ARTICLE VII.—*Is the Dietary authorized by the Secretary of State, in the "Rules for Prisons in Scotland," sufficient to bring up the Physical Frame of an Adult Prisoner to the Standard of Health and Vigour, and maintain it there?* By Dr BONNAR, Cupar, Surgeon to the Fife County Prison.

IT has lately been my duty to investigate the question, why the criminal inmates of our local prison lost weight, in spite of roomy cells, fresh air, faultless drainage, and every attention to cleanliness and health which an experienced and excellent governor and painstaking matron could exercise.

In the course of my inquiries, it became necessary to analyze the authorized dietary according to the very useful and comprehensive table given by Dr Lyon Playfair in the January No. of *Good Words;* and, as the question of food, in relation both to economy and work, as well as health, is occupying a very prominent place in the applied sciences of the present day, I beg to subjoin the results of my labours as an item towards solving the problem what kinds of food, and how much, it is necessary to provide in our prisons for sustaining the general health and condition of the prisoners, without indulgence on the one hand, or deterioration to the *physique* on the other.

I pass over the dietaries appointed for those whose terms of imprisonment are under three days, inasmuch as, although the nutritive matter is much below that on which it would be possible to subsist in health for any lengthened period, yet three days' restraint is a punishment of so slight a character in itself, that, unless the *animal* is made in some measure to feel the penalty of crime, the mere confinement would be a very inadequate preventitive to its re-commission; nor do I comment on those rates of diet prescribed as punishments to the refractory, for it is obvious that the prisoners themselves, and not authority, are responsible for their infliction or continuance.

I would confine my remarks and comparison to those *three* rates under Section 112 of the Rules, which are applicable to all prisoners who are confined for any length of time exceeding three days.

The table of authorized diet is as follows:—

TABLE I.

First Rate.		
Breakfast.	Dinner.	Supper.
6 oz. of oatmeal made into porridge, with ¾ pint (15 oz. by weight) of skimmed or butter milk.	1½ pint of barley-broth or pease-soup, with 6 oz. of wheaten bread; or 2½ lb. of potatoes, with ¾ pint of skimmed or butter milk.	1½ lb. of potatoes; or 4 oz. of oatmeal made into porridge, with ½ pint of skimmed or butter milk.

Breakfast.	Dinner.	Supper.
	Second Rate.	
8 oz. of oatmeal made into porridge, with ¾ pint milk.	2 pints of broth or soup, with 8 oz. of wheaten bread; or 2½ lb. of potatoes, with ¾ pint of milk and 4 oz. bread.	As above.
	Third Rate.	
As above.	2 pints of broth or soup, with 12 oz. of bread; or 2½ lb. potatoes, with ¾ pt. milk and 8 oz. bread.	2 lbs. potatoes; or 6 oz. oatmeal made into porridge, with ½ pint of milk.

In Section 113, rules are laid down as to the kinds and qualities of the various ingredients to be used in the manufacture of the mid-day meal. Two pints of broth must contain 4 oz. of barley, 2 oz. of marrow-bones or 1 oz. of meat, or ½ oz. of dripping, and a proportionate quantity of succulent vegetables. Two pints of pease-soup must contain 4½ oz. of pease, same proportion of meat as the broth, but about half the vegetables.

Potato-soup is permitted to be substituted for broth or pease-soup, 1 lb. of potatoes being reckoned equivalent to the 4 oz. of barley, the other ingredients remaining the same.

Barley-milk, containing to each two pints 4 oz. of barley, well boiled; and half-a-pint of milk may likewise be supplied instead of broth or soup.

Fish may be substituted for broth at the rate of 6 oz. of fish for every pint of broth.

Without complicating my illustrations, I shall take as the standard prison dietary that given in the above table, and analyze its constituents under each rate, and compare the results with the estimated amount of nutrition required for adults in various grades and under different circumstances, as detailed in Dr Playfair's very able paper on "The Food of Man in relation to his Useful Work."

TABLE II.

Under the First or lowest Rate, we have in the 24 hours as follows:—

	When the Dinner or principal Meal consists—				
	1. Of Broth.	2. Of Pease-soup.	3. Of Potato-soup.	4. Of Potatoes and Milk.	5. Of Fish.
Oatmeal, ...	10 oz.	10 oz.	10 oz.	10 oz.	10 oz.
Skimmed Milk, ...	25 oz.	25 oz.	25 oz.	40 oz.	25 oz.
Barley, ...	3 oz.	none.	none.	none.	none.
Succulent Vegetables, . .	3 oz.	1½ oz.	3 oz.	none.	none.
Butcher-meat, ...	¾ oz.	¾ oz.	¾ oz.	none.	none.
Wheaten Bread, . . .	6 oz.	6 oz.	6 oz.	none.	6 oz.
Fish (fresh), ...	none.	none.	none.	none.	9 oz.
Pease, ...	none.	3⅜ oz.	none.	none.	none.
Potatoes, ...	none.	none.	¾ lb.	2½ lb.	none.

The amount of nutritive and heat-giving materials contained in the table are arranged under the following heads :—

TABLE III.

	Flesh-formers.	Heat-givers. Fat.	Heat-givers. Starch or Sugar.	Starch equivalents of heat-givers.	Carbon.
	oz.	oz.	oz.	oz.	oz.
I. Where dinner is of broth, 10 oz. of oatmeal contain . . .	1·6	0·6	6·2	7·64	4·095
25 oz. of milk, ...	1·	0·5	1·15	2·2	1·383
3 oz. of succulent vegetables, .	0·03	...	0·36	0·36	0·183
3 oz. of pearl barley, ...	0·24	0·06	2·22	2·36	0·16
¾ oz. of butcher-meat, . . .	0·14	0·1	...	0·25	0·157
6 oz. of wheaten bread, . . .	0·49	0·06	2·67	2·81	1·496
Totals, .	3·50	1·32	12·60	15·62	7·474
II. Where dinner is of pease-soup, omitting the barley and extra vegetables, and adding pease, Totals, .	4·19	1·33	12·17	15·22	8·551
III. Where dinner is of potato-soup, Totals, .	3·43	1·27	13·08	14·98	8·69
IV. Where dinner is of milk and potatoes, ... Totals, .	3·76	1·44	17·31	20·19	10·895
V. Where dinner is of fish and bread, Totals, .	4·21	1·62	10·02	13·87	7·901
Average of the above, ...	3·81	1·39	13·03	15·97	8·702

Under this rate of diet, all prisoners undergoing sentences of imprisonment not exceeding two months, are kept, not being employed at hard labour; and even a hard labour sentence, if not prolonged beyond ten days, does not entitle the prisoner to any other.

As a change of food, in respect of the dinner, is directed for at least two days in each week, and as it is desirable to obtain an approximatively correct table for the purpose of instituting a comparison between the amount of food recommended by authority, and that deemed necessary for the efficient sustenance of the adult frame according to the latest observations, I have taken the average of the different kinds of diet analyzed above, as the measure of the amount of nutrition supplied, under the lowest rate, to each adult prisoner in the twenty-four hours.

Proceeding after the same method, we obtain for the *second* rate as follows :—

TABLE IV.

	Flesh-formers	Fat.	Starch.	Starch Equiv.	Carbon.
	oz.	oz.	oz.	oz.	oz.
I. Where dinner is of broth (2 pints), Totals,	4·14	1·52	15·61	19·10	10·293
II. Where of pease-soup, " "	4·79	1·53	15·03	18·54	10·394
III. Where of potato-soup, " "	4·04	1·46	16·25	19·58	10·581
IV. Where of potatoes and milk, . . "	4·41	1·60	20·06	23·65	12·711
V. Where of 12 oz. of fish with bread, "	5·08	1·92	12·15	16·62	9·527
Average, ...	4·49	1·61	15·82	19·50	10·701

And for the *third* or highest rate.

TABLE V.

	Flesh-formers	Fat.	Starch.	Starch Equiv.	Carbon.
	oz.	oz.	oz.	oz.	oz.
I. Where the dinner is of broth, . Totals,	4·78	2·18	18·13	22·51	12·110
II. Where of pease-soup, ... "	5·42	2·19	17·55	21·96	12·212
III. Where of potato-soup, ... "	4·68	2·12	18·77	22·99	12·398
IV. Where of potatoes and milk, . . "	5·06	2·26	22·48	27·05	14·527
V. Where of fish and bread, . . . "	5·72	2·48	14·67	20·03	11·344
Average, ...	5·13	2·25	18·32	22·91	12·518

Prisoners whose terms of sentence exceed two, but do not extend beyond six months, if not employed at hard labour, are put on the *second* rate; where they are so employed they are put on this regimen when their terms of imprisonment are upwards of ten, but not beyond sixty days.

The *third* rate is administered to all prisoners whose sentences exceed six months, if they are not employed at hard labour, and in all cases of hard labour above sixty days; also to all prisoners under sentence of transportation or penal servitude.

Special diet may, of course, be ordered by the surgeon in any case which may seem to him to demand deviation from the rules, but such exceptions are necessarily excluded from calculation in the present communication.

We have now to compare the results arrived at with those shown in the tables taken from Dr Playfair's paper before noticed. He divides diet into five degrees (p. 19) as follows:—

1. Subsistence diet, or the amount of nutrition furnished to convalescent patients in our hospitals, while yet they are unable to take active bodily exercise. 2. Diet in quietude, or that required for a very moderate amount of exercise. 3. Diet of adult in full health, such as is furnished to our soldiers in time of peace. 4. Diet of active labourers, or those doing a fair but not excessive amount of active work, represented by a walk of twenty miles during six days of the week. 5. Diet of hard-worked labourers.

The following table shows the comparative value of these diets, and those of the average rates of prison diet, in ounces:—

TABLE VI.

	Flesh F.	Fat.	Starch, &c.	Starch Equiv.	Carbon.
	oz.	oz.	oz.	oz.	oz.
Subsistence diet, ...	2·0	0·5	12·0	13·2	6·7
Diet in quietude, ...	2·5	1·0	12·0	14·4	7·4
Diet of adult in full health, .	4·2	1·8	18·7	22·0	11·9
Diet of active labourer, . . .	5·5	2·5	20·0	26·0	13·7
Diet of hard-worked do., . .	6·5	2·5	20·0	26·0	14·3
Average of 1st rate prison diet,	3·8	1·3	13·0	16·0	8·7
Average of 2d do., .	4·5	1·6	15·8	19·5	10·7
Average of 3d do., .	5·1	2·2	18·3	22·9	12·5

If we keep our attention fixed on the amount of carbon in the last column, and compare that of each of the three different rates with that of the five kinds of diet in the table, we shall observe that the *lowest* rate has a slight advantage over the diet of quietude, while it falls very considerably short of what is needed for sustaining the adult in good health. If the carbon here be represented by 100, the ratios of these divisions of diet will be 85 and 137 respectively.

In the *second* or middle rate of prison fare, if the carbon be compared with that of the same divisions, it will be found to be in the ratio of 100 to 69 of the first, and 111 of the second, being still below the required amount for the health-standard.

In the *third* or highest rate the ratio is, in respect of the healthy adult diet, as 100 to 95, being somewhat above the requirements of the latter; but in respect of the diet required for the active labourer, it stands as 100 to 109, again considerably below the mark, and as 100 to 114 in respect of that of the hard-worked labourer.

Below is a table of ratios, which shows at a glance the comparative values of the different rates of prison fare as compared with Dr Playfair's tables.

TABLE VII.—*Ratios.*

PRISON DIET.	Subsistence diet.	Diet in quietude.	Diet of adult in good health.	Diet of active labourer.	Diet of hard-worked labourer.
Flesh formers:					
1st rate, as 100 is to	52	66	110	144	171
2d rate, "	44	55	93	122	144
3d rate, "	39	49	82	108	127
Fat:					
1st rate, "	39	77	138	192	192
2d rate, "	31	62	112	150	150
3d rate, "	22	45	82	113	113
Starch:					
1st rate, "	92	92	144	154	154
2d rate, "	76	76	118	126	126
3d rate, "	66	66	102	109	109
Starch equivalents:					
1st rate, "	82	90	137	162	162
2d rate, "	67	74	113	133	133
3d rate, "	58	63	96	113	113
Carbon:					
1st rate, "	77	85	137	156	164
2d rate, "	62	69	111	128	133
3d rate, "	53	59	95	109	114

Here it is seen that all the rates are considerably above the lowest, or subsistence diet, and also that of quietude; but the first rate of prison fare falls in the flesh-formers 10 per cent., in the fat 38 per cent., in the starch, starch equivalents and carbon, 44 and 37 per cent. below what is needed to keep the animal frame in full health, while the prisoner may be required to undergo a hard labour

sentence for the period of ten days without additional nourishment.

If we direct our attention to the second class fare, we shall see that while it is 7 per cent. in advance in flesh-forming substances, it falls 12 per cent. behind in the fat and 18 per cent. in the starch materials, and 11 per cent. in the estimated amount of carbon, below the diet required for the maintenance of the body in full vigour, and on this diet a prisoner may be kept for six months without, or sixty days with hard labour.

The third, or highest prison rate, shows a proportion of 18 pe cent. of the flesh-forming materials, and 4 per cent. in the starch equivalents, and 5 per cent of carbon, *above* the full health diet, but falls 8, 13, and 9 per cent. in these respects, below the active labourer's diet, and on this fare a prisoner may be kept to expiate a sentence however long, accompanied with hard labour.

How does this affect the condition of the inmates of our various prisons? Do they lose weight as a general rule? A variety of local circumstances, such as the character of the population, rural or manufacturing, and its general social condition may influence the results in different parts of the country, but we believe that the statistics collected by Dr Thomson of the General Prison, Perth, from every jail in Scotland, in answer to special inquiries on the subject, will show that in respect of the first rate of diet, nearly *one-fourth* of the males, and about 17·5 per cent. of females lose weight; in respect of the second rate, 18·7 per cent. of males, and 12·4 per cent. of females fall off; and with regard to the third rate, 18·5 of the male, and 14·5 of the females deteriorate.

Many questions open up in investigating this interesting subject. Such as the influence of previous habits on the health and condition of prisoners; that of mental emotion, as evinced in first, in comparison with subsequent convictions; that of various employments as affecting the vigour and stamina of prisoners subjected to much the same routine in diet and exercise, etc. These, again, may be influenced, in some degree, by the tone and general character of the population of the district, as the simple and usually more highly moral[1] state of the rural, compared with the sterner and more vicious and depraved of our large manufacturing cities. But whatever may be the influence of these disturbing causes, we think,

[1] I take *morality*, here, in its widest sense, especially in those aspects which bear most materially on the health of the individual; such as the avoidance of dissipation, with its various animal excitements, late hours, irregular meals, and stinted rest, in which the rural population have such an obvious advantage over the depraved criminal class of our large towns.

I am fully aware that, in a certain respect, as borne out by the Registrar General, the morality of our rural friends is said to fall sadly behind that of the same class in our cities; but I take this as a clear evidence,—indeed, as the one exception which proves the rule,—that in tone and vigour of body they are ahead of their town contemporaries, and, accordingly, that the falling off in condition of such prisoners is a thing to be anticipated.

that as a foundation for all statistics, and for all calculations on the subject of prison dietary, we ought to assume that the latter is, at the lowest, sufficient to maintain the *physique* of the adult up to the mark of a healthy standard, which at present it is not.

For juveniles and females a ratio ought to be fixed suited to their requirements. They ought not, as at present, to be slumped with the male adult and subjected to the same rules, without modification. In general, I think them over-fed, and the statistics last alluded to show how few of the females comparatively lose weight under any of the different rates.

In conclusion, I think that if it be laid down as a recognised rule that prisoners are not to be pampered or over-fed, so as to make the prison an attraction to the idly or viciously inclined, the converse should hold good, that in no case ought the dietary to be so scanty and indifferent as in any degree to impair the *vis vitæ* a man may possess on his entrance there, but rather to repair the ravages which crime and its concomitants generally make on his frame, so that his punishment may make him for the future, not only a wiser, but in this, as well as in other respects, a *better* man. I conceive that he ought to be set at liberty better prepared, physically as well as morally, for fighting the great battle of life anew, and the very experience he may have had in his confinement, of the *animal comforts* of regularity and sufficiency, may form a strong inducement for him in after-life to prefer and strive after these in an honest way, instead of exposing himself to the uncertainties and privations of dissipation and crime.

Article VIII.—*The Chief Medical Schools of the Continent.* By William Rutherford, M.D.Edin., Assistant in the Physiological Laboratory, Edinburgh University.

A short account of the chief Continental Medical Schools will doubtless prove serviceable to those who may purpose visiting them, and will, it is hoped, not be without interest to those who are prevented from so doing. Among students generally very vague notions prevail as to the "how, when, and where," of continental medical travel: they have unfortunately no directory for continental schools similar to that contained in "Churchill" for the schools of this country (a deficiency which, if supplied, would prove of the greatest service not only to students but to the medical men of this country generally, very many of whom are anxious to be informed, from year to year, of changes taking place in continental schools). Most students entertain the idea that to spend a year on the Continent would be an advisable thing to do. Some are fortunate enough to be acquainted with men who have visited the