the soul which led to the renunciation of all vegetarianism came in the wake of the adverse publicity given by the press to the death on June 14 of an elderly woman who died of malnutrition after living on a vegan diet. In the past month, the Selene Community, which has only a handful of residents but a fair number of sympathizers and subscribers to its journal, has de-escalated its eating habits by changing to non-vegan food, but expects the gradual change to ordinary food will take longer.

NUTRITION

Iron in Flour

By law, and with the intention of making good the iron lost from wheat during milling, all flour sold in Britain must contain at least 1.65 mg of iron per 100 g. During the past two decades there have been several studies to determine how much of the iron in bread is actually absorbed, but the results have often been inconclusive and contradictory. This and more recent work has now been reviewed, in a report published last week by the Ministry of Health, by Dr P. C. Elwood of the Medical Research Council's Epidemiological Research Unit in Cardiff (*Iron in Flour, Reports on Public Health and Medical Subjects*, HMSO, 7s.).

In Dr Elwood's own investigations, volunteers were fed a standard breakfast containing 5.5 mg of iron in the form of one or more of the following: reduced iron or ferrum redactum, ferric ammonium citrate (either the green or the brown form), powdered iron (electrically precipitated iron) and ferrous sulphate. Absorption of iron was estimated on the basis of the whole body content of ^{59}Fe . Dr Elwood showed that electrolytically precipitated iron—which is one of the main forms of iron added to flour in Britain and elsewhere—is much less available than the other three forms, particularly for iron-deficient patients. In patients with achlorhydria (absence of hydrochloric acid from the gastric juice), both powdered and reduced iron are poorly available.

PERCENTAGE MEAN ABSORPTION OF IRON

	Pow- dered iron	(Ferrous sulphate)	Re- duced iron	(Ferrous sulphate)	Ferric ammon- ium citrate	(Ferrous sulphate)
Bread + egg	0.20	2.05	0.72	0.87	0.94	0.80
Bread alone	0.86	18.30	3.55	7.95	10.35	12.60

It is something of a surprise that omission of an egg from the standard breakfast leads to enhanced absorption of all four iron preparations—the uptake of ferrous sulphate being noticeably greater in its absence than in its presence. Dr Elwood suggests that although it might be that subjects were absorbing the iron in egg in preference to that in bread, he considers this to be unlikely in view of findings by Moore and Dubach which suggest that the iron in eggs laid by radioactive hens is no more readily available than iron in any other foodstuff. Furthermore, Chodos and his colleagues found that egg iron was poorly absorbed by their fourteen subjects.

Although the data are limited, it seems that no adverse effect on the availability of iron is caused by the addition of calcium carbonate to the flour, the baking

process itself or the storage of flour to which iron had been added 6 weeks before baking. In conclusion Dr Elwood tentatively advocates the addition of ferric ammonium citrate to replace lost wheat iron but, in the same breath, points out the need for long-term, large-scale community based trials to establish the real effect of the addition of iron salts to foodstuffs on iron balance.

In a letter in last week's *Lancet*, Dr Elwood suggests that a more realistic test of the value, if any, of ferric ammonium citrate as an additive to flour would be to incorporate this into the entire bread supply of a number of anaemic women and to maintain this supply for a period of at least 9 months (*Lancet*, ii, 516; 1968). He and his colleagues have therefore fed bread containing the statutorily required amount of the iron preparation to 113 anaemic women. In addition, 124 anaemic women have been fed with "ordinary bread". So far, the haemoglobin levels of the two groups of women have remained the same, and Dr Elwood maintains that this shows how complex the whole problem is.

GENERAL PRACTICE

Make or Break

from our Social Medicine Correspondent

GENERAL practice has been the subject of much speculation and controversy over the past few years, and the urgent need for reorganization, both from within and in relation to other parts of the health service, has become increasingly obvious. But reorganization costs money, and in comparison with, for example, the hospital service, general practice fares badly. Although the total expenditure on general medical services increased from £54 million in 1949 to £108 million in 1965, the proportion of the National Health Service expenditure devoted to this actually fell from 12.5 per cent to 7.5 per cent in the same period. At the same time, the proportion of the national income absorbed by these services has fallen since 1949, though it has remained relatively constant during the past decade at about 0.4 per cent of the national income. These are some of the figures quoted in *General Practice Today* (Office of Health Economics, 2s. 6d.) which examines the changes that have taken place in general practice over the past twenty years, the possible changes that will take place over the next twenty, and the way in which general practice is preparing itself for the future.

One well-documented sign of the times is the decline in the number of single-handed practitioners and the move towards partnerships of doctors, particularly group practice. Not only does this enable an efficient appointment system to be worked out—and more than 40 per cent of British doctors are now using a full or partial appointment system—but it will probably lead to some degree of specialization within the group. To a certain extent this will in turn meet McKeown's criticism that one doctor is no longer competent to deal with all age groups, and that personal doctors should therefore be divided into obstetricians, paediatricians and so on, along lines similar to the American systems. Nevertheless, there are still over 4,500 single-handed practitioners in Britain (a quarter of the total) and a further 29 per cent are in partnerships of only two.

As more attention is being attached to the idea of

health teams comprising secretarial and nursing staff as well as health visitors and social workers—all led by the practitioner—it is evident that practitioners will need to have some flair for, and basic training in, management. Through the more efficient use of their time, practitioners could thus foreseeably care for many more patients than they do now, and the present average of 2,500 patients could perhaps be boosted to 6,000 or even 10,000 as in some areas in Sweden. The report also suggests that in the future there could be a move away from the concept of the practitioner being available on demand to his being available instead only according to need as decided by a delegated auxiliary.

It is encouraging that the number of practitioners attending postgraduate courses has increased considerably from 5 per cent in 1952 to 56 per cent in 1967, and so is the indication that their connexion with hospitals is not so remote as most people might think. For example, in 1966 about 6,582 practitioners held part-time hospital appointments, examined 57,000 new patients at out-patient departments, and dealt with nearly half a million attendances. Indeed, the indication is that practitioners desire a greater degree of integration with the hospital services as well as with local health authorities, although this is not by any means always the case.

What seems to be just around the corner is the integration of health services into a unified whole. This has already started in practice and the Minister of Health has proposed that it should be given statutory recognition.

OCCUPATIONAL HEALTH

Asbestos in the Lungs

from our Social Medicine Correspondent

WORKERS who are continuously exposed to asbestos run a real risk of developing pleural and pulmonary fibrosis and even malignant diseases, according to a report in the current issue of the *British Medical Journal*. Based on a large-scale survey—using radiographic techniques—of 15,000 men employed at the Royal Dockyard, Devonport, Dr Geoffrey Sheers, consultant physician at Plymouth General Hospital, and Dr Ann R. Templeton, medical director of the Mass Radiography Centre, Plymouth, have calculated that about 600 of the dockyard employees probably have various types of abnormalities attributable to asbestos and that many more may be at risk (*British Medical Journal*, iii, 574; 1968).

The study which has been undertaken covers 1,504 men, representing a one-in-ten sample. The most striking finding was the much higher prevalence of abnormalities in men experiencing continuous occupational exposure. Thus three of the four men who developed pulmonary fibrosis were in constant contact with asbestos, as were eleven who developed thickening of the pleura. Ten continuously exposed men were found to have limited areas of pleural thickening. In the whole sample, the prevalence of pleural fibrosis varied from 28 per cent in the continuously exposed workers to 1.9 per cent in those who were least exposed. A total of sixty-three cases of abnormalities in 1,414 men were attributed to asbestos, and the prevalence of all types of abnormality was related to the time that had elapsed since the men were first exposed.

A further cause of anxiety arising from these studies is the possibility of a relationship between pleural fibrosis and malignancy. The first confirmed case of mesothelioma of the pleura occurred in 1964 in a man who had been a boilermaker for 31 years. Since then, three cases were confirmed in 1965, two in 1966 and five in 1967. In every case there had been intermittent exposure to asbestos in the course of long periods of employment in the dockyard.

In view of the seriousness of these findings, the draft of the new asbestos regulations published last month will be widely welcomed. In essence, all processes in which asbestos dust is likely to be released in dangerous amounts will, in future, have to be carried out under exhaust draught and the equipment for this will have to be inspected at least once every 7 days. Should it be impracticable to comply with this requirement, workers will have to be provided with respiratory protective equipment and protective clothing. In addition, wherever possible, cleaning should be carried out by means of vacuum cleaning or similar equipment so that asbestos dust is not discharged into the air and, as far as storage and distribution are concerned, all loose asbestos will have to be kept in receptacles when not in use. A particularly cautious note is that any person undertaking a process involving blue asbestos will be obliged to inform the inspector of the district in advance. (*Draft Asbestos Regulations*, 1968, HMSO, 1s. 3d.)

NUCLEAR ENGINEERING

Stresses and Strains at Berkeley

THE Berkeley Nuclear Laboratories were established in 1961 by the Central Electricity Generating Board to conduct some of the basic research then needed for the British nuclear power programme. The annual budget of the laboratories is some £2 million—a sum which their director estimates is saved several times over depending on how the value of the laboratories' largely preventive research is calculated.

A principal research project concerns the integrity of high pressure components of nuclear reactors. The subject is being tackled from several angles, and one programme includes a high pressure test vessel for investigating the behaviour of intersections between cylinders and spheres. Tests can be conducted at temperatures up to 500° C while an array of electrical resistance strain gauges measures the deformations. Models of the components under study are welded into a test plate which can be removed from the pressure vessel and replaced at the end of each experiment, thus allowing the vessel to be re-used.

Structural analysis has been revolutionized by computer techniques which have made possible the analysis of shapes and loading conditions previously insoluble by conventional mathematics. In the finite element method, which has been widely used at the Berkeley laboratories, a structure is considered as a number of small standard elements, such as triangles, cubes or tetrahedra, whose aggregate behaviour under load deformation can be calculated by computer. The mesh of elements which defines a structure is read into the computer with the aid of a coordinate digitizing table, a device whereby the coordinates of each point on the diagram of the mesh are read off onto a set of punched cards.