CHRONIC DISABILITY IN MEN OF MIDDLE AGE A STUDY OF 165 MEN IN A GENERAL PRACTICE AND A REFINERY

BY

P. J. TAYLOR*, M.D., B.Sc., M.R.C.P., D.I.H.
Senior Medical Officer, Shell U.K. Ltd., Shell Haven, Essex

AND

A. J. FAIRRIE, V.R.D., M.R.C.S., L.R.C.P.
General Practitioner, Corringham, Essex

Chronic ailments and their effects on working capacity provide a problem for our society which may be considered in terms of economics, sociology, medicine, or personal suffering, but none alone can give a full picture. Studies such as that of Townsend (1967) have suggested a progressive sequence of ill-health, disablement, lowered income, and social isolation which can aggravate the medical condition. Estimates of the cost of chronic disease (Office of Health Economics, 1964) can be based only upon the more direct forms of expenditure since there is virtually no information about loss of production, and in particular the reduced productivity of the employed but partially disabled.

A previous report (Taylor and Fairrie, 1968) has shown that the prevalence of chronic medical impairment of function among men of working age was remarkably similar in both a general practice and a nearby refinery. Although the number of medically unemployable men in the practice was a little under 2 per cent., the prevalence of all chronic conditions which affected working capacity was about 11 per cent. in both communities, and most of these men were seriously limited in the type of work they could do.

PRESENT STUDY

This investigation was designed to look in more detail at some of the factors which might be associated with disablement by applying a semi-structured interview, a standardized medical examination, and a psychological inventory to the disabled men. Limitations of time and resources made us confine our investigations to men aged 40 to 54 years, since each interview lasted well over one hour. This age group was chosen because it includes men who should be at the peak of their earning capacity and family responsibility.

The populations from which the respondents were drawn were a general practice (list 5,800) and a nearby refinery (direct payroll 2,100), in a semi-rural area of Essex about 30 miles from London.

The definition of a chronic impairment used was based upon that of the Disabled Persons (Employment) Act of 1944, which defines a disabled person as one who "on account of injury, disease, or congenital deformity is substantially handicapped in obtaining or keeping employment, or in undertaking work of a kind which apart from that injury, disease, or deformity would be suited to his age, experience, and qualifications". The conditions selected in this survey were all those that could have affected or actually did affect, the man's working capacity for at least one year, and the man would therefore have been able to register himself with the Ministry of Labour as a "Disabled Person". The reference date for the study was December 31, 1966, and we identified 366 men who fulfilled the necessary requirements (Taylor and Fairrie, 1968).

A four-grade classification was used to relate the working capacity of the men to their disabilities. These grades were defined as follows:

GRADE A Men unfit for work of any sort consistent with their age, training, or experience, and thus medically unemployable.

GRADE B Men whose work had already been changed or substantially modified because of their medical condition.

GRADE C Men who were able to continue in their normal occupation despite the disability, but who were limited in their ability to change their occupation (or in some cases be promoted) because of it. This grade included, for example, men with severe limitations of exercise tolerance but with a sedentary occupation.

GRADE D Men who, despite a permanent medical impairment, were not restricted in their ability to change their occupation to most other jobs consistent

*Present address: Institute of Occupational Health, London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.

with their age, training, or experience except to those, such as bus-driving, for which high standards of physical fitness are required.

A validity check was undertaken to detect errors of ascertainment. We personally questioned 100 men in each population between the ages of 40 and 54 years who had not already been identified. Only one of these men was found to be disabled, a clerk with osteo-arthritis of both knees who would have been included in Grade C. The error of failure to ascertain all disabled men is not large, although deliberate concealment of a chronic medical condition is not excluded.

MEN INCLUDED IN THE INVESTIGATION

The sample initially selected for study consisted of all those with a chronic impairment from 40 to 54 years (162 men). Since only four were medically unemployable (Grade A) and this degree of disablement presents special problems, the sample was extended to include all the disabled in this grade from 16 to 59 years. The grading of the 169 men so selected is shown in Table I. Twenty were patients of the practice also employed in the refinery, six in Grade B and seven each in Grades C and D. Interviews were achieved with all but four: three died early in 1967 (one each in Grades A, B, and D) and one in Grade A left the area. None refused.

TABLE I
DISABLED MEN SELECTED AND INTERVIEWED BY
GRADE OF DISABILITY

Disability Grade* (in descending order of severity)	No. Selected	No. Interviewed
A	11	9
B	44	43
C	63	63
D	51	50
All Grades	169	165

*In this and subsequent Tables A represents the most severe, and D the least severe grade of disability.

SOURCES OF INFORMATION

The support and co-operation at the refinery of management, staff association, and union representatives were obtained before starting the survey. The extensive personal interviews which provided much of the information were completed in the first 4 months of 1967. A standardized questionnaire was used to obtain details of each man's family and personal medical histories, social background, family responsibility, and attitudes towards his home and his work. Views were also sought on the Register of Disabled Persons, and if registered

whether it had been of help. Finally, each man was invited to assess the degree of his own disability and whether it had deteriorated or improved.

A standardized physical examination provided more information about his physique and general health and the special investigations included analysis of urine, spirometry, and a chest radiograph. Each man completed Paper A of Eysenck's Personality Inventory (Eysenck and Eysenck, 1964).

Further information was obtained from medical and other records. Details of all spells of sickness absence for the years 1962-66 inclusive were obtained for the majority of men from their employers, and for nineteen men they were obtained, with their consent, from the Ministry of Social Security. Gross earnings and total hours of overtime for the year ending April, 1967, were available only for the 110 refinery employees, whilst assessment of housing conditions and medical work-load of dependants were made for the 75 men who were patients of the practice.

RESULTS

The large number of observations recorded about each man have been examined separately and in combination to study three aspects of disablement:

- (1) The differences between men in each of the four grades of severity;
- (2) The use made of the Register of Disabled Persons and the opinions of the men about it;
- (3) The differences between men with single and with multiple disabling conditions.

SEVERITY OF DISABLEMENT

Several factors were found to be associated with the grading and some of these will be described, as well as some which to our surprise proved to have no relationship at all.

Social Class and Occupation.—Classification of the men into the five social classes of the Registrar General by their occupation, or in the case of the unemployed men their last occupation, showed a strong association with the grades (Table II, opposite).

Men in Social Classes IV and V formed 44 per cent. of the sample and the progressive decrease in their combined proportion in each grade from A to D is highly significant ($P < 0.0005$). A mentally deficient man in Grade A who had never worked has been classified by his father's occupation.

Shift work, perhaps surprisingly, was not related to the grade of disability. The proportion of men

CHRONIC DISABILITY IN MEN OF MIDDLE AGE

185

TABLE II
DISABILITY GRADES
NUMBER AND PROPORTION OF MEN IN SOCIAL CLASSES

Social Class	Disability Grades									
	A		B		C		D		Total	
	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
I and II	0		0		5	8	9	18	14	8
III	1	11	17	39	33	52	28	56	79	48
IV	3	33	17	39	24	38	10	20	54	33
V	5	56	9	22	1	2	3	6	18	11
All Classes	9	100	43	100	63	100	50	100	165	100

in each grade on shift work was closely similar to the 26 per cent. of all the disabled men who were on this type of work. Amongst refinery employees (for whom full population at risk figures are available), 48 per cent. of the male hourly-paid population work shift hours, and 28 of the 69 disabled refinery employees (41 per cent.) were on shift.

Earnings and Overtime.—Figures were available only for the 110 men employed in the refinery and showed that both were associated with disability grade. The mean gross earnings for the financial year ending April, 1967, for men in Grade B was £1,204, in Grade C £1,541 and in Grade D £1,655. Even more striking was the observation that eight of the nine men who earned less than £1,000 were in Grade B.

Very much less overtime was worked by men with Grade B disablement than by others less severely disabled, and this is demonstrated by the proportions doing less than 50 hours in the year (Table III). Opportunities to do overtime are usually less for staff employees than for the hourly-paid and the two groups are therefore considered separately.

TABLE III
DISABILITY GRADES
PROPORTION OF REFINERY EMPLOYEES DOING LESS THAN 50 HOURS OVERTIME IN THE YEAR

Status	Population	Disability Grade			
		B	C	D	All Disabled
Staff	41	100	56	50	59
Hourly-paid	69	41	15	0	22
All Men	110	50	33	27	35

As with any investigation into overtime, the interpretation of these figures is difficult since there are many interdependent variables, but the proportions of men doing over 350 hours of overtime in

the year did not differ significantly between grades and amounted to 19, 29, and 25 per cent. amongst hourly-paid employees in Grades B, C, and D respectively, although only one staff worker (in Grade C) did this amount of overtime.

Duration and Stability of Grade.—There was no difference between the grades in the duration of the chronic conditions, which in over two-thirds of the men had been present for more than 10 years; 40 per cent. of the men in each grade had already developed their condition when they were engaged by their current employer.

In 83 men the grade had remained unchanged since the chronic impairment began and in this stability there was no difference between the four grades. A reduction in severity of disablement had occurred in 51 men, and only 31 (19 per cent.) were currently more severely disabled than before.

Sickness Absence.—As might be expected there was a significantly progressive association between grade of disablement and sickness absence, in terms both of number of spells and of duration. However, separation of men into "hourly-paid" or manual workers and "staff" or salaried employees showed that this association was found only among the former. The reason for this difference in behaviour is not immediately apparent since the types of medical conditions did not differ between these two categories of employees.

Home Circumstances and Social Activities.—No differences between the grades were observed in education, marital status, number of dependants, or employment of wives. As expected from differences already described in social class, home-ownership was most common amongst men in Grade D (70 per cent.), whilst tenancy was more frequent in Grade B (56 per cent.), with similar trends in both staff and manual workers. Since the area is

relatively prosperous, none of the men claimed to have problems with inadequate housing. An assessment of housing conditions for the 75 patients of the practice revealed only six rated as poor (one in Grade A, two in Grade B, and three in Grade D) and none rated as bad. All homes had indoor sanitation and hot water and there was no serious overcrowding.

Spare-time activities were progressively affected, however, by increasing grades of disability; 30 per cent. of men in Grade D did some voluntary work but only 12 per cent. in Grade B.

Parental Ill Health.—Although the parents of men in each grade of disability had died at similar ages, there was a strikingly progressive association between their diagnoses and those of their sons. 30 per cent. of men in Grade B stated that a parent had suffered from the same medical condition, 11 per cent. in Grade C, and 4 per cent. in Grade D—progressive proportions significant at the 0.001 level.

Parental deprivation by death or serious illness in a parent or sibling when the respondent was under the age of 16 showed a suggestive trend from 51 per cent. in Grade B, to 44 per cent. in Grade C, and 36 per cent. in Grade D, although this progression was not significant ($0.2 > P > 0.1$). The prevalence of serious illness or disablement among the wives or children of the respondents, on the other hand, was similar in all grades of disability.

Personal Medical History.—Few features of the individual's own medical history showed any relationship to grade of disability. Admission to hospital because of the disabling condition was equally common in all grades, whilst admission for other reasons was somewhat more common amongst the least disabled. Although specific symptoms were related to the type of disabling condition, few showed significant differences between grades. A "nervous breakdown" had been more common amongst men in Grade B and also loss of work due to back pain; respiratory symptoms such as cough were of similar prevalence in each grade. Related to this, smoking habits were also similar in each grade.

Diagnostic Cause of Disablement.—Almost all the main causes showed similar distributions in each grade, and this applied whether the diagnoses were grouped by pathological cause, anatomical area, physiological system, or psychosomatic condition (Sainsbury, 1960). The only exceptions which

showed consistent and significant trends were diseases of the central nervous system and psychiatric disorders, both of which affected more men in the severely-disabled grades, and gastrointestinal conditions, which were found more frequently in Grade D.

The types of diagnosis were similar to those already described in the prevalence study of the whole population, with disorders of the spine, cardiovascular, respiratory, and traumatic conditions affecting over half the men. The last, involving 37 men, were evenly divided between occupational, war service, and other causes, and there were no significant differences between the grades.

Iatrogenic disability due to an over-cautious prognosis given many years before deserves mention; four men, whom we placed in Grade D, had been labelled some 20 years ago as medically unfit for normal employment, three because of cardiac murmurs and one with essential hypertension then (and now) at 150/95 mm.Hg. Three of these men had undoubtedly lost opportunities for promotion because of these restrictions and had been treated by their employer as if they were in Grade C. The other man had gone to work for another employer who had less rigorous medical employment standards.

Job Satisfaction and Suitability.—Job satisfaction was measured in three ways; a desire for more responsibility; a desire to change the occupation; and by a direct question about liking the job itself. Only the last showed a significant difference, with nine men in Grade B, four in Grade C, and two in Grade D saying that they disliked their job ($P < 0.01$).

After the interview and examination we assessed the suitability of the job held by each man: only three were considered to be in medically unsuitable jobs, and they were all in Grade C.

One man, a welder aged 48 who was blind in one eye (perception of light only) from an injury in childhood, also had a chronic tension state with somatic features following the breakdown of his marriage 4 years before. The main hazards of welding are the flying particles of metal caused by chipping the weld, and eye injuries are not uncommon.

The second was a boilermaker aged 48 with a recurrent duodenal ulcer and a chronic lumbar disc lesion both conditions, according to the man, aggravated by his work and causing frequent sickness absences for over 10 years.

The third was a long-distance lorry driver aged 40 with a post-gastrectomy anastomotic ulcer and a chronic anxiety state.

None of these men would agree to change his job, even though the boilermaker and the driver

attributed much of their trouble to their work. This unsatisfactory state of affairs was due largely to the high earnings they were currently making which they could not have maintained in other more medically suitable jobs. Skilled craftsmen present a particular problem here, since they also are unwilling to consider any work other than in their own trade.

Self-Rating of Disablement.—The men were offered the choice of “crippled, severe, moderate, or slight” with which to describe the degree of their own disablement. A fifth category proved necessary, since 67 men denied being disabled. The results (Table IV) showed some association with our own grading—but by no means complete agreement. The personal ratings of the eight unemployable men (Grade A) are included in the Table. The two men in the most severely disabled grades who denied disability suffered from hebephrenic schizophrenia (Grade A) and a reticulosis of the Hodgkins type (Grade B). The mentally defective man in Grade A is not included.

The men also described in what aspect of everyday life their condition affected them most. In the more severely disabled grades (A and B), medical symptoms and an inability to do their normal work were most frequently mentioned, whilst social handicaps were considered as most important by about one-third of the men in each grade. In this context, 25 men (five in Grade C and twenty in Grade D) denied any difficulty in everyday life. This illustrates that denial of disability and admission of a chronic medical limitation are not mutually exclusive.

Personality and Adjustment.—The measures of personality provided by the Eysenck Inventory showed that the 164 men who were able to complete the questionnaire tended to be low in extraversion (mean score 10·55) and a little high in neuroticism (mean score 9·62). However, no significant differences were found between the grades, although men in Grade B tended to have a higher neuroticism score than the rest.

We used our previous knowledge of each man, together with the impression gained at the interview, to describe him as showing good, average, or bad adjustment to his chronic condition. We considered twenty men (13 per cent.) to be badly adjusted to their situation, twelve in Grade B, seven in Grade C, and only one in Grade D.

We also considered that further medical assistance was needed by 29 men (6 in Grade A, 13 in Grade B, 9 in Grade C, and one in Grade D), although in a number of them this had already been offered and refused. Help at home or at work was required by fourteen men. Four who were totally disabled (Grade A) might even have managed a sedentary occupation if suitable transport arrangements could have been made, and indeed three men in Grade B were only able to continue working because they used invalid carriages.

REGISTER OF DISABLED PERSONS

82 men reported that they had been advised to register and 74 had actually done so although only 69 were on the register at the time of the survey. Employers had advised the largest number, mostly men in Grades B and C. Labour exchanges and military pension boards had advised more in the two extreme grades of disability, hospitals and general practitioners being much less frequent sources of such advice. One man had been advised to register by a friend (Table V).

TABLE V
REGISTER OF DISABLED PERSONS
SOURCES OF ADVICE, BY GRADE OF DISABILITY

Source	Disability Grades				All Disabled
	A	B	C	D	
Employer	0	16	15	2	33
Employment Exchange	4	5	5	6	20
Armed Services	0	6	3	6	15
Hospitals	1	4	2	1	8
General Practitioner	0	2	1	2	5
Others	0	0	1	0	1
All Sources	5	33	27	17	82

TABLE IV
DISABILITY GRADES
DESCRIPTION BY THE MEN OF THEIR OWN DISABILITY

Respondents' Self-grading	Disability Grades				All Disabled	
	A	B	C	D	No.	Per cent.
Crippled	1	0	0	0	1	1
Severe	2	11	1	0	14	8
Moderate	4	18	20	2	44	27
Slight	0	13	16	9	38	23
Not disabled	1	1	26	39	67	41
Total	8 (5%)	43 (26%)	63 (38%)	50 (31%)	164	100

Eight of these men (10 per cent.) refused this advice, and 22 registered reluctantly. It is of interest that such responses were least common among men in the two extreme grades of disablement (Table VI).

TABLE VI
REGISTER OF DISABLED PERSONS
RESPONSES TO ADVICE TO REGISTER, BY GRADE
OF DISABILITY

Response	Disability Grades				All Disabled
	A	B	C	D	
Ready Acceptance	5	20	13	14	52
Reluctant Acceptance	0	10	10	2	22
Refusal	0	3	4	1	8
Total Advised	5	33	27	17	82

Reluctant acceptance was most common when the advice came from the employer (43 per cent.); advice from other sources was more readily accepted ($P < 0.003$).

The main reasons for refusal or reluctance were fear that employment prospects would be damaged and fear of a social stigma. Social disadvantages were more commonly cited by men who had been reluctant, usually a non-specific unwillingness to be "labelled" or a fear of becoming an object of pity, although one man with severe multiple sclerosis had refused for 4 years because he was afraid, despite reassurances, that he might be deprived of his driving licence.

Only 31 men out of the 74 who had been on the register considered that it had been of benefit to them, and the proportion was very similar in each grade. Twelve thought that it had helped them to obtain a job, eleven that their employer became more considerate, five that their job was more secure, and three that it had helped them to obtain better disablement pensions. Five men had not bothered to renew their certificate even though their medical impairment was unchanged.

Causes of Disability.—The main diagnoses of the 69 men currently on the register were not representative of the causes of impairment in this survey, even when grade of disability was taken into account. Traumatic conditions were more common amongst registered men, and chronic disease amongst the unregistered. Significant differences were also observed between causes of injury, twelve out of the thirteen war-wounded (93 per cent.) were registered and ten out of the thirteen injured in occupational accidents (77 per cent.), but only four out of the eleven injured by other types of accident (36 per cent.). The war-wounded were no more severely disabled than the other injured men, but

ten of them had been advised to register by military pension boards.

Social and Occupational Factors.—Registered and unregistered men were similar in most respects. They were evenly distributed between practice and refinery, between staff and hourly-paid, and between day and shift jobs. Their social background, previous medical history, smoking habits, and sickness absence were all similar. Only in the mean gross earnings of the refinery employees were the registered men at a disadvantage, earning about 10 per cent. less than their unregistered colleagues within each grade of disability, and this was largely because fewer of them did overtime. However, registration as such was no bar to overtime, since seven of the nineteen disabled men at the refinery who did over 350 hours of overtime in the year were on the register.

Self-Rating.—The registered men took a more serious (or realistic) view of their own disabilities than others in the same grade. Thus, of the 29 men in Grade B who rated themselves as severely or moderately disabled, 24 (83 per cent.) were registered. In Grade C the registered men were more ready to admit the limitations imposed by their condition. Despite this attitude the men on the register were not more inclined to think that their condition had deteriorated.

Personality and Adjustment.—There was a tendency for the registered disabled to show a lower extraversion and a higher neuroticism score than those who were not registered (Table VII), and a similar tendency was observed within each grade of disability.

TABLE VII
MEAN SCORE OF REGISTERED AND UNREGISTERED
DISABLED MEN
EYSENCK PERSONALITY INVENTORY (PAPER A)

Registration		Registered	Unregistered	All Disabled
No. of Men		69	95	164
Mean Score	Extraversion	9.93	11.03	10.55
	Neuroticism	10.23	9.17	9.62
	Lie	3.87	3.76	3.81

These differences were slight, however, and lay within the standard deviations for each score. All subjects except the unregistered mentally deficient man in Grade A completed the questionnaire.

A higher proportion of registered men in Grade B were assessed as badly adjusted to their disability, but this did not apply to the other two grades of employed men. On the other hand, a slight but

consistently higher proportion of registered men were working in suitable jobs. The three men in unsuitable jobs were not registered.

MULTIPLE CHRONIC DISABLING CONDITIONS

Almost half (44 per cent.) of the respondents in this survey had more than one chronic condition, the mean number for the whole group seen being 1.64. Most factors studied showed no association with the phenomenon of multiple diagnosis. Occupational status, education, family and social background, smoking habits, and even duration of disablement were all similar in men with single and multiple conditions.

Diagnoses.—Comparisons were made of the frequency with which various types of condition were found alone or in combination: psychiatric disorders showed a significant association with multiple diagnoses, while injuries tended to occur alone. Other diseases, including the psychosomatic disorders, showed no such tendencies.

Adjustment to Life.—Although childhood difficulties were not more common in men with multiple conditions, significantly more of them had failed to adjust to adult life. An unhappy marriage or divorce was admitted by 5 per cent. of men with single conditions and 17 per cent. with multiple conditions ($P<0.02$). A wish to change their job was expressed by 27 per cent. of the men with single conditions and 56 per cent. of men with more than one ($P<0.003$). Definite dislike of their job was admitted by 6 per cent. of men with one condition, 10 per cent. with two, and 26 per cent. with three.

Although men with multiple conditions did not rate themselves as more severely disabled than men with single disabilities, poor adjustment was much more common among them.

Personality Scores.—The mean scores showed no difference in extraversion, but neuroticism increased with the number of disabling conditions (Table VIII). Similar trends occurred within each grade of disability.

TABLE VIII
MULTIPLE CONDITIONS
MEAN SCORES FROM E.P.I. (PAPER A) OF MEN WITH
1, 2, AND 3 OR MORE DISABILITIES

No. of Disabling Conditions		1	2	3+	All Disabled
No. of Men		92	52	20	164
Mean Score	Extraversion	10.87	10.02	10.50	10.55
	Neuroticism	8.76	10.30	11.76	9.62
	Lie	3.92	3.67	3.56	3.81

The 23 men who had a psychiatric condition either as the main or secondary diagnosis showed the lowest mean extraversion score (9.61) and the highest neuroticism score (14.22) of all disease groups studied.

Need for Further Assistance.—Significantly more men with multiple conditions required both medical and social help. Each of the three men in unsuitable jobs described above had two chronic conditions.

DISCUSSION AND CONCLUSIONS

Whilst most studies on disablement have been largely concerned with the severely handicapped, and in particular the elderly or unemployed, the present survey was designed to investigate men at what ought to be at the peak of their earning capacity, many of whom were only slightly or moderately disabled. Our four-grade classification related the functional impairment to each man's usual occupation and therefore differs from that used by Brown, McKeown, and Whitfield (1958) in their study of elderly men, and also from the elaborate numerical assessment of functional loss recommended by the Committee on the Medical Rating of Physical Impairment (1958). Current practice in Great Britain for the award of disability pensions relies upon specific percentages laid down for amputations, and on rather imprecise proportions for overall functional loss. The McCorquodale Report (1965) did not recommend any change from these principles, for which the basis is taken as a healthy man of the same age regardless of occupation or ability.

Some of the differences observed between men in each grade came as no surprise, and these included the predominance of men in Social Class IV and V in the more severely disabled grades. This difference in occupational status is partly responsible for the related gradient of earnings; moreover the data on overtime showed that this remunerative form of work was undertaken by fewer men in the more disabled grades. However, it should be emphasized that a substantial minority in each grade did in fact work a considerable amount of overtime. Disablement as such is therefore not necessarily a bar to this extra work. Only a few men admitted to doing a second paid job, but these were evenly distributed between the grades. Shift workers were found in all three grades in similar proportions and this provides indirect evidence to support an earlier observation that continuous-cycle shift work is not injurious to health (Taylor, 1967).

It is of interest that the duration of the chronic condition did not differ significantly between the grades and that half of the men had remained in the same grade throughout this period. Only one-fifth of them had deteriorated to the extent that their grade had become more severe and these tended to have progressive cardiovascular, pulmonary, or neurological conditions. In a few of these men there had also been a change in social class similar to that observed by Meadows (1961) for men with chronic bronchitis.

Most of the social and family factors which we chose for inquiry revealed no differences between the grades. This may in part be due to the fact that the locality is relatively prosperous and free from slums, and also to the fact that our medically unemployable group (Grade A) was small. The significantly progressive association found between grades of increasing severity and a parent with a similar medical condition must be seen against the fact that the main disease groups were evenly spread between grades. This might be taken to suggest that, where there is an hereditary element, the disease process is more severe, but an alternative explanation could be that the son was psychologically less well equipped to cope with the condition.

Childhood deprivation has recently been suggested as an important factor in chronic ill-health (Cobb, Kasl, Chen, and Christenfeld, 1965; Kissen, 1967) as well as in behavioural disorders (Bowlby, 1962). Our inquiry into parental death during the childhood of our respondents was to some extent related to severity of disability, but the overall percentage for all the men was close to that found by Munro (1965) in psychiatrically normal hospital outpatients of the same age. Serious illness in the family whilst the subject was a child showed a similar trend, but our evidence does not allow any definite conclusion.

Dislike of the job was progressively and significantly more common among men in grades of increasing disability but this was not as marked as the strong association found with frequency of sickness absence (Taylor, 1968). Indeed sickness absence and severity of disablement was associated only amongst the manual workers and not at all amongst staff employees.

The lack of significant difference between the smoking habits of the men in each grade of disability came as a surprise, as did the absence of any trend towards obesity. The previous study of other men in the refinery with different forms of sickness absence (Taylor, 1968) also showed no difference between smokers and non-smokers, but a

trend was found for men with the most frequent sickness absences to be heavy cigarette smokers. A study by Lowe (1960) in a large factory in the Midlands showed a more definite association between smoking and sickness absence.

The problem of disablement caused by an overcautious prognosis given many years before was found in four men. This has recently been described as "non-disease" (Meador, 1965) and seems to occur most frequently in patients with cardiac murmurs (Bergman and Stamm, 1967). It is, of course, easy to be wise 20 years later and medical opinion has changed in this time. It might prove a salutary exercise to try to estimate how many adults are in restricted and less productive employment because of such "non-disease".

On numerous occasions whilst seeing the men in this study we were struck by the remarkable way in which some were able to adjust to severely disabling conditions while others were almost totally incapacitated by much less serious impairment of function. The well adjusted were found to form about half the men in each grade and only in those who were badly adjusted was there a significant difference between the grades. The withdrawal from life in a modern industrial society into the "sick role" has been described in many publications, including those of Kasl and Cobb (1966) and Browne and Freeling (1966), and the evidence we have obtained during this survey suggests that the degree of physical impairment is less important than the emotional structure of the man and his ability or will to adjust. With this in mind we looked for an association between disablement and the so-called psychosomatic diseases but none could be demonstrated.

Men on the Ministry of Labour's "Register of Disabled Persons" were shown in our prevalence study (Taylor and Fairrie, 1968) to be an unrepresentative sample of all our disabled men in terms of age, diagnosis, and severity. The present survey was designed to provide more detailed information about factors relating to registration. The results have confirmed our impression that, for our two populations at least, the application of the present law is not in the best interests of disabled men.

Registration has been suggested to only half of the men we saw and of these 10 per cent. had refused it and a further 27 per cent. had accepted it with considerable reluctance. It is of interest that these adverse responses were more commonly found amongst the more severely disabled (Grade B).

than those with relatively slight disablement (Grade D), and that the source of advice was an important factor in this. The hospital and general practitioner services were the least common sources of the advice, and from discussion with colleagues we have gathered the impression that many doctors have little knowledge of the Register and what registration can do to help their patients. This is supported by Vaughan Jones (1961), who alleged that the attitudes of the medical profession towards rehabilitation could be divided into: tolerant 30 per cent., passive 50 per cent., interested 15 per cent. enthusiastic 3 per cent., and expert 2 per cent.

Most of the men who had been on the Register, however, were of the opinion that it had not been of any help to them; only 16 per cent. thought that it had helped them in obtaining employment, and less than half of these had got their job through a Labour Exchange. Weir and Brass (1964) have clearly shown that unemployment before admission to hospital was the most important prognostic factor indicating serious difficulty in resettlement.

It appears from our survey that there are three important reasons for the present unsatisfactory situation:

- (1) Once an employee is registered he remains as part of the quota even if he makes a complete recovery from his condition.
- (2) The quota applies to all forms of employment, except underground mines and fishing fleets, regardless of their type and, as Townsend (1967) has shown, only half the firms in this country satisfy the quota (there are fewer than 3 per cent. of registered disabled employees in Government service).
- (3) Perhaps the most important reason is that there is a serious lack of understanding about the purpose of registration in a large sector of the medical profession and among the disabled themselves, many of whom are apprehensive about it.

There should, we consider, be specific incentives to encourage registration by the truly disabled, since both our small survey and the figures given by the National Assistance Board (1957) show that many who should be registered are not. The level of the quota should be fixed for each industry, or ideally for each employer, within a national range which might be set from 1 to 10 per cent., depending upon the type of activity required by the work. The place of a disabled employee in his employer's quota should be reviewed at intervals of not more than 5 years. There is also urgent need for more accurate

information and better liaison between the various government and other bodies concerned with this problem (Ministry of Health, 1963).

Finally, it appears that the existence of multiple disabilities presents a special problem. Such men were more seriously disabled and had more difficulty in adjusting themselves to various aspects of adult life, although we were unable to show that a similar difficulty had afflicted them in childhood.

An attempt to show an association between this phenomenon and psychosomatic disease proved fruitless although the men had higher neuroticism scores in the personality inventory. A recent prospective study (Lebovits, Shekelle, Ostfeld, and Paul, 1967) has shown that ratings of emotional instability increase after myocardial infarction and thus the higher neuroticism scores we have observed may well be a *post hoc* phenomenon. We were surprised to find that deterioration in grade of disability was no more common amongst men with multiple conditions than in men with only one. This reinforces our conclusion that it is the attitude of the man towards his own health and work situation that is the crucial factor in the aetiology of disablement, and that the form or severity of the medical condition is of less importance.

SUMMARY

An investigation is described of 165 men with chronic disabilities previously identified from the populations of a general practice and an oil refinery. Only nine of the men were medically unemployable, the others all being in employment and aged between 40 and 54 years. Information was obtained from records, a semi-structured interview, medical examination, and a personality inventory. Four of the men were found to have "non-disease" caused by over-cautious prognosis.

The more severely disabled men were of lower social class and had lower incomes than those less severely affected. There had been little tendency for the men to become more disabled with the passage of time.

The evidence suggests that the Ministry of Labour's "Register of Disabled Persons" is not being used as originally intended and that many doctors are unaware of its potential value. Many men were apprehensive about the Register and reluctant to join it, while less than half of those who had done so found it of benefit. Suggestions are made to improve this situation.

Multiple disabling conditions were found in almost half the respondents but few of the factors

studied showed a positive association with this phenomenon.

It would seem that, in the assessment of disablement, the degree of physical impairment is less important than the emotional structure of the man which determines his ability to adjust himself to his life situation.

We should like to thank Prof. R. S. F. Schilling and Dr Muriel Newhouse for their advice and encouragement in the preparation of this paper, and the London School of Hygiene and Tropical Medicine for a grant towards the cost of this investigation.

We should also like to thank Dr J. Watkins Pitchford, Chief Medical Officer of the Ministry of Social Security, for arranging to provide information about sickness absence.

REFERENCES

- Bergman, A. B., and Stamm S. J. (1967). *New Engl. J. Med.*, **276**, 1008 (The morbidity of cardiac non-disease in schoolchildren).
- Bowlby, J. (1962). "Deprivation of Maternal Care". *World Health Organization Public Health Paper* No. 14. W.H.O., Geneva.
- Brown, R. G. McKeown, T., and Whitfield, A. G. W. (1958). *Brit. med. J.*, **1**, 555 (Observations on the medical condition of men in the seventh decade).
- Browne, K., and Freeling, P. (1966). *Practitioner*, **197**, 829 (The doctor-patient relationship. XII. The discipline and its rewards).
- Cobb, S., Kasl, S. V., Chen, E., and Christenfeld, M. A. (1965). *J. chron. Dis.*, **18**, 1259 (Some psychological and social characteristics of patients hospitalized for rheumatoid arthritis, hypertension, and duodenal ulcer).
- Committee on Medical Rating of Physical Impairment (1958). *J. Amer. med. Ass.*, **166**, Special ed., February 15. (A guide to The Evaluation of Permanent Impairment of the Extremities and Back).
- Eysenck, H. J., and Eysenck, S. B. G. (1964). "Manual of the Eysenck Personality Inventory". Univ. of London Press, London.
- Kasl, S. V., and Cobb, S. (1966). *Arch. environm. Hlth.*, **12**, 246 (Health behaviour, illness behaviour, and sick role behaviour).
- Kissen, D. M. (1967). *Brit. J. med. Psychol.*, **40**, 29 (Psychosocial factors, personality and lung cancer in men aged 55-64).
- Lebovits, B. Z., Shekelle, R. B., Ostfeld, A. M., and Paul, O. (1967). *Psychosom. Med.*, **29**, 265. (Prospective and retrospective psychological studies of coronary heart disease).
- Lowe, C. R. (1960). *Brit. J. prev. soc. Med.*, **14**, 57 (Smoking habits related to injury and absenteeism in industry).
- Meador, C. K. (1965). *New Engl. J. Med.*, **272**, 92 (The art and science of non-disease).
- Meadows, S. H. (1961). *Brit. J. prev. soc. Med.*, **15**, 171 (Social class migration and chronic bronchitis).
- Ministry of Health (1963). "Health and Welfare". Cmnd 1973. H.M.S.O., London.
- Ministry of Pensions and National Insurance (1965). "Report of the Committee on the Assessment of Disablement". McCorquodale Report, Cmnd 2847. H.M.S.O., London.
- Munro, A. (1965). *Brit. J. prev. soc. Med.*, **19**, 69. (Childhood parent-loss in a psychiatrically normal population).
- National Assistance Board (1957). "Report for 1956". Cmnd 181. H.M.S.O., London.
- Office of Health Economics (1964). "The Costs of Medical Care". London.
- Sainsbury, P. (1960). *J. psychosom. Res.*, **4**, 261 (Psychosomatic disorders and neurosis in out-patients attending a general hospital).
- Taylor, P. J. (1967). *Brit. J. industr. Med.*, **24**, 93 (Shift and day work).
- (1968). *Ibid.*, **25**, 106. (Personal factors associated with sickness absence).
- and Fairrie A. J. (1968). *Brit. J. prev. soc. Med.*, **22**, 86 (Chronic disabilities and capacity for work).
- Townsend, P. (1967). "The Disabled in Society". Greater London Association for the Disabled, London.
- Vaughan Jones, J. A. L. (1961). *Brit. J. industr. Med.*, **18**, 241 (Rehabilitation: Concept and practice).
- Weir, R. D., and Brass, W. (1964). *Brit. J. prev. soc. Med.*, **18**, 102 (Occupational prognosis).