

present our teaching involves a large amount of disciplinary drill in subjects like algebra, which affords no outlook beyond that afforded by the examination value of the subject.

Mr. Godfrey finds that, whatever may be the real educational value of this training, we have no definite proof that it confers advantages which could not be at least equally efficiently derived from other studies. On the other hand, we have certainly failed in one thing: broadly speaking, we have failed to make mathematical thought enter as a main element into the life of the educated classes. More and more the affairs of life are being made amenable to mathematical treatment, and as it has turned out the development has been on lines divergent from the lines of schoolwork. In these developments, the study of the calculus has been the fundamental form in which mathematics is applied to the affairs of modern life. This study, however, does not grow out of the summit of school mathematics, but branches off low down the stem, and it is independent of formal geometry; a vigorous pruning of school algebra and arithmetic would in no wise prejudice the growth we want to encourage.

Mr. Godfrey, referring to the requirements of the non-mathematical schoolboy, compares the drudgery and drill of multiplying and dividing long algebraic expressions to the technique of piano-playing, which may be useful for the professional musician, but conspicuously fails to stimulate a taste for music in the average pupil. He finds that the time saved from this drill would amply suffice not only for the teaching of the calculus when its fundamental principles are divested of the unnecessary complications introduced by the consideration of transcendental functions, but that a stimulating course in mechanics can quite well be fitted into the curriculum which the mathematical as distinct from the science master can provide for the non-specialist schoolboy.

As regards statics the position is clear, provided that experimental methods receive due prominence. The case for dynamics is not so clear, and Mr. Godfrey's difficulties may perhaps receive confirmation from the disagreement which still exists among teachers regarding mass and weight, pounds and slugs. He would therefore propose to restrict the study to kinematics, which, as he points out, is really nothing more than geometry with the introduction of a time element. Many of Mr. Godfrey's suggestions have been under the consideration of the committees appointed by the Mathematical Association to inquire into the teaching of school mathematics, and the feasibility of the proposals to which he directs attention is proved by the fact that, in the French lycées for classical specialists, the proposed training in analysis is reached with a far shorter number of hours of schoolwork than is given to mathematics in England.

The views indicated very imperfectly in this abstract will doubtless be read with regret by disciples of the old school. But England's neglect of mathematics requires us to face many hard and unpleasant truths, and it is probably no exaggeration to say that at the present time a plea for the study of classics, even Latin and Greek grammar, would receive a favourable reception at the hands of a large section of the British public which would turn a deaf ear to any corresponding claim of the mathematician.

G. H. B.

THE HEALTH OF THE NATION.

THE sixth annual meeting of the National League for Physical Education and Improvement was held at the Mansion House on December 8, the Lord Mayor presiding. Letters of regret were read from the Archbishop of York, Lord Haldane, the Lord Chief Justice, and others. The first speaker was Sir Archibald Geikie, president of the Royal Society. He greatly approved of the objects of the league, which are to stimulate public interest in the physical improvement of the people, to lessen waste by coordinating agencies already established for this purpose, and starting them where none at present exist, to make better known the local powers already possessed by public authorities, and to promote fresh legislation where necessary. In a short, telling speech he pointed out that while the league was to be congratulated on the very rapid and

excellent progress it had made during the six years in which it has been in existence, it has been, and still is, hampered by want of funds, a want which it is to be hoped will be remedied in the coming year by the aid of all those who have the health of the nation at heart.

Bishop Boyd Carpenter described more in detail the work of the league during the past year. The three subjects on which it had been particularly engaged were the need for a clean milk supply, organised physical recreation, and the dangers arising from the use of inflammable makes of flannelette. He showed that the league's work was not of a purely philanthropic nature—it was an effort at self-protection on the part of a great nation. It tried to protect children in their upgrowth and to prevent them, in various ways, from becoming a source of weakness to the community.

Prof. Bostock Hill, medical officer of health for Warwickshire, suggested that a national health week be instituted, culminating in a Health Sunday, when the churches might bring home to the nation the gospel of hygiene. Communal sanitation has resulted in a very considerable reduction in the death-rate of this country; but he pointed out that more than communal effort was now required, and that this could only be brought about by giving to the people individually a knowledge of what hygiene could do for them, and at the same time co-ordinating the services of all societies, private and public, towards this end. People must be brought to understand that hygiene consists in the spread of cleanliness, applied to air, food, earth, and the dwelling.

Lady St. Davids brought forward several practical suggestions, such as the formation of tooth clubs for toothless people, instead of boot clubs for bootless children, since the former were in more danger of injuring their constitution than the latter. She also pleaded for the closer cooperation of the nursing profession with all who were concerned in the promotion of the health of the nation.

THE ANALYSIS OF SPECIES.¹

THE author of the paper referred to below has made an important pioneer contribution to the study of heredity in crosses between plants of widely divergent phylogeny, viz. reputed species of *Linum*, and has compared the results obtained from such species-hybrids with those obtained from the simpler varietal crosses. Statistical methods have been utilised for the expression of the characters examined, as in the work of Johanssen.

The general trend of the results is to show that even in cases where the composition of F_2 appears to present perfectly smooth variation between the two parental extremes, the behaviour in F_3 shows that the inheritance is in reality factorial, and can be most easily explained on Mendelian principles. The frequency with which the parental forms reappear is least in crosses of reputed species, and becomes more common with closer crosses until simple mono-hybrids are reached. The methods by which the data were obtained appear to have been above suspicion, both experimentally and statistically, while the important error from vicinism is said to have been excluded.

One possibility has perhaps been overlooked, namely, that while the inheritance of such a character as length of seed is probably determined by several allelomorphic pairs, yet the ultimate dimensions of the seed of any given plant, fluctuation having been evaluated, may be influenced through correlation with other similarly inherited characters, notably the dimensions of the fruit. The position of any plant in the frequency curve for a family is thus, apart from fluctuation, firstly determined by the factors which it carries, and secondarily by a deflection of the expression of those factors from the normal by somatic correlation.

The characters studied were the length and breadth of the seed, the length and breadth of the petals, and the

¹ "Das Verhalten fluktuierend variierender Merkmale bei der Bastardierung." Von Tine Tammes, aus dem Botanischen Laboratorium der Universität Groningen. Extrait du Recueil des Travaux botaniques Néerlandais, vol. viii., Livr. 3, 1911.