trations are of good quality and the various diagrams explain the points well, although Fig. 17 looks very like an acute disc lesion and not due to fibrosis of the ligamenta flava—a condition rarely seen at operation.

In the section dealing with treatment all the normal methods are well described together with an excellent chapter on manipulative techniques.

This book will appeal particularly to the practitioner interested in the manipulative treatment of back disorders.

G. P. ARDEN

Evaluation of Industrial Disability, 2nd ed. By Packard Thurber. (Pp. 63; 78 figures. 10s.) New York: Oxford University Press. 1960.

This is the second edition of a book first published in 1950 by Dr. Thurber, chairman of the sub-committee for the standardization of joint measurements in industrial injury cases in California, U.S.A.

From the details and precise measurements in this book it is obvious that this subject is taken more seriously in the States than over here.

Dr. Thurber has tried to standardize the terminology, history taking, and method of measurements in industrial injury cases. A brief description is given of the normal anatomy and an attempt is made to define degrees of pain, which is almost impossible owing to the variability of patients. There are numerous photographs and diagrams showing how various parts of the spine and joints are measured. The methods closely resemble those used over here: in all cases a goniometer is used which certainly helps to reduce the margin of error.

Some confusion is caused by describing the knee and elbow range as 180° extension–140° flexion. Surely 180°–40° extension range is much simpler.

What Dr. Thurber calls thumb abduction is anatomically thumb extension, abduction being at 90° to the plane of the hand. Finger movements are measured in great detail and one wonders whether functional tests would not be better, such as the power of grip and ability to hold domestic articles or tools.

At the end of the book there is a table of average joint movements and a section on eye and head injury disabilities.

This book is a laudable effort to standardize what is at the moment a somewhat inexact science, and it is particularly valuable to those doing medico-legal work and for those concerned with industrial disability examinations.

G. P. ARDEN.

Radiations in Industry: How they affect you. (Pp. 95; illustrated. 4s.) London: Trades Union Congress. 1960.

How does one evaluate the curate's egg, the classical example of something good in parts? Doubtless it depends on the consumer. The Trades Union Congress, who issued this booklet, must know how to judge what the average trades unionist will want to know and to write accordingly. They have not, however, been able

to marry this information with scientific exactitude and so satisfy the scientific reviewer.

Chapter 1 is the plain man's guide to radiations, units, and instruments. There is too much unnecessary loose talk of "atomic radiations" and some misleading information, such as cosmic rays "are all relatively low powered" and radioactive materials enclosed "in containers . . . are then known as 'sealed sources'".

Chapter 2 on the use of radiations in medicine, industry etc. is much better. The whole pamphlet is extremely well illustrated with photographs and this is most helpful.

Chapter 3 is on radiation risks. Here is dogma, which in the circumstances is desirable and excusable.

Chapter 4 is on safeguards. It is in most ways admirable, but marred by howlers like "the maximum genetic dose to the whole population must not exceed 5 rems per year"—an error of thirtyfold.

Chapter 5 is all about international and national ways and means, particularly committees. The most important means is education. This is one of the booklet's messages and cannot be too greatly stressed. To make this publication part of the public's educational reading would need its revision by a firm editor.

JOHN F. LOUITT

Chemicals in Food and in Farm Produce: Their Harmful Effects. By Franklin Bicknell. (Pp. 192. 12s. 6d.) London: Faber and Faber. 1960.

In his first sentence of Chapter 12 the author writes "Congenital abnormalities, physical and mental, are mainly caused by the alien substances added to food." This provides a representative benchmark by which the well-informed medical reader can evaluate the author's knowledge and judgement. An appendix containing about 90 chemical formulae and 291 references should not lead the reader to believe that this is a scientific treatise. If he consults those references which provide factual information he might well draw conclusions sharply at variance with those drawn by the author. It is to be hoped that the credulous reader will neither die of starvation nor require the administration of tranquillizers to allay the anxiety that might be aroused by accepting this as a serious presentation of a medical problem.

J. M. BARNES

Growing Old in a Mechanized World. By F. Le Gros Clark. (Pp. 145; 3 tables. 7s. 6d.) London: The Nuffield Foundation. 1960.

This short book reviews the position of "elderly" men at work, whatever their chronological age, and comments on the trends which seem likely to take place with increasing mechanization. The problems which it highlights are widely experienced in industry, and are illustrated by a description of eight varied but fairly mechanized firms.

The book stresses the urgency of "a recasting of social values" with respect to retirement, including both financial aspects and the use people make of their

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