Brit. J. industr. Med., 1953, **10**, 245.

MORTALITY IN RELATION TO THE PHYSICAL ACTIVITY OF WORK

A PRELIMINARY NOTE ON EXPERIENCE IN MIDDLE AGE

BY

J. N. MORRIS and J. A. HEADY

From the Social Medicine Research Unit, Medical Research Council

(RECEIVED FOR PUBLICATION AUGUST 17, 1953)

In the course of studies of the epidemiology of coronary heart disease the suggestion arose that deaths from this condition in middle age may be less common among men engaged in physically active work than among those in "sedentary" jobs (Morris, Heady, Raffle, Roberts, and Parks, 1953). In testing this hypothesis an analysis was made of data in the Registrar General's Decennial Supplement for 1930–32 on occupational mortality (1938). The 70 occupational groups in social classes III, IV, and V, the skilled, semi-skilled, and unskilled workers for whom information is provided (about two and a half million men, some 80% of all the men in these classes), were graded by two experts in industrial medicine. From their general knowledge about the physical effort that the jobs involved they distinguished three catagories: "heavy" work, "intermediate and doubtful", and "light" work. (Details are given in Appendix 2 at the end of the paper.) The mortality from coronary heart disease at 45–64 years of age among the heavy workers was found to be rather less than half that of the light workers. A preliminary report is now made from the same material, the mortality data of 1930–32, on the experience of these groups of workers in respect of other causes of death. The focus in this note will be on middle age, taken as 45–64 years; mortality rates in younger and older men will be presented only in relation to the trends during middle age. The years 1930–32 are the latest for which such information is available. The following are the mortality rates per million for men from all causes:

MORTALITY RATES FOR MEN AGED 45–64 YEARS FROM ALL CAUSES

Age	Heavy Workers	Intermediate and Doubtful	Light Workers
45–54	10,208	12,561	11,150
55–64	21,042	25,782	23,757

Mortality from Accidents

Table 1 and Fig. 1 present in detail the rates for fatal accidents. There is a definite tendency for mortality to be greater in heavy workers than in light. This is not unexpected in view of the high proportion that industrial accidents formed of all fatal accidents to men during their working life—perhaps as much as 40% in 1930–32. All miners

TABLE 1

MORTALITY FROM ACCIDENTS IN HEAVY AND LIGHT WORKERS DURING MIDDLE AGE IN ENGLAND AND WALES, 1930–32 (AVERAGE ANNUAL MORTALITY RATES PER MILLION MEN)*

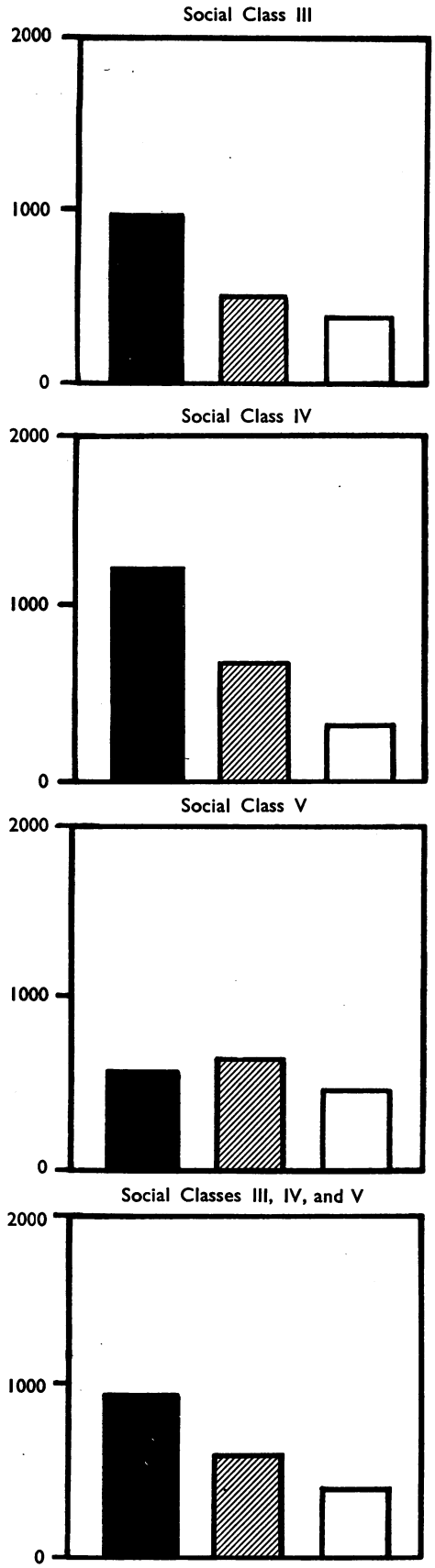
Social Class	Heavy Workers	Intermediate and Doubtful	Light Workers
	Men Aged 45–54 Years		
III	957	431	339
IV	1,198	527	291
V	494	526	323
Mixed	483	—	221
Total III, IV, and V	**864**	**490**	**331**
Total no. of deaths (3 years)	959	1,157	315
1931 census population X 3	1,110,390	2,363,772	951,732
	Men Aged 55–64 Years		
III	1,055	628	499
IV	1,233	895	426
V	679	802	680
Mixed	754	—	312
Total III, IV, and V	**980**	**748**	**500**
Total no. of deaths (3 years)	883	1,389	334
1931 census population X 3	901,005	1,855,875	668,304

Data extracted from the Registrar General's Decennial Supplement, Part IIA, Occupational Mortality (1938).

The classification of the occupation groups was specially made and is detailed in Appendix 2.

Social Class III = Skilled workers.
" " IV = Semi-skilled workers.
" " V = Unskilled workers.

*The figures include all types of fatal accidents. It is not possible to distinguish occupational from other accidents.



were classed as heavy workers, and during 1930–32 fatal accidents in mines and quarries alone accounted for almost a fifth of the total of accidental deaths among men in social classes III, IV, and V (Ministry of Fuel and Power, 1951). Particularly dangerous jobs on the railways and in building are also reflected in the Table. The large number of miners as well as the presence of the railway platelayers (the most hazardous of the main categories of railway workers) in social class IV accounts for the fact that the mortality rates of men in that class are higher than in class III. However, it is the experience of the underground miners among the heavy workers that dominates this picture of accidents.

Table 2 shows that the excess mortality among heavy workers is apparent from 16 to 64 years of age. The trend is not nearly so clear at 65–69 and is not evident at all at 70–74. Occupational mortality statistics after 65 years of age, however, are difficult to interpret because increasing retirement makes the occupational data of the death certificate and of the census return less reliable and, perhaps, not strictly comparable. However that may be, in accidents other causes which are not related to occupation become much more important among the elderly.

TABLE 2
MORTALITY FROM ACCIDENTS IN HEAVY AND LIGHT WORKERS AT DIFFERENT AGES IN ENGLAND AND WALES, 1930–32, IN SOCIAL CLASSES III, IV, AND V COMBINED (AVERAGE ANNUAL MORTALITY RATES PER MILLION MEN)

Ages (years)	Physical Demands of Work		
	Heavy	Intermediate and Doubtful	Light
16–19	754	536	437
20–24	727	654	544
25–34	730	441	362
35–44	758	366	237
45–54	864	490	331
55–64	980	748	500
65–69	1,003	1,116	825
70–74	1,205	1,540	1,263

See footnotes to Table 1.

There are no other conditions in which there is a clear tendency for mortality to be greater among the heavy workers. Perhaps we should not have been surprised at this ; on the other hand, the most striking result of the present analysis seems to be the relatively large number of conditions in which there is an excess of mortality among light workers.

Conditions with Greater Mortality among Light Workers

Table 3 and Fig. 2 present the rates in seven conditions in which in middle age, *taken as 45–64*

FIG. 1.—Mortality from all types of accidents in heavy and light workers in England and Wales in 1930-32 : average annual mortality rates per million men aged 45-64 years.
In the figure black indicates heavy workers; hatching intermediate and doubtful ; and white, light.

TABLE 3

CONDITIONS SHOWING GREATER MORTALITY IN LIGHT WORKERS THAN IN HEAVY WORKERS IN ENGLAND AND WALES, 1930–32, IN SOCIAL CLASSES III, IV, AND V COMBINED (AVERAGE ANNUAL MORTALITY RATES PER MILLION MEN)

Ages (years)	Coronary Heart Disease			Cancer of Lung and Pleura			Diseases of Prostate			Appendicitis			Diabetes			Duodenal Ulcer			Cirrhosis of Liver		
	H.W.	I.D.	L.W.	H.W.	I.D.	L.W.	H.W.	I.D.	L.W.	H.W.	I.D.	L.W.	H.W.	I.D.	L.W.	H.W.	I.D.	L.W.	H.W.	I.D.	L.W.
25–44	*46	*61	*61	*50	*54	*59	—	—	—	48	53	75	43	43	31	53	62	45	—	—	—
45–54	139	225	337	96	158	157	26	28	31	77	83	116	77	84	89	82	137	163	47	59	58
55–64	396	530	866	175	268	301	220	300	334	84	106	151	172	222	332	99	155	172	123	140	199
65–74	1,002	1,274	1,961	182	280	280	1,363	1,618	1,890	94	142	162	491	542	996	115	158	187	232	287	321

*35–44 years. H.W. = heavy workers. I.D. = intermediate and doubtful. L.W. = Light workers.

See footnotes to Table 1

years, the mortality is greater among light workers than among heavy workers. These are, of course, not the only conditions in which this is true, but they are the only ones where the differences pass certain simple objective tests which were used to pick out conditions where the difference meant something in statistical terms. We shall discuss later whether they might mean anything in other terms—medical and social. The statistical tests chosen were : (1) There should be a clear trend for mortality to increase with lightness of work, the " intermediate and doubtful " group lying between the " light " and the " heavy " (Fig. 2) ; (2) mortality should be greater in light workers than in heavy workers in each of the three social classes (III, IV, and V) separately ; (3) mortality among light workers should be at least one-third greater than among heavy workers ; (4) the trend should be a fairly general one and not due to any one occupation group or industry.*

Coronary heart disease shows the strongest trend and the greatest excess in the light occupations, but, as said already, mortality among light workers is at least a third greater than among heavy in all the other conditions in the Table. The early appearance of the trends in the conditions to the left of the thick line in Table 3 (the appendicitis rates at 20–24 years, as a matter of fact, are 54, 69, 74) is interesting, as well as the persistence of the trends at 65–74 years of age.

In Table 4 there are two conditions, pulmonary tuberculosis and disseminated sclerosis, with a lesser tendency in the same direction : in each the mortality in the light groups during middle age is at least a third greater than in the heavy, but in disseminated sclerosis the pattern of mortality in social class IV is erratic, and in pulmonary tuberculosis there is an irregular heavy-light trend in the three classes combined.

Conditions with no Apparent Relationship between Mortality and Physical Activity of Work

Death rates were calculated for 20 other conditions in which numbers were large enough, but the results (Appendix 1) showed so little variation in terms of the particular dimension of physical activity in work as to suggest that it was irrelevant to the problems of these diseases, at any rate during the important period of middle age. In particular, the " heaping up " in the intermediate/doubtful column suggests that the approach is not a meaningful one. The contrast between the figures for coronary disease (Table 3) and those in the other cardiovascular causes of death (Appendix 1) is the most striking result. Nephritis (Platt, 1947), and

*Further analysis showed that, cancer of the lung apart, the pattern of mortality in the conditions in Table 3 at 45–64 years is unexpectedly homogeneous. For each of the six conditions, taking occupation groups with at least 15 deaths during 1930–32, the rate in the individual light occupation groups was higher, with only slight exception, than in the individual heavy groups.

TABLE 4

CONDITIONS SHOWING GREATER MORTALITY IN LIGHT WORKERS THAN IN HEAVY WORKERS WITH A LESS CLEAR TREND IN ENGLAND AND WALES, 1930–32, IN SOCIAL CLASSES III, IV, AND V COMBINED (AVERAGE ANNUAL MORTALITY RATES PER MILLION MEN)

Causes of Death	Men Aged 45–54 Years			Men Aged 55–64 Years		
	Heavy Workers	Intermediate and Doubtful	Light Workers	Heavy Workers	Intermediate and Doubtful	Light Workers
Respiratory tuberculosis	1,196	1,829	1,807	1,016	1,626	1,405
Disseminated sclerosis	35	39	54	42	54	69

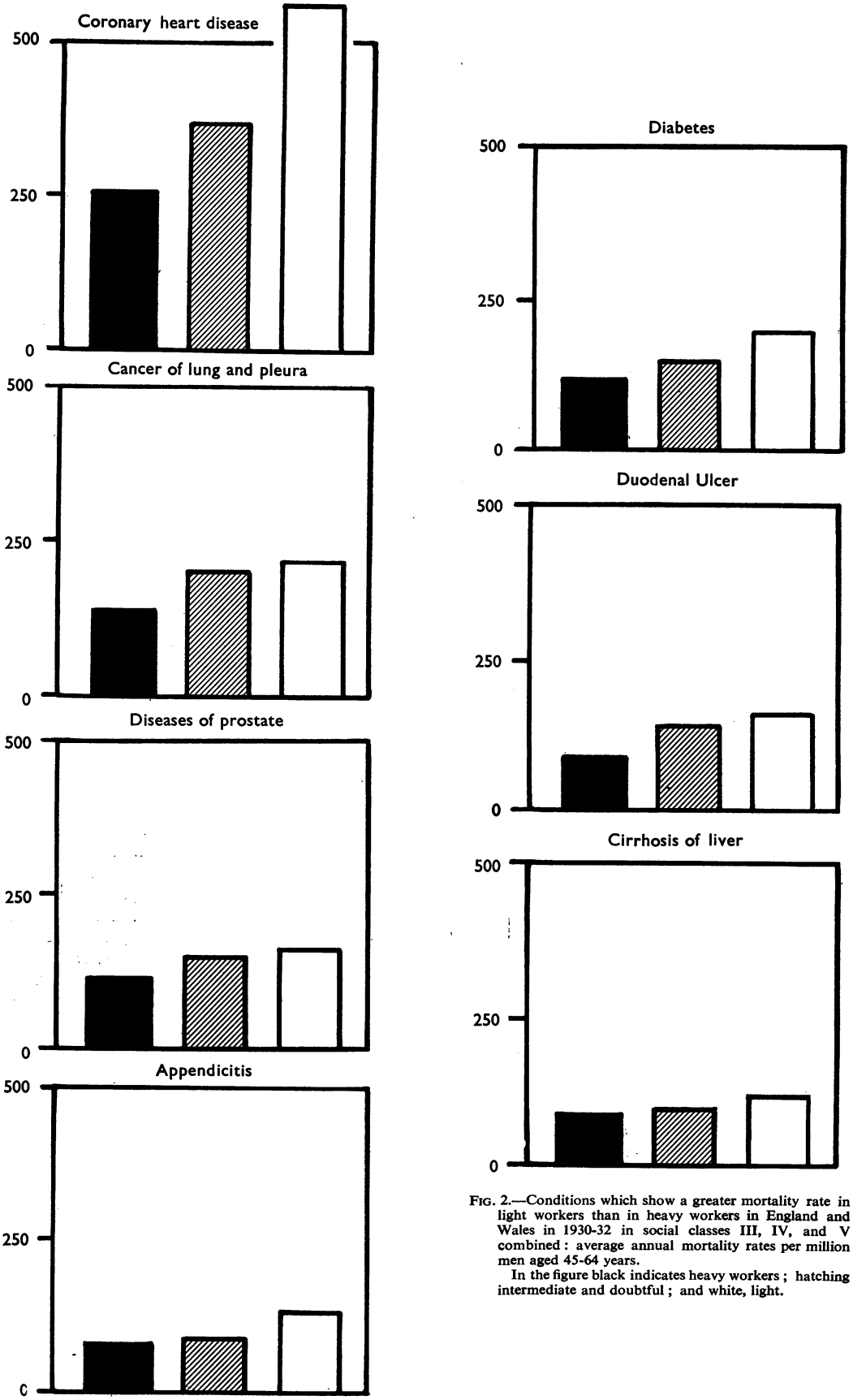


FIG. 2.—Conditions which show a greater mortality rate in light workers than in heavy workers in England and Wales in 1930-32 in social classes III, IV, and V combined: average annual mortality rates per million men aged 45-64 years.

In the figure black indicates heavy workers; hatching intermediate and doubtful; and white, light.

possibly bronchitis might also be considered in the same connexion. The slightness of the trend with *heaviness* of work found in bronchitis and in hernia was unexpected. We cannot understand why there should be any such trend at all in pernicious anaemia. The different behaviour of gastric and duodenal ulcer is notable—another clue from vital statistics on the need to distinguish between these two conditions (Morris and Titmuss, 1944). The syphilis figures (they include aortic and neuro-syphilis) lend themselves to all manner of speculation. In suicide the lower rates among heavy workers is apparent from 25 to 34 years of age and remains to 70 to 74 years.

Occupational Causes and Occupational Results

The main interest of figures such as those of Tables 1, 2, and 3 lies in the possibility that they can provide clues to aetiology. They invite, therefore, a kind of parlour game in which facts, theories, and fancies about the causes and natural history of various diseases are juxtaposed with facts, theories, and fancies about possible occupational factors of disease in the hope that useful hypotheses will emerge. We do not propose to play this game at any length, but before making even a brief comment must stress that analyses like those made in the Tables can be quite bedevilled by change of job *because* of disease. If there is a tendency for doctors to recommend a change from heavy work to light in patients with duodenal ulcer, for example, as there is, or was (Doll and Avery Jones, 1951), the mortality from this condition among light workers may be so exaggerated by such transfers that it could exceed the mortality of heavy workers, even if there is nothing in light work conducive to ulceration, or to death from it. The high mortality among the light workers, that is, would represent an occupational *result* of the disease rather than an occupational *cause*. On the other hand, men may slip down in the scale of skill on account of ill-health, and this may involve a transfer from light work to heavy labouring, for instance, that will inflate the mortality rates of those heavier occupations. It is, therefore, necessary in each individual condition to consider whether this kind of process is likely to be operating before attaching any importance to the figures and beginning to speculate on their possible connexions with aetiology.

It was a safe prophecy that the trend in accident mortality would be found, though perhaps not such a strong one, and it is quite unlikely that change of job on account of the accident that proved fatal has materially affected the pattern displayed in Tables 1 and 2 and in Fig. 1. Table 3 therefore, represents the crux of the problem, and whether we can begin to spin interesting hypotheses about occupational causes of the diseases concerned must depend on the strength of the prima facie evidence that we are not dealing, as said, only or mainly with occupational results of these diseases. There is no point in proceeding further until this problem is out of the way. In the four conditions to the left of the thick line in Table 3 it may be claimed with some reason that the trends are unlikely to be a simple artefact of change of job. In coronary heart disease there is evidence that a majority of all deaths in middle-aged men occur during the early stages of the first clinical episode of the disease, i.e. before there is opportunity to change occupation on account of it (Morris, Heady, and Barley, 1952). In fatal appendicitis, in cancer of the lung, and in prostatic disease clinical experience does not suggest that men will have transferred in large numbers from heavy work to light after the illness has presented.

In the three other conditions analysed in Table 3, diabetes, duodenal ulcer, and cirrhosis of the liver, the situation is different, and there is every reason to suppose that job selection *because* of the disease specified played a part, and it may be a big part, in producing the mortality trends. It is not possible, however, to be sure that this is the whole story. For instance, a small group of occupations was extracted from the light groups of social class III into which it is most unlikely that men would transfer because of these three diseases. Mortality still remained higher in these particular occupations than in the heavy jobs of class III. These occupations were potter, compositor, french polisher, railway engine driver, railway signalman, and the police. This observation, of course, deals with only one side of the question : that light workers have high mortality rates, but there is a little other corroborative evidence also. It is interesting, for example, that the figures for gastric ulcer (Appendix 1), in which condition a change of job was also probable, show no such clear rise of mortality with diminishing physical effort as does duodenal ulcer. Moreover, in neither duodenal nor gastric ulcer is this heavy–light trend seen at 25–44 years of age (and there is no trend in duodenal ulcer at 20–24 either). Because of the coding rules in force in 1930–32 the mortality ascribed to diabetes is probably more correctly regarded as " mortality from various causes " in men with diabetes. Yet, coronary heart disease apart, none of the conditions associated with mortality in middle-aged diabetics, such as cerebrovascular disease and " arteriosclerosis " (the " nephritis " is probably too remote to consider)

shows nearly so clear a heavy–light trend as do the diabetes rates. Perhaps the diabetes trend of Table 3 represents a combination of the important coronary element in diabetic mortality together with a diabetic element itself (see also Joslin, 1937). The mortality among young diabetics, at 16 to 24 years of age as well as 25 to 44, shows, if anything, an opposite trend to that found in the middle aged and elderly. Initial or late preference for light jobs, if it was a major factor, might well have been expected to show up even more strongly at younger ages. (This difference in the behaviour under and over 45 is interesting also because of the different clinical–pathological types of diabetes common in youth and middle age.) In cirrhosis of the liver it may be mentioned that the excess in the lighter occupations cannot be explained by the inclusion in this category of occupations connected with alcoholic drinks. It persists if these occupations are excluded.

Comment

The fatal accidents figure of Tables 1 and 2 are a special problem and need not detain us now. In the light occupations of Table 3 we are left with an interesting list of conditions that reads like part of a catalogue of the " diseases of civilisation "—coronary heart disease, cancer of the lung, duodenal ulcer, appendicitis, diseases of the prostate, and diabetes. (How the " cirrhosis " of 1930–32 should be regarded is not clear.) The first three of these are the " new " conditions which have afflicted in particular the middle-aged men of the western world, and now cause untold illness and probably over 20,000 deaths a year in males aged 45–64 in England and Wales alone. Diabetes apart, all the conditions attack males more than females. It is interesting, too, that none of these conditions are particularly associated with poverty—up till now the main social problem of preventive medicine in this country—and all show higher mortality in the upper social classes or no variation of mortality between the social classes (Registrar General, 1938). This aspect, however, is complicated by the fact that physical activity in work is highly correlated with social class, as evidenced by the sedentary nature of so many of the jobs in social classes I and II. Nevertheless, the present results may suggest one " way in " to the study of the environmental factors of increasingly important public health problems about whose prevention we know little.

In considering what these mortality trends of Table 3 might signify, it is necessary to bear in mind that the relations of work and health are manifold and complicated, direct and indirect, immediate and remote. If it be granted that these mortality rates are not merely the secondary product of selection of job (including complications of this such as the refusal of heavy work to those found at pre-employment examinations to be suffering from certain diseases), it still remains an open question how much these mortality rates are related directly to the physical effort involved in the occupations. Constitutional factors may affect both the initial and later choice of job, and also proneness to particular diseases. Personalities of particular types may find what they need more commonly in light than in heavy jobs and develop diseases also associated with their types of personality while in these light jobs. The physically weak, sooner or later, may try to protect themselves by avoiding heavy work, and suffer while holding their light jobs from the diseases they would have developed in any event, as well as from the diseases causally connected with light work. Such problems need to be investigated disease by disease (see Morris, 1947 ; Stewart, and Hughes, 1949 ; Morris and others, 1953). Meanwhile, two things about the table are interesting : the various nature of the conditions with excess mortality in light jobs, suggesting a wide range of dispositions in constitution and experience, and the fact that mortality from all causes combined is little different between the light workers and the heavy, which does not suggest any particular " weakness " of the men in the light jobs. Another kind of difficulty arises because it is exceedingly doubtful how far in the present state of knowledge the physical dimensions of work can be isolated from the psychological and social. The emotional satisfactions and supports of heavy physical work may be the operative factor in any of these diseases that possibly have important psychological components in their aetiology—duodenal ulcer, for example. Or the emotional stresses and frustrations that may well be commoner in jobs classified as light may be influential in the opposite direction. The problem is very complicated because the importance to the individual of the *particular job situation* may often be far greater in respect of its psychological aspects than its physical aspects. It is quite conceivable, moreover, that heavy workers are " tougher ", readier to ignore symptoms, and so increase their mortality. (If only we had more facts about the psychological components of work !) Again, the economic aspects of work may be important, though an attempt was made to allow for some of these by considering only conditions in which there is a trend in each social class, whatever the difference between the social classes might be. It has been suggested, for instance, that unemployment may be

associated with a falling mortality from peptic ulcer (Morris and Titmuss, 1944), and heavy jobs, such as coal-mining, undoubtedly suffered particularly severely from the slump in 1930–32. There are other aspects of work that might be regarded as " social ". Thus in 1930–32, heavy workers were concentrated largely in mining villages and in rural areas. Quite conceivably this was reflected in a lower diagnosis rate of cancer of the lung than was current at the same time in the cities where many of the light workers lived—a social relation of work that has little to do with the heaviness of the labour. Moreover, the low mortality from cancer of the lung among heavy workers is due almost entirely to low rates among coal miners and agricultural workers. There are stringent " no smoking " regulations in most coal mines and rural populations indulge less in the cigarette-smoking habit than urban (Doll and Hill, 1952), certainly a physical aspect of work, but not a matter of the physical activity of the job.* Closer to this physical activity factor are various aspects of diet and its partition between different nutrients. These may be relevant to the trend of appendicitis mortality though, of course, we cannot say anything about the great majority—i.e., non-fatal appendicitis. Meanwhile previous study suggests that in coronary heart disease the association with physical activity in work may be a direct one (Morris and others, 1953). The common outdoor element of physically active work, and the indoor of sedentary, should also be remembered (Vernon, 1939).

It is possible, therefore, that the physical effort which the present classification of occupations was designed to isolate may be only one of many factors operating to produce the trends of Table 3. Physical activity itself, however, may be a factor of health through promoting muscular fitness, cardiac and respiratory efficiency (conceivably improving the coronary circulation directly through its greater exercise with muscular work), and it may be also through its promotion of leanness. If heavy workers are less commonly obese it would be expected that they would have less atheroma, hypertension, and diabetes, and that they would stand operations better (compare the trends in appendicitis and prostatic disease). The physical effort in work may thus be a "general factor" of health, part of a " way of life " promoting good health and preventive not of a particular disease, but of many disorders of structure and function, and finding expression in lower mortality from a variety of " causes ". Such " general factors ", both positive and negative, are of course well recognized in promoting growth and development (balanced diets with fresh foods, for example), in preventing infections (the virtues of unpolluted water, of cleanliness and generous living space), in reproduction (the advantages of youth), in preventing diseases of middle age, (weight control), in promoting mental health (family relations in early life). The identification of these general factors, of healthy ways of living, is a main objective of research in social medicine.

*There is an interesting point in cancer of the lung (Table 3). The trend at 45–64 is not explicable simply in terms of possibilities of smoking at work :—

ANNUAL MORTALITY PER MILLION 1930–32

Workers Aged 45–64	Occupation Groups	
	Smoking Possible	Smoking Prohibited*
Heavy	156	95
Intermediate and doubtful ..	210	136
Light	209	260

*Underground miners, textile workers, workers in chemical processes, potters, etc., french polishers, policemen, printing machine minders, printers, etc. Ref. Code Nos. 4, 5, 6, 7, 8 ; 29, 30, 31, 32, 33 ; 14, 15, 43, 49, 69 (Registrar General, 1938).

The heavy workers with the low rate of 95 are entirely the underground miners. These lose their advantage after the age of 70 though, as said, such rates are particularly difficult to interpret in old people—small numbers apart.

ANNUAL MORTALITY PER MILLION IN 1930–32*

Occupation	Men Aged		
	45–64	65–69	70–74
Smoking prohibited			
Coal miners	95 (81)	192 (20)	297 (18)
Others	199 (51)	185 (6)	201 (4)
All in occupations where smoking prohibited	119 (132)	190 (26)	273 (22)
All in occupations where smoking possible	200 (1224)	274 (232)	250 (131)

*Numbers of deaths in brackets (see also Kennaway and Kennaway, 1953).

Summary and Conclusions

The occupation groups of social classes III, IV, and V in the Registrar General's Occupational Mortality Supplement for 1930–32 were classified into " heavy ", intermediate and doubtful, and " light " in terms of the physical activity involved in the jobs.

Seven conditions were isolated in which there was greater mortality among middle-aged men engaged in light jobs than heavy ones, and in which this excess did not appear to be primarily or only a result of the transfer of men from heavy work to light on account of the diseases concerned. These conditions are coronary heart disease, cancer of the lung, appendicitis, diseases of the prostate, duodenal ulcer, diabetes, and cirrhosis of the liver—a particularly interesting group, as several of them are among the " new " diseases of increasing importance

as health problems. The possibility was considered that there may be a " general factor " of health and disease associated with physical effort and sedentariness in work—that physical work may be " a way of life " conducive to good health—as well as special factors directly or indirectly relating the physical activity of work with the individual diseases.

In only one condition was there significant excess mortality among heavy workers, that for fatal accidents. Underground coal miners had by far the highest fatal accident rate and they were all classed as heavy workers.

Reference is made to the problems of isolating occupational results of disease (such as the changing of jobs because of ill health) from occupational causes; environmental factors from constitutional factors; and the physical components from the unknown psychological, and the multiple social, components of work.

We are very grateful to Dr. R. S. F. Schilling and Dr. R. Murray for making the classification of occupation groups for us; and to Mrs. V. Hall for much heavy work in computing.

REFERENCES

Doll, R., and Avery Jones, F. (1951). *Spec. Rep. Ser. med. Res. Coun. Lond.*, No. 276.
——, Hill, A. B. (1952). *Brit. med. J.*, **2**, 1271.
Joslin, E. P. (1937). *The Treatment of Diabetes Mellitus*, 6th ed. Kimpton, London.
Kennaway, E. L., and Kennaway, N. M. (1953). *Brit. J. Cancer*, **7**, 10.
Ministry of Fuel and Power (1951). *Statistical Digest*, 1950. H.M.S.O. London.
Morris, J. N. (1947). *Lancet*, **2**, 341.
——, Heady, J. A., and Barley, R. G. (1952). *Brit. med. J.*, **1**, 503.
——, ——, Raffle, P. A. B., Roberts, C. G., and Parks, J. W. (1953). *Lancet*. In the press.
——, and Titmuss, R. M. (1944). *Lancet*, **2**, 841.
Platt, R. (1947). *Brit. med. J.*, **2**, 771.
Registrar General (1938). Decennial Supplement, England and Wales 1931, Part IIA, Occupational Mortality.
Stewart, A., and Hughes, J. P. W. (1949). *Brit. med. J.*, **1**, 926.
Vernon, H. M. (1939). *Health in Relation to Occupation*. Oxford University Press, London.

APPENDIX 1

CONDITIONS WITH LITTLE OR NO APPARENT ASSOCIATION BETWEEN MORTALITY AND HEAVINESS OR LIGHTNESS OF WORK IN ENGLAND AND WALES, 1930–32, IN SOCIAL CLASSES III, IV, AND V COMBINED (AVERAGE ANNUAL MORTALITY RATES PER MILLION MEN)

Causes of Death	Men Aged 45–54 Years			Men Aged 55–64 Years		
	Heavy Workers	Intermediate and Doubtful	Light Workers	Heavy Workers	Intermediate and Doubtful	Light Workers
Cardiovascular Conditions						
Valvular disease	612	729	612	1,586	1,752	1,537
Myocardial disease	626	820	656	2,299	2,835	2,442
Cerebral vascular lesions	383	523	487	1,750	2,069	2,141
Arteriosclerosis without cerebral lesion	41	62	56	278	344	283
Nephritis	370	503	496	825	1,022	1,122
Abdominal Conditions						
Gastric ulcer	196	305	241	236	310	302
Hernia	37	39	41	102	127	99
Intestinal obstruction	73	82	89	100	125	118
Gallstones	31	24	32	84	78	124
Respiratory Conditions						
Bronchitis	421	549	334	1,006	1,235	790
Pneumonia	887	1,194	870	1,171	1,661	1,347
Pleurisy	50	56	45	69	74	69
Asthma	95	101	76	148	155	136
Infections						
Influenza	348	380	332	539	580	548
Tuberculosis, non-respiratory	70	83	78	91	101	91
Syphilis, etc.	357	503	366	381	692	623
Cancer						
Buccal cavity and pharynx	132	170	130	499	826	519
Oesophagus and stomach	534	610	496	1,509	1,776	1,407
Miscellaneous						
Pernicious anaemia	66	53	52	205	147	160
Suicide	276	350	374	416	522	488

See footnotes to Table 1

APPENDIX 2

CLASSIFICATION OF OCCUPATION GROUPS FROM THE REGISTRAR GENERAL'S OCCUPATIONAL MORTALITY SUPPLEMENT (1930–32)

Social Class	Heavy Work	Intermediate and Doubtful	Light Work
III	Coal hewers and getters (4)	Gardeners, nurserymen, seedsmen, florists (2)	Potters, ware makers, casters, and finishers (14)
	Iron ore mines — workers below ground (10)	Workers in chemical processes (15)	Fitters, mechanics, toolmakers, etc. (21)
	Furnacemen, rollers, and skilled assistants (16)	Metal moulders and die casters (17)	Plumbers (not chemical plumbers) (27)
	Smiths and skilled forge workers (19)	Textile spinners (cotton) (29)	Makers of textile goods, dress, etc. (35)
	Boiler makers, platers, and iron shipwrights (23)	Textile spinners (wool, worsted, etc.) (30)	Boot and shoe makers, repairers (36)
		Textile weavers (cotton) (31)	Boot and shoe, etc., workers and factory operatives (37)
		Textile weavers (wool, worsted, etc.) (32)	Compositors (42)
		Bakers and pastrycooks (38)	French polishers (49)
		Carpenters (40)	Railway—engine drivers, etc. (52)
		Bricklayers (45)	Railway—signalmen (53)
		Masons, etc. (46)	Postmen and sorters (58)
		Paper hangers, painters, etc. (50)	
		Road transport—motor drivers (56)	Retail salesmen, etc.—grocery (64)
		Domestic servants (indoor) (76)	Retail salesmen, etc.—dairy, meat, fish, greengrocery (65)
		Waiters (79)	Police (69)
		Warehousemen and storekeepers (84)	Hairdressers, etc. (80)
		Stationary engine drivers—not underground—in mines (85)	Typists and other clerks—Civil Service (82)
			Typists and other clerks (other than Civil Service) (83)
Population	 193,303	523,668	451,334
IV	Coal mines — workers below ground, other than hewers, etc. (5)	Coal mines — other workers above ground (9)	Skilled workers in gas works service (13)
	Coal mines—conveying material to the shaft (6)	Fitters, mechanics, etc., labourers (22)	Metal machinists (20)
	Coal mines—making and repairing roads (7)	Drillers (hand, pneumatic, or electric) (24)	Metal glazers, polishers, buffers, and moppers (26)
	Coal mines — other workers below ground (8)	Metal grinders (25)	Barmen (78)
		Textile strippers and grinders, etc., cotton (33)	
		Textile dyers (34)	
		Makers of alcoholic drinks (39)	
	Stone miners, quarriers (11)	Sawyers and wood turners (41)	
	Iron and steel foundry — furnacemen, etc. (18)	Road transport—horse drivers (55)	
	Platelayers (47)		
	Boiler firemen and stokers (86)		
Population	 220,231	128,606	45,531
Mixed III and IV			Printing machine minders, printers, machine rulers (43)
Population	.. ..	 12,883	

APPENDIX 2—CONTINUED

Social Class	Heavy Work	Intermediate and Doubtful	Light Work
V	Other workers (navvies) in building, etc. (48) Water transport—dock labourers (57)	Builders', plasterers', bricklayers', and masons' labourers (44) Railway—porters (54) Costermongers, etc., newspaper sellers (66) General labourers and labourers (so described) (87) General labourers, labourers, and other unskilled workers (88)	Messengers and porters, etc. (59)
Population 108,271		754,275	30,264
Mixed IV and V	Agricultural and gardeners' labourers, etc. (3)		
Population 148,660			
Total population social classes III, IV, and V 670,465		1,406,549	540,012

The number in brackets after each occupational group is the Registrar General's code number. The classification of the occupation groups was specially made. Armed Forces were excluded. The populations are taken from the 1931 Census and are for men aged 45–64 inclusive. These 70 groups alone were examined, and not the individual occupations of which the groups are composed.

THE JULY (1953) ISSUE

The July (1953) issue contains the following papers :—

The Pre-impinger. A Selective Aerosol Sampler. By K. R. May and H. A. Druett.

Studies on the Nature of Silicosis : The Effect of Silicic Acid on Connective Tissue. By P. F. Holt and Sonia G. Osborne.

The Incidence of Peptic Ulcer and Chronic Gastritis Among Swedish Sea Pilots. By Tore Dalhamn.

Acute Poisoning Caused by Ingestion of Ethylene Chlorohydrin. By F. Ballotta, P. Bertagni, and F. M. Troisi.

Night Work and Shift Changes. By S. Wyatt and R. Marriott.

Legislation and Litigation. Comments on the Development of Industrial Law. By W. Mansfield Cooper.

From Factory Inspection to Adult Health Service. A Review of Governmental Administration of Occupational Health. By Milton I. Roemer.

Occupational Health Problems of English Painters and Varnishers in 1825. By George Rosen.

Miscellany :

Preliminary Notes on the Treatment of 50 Cases of Tenosynovitis in Industry. By E. L. Knowles and M. D. Kipling.

An Occupational Hygiene Team. By Peter H. Nash and R. J. Sherwood, with the assistance of Joan Bedford.

The Sewerman at Work. By Andrew Meiklejohn.

Health in the Army. A review by Sir Alexander Hood.