

To enable the ship to rise or descend during flight there are three parallel horizontal planes on both port and starboard sides, forward and aft. These are comparatively small, pivoted in the centre at each side, with a vertical rod at each corner, and through these all are tilted to the desired angle by wire gear operated from either gondola. For lateral movement there are three groups of vertical rudders, one having four parallel planes above and a similar one below the main structure near to the stern, while abaft of the propeller, in the after gondola, there is a group of three rudders. Rudders, engines, and propellers were worked before the members of the advisory committee at the trials. The committee are to be congratulated, as well as Captain Sueter, who has had charge of the work on behalf of the Admiralty, and also the Vickers Company on the important stage which their unique work for the Navy has now reached.

#### INFANT AND CHILD MORTALITY.<sup>1</sup>

THE report before us is one of the most important studies of infantile mortality yet produced. Administratively, it will be of immense value, for it constitutes a first guide to the "dark areas" of England. Scientifically, it is also of value, for it brings actual administrative data to bear on a fundamental social question, namely, does the prevention of infant deaths tend to the deterioration of the race? Whatever be the final reply to this question, the work of prevention will certainly proceed as if the question had never been asked, because the impulse towards prevention is itself a fundamental impulse in modern society, and will realise itself against all hindrances.

It is, however, of immense importance to know whether, on the whole, the methods of prevention in this particular field are favourable to the rearing of a sound race or not. Survival of the fittest, however, is no longer to be imagined merely as survival of individuals of a single quality. Rather it is imagined as survival of fit groups, and the concept of the "group-person" is steadily gaining a place, not in biology alone, but also in economics. The preservation of the "group-person" implies that natural selection must be regarded as operating on the group, not on the mere individual considered abstractly. Consequently, it may well happen that, as the preservation of the group is the primary and immediate object of social organisation, the preservation of a certain proportion of relatively weak individuals may be ultimately harmless even on the most stringent interpretation of the Darwinian principle of natural selection. At all events, it is important to have the problem studied in detail, as is the case in this well-loaded document. If it turns out that the preservation of the individual does not, even in a minor degree, impair the fitness of the group, all the better.

It is this important consequence that Dr. Newsholme's investigation, so far as it goes, tends to establish by actual facts. The administrative results we may leave alone. One of the primary intentions of the report was "to determine, on the basis of our national statistics, whether reduction of infant mortality implies any untoward influence on the health of the survivors to later years" (p. 1). The figures of a single year, 1908, are taken and carefully analysed. The counties of high infantile mortality are compared in sufficient detail with the counties of low infantile mortality. Infantile mortality is compared and correlated with the mortality at later ages—age one to two, two to three, three to four, and four to five, and even at age-groups five to ten, ten to fifteen, fifteen to twenty. In this way, data variously presented are obtained for testing the influence that the infantile mortality has on the mortality of the survivors, even up to adult ages.

"This comparison is important, because attempts to reduce infant mortality are regarded by many as an interference with natural selection, which must be inimical to the average health of those surviving. According to this school of thought" (we think Dr. Newsholme too generous, if he is not ironical, in dignifying those somewhat casual theorists by the name of "school"), "efforts

<sup>1</sup> Supplement to the Thirty-ninth Annual Report of the Local Government Board, 1909-10. By Dr. Arthur Newsholme, Medical Officer to the Board. (London: Wyman and Sons, Ltd., 1910.) Price 1s. 3d.

to save infant life merely prevent the weeding out of the unfit, and ensure the survival of an excessive proportion of weaklings" (p. 9). The results of the "correlations" are startling, though some of them may equally be come at by general reasoning. However we turn the figures, it remains true that "a high infant death-rate in a given community implies, in general, a high death-rate in the next four years of life, while low death-rates at both age-periods are similarly associated" (p. 13). Thus of the eight administrative counties with highest infant death-rates, the infant death-rate was 139.1 per 1000 births, and the death-rate at age one to five was 69.2, while in the eight administrative counties with lowest infant death-rate, the corresponding figures were 77.9 and 32.6.

This relationship is found also in the comparisons of the individual counties. But the correlations reveal the further fact that at the later ages the same general relation is true. "Speaking generally, it will be seen that the eight counties having a high infant mortality also had a relatively high death-rate of males during each of the four first lustra of life, and the eight counties having a low infant mortality had also a relatively low mortality at ages 0-5 and 5-10, and to a diminishing extent at 10-15 and 15-20" (p. 16). Probably at the later ages other special influences, such as migration, complicate the issue.

The problem of the "selective influence" is analysed and estimated in greater detail in a special section by Mr. Udney Yule, whose general conclusion, from somewhat inadequate data, is "that there is little definite evidence of such selection beyond the second year of life, and that after the third year the environmental influences even of infancy alone appear to preponderate over any possible selective influence" (p. 78). There is no space even to indicate the wealth of fact that goes to the discussion of the causes of infant mortality. The broad conclusion is that no effort should be spared to reduce the mortality of infants and to remove all removable causes of death. Philanthropic impulse is thus reinforced by scientific analysis of the facts. This report will be followed next year by a similar study of infant mortality in the large towns. Dr. Newsholme is to be congratulated on his admirable combination of scientific analysis with practical administration.

#### FIXATION OF ATMOSPHERIC NITROGEN.

SINCE the work of Lord Rayleigh in 1894, when he repeated the experiments of Cavendish with improved apparatus and more modern methods, continual progress has been made in connection with the oxidation of atmospheric nitrogen. Rayleigh's experiments, carried out on a large laboratory scale, showed the feasibility of obtaining nitric acid or nitrates from the atmosphere, and, given cheap power and appropriate appliances, the possibility of it being done on a paying commercial scale.

The pioneering work which followed for a long time spelt—commercially—failure. But as first one idea and then another was shown to be unsatisfactory, and had to be discarded, knowledge increased, as is always the case with research, and in 1903 Birkeland and Eyde designed and erected a plant which, at any rate, in part solved the problem. In a lecture delivered before the German Association of Naturalists and Physicians in September last, Prof. J. Zenneck takes up the subject at that stage, and reviews this process and others which have since been devised (Leipzig: S. Hirzel, 1911). The lecture was evidently delivered to a popular audience, because Prof. Zenneck describes and illustrates the processes in a way which will interest and instruct those who may have very little knowledge of chemistry. For example, by means of a model, he showed how in the Notodden process of Birkeland and Eyde the air is driven by means of a compressor through the furnace containing the disc-shaped arc, then how gases are partially cooled and the heat given up is used for the generation of steam and for evaporating the liquors. We believe, indeed, that coal is not required in the works at all for heating purposes. The Notodden plant, however, is so well known that it will be superfluous to describe it further, except to mention that very good diagrams and pictures of the works are included in the printed lecture.