leisure. It also stimulates thought concerning present attitudes and practices to the older man at work. For example, the shortage of very "light" work for men in their 60's suggests to the reviewer that firms might find it worth while to retrain men in middle life known to be on "demanding" jobs. Mr. Le Gros Clark suspected that this was already happening informally and successfully in one of the firms.

This book should be read by all connected with the shaping of industrial policy, whether in a medical, managerial, or trade union capacity. Also, anyone interested in social problems of ageing would do well to read it and to recommend it to others.

SHEILA M. CHOWN

The Hazards to Man of Nuclear and Allied Radiations. Second Report to Medical Research Council. (Pp. 154. 7s.) London: H.M. Stationery Office. 1960.

The Medical Research Council, in their second report on radiation hazards, take account of recent radiobiological and genetics research work in their evaluation.

The picture is coming into better focus but remains unaltered in essentials: however, some areas of uncertainty are less blurred than in the first report in 1956.

In the Hiroshima survivors, leukaemia has been shown to have a maximum incidence in the sixth to eighth years after radiation exposure; thereafter the risk of this disease as a sequel diminishes, and there is an increased mortality from cancer, though as yet it is not possible to say whether all forms of cancer contribute to this or only certain types. Since the mean latent period for many types of cancer is more than 10 years, it is too early to say whether a peak has yet been reached in this instance.

Experimental work with mammals shows that loss of fertility is perhaps the most sensitive of all indicators of damage by irradiation and such effects, the report predicts, might be of profound biological significance under conditions of considerable over-exposure as in accidents or nuclear warfare. There is no suggestion of impaired fertility in either sex in occupational radiation exposure.

A survey of the mortality of British radiologists in a 60-year period up to 1956 shows no life-shortening effect of radiation in this group.

The views on genetic effects in the 1956 report are not materially altered. Recent experimental work shows that, in mice, fewer gene mutations are caused in spermatogonia and oocytes if a total radiation dose is spread out over a longer time than if it is given rapidly as a single brief exposure: so in this work, the effect is reduced by a lower dose-rate. This does not affect the "no-threshold" concept for genetic effects. Chromosomal abnormalities, in addition to gene mutations, may be produced by irradiation in man—hence wisdom dictates a cautious attitude at present.

According to the survey of the Adrian Committee, radiation received by the general population from diagnostic radiology is equivalent to a genetically effective dose of 14 milliroentgens (14 mr.). By comparison, the gonad dose-rate from naturally occurring radiation

sources is in the range between 85 mr. and 106 mr. The reduction in gonad dose from x-rays used in diagnosis is praiseworthy but not yet equally good in all hospital x-ray departments. If the techniques of all departments could be brought up to the standard present in one-quarter of the hospitals studied, this dose could be further reduced to one-seventh of the present level, that is, about 2 milliroentgens, without any curtailment of the work.

An appendix gives additional data on fall-out from which it appears that short-lived isotopes are relatively more important than in the last report because of the changed pattern of nuclear tests. The amount of fall-out shows a seasonal trend with highest values in Spring. Distribution is non-uniform with the greatest deposition in Northern temperate latitudes. Most fall-out comes down in rain; the amounts recorded at various U.K. sampling stations are proportional to the rainfall there. Short-lived fission products are of significance in contributing to external radiation: long-lived fission products which are important are those stored in the body, strontium-90, caesium-137, and carbon-14, which give internal radiation. Strontium-90, which is concentrated in bone, is regarded as the best single indicator of possible hazard. But a sudden rapid rise in bone retention to levels higher than predicted, which was feared as a possibility in 1956, is now considered to be unlikely, so the warning level need not be quite as low as one-tenth of the permissible average population dose suggested then and is now raised to one-half.

The report concludes by repeating verbatim the views expressed in 1956 on wartime hazards and the biological significance of atomic warfare: "we have no reason to change these views".

KATHARINE WILLIAMS

Health Plans and Collective Bargaining. By Joseph W. Garbarino. (Pp. xi + 301. 40s.) University of California Press. 1960. (Agents in this country, London: Cambridge University Press.)

This is an important book. It appears just as the new American President focuses attention on the social services and gives a completely neutral evaluation of the parts played so far by the protagonists in the battle to decide the future of medicine in the United States.

To set the stage, the author describes how, in the past 40 years, all attempts to introduce compulsory health insurance at either Federal or State level have been defeated and how the Trade Unions, always the leaders of this movement, changed their tactics without losing sight of their original aim. Instead of beating against the door firmly closed in the face of government-sponsored health insurance, they used their collective bargaining power to force employers to introduce schemes for their employees. The inherent disadvantage of such isolated schemes in tying the employee to his employer has been outweighed by the real need for the benefits. As a result, the number of schemes has increased with great rapidity. Some of the unions found them so lucrative that they abandoned the original idea to use the development of private schemes as a weapon with which

to coerce the medical profession as a whole. Thus the situation became increasingly complex as the medical profession, the unions (in majority and minority groups), the insurance companies, and the government all joined the fray.

Political struggles of such magnitude must be reflected in the day-to-day provision of medical care. Professor Garbarino sets out to assess this interaction and has studied the effects of the political manoeuvring on the medical services in the San Francisco Bay area of California. This area was chosen, not because it was typical of the United States as a whole, but because representative examples of all types of medical service are to be found there.

The sharp rise in the cost of medical care in the United States during the past 25 years has brought opprobrium on the medical profession. The American public cannot overlook the fact that, of all the professional men in the country, the doctors now have the highest average income. The study shows that the rise is largely due to the increase in the cost of admission to hospital, which has gone up by 319% in the time taken for the cost of living index to rise by 110%. During the same period physicians' and surgeons' fees have increased by 88% and 66% respectively. Both doctors and patients have played a part in forcing up the hospital costs, mainly by abuse of the insurance schemes. The abuses are inextricably bound up with the quality of medical care and are usually in the field of overmedication. The seriousness of this trend is revealed by the prevalence of unnecessary admission to hospital and even the performance of unnecessary operations.

The reaction of the American medical profession to various political pressures has been the subject of study first, at the level of the American Medical Association, next, at the level of the State or County Medical Society (which is all-powerful in the control of the methods of medical practice) and finally at the level of the individual practitioner. The arguments for Federal and for State medical plans are elaborated and the plans themselves are compared with the group practice pre-payment schemes organized by practitioners, and with the services provided by insurance companies.

The effect of these developments on the movement towards compulsory health insurance on a national basis is evaluated and the book ends with the conclusion that the growth of private health insurance, and in particular of collectively bargained plans, has virtually eliminated the possibility of a governmental monopoly of health insurance in America.

Professor Garbarino is an economist with a special interest in industrial relations. He has presented us with a most topical evaluation of a situation that Mr. Kennedy will find hard to unravel.

C. J. H. MANN

Morbidity Statistics from General Practice. Volume II (Occupation). By W. P. D. Logan. (Pp. vii + 269. 25s.) London: H.M.S.O. 1960.

This is the second volume presenting the results of a statistical study of some 280,000 clinical records of over

100 general practitioners in England and Wales from May 1955 to April 1956, carried out jointly by the College of General Practitioners and the General Register Office. The amount of sickness for which patients consulted their doctors and its distribution by sex, age, and area was described in the first volume. This volume deals with its distribution by occupation and is based on the records from 76 practices which had on their lists 85,352 males and 96,727 females aged 15-64, and 58,427 children. Only patients on National Health Service lists were included so that data about occupational groups likely to be private patients must be incomplete.

The measurements of morbidity that have been used are the consultation rate (number of consultations recorded in 12 months/1,000 patients on lists) and the patient consulting rate (number of patients who had one or more consultations in 12 months/1,000 patients on lists) with the emphasis on the more useful latter index.

Because the occupational description of each individual was obtained from only one source (the doctor's record card) the occupational classification in this study does not contain one of the major sources of error of the studies of occupational mortality—the collection of information about occupation from different sources, the numerator from death registration records, and the denominator from the Census. However, information about occupation in this study was obtained by the general practitioners asking the patients the nature of the work performed and the article or commodity made or dealt in or the material worked in. There seem to be risks of considerable inaccuracy here. One-third of the patients included in the survey did not consult their doctors and for these information about their occupation was obtained from any other member of the family who had a consultation during the year. The Classification of Occupations used in the study was the one used for the 1951 Census of Occupations. There were small numbers of patients in some occupational categories which curtailed the amount of tabulation possible, and the reader is warned that many of the figures in the tables may have a large element of uncertainty due to the possibility of chance fluctuation.

The age structure of the population at risk was available from the general practitioners' records but it was not possible to carry out extensive age-standardization. A series of standardized patient consulting ratios for men analogous to standardized mortality ratios is presented but it is not clear how far the age standardization goes within the age-range 15-64.

With the reservations mentioned, and there are reservations with all morbidity data, there is a wealth of interesting material in the 160 pages of tables. There are consultation and patient consulting rates for men aged 15-64 by diagnoses and by occupational groups, social classes, and socio-economic groups for retired men, for men aged 65 and over, for women aged 15-64 (those in whole time and part time occupation and housewives), and for children classified by fathers' occupations. There are some interesting social class gradients in some diagnoses which are commented upon in the text.

The study is complementary to those from individual