last occupation was at the coalface the death rate was substantially lower. The effect of selection in original choice of job and later selective elimination is thus obvious.

The limitations of the conventional mortality rate by last occupation as a measure of the specific occupational risk to life thus made plain are emphasized by the Registrar General who confines his discussion largely to the experience of coal-miners as a whole. He also relates present death rates in this occupational group to the history of the industry in the present century. The moribund state of coal-mining in this period was reflected in fewer young men joining the labour force and the drift away from the more depressed areas to other mines or to alternative jobs in other parts of the country. These movements within the industry as new coalfields expanded and others shut down caused low death rates in the new districts which have attracted the younger and fitter men and, conversely, high rates in the derelict areas with an older residual population. Outside the industry, the bringing of new alternative forms of employment to a mining area may also have drawn off the younger and fitter men. It is thus not surprising to find that, when accidents have been dropped from the account, miners' mortality is, relative to that of other men, worse at ages over 55; and the position has deteriorated since the last census.

Despite the admitted imperfections of these death rates by occupation, certain hazards to health are still clearly revealed. Accidents among the younger men and the dust diseases of the chest stand out above any likely artifact due to inadequate descriptions of jobs on death certificates or census schedule. As usual, the South Wales anthracite fields have the highest rates in this latter respect. On the other hand, the general tendency towards inflation of death rates underlines the significance of the death rates from lung cancer, vascular lesions of the central nervous system, and coronary thrombosis which, particularly among the underground workers, are well below the national level. Cancer of the stomach seems to be the only malignant disease which causes an excessive death rate among miners.

The death rates among miners' wives are doubtless subject to the same sort of bias in reporting of occupation as those of their husbands. To that extent, therefore, their value as a control of the component of social environment in mortality is limited. Nevertheless, the consistency of the pattern of death rates by cause in the two sexes does suggest that some of the excess mortality among miners, e.g., from tuberculosis, bronchitis, or cancer of the stomach, may be socially rather than occupationally determined. But miners' wives also have disabilities not shared by their husbands: an excessive mortality from all causes even in early adult life and from all the cardiovascular-renal group of disorders at all ages. For suicide at least, both miners and their wives have a relatively low rate.

Some of the problems of interpretation encountered in the coal-mining industry exist for the death experience in other forms of mining in this country. Tin and copper mining, for example, is a dying craft subject to the selective loss of the younger and fitter men. Even for the period covered by this Occupational Supplement, however, it is difficult to explain 78 deaths from industrial pulmonary disease instead of the one expected except on the basis of a serious and specific occupational risk. For "getters in open quarries" some of these occupational hazards were serious enough, but in general their death rates differed little from the national average.

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REFERENCE

Mortality in Transport Occupations

Difficulties of interpretation, to which the Registrar General refers in his introduction, apply in full measure to the data for transport workers. First, the classification of the data may lead to misunderstanding. For example, the number of "railway transport workers" is about half the total employed by British Railways because engineering, clerical, and miscellaneous grades have been omitted. Only operating grades are covered, and the heading "railway officials" is similarly restricted. By contrast, bus and tramway managers are included among transport workers.

Secondly, mis-statements of occupation are probably frequent. For example, it appears that many owner-drivers of taxis, returned at the census as drivers, are included on death among car and coach hire proprietors; the standardized mortality ratio (S.M.R.) of this group is no less than 427.

Thirdly, public safety demands selection on entry and, subsequently, transfer of the unfit to less responsible posts. This makes it difficult to associate mortality with occupational factors.

This last difficulty is illustrated by the overall S.M.R.s for the various groups of railway workers. The groups with low S.M.R.s are engine drivers (93), firemen (86), guards (86), and signalmen (83). Average figures occur among railway officials (95), shunters (103), porters (104), and running shed workers (96). The only significantly high S.M.R. is for ticket collectors (135). Collecting tickets is not evidently detrimental to health but ticket collectors include many rejects from other grades.

The point is further illustrated by deaths from bronchitis which are higher than expected among ticket collectors, porters, and running shed workers (all receiving grades for chronic bronchitis), and lower among railway officials and signalmen. Deaths from tuberculosis also are higher than expected among ticket collectors and lower among officials, drivers, guards, and signalmen. Coronary diseases, the sudden onset of which may preclude transfer to other work, caused deaths above expected among officials and drivers, below expected among porters.

Deaths from accidents not in the home were above expected among drivers, firemen, guards, and shunters. Deaths from leukaemia were higher than expected for officials and drivers but not significantly different from the expected level for other railway workers. Signalmen enjoyed a low death rate for cancer.

For many groups of road transport workers inter-
The interpretation of the figures is made difficult by mis-statements of occupation. For drivers the S.M.R. is lowest for bus drivers (82), perhaps because of medical selection in the issue of public service vehicle licences, and highest for tram and trolleybus drivers (114), perhaps because the replacement of trams by buses in the years 1949-53 involved some adverse medical selection of those continuing as tram drivers. Intermediate S.M.R.s were recorded for drivers of goods vehicles (91) and other passenger vehicles (98).

Bus and tram conductors showed an S.M.R. of 97. Conductors showed a lower S.M.R. than bus drivers for coronary diseases but higher S.M.R.s for tuberculosis and bronchitis. Deaths from cancer of the lung were higher than expected among drivers of buses or of trams and trolleybuses nor among lorry drivers’ mates and not significantly among conductors.

The figures for water transport workers are affected by deficiencies in the census returns for the merchant navy and probably by some overstatement on deaths of the status of dock labourers. The deaths of dock labourers were nevertheless above expected under the headings of tuberculosis, cancer, bronchitis, pneumonia, stomach ulcers, and accidents not in the home. Deaths from coronary diseases were below expected.

As for the merchant navy, the census returns for aircrew were deficient. Excluding aircrew and managerial workers, only 40 deaths were recorded among air transport workers.

Among workers in communications, managerial and supervisory workers and radio, telegraph, and telephone operators experienced an excessive number of deaths from coronary disease but of these only telephone operators returned a significantly high S.M.R. for all deaths. Postmen and Post Office sorters returned an S.M.R. of 93 but their mortality was significantly above the average for cancer of the lung and bronchitis.

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