limited inheritance and other important problems connected with inheritance studies, but I have already too severely tested your endurance.

As breeders and genetists we have every reason to congratulate ourselves on the rapid advance of our science and the growing recognition of the importance of the subject in practical agriculture. Colleges throughout the country are extending their courses of study to include genetics. In almost all of the experiment stations studies on genetics and practical breeding are now given fully as much attention as any other subject. With all of this advance, however, only in a few institutions have there been established special professorships or investigatorships in breeding or genetics. If the subject of genetics is to be properly taught or the investigations are to reach the highest standard, it is clear that men should have this as their special and recognized field. The subject should no longer be assigned indiscriminately to the horticulturist, agronomist, animal husbandmen or dairymen. We must establish more professorships of genetics or breeding.

HERBERT J. WEBBER
CORNELL UNIVERSITY

GENERAL HYGIENE AS A REQUIRED COLLEGE COURSE[1]

DURING the last two or three decades, scientific method has been increasingly applied to the solution of problems bearing upon the health of the individual and of the community. Out of the region of controversy, in the study of problems of the maintenance and preservation of health, there has thus come to maturity during comparatively recent years a body of organized knowledge, of which the cardinal facts and broader methods may, perhaps, be grouped together under the title "general hygiene." The more technical and detailed side of the same subject is already taught as a professional course in some of our medical schools as "hygiene" or, with nominally a more specialized bearing, as "public health." On the other hand, a somewhat slight and semi-popular treatment of several hygienic topics is given in certain colleges by the instructors in physical training. Between these two types of instruction, a course in general hygiene, very substantial although non-technical, would strike a happy mean.

Before answering the question whether the teaching of general hygiene, thus defined, to every college undergraduate is necessary, it may first be enquired whether the average student is not already well-informed on this subject. On investigation, it will be found that he may have, in an informal way, attended one or two popular health lectures; that he has a hear-say, gossiping knowledge of the names of the commoner diseases, with a more personal but badly proportioned knowledge of one or two; has never seen a microbe, although he can use the word correctly; trusts implicitly to the initiative of the local civic authorities (who are less well educated than himself) for improvement in his supplies of water, milk and food; and is indebted to his newspaper or magazine for a variety of scraps of knowledge in the domain of preventive medicine, which scraps, if not partially forgotten, are admixed with much that is vague, or controversial or else fallacious. The fact is that his knowledge of general hygiene is altogether accidental and amateurish in character. Now, if the average undergraduate is in a twilight of ignorance in regard to aspects of this subject where knowledge would be vitally important to himself, he is in still greater darkness in

[1] The substance of an address given at Oberlin College, December 1, 1911.

regard to those aspects which are of importance to the community. In this respect, therefore, he is altogether unqualified for good citizenship.

It is true that the larger cities have, in general, progressive health departments. The chief difficulty which these departments have to contend with in their efforts at reform is the ignorance of the public. Their battle is the old battle against ignorance. If only the people had a clear knowledge of the facts, they would themselves clamor for the very reforms that the health departments can not yet introduce simply because public opinion is not yet sufficiently educated. In the smaller cities and towns, many municipal conditions are excellent because their utility is obvious and because, being of a purely economic character, they are understood by business men. This is not at all the case with the hygiene of such towns, for the good reason that people and civic authorities alike do not, for want of the appropriate education, realize what conditions are desirable for the public health. Milk inspection and food inspection are not rated at their true value for want of the necessary mental perspective. The town sells water whose purity is not controlled. Appropriations made for the health department are entirely inadequate and the health officer, therefore, lacks the sinews of war against disease. This state of matters is typical of the smaller cities and towns of this country. The remedy lies in an educated public opinion; and who, in such a community, should be the leaders and educators of public opinion rather than the college graduates?

It is not at all necessary, in the meantime, to make any rigid decision what should constitute the essentials of a course of general hygiene, nor to determine how the emphasis shall be distributed between personal hygiene and public hygiene. The precise content of the course can be outlined after it is decided that something of the kind must be taught. Now, if there is any reason for teaching civics in college, there is at once a still better reason for teaching public hygiene. Again, if you make "physical culture" a required course and compel each undergraduate to take exercise, are you not in a position to join to this an exhortation that he shall sterilize his toothbrush? It is absurd that any post-Levitican scheme of physical education should rely upon exercise alone for health.

To a people living amid artificial surroundings, the kind of special knowledge that promotes physical efficiency may not be the most important of all knowledge, but it is at least a very necessary kind of knowledge. Upon this matter, Herbert Spencer's judgment is still modern. We are probably tired of the threadbare subject of ventilation, and bored at the mention of the low humidity of steam-heated buildings. But do many of us yet ventilate adequately, or suitably moisten our living air? Do we have in mind the direct relationship between ventilation and bad-air diseases in terms of facts sufficiently definite to spur us to action? Are we positive and militant in our knowledge of the sources of infection and the modes of transmission of communicable diseases; or, when we ought to act, do we remain supine because our knowledge is not a compelling knowledge? Can our typical undergraduate pass a simple examination even on such well-canvassed subjects as diphtheria antitoxin, deep cuts and tetanus, mosquitoes and malaria, pasteurization of milk, sunlight and germs, spitting, dust, flies and the dozen other familiar newspaper topics; or is his knowledge even of these topics too entirely in journalese?

It should be recalled that the war with ignorance is nowadays not only with ignorance of the ways of nature, but also with ignorance of the deceits and methods of wickedness of our fellowmen. As part of their equipment for the battle of life is it, then, anything more than common fairness to give to our college youth at least the bare facts in regard to typical "cough cures" (containing morphine, codeine, heroine, cannabis indica, chloroform, ether), "catarrh powders" (containing cocaine, etc.), asthma, headache, colic, tobacco and drug habit cures (the last themselves containing morphine) and medicated "soft-drinks" (containing caffein, extract of kola nut, etc.)? "It may be of interest to note that life insurance companies are considering the status of soft-drink habitués as future risks."[2] When the particular drug alcohol is under discussion, we are reminded of the strongly partisan, unbalanced and therefore unconvincing oratory of a certain type of temperance lecturer. Upon this and several other subjects it were surely wiser to give the undergraduate the benefit of a scientific and dispassionate statement of the facts, removed from all suspicion of the distortions arising from controversy. The facts require no garnishing.

It is a platitude that the fraudulent, worthless or harmful drugs, "remedies" and "treatments" are introduced to and used by a very wide public because of their very wide advertising in the newspapers. There are, indeed, a few newspapers which will not print such advertisements, but these are honorable exceptions to a general rule. The government and medical association laboratories, whose analyses expose the nature of these drugs, do not similarly advertise their exposures in the public press, nor do they by their own publications reach a wide public. Under these circumstances has not the college, as a public institution, a duty to fulfil in spreading the truth? For all our colleges must be regarded as public institutions—state-aided colleges and universities most obviously of all. Stating the case generally, therefore, can we not fairly say that the colleges, in their relation to the state, are in duty bound, in partial return for public moneys expended upon them, to contribute, by educating their students in hygiene, towards that most important factor of the public welfare, the public health?

Turn now to the question whether instruction in general hygiene as a required course could be sound educationally without the postulation of half a dozen prerequisite courses that could not be made required courses. The *a priori* answer to this question must be left to the experts. In our opinion, however, there are no difficulties here that are insurmountable. It may be recalled, in the first place, that, in some states, the public schools, with their "physiology" teaching, have already begun a type of instruction which it would be perfectly good pedagogy to continue in college. That the school should be more progressive than the college seems, by the way, to be the normal condition of affairs. The general hygiene course need not necessarily be made a freshman course; thus, many students may come to this course with some previous training in contributing sciences. Taking, therefore, what would appear to be the most unfavorable case, that, namely, of the student who has touched no science whatever, let us consider to what pedagogical catastrophe he will be subjected in studying general hygiene. It has been said above that the rapid modern growth of this science is

[2] Dr. Kebler, chief of the Division of Drugs, Bureau of Chemistry, U. S. Dept. of Agriculture.

attributable, in general terms, to the increasing application of scientific method to health problems. It may now be added that many of the very most striking examples of successful application of scientific method are to be found precisely in this domain. Here, therefore, is to be found one of the richest fields in which to exemplify and illustrate scientific method. To a student entirely innocent of science such a course would, in this way, be of superlative value as an introduction to scientific method, and this apart altogether from any utilitarian value inherent in the facts presented. Laboratory work, although we often make a fetish of it, is by no means a *sine qua non* in the teaching of scientific method; and the teaching of a substantial though non-technical course in hygiene would, from the very variety of the contributing sciences, offer exceptional opportunities for utilizing the whole battery of modern methods of class-room demonstration.

Some one has truly said that, as a nation, we are prodigal of nothing in so great a degree as of our health. It is the chief of the wastes of our national resources, our largest preventable waste. To be effective, a knowledge of preventive medicine must be in the hands of the many, whereas a knowledge of merely remedial medicine may be effective in the hands of the few. To conserve our health resources, therefore, the logical policy is plainly to teach prevention to many and cure to a few. To the medical student, who is a specialist, teach cure; but to the general student teach prevention. If prevention can not be taught more widely still in the community, its teaching in colleges makes it at least possible that, in this matter, the college graduates may become the little leaven that shall leaven the whole lump.

If it be true that the last few decades have witnessed abnormally swift progress in the science of preventive medicine, and if it also be true that the development of a social conscience has been unusually rapid in recent years, then it may well be the case that the time for requiring the teaching of general hygiene in our colleges is now at hand.

Alan W. C. Menzies
The University of Chicago

ELIZABETH THOMPSON SCIENCE FUND

The thirty-seventh meeting of the board of trustees was held on February 9 last at Cambridge, Mass. The records of the last meeting were read and approved. The following officers were elected:

President—Edward C. Pickering.
Treasurer—Charles S. Rackemann.
Secretary—Charles S. Minot.

The secretary reported that a pamphlet, giving the record of the Fund for the twenty-five years of its existence, had been prepared and printed in accordance with the vote of last year. This carries the record of the fund to April, 1911. In compiling the matter for this record valuable assistance had been received from Dr. F. T. Lewis. Copies of the report have been sent to each of the trustees, to all living recipients of previous grants, and to a small number of libraries and institutions. Any one desiring a copy of the report should address the secretary.

The secretary reported that additional publications had been received connected with grants, the record of which had been closed, as follows:

139. Joh. Königsberger.
153. W. Doberck.
159. B. M. Davis.

It was voted to close the record of grants 117, E. Salkowski, and 146, M. Nussbaum. No reports had been received from the holders of grants Nos. 22 and 27, 109, 112, 124 and 147. The trustees much regret that the recipients of these grants have failed to ful-