

SCIENCE.—SUPPLEMENT.

FRIDAY, OCTOBER 16, 1885.

EDUCATION AND THE HEALTH OF WOMEN.

THE tendency to apply the exact methods of science to problems of education, is one of the most hopeful signs of present pedagogy. One of the more fruitful lines of application will be found, doubtless, in the consideration of educational questions in relation to the wider sphere of social science, and the application of the statistical method. As one of the first fruits of this application, we hail the returns collected by the Association of college alumnae, wisely embodied in the current report of the Massachusetts labor bureau. These are directed especially to ascertaining the effect of education upon the health of women, but there are incidentally discussed a number of other very interesting problems. The returns include 12 institutions, which had (1882) graduated 1,290 women, from 705 or 54.65 per cent of whom returns have been received. Of these the average age at beginning study was 5.6 years; at beginning of menstrual period, 13.6 years; at entering college, 18.3 years; and at the present time, 28.5 years. This gives about six years as the average time since graduation, certainly ample for the determination of the general effects upon health of their collegiate training. Of the 705, 19.5 per cent report a deterioration in health during college life; 59.3 per cent, no change; 21.1 per cent, an improvement. The corresponding figures for working girls of Boston show a deterioration of 16 per cent, a favorable balance of 3.5 per cent in favor of the working girls. The total number of disorders reported by the 705 is 865. The aetiology of disease, as reported, is exceedingly defective, but we give it for what it is worth. 135 consider constitutional weakness cause of disorders; 81 bad sanitary conditions; 81 intellectual overwork; 73 emotional strain, and 47 physical accident, while the others report no cause. Defective as this report is in detail, it is remarkably suggestive. The general conclusion stated in the report is that the health of women engaged in the pursuit of a college education, does not suffer more than that of a corresponding number of other women in other occupations, or without occupation.

This general conclusion may be allowed to stand. But the figures are not 'worked for all they are

worth.' A more detailed examination of them brings out the following points which the report fails to explicitly notice.

Of those who entered college one or two years after the commencement of the menstrual function 20.5 per cent had poor health during the four years of college life, while of those entering three to five years after its establishment 17.7 per cent, and more than five years 15.4 per cent had poor health. The following figures tell the same story with slight variation: of those who entered at the age of sixteen, or under, 28.1 per cent deteriorated, 17.2 per cent improved in health; of those seventeen to nineteen 17.3 per cent deteriorated and 19.7 per cent improved; while of those who were twenty or over 17.9 per cent deteriorated, while 28.4 per cent improved—almost exactly reversing the figures for the youngest class. The fact that of the married 37 per cent are without children, although the average number of years spent in married life is 6.2, must be included in any discussion that wishes to reach complete results. There were, moreover, to those bearing children but an average of two children to every seven years of married life, while, if all married couples are included, the average falls to 1.2 children for five years. With such statistics, however, there must be borne in mind the general falling off in fertility of all women occupying about the same social rank. Of the children born, 12 per cent have died, and of these the unusually large per cent of 25 is due to causes occurring contemporary with birth, still, premature birth, etc.

The following figures fall into the same category. During the period of development 53 per cent were troubled during the menstrual period with disorders, including irregularities, uterine and reflex pain, one, two, or all three. During college life the per cent was 66; since graduation 64. If mere irregularities be isolated, and they and the more organic disturbances treated separately we find: Irregularities alone—development, 16 per cent; college life, 9 per cent; graduate life, 7 per cent. Uterine and reflex pain—development 24 per cent; college life, 36 per cent; graduate life, 36 per cent. Of the disorders reported 7 per cent are brain troubles, 33 per cent nervousness, in addition to which 15 per cent report neuralgia; 26 per cent disorders of generative organs.

We give only figures, and these only such as bear directly upon the central question of the health of woman in reference to her education.

They certainly show that the time for optimistic congratulations is not yet reached.

The other general conclusion of the report that such falling off in health during college life, as did appear, is due rather to predisposing causes, than directly attributable to college life itself, brings out some very interesting contributions to the scanty generalizations we already possess, concerning the relations between health and social environment. First as to heredity: A total of 35 per cent report a tendency to disease inherited from one or both parents. Those inheriting tendency from one parent only present some slight falling off in good health when compared with the entire average; while for those inheriting from both 58.3 per cent are in good health; 41.7 in poor, the average for all being 83 and 17 per cent respectively. For the 65 per cent inheriting tendencies from neither the figures are 85 and 15. As to relative change there is for those inheriting from both a relative decrease of 19.5 per cent in those having excellent health; an increase of 24.6 per cent in those having poor; the corresponding figures for those inheriting from neither being an increase in good health of 2.6 per cent, a decrease of poor of 1.6. The following tables show the effects of exercise, worry and study upon health:

EXERCISE.

Hours taken.	Health.	
	Good.	Poor.
	Per cent.	Per cent.
0-2.....	75	25
2-6.....	83	17
6 and over.....	84	16

WORRY.

Concerning.	Health.	
	Good.	Poor.
	Per cent.	Per cent.
Study.....	80	20
Personal affairs.....	75	25
Both.....	68	32
Neither.....	92	8

The differences in the last two results furnish one of the most interesting contributions yet made to the student of sound sanitary, social, and moral conditions.

STUDY.

Amount.	Health.	
	Good.	Poor.
	Per cent.	Per cent.
Moderate.....	85	15
Moderate to severe.....	83	17
Severe.....	79	21

The report upon the whole is surprisingly full. For the social student, however, it presents

certain notable deficiencies. The physical, social and moral environment of the students during college requires infinitely more investigation. The details concerning intellectual surroundings are comparatively full, though the number of hours of study should be given instead of the indefinite terms, 'moderate,' 'severe.' The inquiries concerning social surroundings are virtually confined to the inquiry as to whether the person 'entered society,' a little, a good deal, or none. Such vague expressions are worse than none. The question is as to how the student spent the hours of social recreation, and how many were so spent. The complete answer of this question, it is hardly too much to say, would throw more light on the hygienic problem than almost all else. It should include information as to whether the institution is female only or co-educational; what its social relations are to the town in which it is situated, the nature of the town; whether the young women live in dormitories, in cottages, in selected homes, or in ordinary boarding-houses; what regulations, if any, the faculty have made concerning study hours, and the hours not spent in study; whether the institution has a matron; whether her duties extend to moral and social matters, or to physical only; whether the institution has a gymnasium, etc. Complete answers to such a protocol of questions as these suggest would show what was meant by saying that 81 regard bad sanitary conditions as cause of their diseases, 135, constitutional weakness, and 73, emotional strain. If the association will study the conditions of the problem along this line, and frame questions accordingly, they will deserve still more at the hands of both the scientific educator, and the social student. Meanwhile we will be thankful for what we have.

JOHN DEWEY.

THE CLAPP-GRIFFITHS BESSEMER PLANT.

THE Bessemer process of converting molten cast-iron into steel by oxidizing and removing its carbon and silicon by blowing immense volumes of air through it, appears to be entering a new phase. Aiming for many years almost solely at the production of rails, the captains of the Bessemer industry found it much easier to satisfy the demands of purchasers as to the quality of their product than those of their employers as to its quantity. Hence arose the present type of Bessemer plant, in which no expense of construction is spared which promises to increase the quantity and thus to diminish the cost of the product. To-day, however, the uses of Bessemer steel are being rapidly extended and diversified. While most of the new demands