), evaluation of cloth characteristics (page 117), and analysis and identification of fibres (pages 121, 122), showing that definite progress has been made in this field during the year. H. A. THOMAS.

Wool: A Review of the Past as an aid to the Study of the Future. New Zealand Loan and Mercantile Agency Co., Limited. (New publication, London, 1944).

This booklet, prepared primarily for those not engaged in the wool merchanting side of the trade, fully merits careful consideration. A digest is given of official figures regarding the production and use of wool in the chief wool growing and processing countries; as well as of the machinery and labour available. Comparison is made of the fluctuations in the price of wool and other commodities, together with notes upon the political and financial events which influenced those prices; the comparison is not unfavourable to wool. It is shown that Britain is not only the world's largest importer of wool, but, a fact not always realised, she is the seventh or eighth largest producer of wool (111 million lb. in 1938, of which 28 million lb. or over 25 per cent. was exported). The retained home wool represented one-sixth of the wool used in British industry. The yield per sheep in Britain is much lower than it is for instance in Australia and New Zealand, and there would appear to be little doubt that it could be greatly improved. It is noteworthy that the production of wool increased by 65 per cent. in the 20 years preceding the war. The world consumption of wool has gone down during the war, half the wool processing machinery of the world being now under German control; and the largest individual industry, our own, being rigidly restricted. There is thus a considerable surplus of wool piling up but there is every probability that at least during the first few post-war years the demand for wool will be on an hitherto unknown scale and, in fact, shortage of machinery and trained labour may very well be one of our greatest difficulties. Cessation of exports of manufactured wool goods from Britain and Europe has led to the large wool exporting countries greatly increasing the processing of their own wool; for example, the Argentine has nearly doubled its pre-war consumption of wool and it now processes over 20 per cent. of its own clip and, in addition to raw wool, exports yarns and fabrics to other South American countries and to South Africa. It would seem that the effect of synthetic fibres on the wool trade has been greatly exaggerated in some quarters, but whatever danger it presents there is only one way of combating it. Rayon and the synthetic fibre industry (nylon, etc.) were born of and bred by research and to research they still cling for nourishment, strength and increased growth. It is no exaggeration to say that there are British firms of rayon or synthetic fibre manufacturers who each individually spend more in a year on research than do the combined wool industries of the world, certainly one firm alone is spending much more than ten times the amount spent by the whole of the British wool industries.

It is pointed out that the U.S.A. is the only country which requires goods containing wool to be plainly marked with the percentage and composition of the fibre content. This is an example which might well be followed here both to the advantage of the trade and of the public. The latter assumes that "woollen" means made of wool but to the trade it means quite a different thing. To the Government it means different things at different times. According to the Consumer Rationing (Control dated) Order, 1943, a fabric composed of 85 per cent. cotton and 15 per cent. horsehair may be described as woollen! The whole use of the word woollen is a mass of contradictions, to the detriment of the maker of all wool goods and often to the confusion of the public. The booklet fully fulfils its declared object of collecting and presenting in a convenient form some salient facts of the past to form a foundation for consideration of the future. It is well worth study by each and every member of the Institute both as technologist and as a citizen of a country whose fortunes throughout history have so very largely depended upon its having flourishing wool industries.

C. O. CLARK.

Institute Membership

The following applicants were elected to membership at a recent meeting of Council:— *Ordinary.*

Gathorne Dixon Barrow, Messrs. Flinn & Son Ltd., Fishersgate Dye Works, Brighton (Chemist, Local Director).

Arthur W. Dymond, "Tweenways," Rackenford Road, Tiverton, Devon (Assistant Manager, John Heathcoat & Co., Tiverton).

Norman H. Fairbairn, Messrs. Keddie Gordon & Co. Ltd., Rosebank Mill, Galashiels (Tweed Manufacturer).

William Henry Green, 760, Walmersley Road, Bury (Doubling Manager, Waterside Mill Co. (Bury) Ltd., Wellington Mill, Bury).

Frederick Hugh Howorth, Roscoe House, Anderton, Nr. Chorley (Heating and Air Conditioning Engineer, James Howorth & Co. Ltd., Victoria Works, Farnworth, Nr. Bolton).

Nitya Nand Karan, Baratpur, Aurangabad, P.O., Dist. Gaya (Bihar), India (Supervisor of Spinning and Carding, Madura Mills & Co. Ltd., Madura, S. India).

Fred Kershaw, Race Course Road, Coimbatore, S. India (Textile Manager, Cambodia Mills Ltd., Singanallur, Coimbatore, S. India).

Maurice Lorrimer, 2, Spencer Road, Coventry (Director, Messrs. Pool Lorrimer and Tabberer, Lockhurst Lane, Coventry).

William George Macmillan, Ph.D., B.Sc., F.R.I.C., Research Institute, Indian Jute Mills Association, 16, Old Court House Street, Calcutta, India (Chief Chemist).

A. S. Marquart, 2, Embankment Gardens, London, S.W.3 (Fibre Manufacturer, 109, Battersea High Street, London, S.W.11).

Charles William Nowell, 5, Douglas Street, Bolton (Heating, Ventilating and Air Conditioning Engineer, James Howorth & Co. Ltd., Victoria Works, Farnworth, Bolton).

David Pike, c/o David Pike & Co. Ltd., Ebor Mills, Dubb Lane, Bingley (Manufacturer).

John Pollitt, B.Sc., 15, Delamere Road, Gatley, Cheshire (Research in Textiles, British Cotton Industry Research Association, Shirley Institute, Didsbury, Manchester).

Aubrey Fred Smart, 57, Cutenhoe Road, Luton, Beds. (Textile Chemist, B. Laporte Ltd., Kingsway, Luton).

Josef Stross, 7, Claremont, Bradford (Weaving Overlooker, Holme Top Mills, Bradford).

Clarence Rallisom Wilkinson, I.C.I. Ltd., Shell-B.P. House, London Road, Leicester (Technical Representative, Dyestuffs).

Obituary

John Dodds Athey

The Textile Institute suffered a severe loss when, in 1936, illness deprived it of the services of J. D. Athey. His death, recently, will be deplored by all who knew him and it is perhaps fitting that the sad occasion should be marked by putting on record some tribute to him by one who knew him well.

He was actually born at Newcastle-on-Tyne, but his family moved to Bradford when he was very young, so that his school days were spent in the Yorkshire city. He used to remind Mr. W. W. L. Lishman, for so long Treasurer of the Institute, that they were both pupils of the same school. Off duty " J.D.A." was a most interesting companion and his fund of reminiscences and stories included many of his early boyhood and working days.

Returning to Newcastle, he became a journalist, and all members of that profession will understand when it is recorded that he was a journalist at heart to the very end. He knew what was " a story " and how and when to put it out. As a journalist he pursued his profession, as sub-editor on the *North Eastern Daily Gazette*, on the reporting staff of the *North Star*, and later as Editor and Manager of *The Auckland Times*.

When that organ was amalgamated with the *Auckland Chronicle*, through the activities of the late Arthur Henderson, Athey went to London as a " free-lance." A full record of his work in London, for the *Morning Leader*, *Lloyds Weekly*, and a host of other journals would be too long for an article of this character, but there can be no doubt that he was indefatigable, ubiquitous and in every sense of the word a " good and successful journalist." His ver-

satility was proven by his work as Editor of *The Grocer* and for *Footwear*. His recollections of such well-known personalities as Sir William Eden (father of Anthony Eden), St. John Ervine, G. K. Chesterton, Lord Justice Darling, and many others, made him a most welcome companion on those occasions when men foregather after meetings and conferences to spend a social hour or two together.

The Great War cut right across the work of all free lance journalism, and it was then that Athey turned his thoughts to the North again. In early 1915 he was appointed General Secretary of the Textile Institute and Editor of its *Journal*. No finer tribute to his work could be paid than by a comparison of the "J.T.I." from 1911-1914 with the same *Journal* from 1915-1918. As a journal in the professional sense and as the organ of a learned Society the metamorphosis was complete and masterly.

The Textile Institute is founded on certain sure foundations; its Charter; its Diplomas; its *Journal*; its Sectional activities; its National Certificates; and its Competitions. Its finances are modest perhaps, but they too are founded on a rock. Behind all this lies the quiet enduring work of John Dodds Athey, and it is but right and proper that this should be recorded in the *Journal* of which he was justly proud and thus put on record for all time.

The writer joined him in 1923, coming as Editor of the *Journal* when the work of the Institute as a whole necessitated a sub-division of the tasks involved. Though he relinquished the Editorship then, and later handed over the management side too, he never lost interest in the work and was always its most stern critic.

To the end of his 21 years' service with the Institute he wrote everything that had to be printed so meticulously, that all the compositor had to do was "follow copy" and woe betide him if he did not.

Whatever may be the heights to which the Institute may rise, and its well-wishers see no "ceiling" yet, it should never be forgotten that the man who focused and co-ordinated the efforts of those loyal voluntary workers who have given so much of their time to its service, and who helped to fashion and lay its sure foundations was John Dodds Athey.

HUGH L. ROBINSON.

Employment Register

The following announcements are taken from entries in our Register of Members whose services are on offer. Employers may obtain full particulars on application.

No. 235—Member, holding Diploma in Dyeing, with practical experience in chemistry and dyeing, desires position with dyestuffs and chemical manufacturers with view to later position in connection with technical sales and services abroad.

No. 236—Associate desires position as Assistant Manager or Inside Manager in Cotton Spinning Mill. Age 42 years. Knowledge of weaving, knitting and finishing processes. Good experience of modern spinning machinery. Sixteen years' experience as head spinning overlooker. Excellent references. Accustomed to handling labour.

Vacancy

TEXTILE CHEMIST required by large Textile Firm. Duties will include the operation of a well-equipped textile laboratory for routine laboratory work. Opportunity for work on research in collaboration with Textile Research Associations. Applicant should be fully trained and hold appropriate scientific qualifications. Permanent position and suitable salary for the right man.—Box No. 67.

NOTICES: INSTITUTE MEETINGS

LANCASHIRE SECTION

Friday, 9th June—*Manchester*. 1.0 p.m. Lunch-time meeting at the Institute's premises. "Patents and Textiles," by W. A. Silvester, M.Sc.