THE GIRL IN INDUSTRY

BY

D. J. COLLIER

WITH A FOREWORD AND INTRODUCTION BY

B. L. HUTCHINS

AUTHOR OF "WOMEN IN MODERN INDUSTRY"

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"The adolescent stage of life has long seemed to me one of the most fascinating of all themes, more worthy, perhaps, than anything in the world of reverence, most inviting study, and in most crying need of a service we do not yet understand how to render aright."

G. STANLEY HALL, *Adolescence*, I. xix.

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FOREWORD

THE problem of the adolescent at work is a very complex one; not only the economic, but also the educational, physiological, and biological reactions of industrial work have to be considered. The present work does not attempt anything like a comprehensive discussion of the subject; it is merely a small contribution to existing knowledge of the facts in regard to one section only: the physiological effects of industrial work on growing girls.

The young, it is often said, are the nation's capital. If by this we merely mean that they are the force by which the material goods of the future will be produced, our view of life is inadequate and rather brutal, but if the words are given a higher and more spiritual sense they become full of significance. Youth is the future: from among the young of to-day the parents, citizens, leaders, prophets, artists of the next generation will arise. Work at this age should be considered not only for the shillings it will immediately produce, but partly for its effects on the worker's productive power later on, partly for its effects on character, physique, mind. Dr. Stanley Hall says of modern industry: "Not only have the forms of labour been radically

changed within a generation or two, but the basal activities that shaped the body of primitive man have been suddenly swept away by the new methods of modern industry. . . . Work is rigidly bound to fixed hours, uniform standards, stints and piece-products, and instead of a finished article, each individual now achieves a part of a single process, and knows little of those that precede or follow. Machinery has relieved the large basal muscles and laid more stress upon fine and exact movements that involve nerve strain. . . . Personal interest in, and the old native sense of responsibility for results, ownership and use of the finished products, which have been the inspiration and soul of work in the past, are in more and more fields gone." [1] The conditions of much work undoubtedly tend to become mechanical, deadening, and soul-destroying.

A strong impression seems to haunt the minds of some who are intimately in touch with working-class conditions that adolescent labour is excessive in amount, and that the resulting fatigue may be cumulative in its effects and injurious to the continuance of the race. Thus in 1904 Miss Anderson and her colleagues of the Factory Department, being invited to report on the subject of married women's work, found themselves impelled to the consideration of the previous life-conditions of the women, and stated: "It is the employment of women from *girlhood*, all through married life and through child-bearing that impresses itself on the mind. It is useless for any not familiar with the conditions of mill life to pronounce any opinion

[1] *Adolescence*, vol. i. 167.

. . . they have no conception of the stress and strain." [1]

More recently Mr. Arthur Greenwood in a pamphlet (*The Schoolchild in Industry*, published by the Workers' Educational Association, Manchester, 1914) states that the fatigue and prolonged standing characteristic of some factory industries produce serious disease in girls and young women, "and, in the opinion of many doctors, sterility." The same impression may be found occasionally among Sick Visitors and the like, who work among these women. Whether there is a scientific basis for the belief it is impossible to say; there is not at present sufficient information.

The investigation embodied in the present volume was undertaken in the hope that it would yield some information as to the vitally important subject of the biological effects of early employment, or, in other words, the reaction on the woman and her offspring of industrial employment in the adolescent years. No statistical data have, however, been obtained on this point; probably none such could be obtained within the limits of a small inquiry directed and financed by private persons. Even in regard to the effects of industrial work on the health of girls, without special regard to ulterior effects, there is at present very little scientific information.

I welcome Miss Collier's report, therefore, as a pioneer effort; it is limited in scope and matter by the nature of the undertaking, but I know that she has spared no pains in collecting her facts, and has

[1] *Report on Physical Deterioration*, 1904, p. 123.

set them out without prejudice or bias. Her experience has suggested to us the desirability of a form of inquiry which is probably beyond the resources of most private inquirers, but might well be undertaken either by a Government department or by some public fund for sociological research. Some years ago, statistics of the anthropometrical measurements of school children in certain districts were published.[1] These figures were obtained from elementary school records in rural and industrial districts, and the results were valuable and instructive. Such a survey of young people, aged 14 to 18, might usefully include not only those in industry, but also those attending secondary schools, who in certain districts belong to much the same social grade, and often come from the same families. Thus the material for a valid comparison would be available, and the results, under scientific medical guidance, might be of first-rate social importance. Possibly also some light might be thrown upon the subject by investigating the previous occupational histories, from the onset of puberty onwards, of patients in maternity hospitals, and tabulating the results with the nature of the confinement, whether normal, difficult, or complicated.

In conclusion, Miss Collier and I wish here to offer our best thanks to the many friends who kindly allowed themselves to be interviewed, and gave the help and information necessary for carrying out the inquiry.

[1] *Health and Physique of School Children*, by Arthur Greenwood. P. S. King, London, 1913, 1s. net.

INTRODUCTION

Numbers Employed.—The whole number of girls employed from 10 to 21 years of age amounted in 1911 to over a million and a half, or about 40 per cent of the total female population of that age. If, however, we restrict ourselves to the adolescent girls at the ages 14 and under 18, we find that the total number employed amounted to nearly 794,800, or 58·6 per cent of the whole. The 41·4 per cent unoccupied include girls of the class in which women do not work for money, girls studying who intend to follow a profession or occupation, and some girls of the higher industrial classes who attend school one, two, or three years beyond the elementary school age. There must also be in this group some proportion of working-class girls who are kept at home to help their mothers, and a small number of invalids and imbeciles who are incapable of work.

Of the 794,800 girls occupied, it is interesting to note that 30·5 per cent had entered service (including hotel service, but not including laundry and washing service). If we take the whole domestic group which includes laundry and charing as well as service, we find it takes up 34·8 of the total girls employed.

Considering how much complaint is frequently made of the unwillingness of girls to enter these ancient and traditional paths, it is worth noting that one girl in every three actually does so, and the girls who stay at home to help their mothers, if we knew their numbers, would bring this proportion up a good deal higher.

The textile trades employ 16·8 of our occupied girls, and the various dress trades 19·2. We thus find nearly 71 per cent of occupied girls are engaged in the occupations constantly associated with their sex and regarded as "womanly," although in modern times nearly all textile and a considerable proportion of the dress and laundry trades are organised on factory lines. The other 29 per cent are dispersed over the clerical, artistic, and other professions, and in miscellaneous factory industries.

The proportion of girls employed varies from one place to another; it is highest in districts where there is a well-marked industry, especially where textile factories absorb a large proportion of female labour. Table II. shows the proportion of girls in a few selected districts. In industrial districts the proportion of domestic servants is very low, and the figures bring home to us the fact that in certain districts a large proportion of the female population spends the transition from childhood to adult life in the mill.

It is, however, useless to spend much time over these figures, which have become completely out of date through the war. No details for young workers are obtainable in official statistics, but the increase in numbers of females employed in industry

since the outbreak of war was estimated in July 1917 at 23·7, while the increase in professional and other occupations, including transport, was 82 per cent. The total increase in industry, commerce, and government service of various kinds amounted to over 1,420,000, or 42·5 per cent.[1] It is probable that the increase among girls of 14 to 18 was at least no less than among female workers generally. The net increase in numbers must also be only an imperfect indication of the enormous changes within the employed group. The Munitions group, the metal trades, all the textile and other trades that produce the clothing and other accoutrement of soldiers, the supply of food and comforts for the army, all these industries have expanded considerably and have drawn recruits not only from the unoccupied but from the domestic workers, and from many other less indispensable occupations. Women and girls have also taken the places of men and boys in many civilian occupations.

The Factory Act.—During the war the regulations of the Factory Act have been considerably relaxed or suspended. The strain of industry on the immature, however, though undoubtedly intensified by the war, was already a matter of anxious consideration before 1914. Even in times of peace the Factory Act vouchsafes to the adolescent worker a meagre and inadequate protection. As regards hours of work, "young persons," *i.e.* such as are between 14 and 18, and also such as though only 13 have obtained a school attendance certificate, are placed on a level, but for some trifling exceptions,

[1] *Labour Gazette*, November 1917.

with adult women. The hours of work for both classes are the same, viz.: 10 hours in textile factories, 10½ in non-textile factories and workshops, plus meal times. It is thus legal for a girl of 13, a mere child, as most people would call her, to be at work "all round the clock," or, including meal times, for full 12 hours. On Saturday there is a half-holiday. The only difference in regard to hours is that in certain industries women are permitted overtime, which is prohibited to young persons.

Medical Inspection.—There is, however, a provision special to workers under 16, which is of interest, and that is the requirement of a certificate by the certifying factory surgeon that the young person is physically fit for the proposed employment. The surgeon has power to reject boys and girls for work he considers unsuitable to them, and he may also make certain qualifications or conditions as to the kind of work on which the boy or girl should be employed. It is evident that here we have a provision with great possibilities of good for young people. The unfortunate side of the matter is that the certifying surgeon is not concerned with the care of the child; he is merely remunerated by the employer to fulfil a legal formality. Within a few years the Women Factory Inspectors have, however, taken the matter up and initiated action in the interests of rejected children. The system has been shown to be most unsatisfactory. No certificates are required for other than factory industries, so that in many cases rejected children go to some employment which may be more harmful than the

one for which they have been rejected, or may even be admitted by one factory surgeon into the very occupation for which another had disqualified them.

Equally serious is the absence of any system of medical advice or treatment for the cases in which physical defect or disease has been notified. For these and other reasons it is highly desirable that the factory medical service, so far as it relates to juveniles, should be absorbed in the School Medical Service, which for nearly ten years has been doing such good work in the detection and to some extent the treatment of pathological conditions among school children. This body is far better placed than the certifying surgeons, as the whole of the elementary school population passes under its hands. Medical inspection could then become a condition of all employment, instead of, as at present, factory employment merely, and suitable arrangements could be made without much difficulty for medical care and treatment where necessary. It would be likely, also, that the school doctors would take a more enlightened view of factory conditions and the needs of adolescence than the certifying surgeons, and would have the Education Authority at their backs in urging the importance of healthful conditions on the employer in the factory.[1]

The Industrial Conditions needed for the Young.—In regard to girls the importance of adapting conditions of work to the needs of the immature woman

[1] See *The Present Position of the Juvenile Labour Problem*, by Frederic Keeling, 1914, 2d.; compare the same author's *Child Labour in the United Kingdom*, P. S. King, 1914.

is a matter of thought and care, of details intelligently combined into a coherent whole. Given suitable arrangements it need by no means be assumed that the factory is inherently injurious to women and girls. Several persons whose views have been included in the following report even thought that factory life was beneficial in some respects. Dr. Louis Starr also says : " While there is no question of the evils of child-labour, more of the young suffer from too little than too much use of the muscles. Where harm comes the blame should not be put upon the mere work, but upon the unhealthy surroundings, bad work-rooms, long hours, great monotony, over-specialisation and excessive use of the accessory and neglect of the fundamental muscles." [1]

The principle of economic individualism has been definitely thrown over by all but a few invincible doctrinaires, and it is coming to be recognised that the shoe must fit the human foot and not the foot be cut down to suit the shoe. We are beginning, greatly daring, to foresee a time when directors of industry will be required to revise their schemes of management or even to construct new ones, not merely to avoid injury to workers, but with the view of promoting their healthy mental and physical development. Hours of work must be considerably shortened for young workers, rest pauses must be introduced to minimise fatigue, time must be allowed for physical exercise, education, and recreation, and the whole surroundings of work modified with a regard for the personality of the workers.

[1] Starr, *The Adolescent Period*, p. 15.

The question of speed is of special importance in regard to young girls. In America, where speed and strain have been and still are extreme, it is beginning to be recognised by the most enlightened employers that it is useless to urge the human organisation beyond the power of endurance. In some cases speeds have been reduced to get the best results.[1]

Detailed study is necessary in order to adapt the work to the capabilities of the workers. In Miss Collier's reports several interesting notes will be found on the desirability of picking strong girls for certain kinds of work : on the need of seats, and specially of the right kind of seats, and other points. When a new Factory Act comes under consideration, as we hope it may after the war, the needs of youthful workers will be the point that most urgently requires emphasis and re-statement, and I venture to hope that the then Home Secretary will take account of Miss Collier's investigation.

The war has shown us the extraordinary elasticity of productive power in modern times. In response to an urgent national need, material production has been stretched to a point that would have been incredible a few years ago. This is surely an indication that—apart from the present need for enormous quantities of war-material—production can satisfy the bodily wants of men and yield a surplus for the higher needs of civilised communities without excessive toil, certainly without overtaxing the young and immature. Further, much evidence collected both before and during the war indicates that over-

[1] Tarbell, *New Ideals in Business*, p. 211.

work is relatively unproductive compared with work for reasonable hours. All this shows that we can, if we wish, decide to be the master of the machine and not its slave. The knowledge and the power are there : let not the will be lacking.

INVESTIGATION

LITTLE attention has been given until quite recent times to the effects of industrial work on the health and physique of adolescent girls. Child labour has been the subject of much discussion, and medical investigations have shown the detrimental influence exerted by wage-earning employment on the plastic organism of the growing child. It is recognised that with children bodily work often produces a greater degree of fatigue both mental and physical than does mental work of equal duration. The various legal restrictions limiting the hours and controlling the conditions of the labour of children, although inadequate in extent and sometimes only permissive in character, are evidence of a realisation that the well-being of the child is of more importance than its immediate commercial utility. This recognition of the necessity of guarding against overstrain during the critical early years does not, however, extend to the period of adolescence. The restrictions of the hours of work and the conditions of employment of young persons of both sexes differ but slightly from those applying to adult women. This failure to appreciate the special problems of adolescence is the more remarkable in that medical evidence has shown

that young children grow and develop despite great hardships, while adolescence is more dependent upon favouring conditions in the environment, disturbances of which more easily retard development and effectively injure the still growing body. "In late adolescence contrasted with earlier life there is more variation in growth, much greater liability to retrogression, and increased susceptibility to outside influences, unfavourable surroundings, and conditions more readily causing arrest of growth and preventing perfect maturity." [1]

In the evidence before the Physical Deterioration Committee in 1904, Dr. Eichholz [2] emphasised the need of close attention to the physical condition of young girls who take up industrial work between the ages of 14 and 18, for the conditions under which they work, rest, and eat doubtless account for the rapid falling off in physique which so frequently accompanies the transition from school to work. And the summary of that Committee states: "The period of adolescence is responsible for much waste of human material and for the entrance upon maturity of permanently damaged and ineffective persons of both sexes. The plasticity of the human organisation, the power it possesses of yielding rapidly towards degenerative or recuperative influences appears to terminate at 18."

This sketch of the conditions and circumstances of the girl in industry was undertaken as a contribution to the study of the effects of industrial employ-

[1] Starr, *The Adolescent Period.*
[2] *Inter-Departmental Committee on Physical Deterioration, Report,* 1904.

ment on the health and physique of the female population of the country, and it was hoped that in the course of the investigation some light would be thrown on the question of the relation of the employment of the young girl to her health after marriage. Only a minority of women are normally employed at any time, but as an examination of the figures in Table I. shows, a large majority of girls between the ages of 15 and 19 are employed, and of these more than one-half work in manufactures, over two-thirds of the factory and workshop girls being absorbed in the textile and clothing trades. It follows from this that the majority of women have been employed during the critical years of adolescence which have so great an influence on the physical constitution of later years.

As it was impossible in a private inquiry, such as this, to cover a wide range, certain industries which seemed to offer the best scope for the investigation were selected and subjected to as detailed an examination as was possible. The entrance of large numbers of girls and young women into the industries connected with the manufacture of munitions suggested Birmingham and Coventry as fruitful fields of inquiry, and the increase in welfare supervision with appointment of matrons and nurses in charge of surgeries and rest-rooms seemed to indicate that the required information would be easily obtained, while the abnormal conditions prevailing in these industries offered a favourable ground for investigation in that they afforded unusual opportunities of studying the effects of excessive hours of work, night work, and other variations in hours and

conditions of employment. In addition to collecting evidence from a number of these supervisors in the factories, I endeavoured to find out from social workers, in touch with girls outside the factory, how far the abnormal conditions due to the pressure of war work are affecting the general health of girls. It is only natural that patriotic zeal and a desire to earn good money on piece-rates may mask any possible evil influences that long hours and increased speeding up may exert, so that the evidence from those in charge of girls in the factories, if considered alone, might not disclose the true state of affairs. Since it was impossible to get statistical evidence as to output, accidents, and actual industrial fatigue, I interviewed secretaries of Girls' Clubs and Care Committee workers connected with the Birmingham Juvenile Advisory Boards, who were in touch with girls between the ages of 14 and 16. I saw also a number of medical men and women with panel practices in industrial districts. The certifying surgeons were not able to give me any information, as they deal only with young persons who are commencing their industrial careers.

But it is from the textile trades that the great mass of the evidence is derived. The cotton industry of Lancashire and the wool and worsted industries of the West Riding of Yorkshire, built up as they are on the labour of children and young persons, offered a much wider field than the non-textile trades, and here, where the girls join their Trade Union directly they are working full time, there is much more class consciousness and reflection upon industrial conditions. Consequently evidence as to

these industries, together with that of the clothing trade, is derived mainly from the Trade Union officials, particularly from the Sick Visitors of the Insurance sections, and from meetings of operatives called together for the purpose by the Trade Union secretary. In the course of the inquiry I visited a number of mills, both spinning and manufacturing, and thus gathered a good deal of information from employers, managers, and overlookers. A certain number of doctors were also visited, and some of these supplied much valuable evidence, but it must be remarked here that many doctors, possibly from stress of work, fail to note the relation between occupation and disease except in extreme and obvious cases, particularly in towns where one main industry occupies a large proportion of the inhabitants, and where one imagines deductions as to occupational disease and tendencies to disease could be most easily made.

In addition to the engineering and textile trades I have collected evidence from a few miscellaneous industries in the various towns I have visited, generally from "good" employers, who have made some study of industrial fatigue or whose interest in the welfare of their employees had directed their attention to some of the problems under discussion.

The evidence from the clothing trade was collected at Hebden Bridge and from various other towns where wholesale tailoring is merely a subsidiary industry. The conditions in Hebden Bridge due to the ever-present shortage of female labour make these clothing operatives the aristocrats of their trade, so that the general results of industrial work

here had to be correlated with the evidence from the clothing trade in other towns.

General Conclusions

Hours.—The evidence to be considered under this heading is concerned with various factors: the total number of hours worked each week, the length of the spells, and the number and length of the pauses for rest and meals, as well as the time of employment, *i.e.* day or night work.

At the time when the inquiry was initiated (October 1916), practically all the munition factories in Birmingham were working a 60-hour week, and only in a very few cases had three 8-hour shifts been tried. This was due mainly to the difficulty of securing sufficient male labour for setting tools, etc., and also to the fact that there was already some difficulty in getting enough female workers. Similarly in Coventry the total weekly hours ranged between 55 and 60, though at one factory visited girls under 18 worked only 47 hours, and those over 18 worked 53 hours. The evidence of Welfare supervisors and nurses in charge of rest-rooms went to show that these long hours had not exerted the bad effect that had been expected. Various witnesses stated that "no signs of undue fatigue had been observed," "no increased sickness since the hours had been lengthened," "the strain of the long hours is considerable, but actual breakdowns are rare." Another witness is "quite astounded" at the good standard of health after a long period of 55-hour weeks. One witness, a medical woman

who had examined the girls at a factory working 10 hours and more per day for six and sometimes seven days per week, found no marked deterioration when she examined them again at the end of six months. But she stated emphatically that the good food now obtainable because of the better wages was largely responsible for this result. It must be remembered that in pre-war times the average wage for girls on simple engineering processes in Birmingham and district was about 8s. to 10s. per week, while now they would get 16s. to 30s., and it must be concluded that some of the girls under discussion were now adequately nourished for the first time in their lives. Again, the results of this particular inquiry must be taken as representing the survival of the fittest, as many of the girls examined the first time the doctor visited the factory had left, possibly because of ill-health, before the second visit.

Nearly all the witnesses quoted above insisted that the high standard of health that prevailed was due mainly to better living and increased care, which did much to mitigate the possible evil effects of the long hours. One matron pointed out that girls who are earning good wages and who are therefore financially independent, get far better care and attention at home than if they are not earning, and this prevents breakdowns.

There is, however, another side to this optimistic picture, and this is presented by some of the doctors interviewed and by Girls' Club secretaries and Care Committee workers. One woman doctor stated that there is much increased sickness—anaemia, gastric disturbances, etc., among girls working long hours.

Another doctor declared that the fatigue resulting from long hours of labour frequently leads to acute anaemia and then to irregular menstruation, and he said that the greater part of the work was not too heavy and not entirely unsuitable for girls, but that the hours were so long as not to allow time to recover from fatigue.

The secretaries of Clubs and Care Committees were unanimous in their condemnation of the present system of long hours. They say the girls they come across are thoroughly worn out, " languid and lacking in vitality," " pale and nervous," and " incapable of taking an interest in anything." The fatigue seemed to affect them mentally more than physically ; thus the worker at one Club said that the girls working long hours, *i.e.* about 60 per week, were quite incapable of brainwork, so all classes, even needlework, had to be stopped, but they could stand the most strenuous drill and gymnastic work for two evenings a week and did not want to stop when the Club closed : the constrained nature of their work, generally tending automatic machines, seemed to increase their restlessness, and they are glad to work it off in any occupation involving movement. In case this point, which others corroborated, seems to contradict the view that the long hours made the girls lethargic and apathetic, it must be mentioned that this same witness said that when any girls were working 1½ hours over their 10 hours, they were fagged physically as well as mentally and would not have the energy to drill, etc., but would just sit and watch the others. As a general rule the girls do not complain of the long hours, and very

few cases of complete breakdown are recorded. This is attributed to the higher standard of living made possible by the increased wages and to the fact that many girls have been lost sight of since the pressure of work has become so great.

The evidence from a few miscellaneous industries, drawn as it is from the experience of a few " good " employers, is of a very different nature. Here the hours worked seldom, if ever, exceed 9 per day, and in some instances experiments had been tried with an 8-hour day with satisfactory results to both health and output. It must be remembered that most of the work done by girls in these miscellaneous factories is of an intensely monotonous nature—packing and sorting finished goods, " taking off " on printing machines, making cardboard boxes or tin canisters, but, at the same time, the work is very light and easy and is learnt in a day or so, although some weeks may elapse before the maximum speed is attained. The only danger in these light automatic processes is the temptation, often encouraged by the employer, of excessive speeding up, but to this I will refer later. As a general rule, the evidence from this group goes to show that the standard of health among girls working 8 or 9 hours a day is quite satisfactory, and the sickness rates are very low. How far these good results are due to the shortness of the working-day compared with that of the munition and textile industries, and how far to the various " welfare " provisions, such as special attention to delicate girls, supply of hot drinks in the middle of the morning and afternoon spells, gymnastic classes during work hours and so

on, it is difficult to say. It is interesting to note that one employer reported that the addition of two hours' overtime to a 9-hour day for three days a week caused excessive fatigue after a few months, so that the overtime was stopped, but after a month the pressure of work was so great that they had to return to it, and now they find that this excessive fatigue is avoided, or, rather, fatigue so extreme as to diminish output is avoided by working every fourth week without overtime.

Turning now to the textile industry, particularly the cotton trade of Lancashire with its 55½-hour week and its 6 A.M. start, we find opinion somewhat divided. A certain number of employers and their representatives declared that the hours worked exert no detrimental effect on young girls, and that the time lost through sickness is very slight. But these statements are outweighed by the evidence of most of the inside managers and some of the employers interviewed. One of the latter firmly believed that the present working hours are too long for young girls, and had often noticed how they fell off in health. Another states that young workers find the long hours very tiring and that a shorter working-day, which would be an advantage for all, is almost a necessity for young girls, although he has no exact evidence that the hours worked are actually detrimental.

But the heaviest indictment against the 10-hour day comes from the Trade Union representatives. Many of these declare that the girls are utterly worn out at the end of the day and are generally incapable of any serious work, which accounts for the small

proportion of girls who attend Workers' Educational Association and other evening classes. The strain of most of the work in cotton factories, both on the preparing and on the manufacturing sides, is considerable, and the competition to increase output is very great. Girls and women are indirectly set to emulate one another and to compete with men and boys. Some observers say that the girls are tired out by 4.30 P.M., and that if the hours were reduced the output would be more regular, as at the present time girls are unconsciously forced to "slack." The Sick Visitors of one of the large Weavers' Unions in north-east Lancashire state that "shorter hours are far more important for the well-being of the weaver than either weavers or manufacturers realise," and they point out that the girls look much brighter and better when they are away from work with minor ailments, and certainly the sickness returns show that fewer are ill when "short time" is general as in the latter half of 1914. This is confirmed by the experience of other Unions. The weaving master in one of the technical schools, who had been a working weaver for years, was convinced that the hours are too long for all operatives, but especially for growing girls, and he said, "One has only to live in a household of weavers to notice the extreme weariness and lassitude with which they sink into chairs as soon as they get home in the evening."

As a proof of the evil effects of the long working-day my attention was frequently drawn to the physical differences between the girls attending the secondary schools and those who work in the mills.

In the majority of cases, particularly in north-east Lancashire, both groups come from the same class and from the same type of home, but the former are tall, well-built, and rosy-cheeked, while the latter are often short, always thin, and generally pale and anaemic.

The comparison between the different effects of weaving and winding is instructive. The latter process is of itself more tiring and monotonous, and the strain is continuous; yet winders are said to be in better health and to be much more cheerful and energetic out of work hours. This apparent inconsistency is explained by the fact that the winders seldom work a full week; they frequently start after breakfast, and generally "play" on Saturday and one other morning every week.

One witness emphasised her conviction that the long hours were mainly responsible for the very prevalent ill-health of girls and of older women by declaring that no reform of factory conditions can be effective until the hours are shortened.

The medical witnesses were also unanimous in their belief that the long hours of confinement in the close atmosphere of the mill is the cause of much of the ill-health that is prevalent among girls about 16 and 17. The fatigue resulting from the hours of labour weakens their resistance to disease, and they are liable to fall victims to any epidemics, while anaemia, gastric and menstrual disturbances are very frequent about this age.

The worsted industry told the same tale. Many of the employers interviewed were in favour of a shorter working-day, as the younger operatives get

very tired at 4.30 P.M. and work suffers, while a Trade Union representative declared that the hours are exceedingly fatiguing for all female workers, particularly for growing girls, who, unlike the men and boys, practically in all cases have domestic work when the factory day is over.

The majority of the employers in the clothing trade had never given any consideration to the effects of the hours on the health of their operatives. Consequently they were vehement in declaring that a 52-hour week exerted no injurious influences. On the other hand, the Sick Visitors of the local branches of the United Garment Workers' Union were confident that the 9½-hour day in the confined atmosphere of the factory was particularly harmful for young girls, and they pointed out that the sickness returns were always lower during slack time and during strikes, while other witnesses, although unable to make any definite statement on the effects of the hours worked, said that very few girls at the clothing factories have much energy for Continuation and Workers' Educational Classes after their full day's work.

In non-textile factories 5-hour spells are very common. All the doctors interviewed spoke very strongly against this practice. It is noteworthy that far more accidents are reported as occurring in the 5-hour spells than in shorter periods, and the general opinion is that the spell is too long for health and efficiency. In many munition factories short breaks for ten or fifteen minutes have been instituted in the 5-hour spells, and trolleys from the canteens are sent round with cheap refreshments. The

benefit derived from this system is everywhere acknowledged, and the wonder is that so few experiments with rest pauses have been tried. The 4½-hour spell also comes in for much criticism, and some observers say that the girls are thoroughly fatigued at the end of the time, while the Welfare supervisor at one works goes so far as to say that the last half-hour even of a 4-hour spell drags so heavily with the younger workers that a 3½-hour spell would be a distinct advantage both to health and to output.

The continuous 4½-hour spell allowed by the Factory Acts for the textile industry is seldom adopted in either the cotton or worsted trades, the most usual hours being 6 A.M. to 8 A.M., 8.30 A.M. to 12.30 P.M., and 1.30 P.M. to 5.30 P.M. Very little attention has been paid to the effects of the 4-hour spells as such, and though many observers say that girls are thoroughly fatigued by 3.30 or 4.30 P.M., this seems to be due mainly to the total number of hours already worked rather than to the fatiguing influence of the individual spell. With regard to the early morning start characteristic of these industries, opinion was sharply divided. Some employers and Trade Union representatives declared that no ill-effects resulted, while others were most insistent that the work before breakfast was the cause of much illness and discomfort. Whilst it is impossible to dogmatise in the face of these conflicting statements, especially in view of the fact that neither side can produce scientific evidence in its defence, so that the statements are probably the result of social and domestic considerations, it may

be assumed that the early start is harmful in the cold winter months, but that it does not of itself exert any injurious influence in the summer.

Night work for juvenile workers is now almost universally condemned. The effects of such work are more marked than with adult workers, the nervous strain is considerable, and lassitude and weariness invariably accompany the night shift. This results in spite of the fact that girls are reported to sleep well during the day, unlike the older women, whose domestic concerns frequently prevent sleep in the daytime. Some witnesses from Birmingham and Coventry report that night-work was still (November 1916) common for juvenile workers. Where Welfare Workers are in charge, however, they endeavour to restrict it to girls over 16, though even with these the fatigue is considerable, as sleep is frequently broken by the mother waking the girl to partake of the family mid-day meal. Evidence as to the relative merits of long and short periods of night-work are so conflicting that it is impossible to draw any conclusions, and as the question is receiving considerable attention from the Health of Munition Workers' Committee, it was not made the subject of special investigation.

Some explanation of the conflict of evidence recorded under this section of the inquiry may be found in the outlook of the witnesses interviewed. Where increased output and commercial profit were the chief concern, so long as few actual breakdowns occurred the witness would report no unfavourable results from long hours of labour, while those whose main interest lay with the well-being of the worker

would notice any falling off in health with long hours and would report accordingly. It is obvious that no definite conclusions as to the immediate or ultimate effect of long hours can be made from evidence of this nature. In the second part of this report suggestions will be made as to the lines on which more scientific inquiry should be conducted in order to determine the exact effects of varying hours of industrial work on the physical organisation of adolescent girls.

Protracted Standing and Opportunity for Rest.—Evidence as to the provision of seats in munition factories is, on the whole, very encouraging. Most workshops have stools or seats for use during the short pauses which occur whilst waiting for materials or for the setting of tools, and where possible younger girls are put on work that can be done sitting down, whilst Welfare supervisors are generally ready to recommend that delicate girls be transferred from work which involves protracted standing to processes which allow occasional or even continued sitting-down, and foremen are nearly always willing to fall in with the Welfare Workers' suggestions. Only in a few cases have there been difficulties in securing seats: where men have been formerly employed the foremen are sometimes prejudiced against allowing girls to sit down, but they are soon convinced of the wisdom of making this concession.

With certain processes prolonged standing is inevitable, but evidence as to resulting injury was not forthcoming in Birmingham or Coventry. None of the doctors interviewed was able to make any

statement regarding the effects of a continued standing posture, as no cases of injury that could be attributed to this cause had come to their notice. Some of the Welfare supervisors stated that girls got very tired at first but soon got used to the permanent standing, and that no serious or lasting injuries resulted, though in a few cases girls not used to industrial work would get flat-footed or would suffer from swollen feet. While varicose veins are rare in young girls, every witness brought into contact with older married women was impressed by the apparent inevitability of this trouble in later years, but it is impossible to gather how far work during adolescence is responsible.

Evidence as to the effects of standing on the menstrual function will be discussed later.

From the evidence received it seems probable that only a small proportion, and these perhaps the more delicate, are troubled by prolonged standing, but attention may be drawn to the evidence of one large factory where 50 per cent of all new workers leave before the end of six months, and of these 30 per cent declare that they find the standing so fatiguing that they cannot remain at the work.

In most of the processes of the cotton and worsted industries chances of resting are exceedingly rare. Girls carrying laps[1] from the blowing-room to the cards, can-tenters and drawing-frame minders in the card-room, and winders and weavers, seldom, if ever, get an opportunity to sit down. Girls on the slubber, intermediate, and roving frames, and those

[1] A lap is a thick layer of cotton fibre wound on a roller in early stage of preparation.

in the ring-room of the cotton trade and the spinning-rooms of the worsted industry, are in a better position in that a few minutes' rest is sometimes possible, and some managers and overlookers believe that these girls are less tired and show a better sickness record than the former group. Even where the nature of the work allows occasional periods of rest, seats are scarcely ever provided, so that the girls seldom sit down unless the waste-boxes or the skips are in a suitable position so that they can see down their frames to note if the work is proceeding all right. Many of the witnesses stated complacently that the girls soon got used to the prolonged standing, but doctors noted that prolapsed wombs were not uncommon in young women between 20 and 30, though some felt that the number of cases were not sufficient to warrant any conclusions. Sick Visitors also reported that prolapse was not unusual, and that most girls found the long hours of standing very fatiguing. Cases of prolapse are sometimes reported amongst young married women who have not worked after marriage and who have had every care after child-birth, which seems to point to an adverse influence exerted during adolescence. Sometimes girls complain bitterly of the lack of opportunity for even a few minutes' rest, and the Sick Visitors say that conditions of work which do not allow a girl to snatch even a short respite during a 10-hour day do not give her a chance to get over any constitutional delicacy. As a general rule, however, the girls make no complaints, but older women find the continued standing very tiring, and many witnesses believe that this is due to the

cumulative strain of long years, while some declare that the anaemia prevalent among young textile workers is largely due to the weakened condition brought about by long hours of standing.

Reference may be made here to the necessity for attention to the type of seat provided, particularly in entirely sedentary occupations, as in the clothing trade and in many of the processes of such industries as biscuit-making, soap-manufacturing, etc. Witnesses from the clothing trade laid great stress on the fact that sitting all day on a small hard stool was extremely fatiguing for growing girls, as it gave no support to their backs, and the Welfare Worker of a large soap-works, after trying one of the stools in her own office, is having them all replaced by chairs with suitable backs in those departments where the work is mainly sedentary.

Weight-carrying and Heavy Work.—As far as one can gather from the rather scanty evidence available under this heading, girls under 16 in munition works are seldom engaged on work involving heavy lifting and carrying. The majority of young girls are feeding automatic machines and working power presses, and all materials are brought and taken away by special labourers. Many girls over 16 have been substituted for men workers, but it is exceedingly difficult to gauge the effect which such work is exerting on their health. Overlookers and Welfare supervisors declare that tall strong girls are chosen for heavy processes and that very few injuries result, while a girl can be transferred to lighter work if the heavy work is too fatiguing. One doctor related how she had just concluded the

examination of 200 women and girls engaged on heavy capstan lathes and had discovered no injurious effects, but she pointed out that they were all from the Black Country, where women and girls have been doing heavy work for several generations, and their physique was undoubtedly superior to that of the average industrial girl worker. Another doctor stated that the carrying of weights over 50 lbs. is exceedingly injurious to adolescent girls, as it causes the heart to beat too quickly, so that after a time the beat is continuously rapid and anaemia sets in. This effect is seldom, if ever, noticed in girls over 20. On the other hand, uterine injuries are practically unknown in young girls and hernia is very rare.

In one large works the girls who are transferred to men's work of lifting and carrying goods are selected by the gymnasium mistress and wear gymnastic costumes to facilitate their movements, and the works doctor reports that there have been no ill effects beyond a few cases of sprained ankles and wrists.

By an agreement between the Master Cotton Spinners and the Card and Blowing Room Amalgamation, which was signed in February 1917, women and girls are allowed to break off laps from openers and scutchers provided they do not exceed 45 lbs. in weight, and also to fetch these from the blowing-room on lap-trams and put them on the cards. In Leigh, Wigan, and other districts where Trade Unionism is weak, girls have been employed at this work for a long time prior to the agreement, and the laps are seldom moved on lap-trams but are carried on the girl's shoulder. Some overlookers

said that they had always tried to get tall strong girls for lap-carrying, as the laps, though seldom very heavy—average weight 32-42 lbs.—are very cumbersome to manipulate, and that such girls never experienced any difficulty in carrying the laps. Where this care is not exercised (and it is to be feared that in the majority of cases no regard is paid to the girl's capacity for the work) difficulty in manipulating the bulky lap may be experienced by small girls.

Can-tenting on the cards is an easy or fatiguing occupation according as the cans are made of fibre or of tin. When the latter are in use girls get very tired, as they are continually dragging the cans, three or four at a time, from the cards to the drawing-frames, which are often some distance away. The secretary of one branch of the Card Room Amalgamation expressed the opinion that the use of fibre-cans ought to be compulsory, as the improvement in physical condition when these are introduced is quite remarkable. But in view of the fact that whenever cans are being renewed fibre ones invariably replace the old-fashioned tin cans, legislation seems unnecessary, and in many places where tin cans are still in use trams are used to convey them to the drawing-frames.

At the present time girls are frequently seen dragging skips of cops and bobbins from one room to another or on to the hoist. In well-managed mills the skips are moved on lines, or else are furnished with wheels, but sometimes cases are reported of girls getting ruptured through pulling skips without wheels up sloping floors.

In most weaving sheds—cotton and worsted—the weavers' work is to fetch the tins of weft, keep the shuttles full, repair broken threads, and carry the finished pieces or cuts to the warehouse. The actual process of weaving does not involve any heavy work, and fetching the cops of weft is only fatiguing when heavy tins have to be brought from the cellars, which is not usual. But the dangerous element in the work is the occasional necessity of altering the weights, which are placed by the overlooker on levers at the back of the loom, to maintain the required tension of the warp. Many witnesses, Trade Union officials, doctors, overlookers, employers, and technical schoolmasters bore testimony to the risk of internal strain and hernia which attends the manipulation of these weighted levers. A broad loom for the manufacture of cotton sheetings or worsted cloths may have two or three 56-lb. weights on both levers, while for lighter fabrics two 32-lb. weights on each side are quite common. In most sheds the space between the looms is so restricted that the weavers have to move the weights in the position of maximum disadvantage. As a matter of fact the actual number of cases of rupture and other injuries is very small. Many witnesses said it was a cause of perennial amazement to them that this should be so, but some Sick Visitors and Trade Union secretaries said that not all the cases came to their official notice, as girls are often too reticent to claim compensation for internal injuries. Other witnesses recorded their conviction that the effect of the risk was seen better in the gradual strain and the deterioration in health than in the

few cases where actual injury results. It must be remarked here that men weavers are often willing to help women and girls with this lifting of the weights, but as a general rule the girls are too independent to ask for the help, and the competition and speeding up are so intense that they will not take up the time of a fellow-weaver. There are a number of patent weighting motions on the market whose object is to dispense with heavy weights, a 9-lb. weight being sufficient for any ordinary warp, so that a young person can roll back the yarn on the beam after unweaving or pulling back equally with the strongest man. Many witnesses considered that legislation ought to be introduced making such contrivances compulsory, and it is interesting to note that some employers who had tried these patents on a few looms intend to introduce them altogether when the war is over, and some have found that by selling the old weights they have been able to install patent weighting motions at a very small cost per loom.

Carrying finished pieces to the warehouse is an advantage to the weavers in so far as it breaks the monotony of the work, but where the cloth is heavy it is very tiring, particularly for short weavers, as lifting the bundle over the loom-end in the narrow alley is exceedingly fatiguing. In the worsted industry most pieces weigh 100 lbs., and two girls are said to carry one piece to the warehouse. Cotton goods seldom reach this weight, but in many districts the trade is becoming heavier, and 60 lbs. is not unusual, and girls will carry such a piece without any help. Most witnesses insisted that cut carriers

ought to be employed, as they are in a few places, where heavy cloth and broad pieces are woven; even though few cases of serious injury can be attributed to this cause, girls at work on heavy goods and broad looms are "off sick" more frequently than other weavers.

Peculiar Movements.—The points to be considered under this heading were included in the investigation as it was felt that movements involving continued use of one foot, while the full weight rested on the other, as in working a treadle, or frequent stretching might exert a harmful effect during adolescence, whilst they might be quite innocuous for adults. The evidence, however, is too scanty to warrant any conclusion, as work of this character is much less general than formerly. On some of the machines used in engineering girls have either to work a foot lever continuously or to start and stop the motion, but where Welfare Workers and nurses are in charge they frequently arrange that girls be transferred to other work after a time, so they have nothing to report as to the effects of the work. The doctor at one large factory considers that such work causes trouble with womb and bowels and may lead to prolapse, and that it is likely to weaken the abdominal muscles, but she had no definite evidence from girls under her supervision as she had insisted some time previously that girls should only do pedal work on alternate days, so that now they are engaged on another process in the same room every other day. She was, however, able to report that, previous to the enforcement of this arrangement, many girls working treadle machines

would go home during their menstrual periods, and now very few feel the need to do this.

In some of the card-room processes, particularly on the intermediate frames, also in the ring spinning-room, and at worsted spinning, short girls have much stretching to reach the top rows of bobbins, but though this is tiring no special injurious effects are recorded. The difficulties of stretching movements are further intensified in the case of preparation work on drawing-boxes in the worsted industry, as girls have to lift large bobbins weighing about 28 to 30 lbs. into creels above their heads; but though some witnesses declared that this was very tiring, no evidence as to actual effects could be secured. A Trade Union delegate mentioned that some girls on this work have broken down completely, and have been forbidden by their doctors to return to the work—the effect showing itself in a rapid deterioration in general health rather than in actual injury. Further inquiry, however, brought out the fact that the majority of workers on this process are over 20 years of age, and are therefore outside the scope of this investigation.

Sanitary Conditions.—Reports as to sanitary accommodation in factories are generally satisfactory, thanks to the untiring efforts of the Women Factory Inspectors. In Birmingham, with its multiplicity of small workshops, however, conditions, to put it mildly, are not always ideal. As one doctor remarked, "Things are not so bad as to allow closing down of workrooms, but the sanitary arrangements often fall short of a reasonable standard of decency, though the competition with large firms is having a

salutary effect." The only complaints that were brought to my notice referred to inadequate ventilation and lighting and the objectionable system of "timing." The former is generally remedied with the advent of the Welfare supervisor, the latter complaint appears to be quite general in Coventry and is the cause of much discomfort and annoyance. Where a large number of girls are employed the temptation to remain away from the workshop for long periods, playing in the lavatories, appears to be very general among younger girls. One cannot help feeling that the difficulty can be overcome by arranging for a woman attendant to take charge of lavatories and cloak-rooms, rather than by a system which runs counter to all decent instincts. Welfare Workers report that where such attendants are employed the behaviour of young girls seldom gives cause for complaint. In a few factories the attendants in charge of the lavatories supply sanitary towels at 1d. or ½d. each, a practice which might be universally adopted.

The sanitary arrangements in textile mills are not always adequate, though few are reported as actually unsatisfactory. Pail closets are, however, still present in a fair proportion of the older mills. The chief complaint, particularly in reference to the needs of adolescent girls, concerns the position of the closets; in most mills the male and female conveniences are next to each other, and witnesses report that young girls are frequently too shy to make use of them, especially in weaving-sheds where the doors of the closets are in view of all. Much unnecessary suffering therefore results, and

girls sometimes turn ill from this cause. These witnesses recommend that the sanitary conveniences be placed outside the sheds, and that male and female accommodation be in different parts of the mills. It may be noted in passing that this difficulty was only represented in north-east Lancashire, where the social position of the operatives is generally somewhat superior to those of other districts, and where reticence in such matters is more likely to be intensified.

Lighting and ventilation of closets is frequently faulty, and stress must be laid on the necessity for washing facilities, generally entirely lacking in textile factories.

Meals.—Attention has been drawn in the section devoted to hours to the value of good feeding in mitigating the injurious effects of long hours of labour. It must be remembered that the evidence from the engineering industry was collected towards the end of 1916, so that the reports refer to the period before the increase in food prices had balanced the rise in wages. It seems to be fairly established that where good wages are earned adequate food is eaten, though one or two observers reported that girls are still eating unsuitable food, with the result that gastric troubles are common. As a general rule, however, particularly where canteens have been set up, good meat dinners are eaten, and the girls appear to be well nourished. Welfare Workers report on the improvement in health which follows the opening of canteens, and they note especially how anaemia is reduced. Inquiries by club secretaries and the experience of district nurses who visit

working-class households show that improved feeding invariably follows an increase in wages. As one witness says, "If they have the money they eat good food, and once in the habit they do not easily fall back." This is encouraging in face of the widespread belief that girls are careless about their food and willingly live on tea and bread. The only complaints concern the lack of variety in the food provided in the canteens. One Welfare supervisor lays great stress on the value of a long dinner-hour, and she attributes the absence of digestive troubles at her factory to the hour and a half allowed at midday.[1]

One witness pointed out that when work starts at 8 A.M. many girls get no breakfast, and when dinner-time comes at 12 or 12.30 they do not feel able to eat ordinary food and take only bread and tea, or something "tasty," but not nourishing. This point should be borne in mind when the arrangement of hours is under discussion, especially in view of the suggestion of one doctor who thought that the ideal working-day when long hours are necessary for output, would be from 7 A.M. to 12 and 1 P.M. to 6 P.M., with ten minutes break for tea, etc., in the middle of each spell. His reason for opposing an earlier start with a breakfast interval at 8 o'clock depended on the fact that the earlier spell (6 A.M.–8 A.M.) would probably be worked fasting, which he considered to be very injurious. How much more harmful then must be a whole morning's work with only a very light refreshment at the interval. The Sick Visitor of the United Garment

[1] See below, p. 33.

Workers' Union at Hebden Bridge also draws attention to the difficulty of obtaining an adequate breakfast at 7 o'clock in time for the 7.30 A.M. start general at Hebden Bridge, and she attributes the prevalent trouble of indigestion to this cause.

In the textile industries such amenities as dining-rooms are practically unknown. A benevolent employer here and there, or a Co-operative Wholesale Society, may provide a canteen, but such examples are exceedingly rare. In south-east Lancashire most operatives who work at a distance from their homes arrange with a family in the neighbourhood of the mill to provide them with hot water for tea, and possibly to cook some food for them, for breakfast and dinner. Those who do not do this take their meals in the mill, and as seats are non-existent they have to sit on skips or on the floor. When one realises the atmospheric conditions of most mills, the heat, the damp resulting from steaming, to say nothing of the smell from oil and size, one cannot imagine a worse arrangement. In north Lancashire conditions are somewhat better in that most mills provide hot water for tea at a charge of 1d. or 2d. per week, and a certain few provide ovens for heating food, but here again the meals have to be taken in the vitiated atmosphere of the mill. Practically all operatives remain at the mill for their breakfast, but the majority go home to dinner. The standard of living is high, but too much carbo-hydrate and too little protein food is general; bread and tea, chips and fish (mostly batter), and cakes and pasties, and potato pie with very little meat, form the staple diet. Doctors especially remark on this, and they

attribute the distaste for nourishing food to the long hours of confinement in the close atmosphere of the mill. Industrial employment of the mothers is also held to be responsible for faulty feeding, and when the mother leaves the mill to look after the needs of a large family the taste for unsuitable food is settled, and the diet continues as before.

General Effects of Industry on Physical Condition

In addition to the influence of these special considerations on the health of girls in factory employment, certain ailments and forms of physical disability which may not of themselves be immediately incapacitating may be induced by the general unfavourable environment of industrial life Amongst such disorders may be classed :

1. Anaemia.
2. Gastric disorders.
3. Nervous affections.
4. Disturbances of menstrual function.

Growing girls are particularly liable to these disorders, so that their extent was made the subject of special inquiry.

Anaemia.—The absence of an absolute standard and complete lack of statistical information render the evidence under this heading vague and inconclusive. Most of the Welfare Workers in the various munition factories visited stated that very few girls suffer from anaemia ; two or three stated that many girls were anaemic when they started their

industrial life, but that after a short time, thanks, as they believed, to better feeding and a regular life, the disorder passed off. On the other hand, the doctors and club workers interviewed were confident that the long hours worked were increasing the proportion of anaemic girls. One doctor, when recording the prevalence of anaemia among industrially employed girls, attributed it to the fatigue following inadequate rest, coupled in many cases with excessive menstruation, due similarly to the fatigue of long hours. There was considerable divergence of opinion as to the age incidence of anaemia, some observers stating that the period immediately following the taking up of employment, 14 to 16, showed the worst record, whilst others found the years 16 to 20 were responsible for most of the anaemia. It is interesting to note that some of the Coventry witnesses found anaemia much reduced since the War, no doubt as a result of the better feeding, and one Welfare Worker stated that only those girls who were found to be eating insufficient food or who came from long distances without breakfast suffered in this way.

The textile industry presents a more uniform picture, and there is much evidence to show that a large proportion of the girls employed in the cotton and the worsted trades suffer excessively from this disorder. Some observers state that many girls are anaemic about the age of 12 when they start work, and then again between 18 and 22 ; others declare that most girls suffer from anaemia at some time between the ages of 13 and 18. As far as the actual sickness returns of the Trade Union Insurance

Societies are concerned, it appears that anaemia is more frequent after 21 than before, but these refer to anaemia of such severity that absence from work is necessary, and the Sick Visitors say that many girls under 21 suffer from anaemia for lengthy periods without medical attention or sickness pay.

Doctors are inclined to attribute the excessive anaemia to the fatigue of long hours of labour in a close atmosphere, continued standing, insufficient sleep due to the early morning start, and faulty feeding.

The sedentary nature of the clothing industry renders the girls very liable to anaemia, and though the employers frequently deny this, the evidence from the Trade Union Secretaries and the Sick Visitors with their actual record of cases outweighs the observations of the employers. Witnesses from girls' clubs and evening classes often state that the clothing trade is responsible for a higher proportion of anaemic girls than any other industry.

Gastric Disorders.—Most witnesses report that indigestion and other gastric disorders are general among girls, though it is often noted that men and older women suffer more frequently from these complaints. Seldom is the actual work held to be responsible. Girls working with powder in munition factories or where the smell of oil is disagreeable appear to be more liable than others, and weavers who are taller than the average—only a small proportion—find the constant bending over the loom aggravates a tendency to indigestion, but beyond these few cases faulty and irregular feeding seems to be the main cause for the prevalent gastric

troubles. It is interesting to note that hygiene and physiology classes are doing much to inculcate sound notions of diet, which, taken in conjunction with increased wages and easy accessibility of food in canteens, are doing much to prevent gastric disorders. Irregular and hurried feeding depends mainly on the arrangement of hours of labour, and can only be overcome when these are based on more rational lines. One Welfare Worker records a very small proportion of digestive troubles, and this she attributes to the hour and a half allowed for the midday meal.[1]

Where work starts at 7.30, as in the clothing trade at Hebden Bridge, many girls take only a cup of tea or a piece of bread before commencing work, and then have to wait until 12.30 before they can get a proper meal. Doctors point out how the long hours of labour in the close atmosphere of mills and factories engender a poor appetite, so that nourishing food becomes distasteful, and tea and confectionery frequently form the staple diet, with disastrous results to the digestive functions.

Headaches.—Headaches appear to be extremely common amongst girls in all the industries reviewed, the reasons advanced to account for this being variously the noise of machinery, the smell of oil and size, inadequate ventilation, and eye-strain consequent on close attention to the work.

Ventilation is notoriously bad in those factories where previously only men were employed, but new

[1] Cf. the evidence of the British Mission on the output of munitions in France in December 1915, who note the advantage to health accruing from the long dinner hour, generally one and a half hours, and often two hours. (Cd. 8187 of 1916, p. 7.)

and large factories, particularly where there is a Welfare Worker, show much improvement, and under such conditions headaches are said to be rare. Defective eyesight is a frequent cause of headaches, and here again a careful Welfare supervisor can do much good by advising a visit to the optician or eye hospital. Clothing operatives are especially liable to eye-strain, and care in lighting arrangements is very necessary. Mending in the worsted industry is also trying for the eyes. In one large mill visited a superior woman overlooker was in charge of the mending and burling, and she was careful to vary the work so that the tedious pieces did not always come to the same girls. By this means, and by the use of eye-shades to keep off the glare of the light, she finds headaches can be largely prevented. It is to be feared that such care is not general in the industry, as a Trade Union representative reports that headaches are very common.

Nervous Disorders.—The evidence here is extremely scanty. One doctor drew attention to the danger of automatism. When very monotonous and restricted movements are employed, a whole room of girls may become nervous and hysterical. He has known this to occur in the making of nails, where the difference between the various processes is so slight that the monotony cannot be obviated by periodically transferring the girls to different kinds of work. Two other witnesses drew attention to the effect of piece-work at high pressure in causing a tendency to hysteria and other nerve disorders, and doffing in the worsted spinning rooms is said to be responsible for the noisy excitability which

is so marked among the younger boys and girls. The more common experience, however, is the absence of nervous disorders among industrially employed girls. Various doctors in Lancashire and Welfare Workers and others in Birmingham and Coventry commented on this, and recorded their conviction that the social influences at work, cheerful companionship and an increased interest in life, are powerful antidotes to possible nervous afflictions.

Menstrual Disorders.—As far as can be ascertained from an inquiry based on the general experiences of persons in touch with girls either inside or outside the factory, the extent of menstrual disorders appears to be much slighter than is generally supposed. In most of the non-textile industries reviewed, opportunities for sitting down were fairly general, and here painful or excessive menstruation was exceedingly rare. Nurses in charge of rest-rooms and surgeries report that only a small proportion of girls are troubled in any way, and those who make use of the rest-rooms during their periods are always the same ones each month, so it may be presumed that these are constitutionally delicate, and that the work is not responsible for their disorder. Doctors declare that if the general health is good, industrial work for a reasonable number of hours has no ill-effects, but, on the contrary, the active movements involved are a positive advantage. When, however, the hours worked are so long as to cause extreme fatigue, excessive and painful menstruation frequently results. Nurses and Welfare Workers notice that many girls of 14 have not commenced their menstrual periods when they start

work, and they point out that the active life and the chance of good nourishment which wage-earning ensures has a good effect in bringing on normal periods.

Some witnesses report that girls who have no opportunity of sitting down suffer much pain during menstruation and get very fatigued, but the evidence on this point was not unanimous.

Evidence from the textile industry is not so satisfactory. As was pointed out when the provision of seats was under discussion, cotton and worsted factories are lamentably behind other industries in this respect, and as hours are uniformly 10 per day and the pressure of work generally very considerable, it is not surprising that menstrual disorders are reported more frequently than in non-textile trades. It must also be remembered that the large majority of textile operatives start work at 12 or 13 years of age, just at the onset of puberty, while in other industries 14 is the general school-leaving age.

Many girls find the long hours of continued standing very tiring during menstruation, and as these factors conduce to anaemia, failure of the menses and dysmenorrhoea are more common than in other industries.

Most witnesses laid stress on the need for seats and rest-rooms in textile factories as a means of preventing painful menstruation; in many mills girls are not even allowed to snatch a few minutes' rest by sitting on the waste-boxes or on straps slung between their looms, and they frequently experience difficulty in getting permission to go home when feeling unwell unless they can get a substitute.

Two men overlookers drew attention to the advantage which results when the foremen and overlookers are married, as they are then more sympathetic about periodical lost-time and are more willing to allow girls to go home at the half-day.

But the doctors interviewed are unable to attribute any permanent menstrual disorders or resultant injuries to these causes, and they are inclined to believe that the active life of the mill is a help rather than a hindrance to the menstrual function.

Realisation of the Needs of Adolescents

Any realisation of the particular problems and needs of adolescents by attempts to fit work to their physical capacity is so rare that the few cases where such provisions are made stand out in marked contrast. In munition and other factories where Welfare Workers are in charge, efforts are generally made to limit overtime and night work to those over 18, but at the time the inquiry was made in Birmingham and Coventry girls over 16 were in most cases expected to take their turn at night work with the older workers, while in some factories, after the first few weeks' probationary period is over, old and young alike have to work on the alternate night and day shifts, although it is now generally acknowledged that night work is more detrimental for young than for adult workers. At one of the larger factories visited, girls under 16 always stop work at 6 P.M. after a 9¾-hour day, while those over 16 work another hour, and when overtime is being worked, another two hours. At another factory

all the girls under 18 were engaged on light sedentary work for 42 hours per week, while the heavy work on presses and capstan lathes was done by girls and women over 18 for 53 hours. In some works the majority of the younger workers are on light work, such as " examining," and in others the foremen are willing to transfer girls from work they find specially fatiguing, on the recommendation of the Welfare Worker. This, however, is not general, and few foremen exercise care in the selection of girls for heavy processes. As one witness pointed out, girls are chosen for their bright and intelligent appearance, with little attention to physical capacity.

In the cotton industry the position is even worse. Girls entering the mill at 12 as half-timers or at 13 for full time are expected to conform in every way to factory life. Voluntary reduction of hours by employers for younger workers is completely unknown, and instead of suiting the work to the capacity of young workers, the girls have to adapt themselves to the requirements of their work. As soon as a girl has her own looms—at the present time weavers are on two looms at 13, and frequently on four at 14 or 15—the manager expects her to produce the average output every week, and the strain to do this is responsible for much deterioration in health. The competition between weavers is encouraged by overlookers and managers, and no effort is ever made to teach girls to conserve their energies.

In the worsted industry the majority of the younger workers are employed in the spinning rooms, first as doffers and then as spinners, which one witness describes as the hardest process in the

industry. Few girls remain at spinning after they are 18, as the money earned here seldom exceeds 18s. per week, but it is during the critical years of adolescence that they are engaged on this exceedingly fatiguing work, and no effort is made to reduce the burden of their employment.

In the clothing trade of Hebden Bridge the Trade Union officials report that the younger workers are not subjected to heavy pressure of work, and are able to take their ease at the workshops if they so desire, the peculiar circumstances of the trade here preventing any attempt to speed them up by threat of dismissal. In one or two factories learners and young operatives work in a separate room in charge of women overlookers, and in most cases these supervisors are careful about the health of their charges and prevent them working at an excessive pace.

The Transition from School to Factory Life

In reviewing the effects of the transition from school to factory life it must be remembered that the evidence from the non-textile industries refers to girls who are over 14 years of age, while in the textile towns the large majority of the children start work either as half-timers at 12 or as full timers at 13. The general trend of the evidence shows that the taking up of non-textile employment is attended by a considerable falling-off in health. Most girls become thinner and lose their colour and vitality during their first six months at the factory, and those working long hours become " like machines, able to keep on without breakdown, but lose all

their normal interests." This, however, appears to pass off after a time, and their health and vitality return.

Some witnesses had noticed that the usual manifestations of lessened vitality and anaemia were not so general as in pre-war days, and this is naturally attributed to the better feeding and consideration obtainable at the present time. My attention was drawn several times to the desirability of increased care during the critical years of early adolescence through an extension of the medical service under the National Insurance Act to all industrially employed persons. Some Welfare Workers found that constant attention was needed to prevent a widespread deterioration in health during the first period of employment, and their efforts were frequently hampered by lack of facilities for medical attention.

Some witnesses, notably those from the Hebden Bridge clothing trade, as well as from some of the miscellaneous trades investigated, state that girls are put to easier and lighter work when they first leave school and that they take their ease at it, so that no falling-off in health accompanies the transition stage, but a deterioration in physique with increased sickness shows itself at 16 or 17, when they begin to work at a high pressure.

The special problem of half-time labour in the cotton and worsted industries, dealing as it does with the employment of children as distinct from adolescents, does not concern us here, so that we will review only the taking up of full-time employment at 13. Where girls come straight from 6 hours' work at school to the full working-day of

10 hours the change involves a considerable strain, even when, as tenters and learners, they are not worked hard. Opinions vary as to the stress of work during the first few months of employment, some witnesses declaring that the children take their ease at first. This may be the case when they are earning a time-wage as back-tenters in the card room or as tenters in the weaving shed, provided they are working for kindly, considerate persons, but where they are put on piece-work the more general opinion is that the anxiety for earnings is as strong an incentive to young as to adult workers, and that all alike work at top speed. These witnesses lay stress on the inevitable deterioration which sets in at this time, and they attribute it mainly to the strain of factory life coming at the same time as the onset of puberty. This opinion is reinforced by the examples often quoted of girls who have not taken up industrial work until 15 or 16; these soon settle down without any falling-off in health. The comparison between girls who go to the mills at 13 and those who go to the secondary schools is even more striking. In most of the cotton towns, particularly in north-east Lancashire, the majority of the pupils at the secondary schools are drawn from the same class and come from the same type of homes as the girls who go to the mills, so that the different circumstances of their lives after they leave the elementary schools must be responsible for the differences in health and physique which are so marked at this period.

Many witnesses were of the opinion that the certifying factory surgeons are not careful enough

in excluding girls from the factories, so that many delicate girls work at the mills who might grow out of their weakness in a more favourable environment. If the surgeons were able to postpone admission to the factory for varying periods much deterioration might be avoided.

Special Problems

Girls in the Mule Rooms.—The shortage of boy labour in the spinning branch of the cotton industry has led during recent years to a revival of the old custom of employing women and girls in the mule rooms. In strongly organised districts this means that girls are being engaged as piecers in increasing numbers, while where Trade Union organisation is weak, outside the great spinning areas, as in Wigan, they are frequently acting as mule minders. As might be expected, the influence of war conditions has been to intensify this shortage of boy labour and to increase the number of female piecers, so that the Bolton Operative Cotton Spinners' Association finds that no fewer than 1163 additional girl piecers have been brought into the mule rooms in their district since the outbreak of war, making a total of 3315. The increase will be proportional in Oldham and district.

In this inquiry the evidence as to the effects of such work was drawn entirely from non-medical sources, as it was impossible to get definite medical experience of the problem. Consequently the conclusions are more general than exact. Many employers and overlookers and some Trade Union

witnesses were firmly of the opinion that mule-room work exerted no injurious influence on the health of girls, but it must be noted that these witnesses were drawn entirely from Wigan and Leigh, where the proximity of coal-mines with the attraction of higher wages absorbs most of the available boy labour, so that the shortage has been acute for some years, and the witnesses have got so accustomed to the presence of girls in the mule rooms that they can see nothing against it. All the more striking, therefore, is the testimony of some overlookers in these districts who declared that the work made girls thin, weak-chested, and anaemic. The temperature of the mule room frequently exceeds 90° F. and girls and men work in very scanty clothing, and the liability to colds on leaving the overheated atmosphere is very marked. Girls are on their feet the whole day, with no opportunity for rest, and by the end of the day they have walked many miles. One witness said that girls get very tired, but that no permanent ill-effects are noticed; but he advocated that rest-rooms be provided in order to prevent undue fatigue. More than one mule-room overlooker declared that no daughter of his should ever work in the spinning room, and the opposition to such work was based on physical as well as on moral grounds. One manager pointed out that "wiping down" the mule is particularly "nasty work" for girls: every two hours or so the little piecer has to run down the mule under the ends and clean with both hands as she runs, and this has to be done with great speed, as the spinners object to the mules being stopped for more than a minute or so.

A small meeting of mule-room women workers, joint minders, and piecers whom I interviewed were very resentful that their work should be considered harmful, probably from fear of losing their employment, so it was difficult to get any definite evidence. The only reform for which they pressed dealt with the provision of cloak-rooms where men and women work together. As mentioned above, the heat is so intense that very little clothing is worn—men wear a pair of linen drawers and a shirt, the women and girls frequently only a skirt and blouse; and they dress and undress in sight of one another. The moral effects of mule-room work are outside the scope of this investigation, but attention must be drawn in passing to the undesirable position occasioned by the heat, the scanty clothing, the attitudes necessary for the work, and the subordination of women and girls to the male minders in an unhealthy atmosphere. In Wigan, where women minders or joiner-minders are the rule, these moral objections seldom occur.

Witnesses from mills that do not employ girls in mule-room work were very insistent on the objectionable moral and physical effects of such work, agreeing with Mr. James Haslam that it makes girls "sallow and tired, crooked in limbs, bloodless and dyspeptic."[1]

Speeding up.—We have already referred to the driving effect of piece-work on simple automatic processes, but it is difficult to deduce any definite conclusions from the evidence of the non-textile industries. Thus some Welfare Workers and employers say that

[1] "Lancashire Women as Cotton-Piecers," *Englishwoman*, June 1914.

the girls take full advantage of the liberty allowed them, and are frequently to be seen wandering into other rooms and workshops for conversations with their friends. This seems to contradict the view that anxiety to earn a good wage causes excessive speeding up, but other witnesses find that the incentive to increase output which piece-wages provide is so strong that girls will not make use of rest-pauses when these are allowed, and sometimes consequently become exceedingly nervous. The pace is set by the quickest workers, and the effort to keep up is very wearying to weaker and slower girls, who will not sit down or rest even when seats are provided. Some interesting observations were made by the director of a factory employing about a thousand female workers. He has found that continuous piece-work on simple processes has a cramping mental effect, so that the girls become perfect machines. Thus young women who have been in the works for about six years will not face the responsibility of an overlooker's position, and seem to have no interests outside their output and their wages. On the other hand, a small proportion of the workers do not work at top speed if they can get a moderate wage which seems to supply their ordinary needs. Some girls previously earning 16s. per week on piece-work are still getting the same money, although they now get 3s. or 4s. war bonus, plus their piece-earnings.

Speeding up of the machinery in the cotton industry has been very marked during recent years. In each department unremitting attention is necessary if even a moderate wage is desired. The standard

of comfort is higher in Lancashire than in any other industrial district, and a good family income is considered essential. Consequently children and young persons are just as keen on their output as adult workers. Some witnesses pointed out that doffers and back-tenters and other beginners who are paid a time-wage are saved from the excessive speeding up which results from piece-wages, and that they get time to sit down and rest in the intervals of doffing, etc. But any one who has watched the gang of doffers passing from frame to frame in the ring spinning rooms of the cotton industry or at fly or cap spinning in the worsted trade will be inclined to disagree with this view; and indeed the textile master at the technical schools of one of the West Riding worsted centres said that doffing was done at top speed amid deafening noise, so that the work was more fatiguing than any other occupation in the mill.

Weavers and winders suffer from increased speed as much as the card- and spinning-room workers. Attention has been drawn to the spirit of competition which managers and overlookers encourage between weaver and weaver. Boys and girls, men and women, are indirectly set to emulate each other. Some witnesses believe that women and girls work at higher pressure than men and boys, and since the former invariably have domestic work when the factory day is over, the strain is considerably increased. At the present time girls are given responsible work before they are equal for it. Teachers frequently find half-time scholars, who have not been at the mill more than a couple of months,

announcing that they were working " for sick," that is, minding the looms for a weaver who is away ill. Such girls will get two looms of their own before they are on full time, and at 14 they have four looms under their charge. It was no uncommon thing in north-east Lancashire to find that girls have been working their mother's four looms for some months while the mothers are minding the soldier father's six looms. In some cases girls of 16 have six looms, and Sick Visitors report that cases of heart trouble, anaemia, and general weakness are most common at the present time amongst these girls; " the possible lasting effects of this severe strain are terrible to contemplate." The Sick Visitors of another Union say that the falling-off in health which is marked in adolescent workers, shows itself most when the girl is put on to three looms. Even in normal times girls mind three looms at 16, and the strain is considerable. These witnesses believe that the average girl should not be in charge of three looms until she is 18, and that 21 is soon enough for four looms. In this connection the evidence of one large mill where the quality of the weaving is above the average is particularly instructive. The manager reported that the standard of health was extremely satisfactory, and he pointed out that girls are not allowed to take three or four looms until they are strong and capable enough to manage them, and he had found by experience that it is seldom advisable to put them on the full number of looms until 17 or 18.

RECOMMENDATIONS

THE greater part of the evidence considered in this report was based on opinions derived from personal observations with very little scientific and no statistical groundwork. The complete report leaves us with a fairly accurate picture of the conditions under which a large proportion of the adolescent workers of the country are employed, with some general notions as to how these conditions react on their health and physique. Exact conclusions as to the particular effects of the conditions of labour cannot be obtained, as no records dealing with the health of girls in factories are in existence. The impossibility of securing scientific and reliable data was apparent at an early stage of the inquiry, but it was felt that by reviewing the conditions of adolescent labour and by noting general tendencies the way might be cleared for further investigation on a more scientific basis.

It is now generally recognised that " fatigue has a larger share in the promotion and permission of disease than any other causal condition," and as adolescents need a sufficient reserve of energy to maintain growth as well as health, it is obvious that conditions of work that exert no injurious effect on

adults may be unduly fatiguing for juvenile workers with their twofold need. Consequently the best criterion for judging the effects of industry on the health of adolescent girls will be based on observations as to the incidence of fatigue with different industrial occupations.

The presence of fatigue among girl workers has been frequently noted in the course of the investigation, but in every case the evidence is deduced merely from the observations of those in contact with the girls or from the testimony of the girls themselves. Physiological research has conclusively proved that subjective sensations are not a measure or even an early sign of fatigue, and that real or objective fatigue is shown and is measurable only by the diminished capacity for performing the act that caused it. Considerable attention has been devoted to the subject of industrial fatigue during recent years, and various tests for the detection of latent fatigue have been employed. Measurement of the output of work gives the most direct test of fatigue provided allowance is made for all variable factors except the worker's changing capacity. In addition, the observation of certain secondary symptoms supplies a useful index to the degree of fatigue which work induces. Lack of co-ordination, one of the earliest manifestations of nervous fatigue, results in increased accidents. The accident rate in factories tends to be 25 to 55 per cent higher for boys and girls than for men and women. In 1912 there were 4914 accidents to female young persons in factories and workshops.[1] Much light might be thrown on

[1] Keeling, *op. cit.* p. 7.

the presence of fatigue amongst industrially employed girls by records of the accident rates in factories, corrected with reference to the hours and conditions of labour and to the speed of work as shown by the output curves.

Laboratory tests for the detection of accumulated fatigue have not sufficiently justified the trouble they involve, but observations as to complex reaction time with letter or colour tests, determination of acuity of auditory and visual sensations, and records of the systolic blood-pressure may be found to serve as an index to the incidence of fatigue when other methods are not applicable.

There is no need to amplify these points. It only remains to suggest that inquiry on such lines be applied to groups of adolescent workers to discover the extent to which industrial fatigue may be undermining the health and physique of growing girls.

It was stated above that the absence of accurate data in the shape of records of the health of industrially employed girls made it impossible to arrive at any exact estimate of the effects of such work, but the sickness returns of industrial Insurance Societies must have been accumulating a vast mass of evidence as to the particular ailments and diseases to which employed girls are especially liable, so that an examination of these records may be extremely enlightening.

The secretary of the Insurance Section of the Northern Counties Weavers' Amalgamation informed us that at the present time the sickness returns of this Association are not tabulated according to ages, but that such tables could be obtained from the local

Unions and a complete estimate made if the need be proved. One Weavers' Society, the Nelson and District Weavers' Insurance Society, No. 1882, which is outside the Amalgamation, does indeed tabulate its records according to ages, but the total number of women and girls in this society reaches only 5982, so that far-reaching conclusions cannot be drawn from its experience. Unfortunately not all the members of the Trade Union are in the Insurance section of their Society for the National Insurance Benefit, but many belong to such Approved Societies as the Prudential, the Blackburn Unity, etc., so that evidence from these sources cannot be regarded as entirely conclusive. Nevertheless, were such data available for purposes of comparison between one industry and another, considerable evidence as to the particular effects of different industries might be obtained.

During adolescence the plasticity of the human organism makes it more easily affected by external factors. Chief among the external influences which may disturb normal development are the attitudes, postures, and movements which industrial work involves. If these are cramped and constrained the healthy action of the heart and lungs and their natural development may be retarded, while if excessive muscular strain, such as that resulting from heavy lifting or prolonged standing, is experienced, active injury to vital organs may be brought about, and similarly these factors and the demands which excessive fatigue due to long hours, etc., makes on the growing organism may result in stunted growth and abnormal development.

Information on these lines can only be obtained by detailed anthropometric and medical examination, and would have to be carried out on a large scale if the datum is to be of any value. But the material so collected would be the most reliable index of the effect of industry on health and physique, and if comparison be made between industrially employed and unoccupied girls by examination of different groups the final results would be invaluable. Such an inquiry might be carried out by medical women and anthropometric investigators in specific industries throughout the country. The exact conditions of the work, number of hours worked, etc., would have to be observed, and a record made of the history as well as the present physical condition of each girl examined. If groups of girls aged between 14 and 20 from different industries are thus examined, comparison can be made by similar examination amongst girls attending secondary schools. In districts like north-east Lancashire, where the pupils of the secondary schools are drawn from the same class and from the same type of home as the majority of the operatives, the exact influence of industrial work will be more accurately gauged than where the home environment differs in the two groups.

An inquiry based on methods such as these would be of vast national importance. What is needed is exact scientific information available for the guidance of those responsible for the organisation of adolescent labour, and, more important still, as a basis for new regulations controlling the extent and conditions of this labour.

TABLE I

Occupations of Girls in England and Wales, according to Census of 1911

00's omitted in Employed Columns

Trades.	14 years.		15 years.		16 years.		17 years.		18 years.	
	Em-ployed.	Per cent.	Em-ployed.	Per cent.	Em-ployed.	Per cent.	Em-ployed.	Per cent.	Em-ployed.	Per cent.
Manufacture—										
Textiles	312	9·1	343	10·3	352	10·4	357	10·6	356	10·5
Dress	251	7·3	383	11·5	425	12·6	414	12·3	405	11·9
Other	234	6·7	328	9·7	366	10·7	381	11·2	386	11·3
Domestic, Hotel and Restaurant Service—										
Private Indoor and Other Domestic	367	10·7	598	17·8	733	21·8	810	24·1	855	25·1
Hotel and Restaurant, etc., Service	16	·5	35	1·	57	1·7	76	2·3	93	2·7
Commercial	89	2·6	168	5·	225	6·7	257	7·7	275	8·1
Other	63	1·8	78	2·3	95	2·8	125	3·7	160	4·7
Total Occupied	1332	38·7	1933	57·6	2253	66·7	2420	71·9	2530	74·3
Total Unoccupied	2111	61·3	1424	42·4	1121	33·3	946	28·1	874	25·7
Total	3443	100	3357	100	3374	100	3366	100	3404	100

[Extracted from *The Present Position of the Juvenile Labour Problem,* by F. Keeling.]

TABLE II

PROPORTION PER 1000 GIRLS ENGAGED IN OCCUPATIONS IN CERTAIN DISTRICTS, ENGLAND AND WALES, 1911 [1]

	Ages.				
	14 Years.	15 Years.	16 Years.	17 Years.	18 Years.
England and Wales	387	576	668	719	743
Lancashire . .	651	751	801	826	837
Blackburn . .	841	905	925	931	934
Burnley . . .	872	899	932	940	938
Oldham . . .	843	890	910	926	923
Preston . . .	784	887	906	930	916
Rochdale . .	853	904	910	932	932
London . . .	365	625	737	795	820
Birmingham . .	643	812	867	890	894
Bradford . .	790	858	881	895	896
Leeds . . .	673	768	815	831	835
Sheffield . . .	435	595	660	699	714

[1] Census, Summary Tables, p. 242.

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