29, and comprises the leading official economic entomologists of the world.

A number of resolutions were passed; among others, the following: (1) Resolutions relating to the death of Dr. C. V. Riley, the originator and first President of the Association; (2) urging the publication by the U. S. Department of Agriculture of the general index to the seven volumes of Insect Life; (3) recognizing the importance of the work being done by the State of Massachusetts in the control of the gypsy moth, urging the continuance by the State of work in this direction and expressing the greatest confidence in the officers now charged with it.

The annual address of the President, Mr. C. H. Fernald, professor of entomology, Massachusetts State Agricultural College, Amherst, Mass., was entitled 'The Evolution of Economic Entomology,' and was devoted to a historical resumé of the progress in the practical control of insects from the earliest times to the present. It is printed in this Journal.

The following papers were read and discussed:

Some Temperature Effects on Household Insects; *On the Futility of Trunk and Crown Washes for the Elm Leaf-beetle*; *Remarks on Steam Spraying Machines.* L. O. Howard.

Three Years' Study of an Outbreak of the Chinch Bug in Ohio; Insects of the Year in Ohio. F. M. Webster.

A New Insecticide. A. H. Kirkland.

Comparative Tests with New and Old Arsenicals on Foliage and with Larvæ; Insecticide Soaps. C. L. Marlatt.

Enemies of the San José Scale in California. J. B. Smith.

Insect Enemies of Forest Trees; *Notes on Some Observations in West Virginia.* A. D. Hopkins.

Notes on Insect Attacks of the Year. J. A. Lintner.

Entomological Notes from Maryland. W. G. Johnson.

The following papers, the authors of which were not present, were read by title, but, it is expected, will be included in the published proceedings of the Association:

The Grasshopper Disease in Colorado. C. P. Gillette.

The Development of the Mediterranean Flour Moth. F. H. Chittenden.

Notes on the San José Scale. W. B. Alwood.

A New Garden Smynthurid. F. L. Harvey.

A Simple Device for the Preparation of Oil Emulsions. H. A. Morgan.

The following officers were elected for the ensuing year: President, F. M. Webster; First Vice-President, Herbert Osborn; Second Vice-President, Lawrence Bruner; Secretary, C. L. Marlatt.

In accordance with the established custom, the next session will be held on the two days preceding the general sessions of the American Association for the Advancement of Science, Detroit, Mich., August 6–7, 1897.

C. L. Marlatt,
Secretary.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

ADDRESS BY THE VICE-PRESIDENT BEFORE SECTION I.—SOCIAL AND ECONOMIC SCIENCE.—HORTICULTURE AND HEALTH.

I should be lacking in ordinary sensibility did I not appreciate the compliment of being elected Vice-President of Section I of the American Association for the Advancement of Science.

To be called to this office in an Association that has for years stood for the scientific thought and scientific progress of this continent; an Association whose list of officers and members has contained the names of some of the most distinguished men and women of our time; an Association whose proceedings are an index of the marvellous advances made by scientific research during the latter half of the nineteenth century, is truly an honor that any man or woman might covet.

Since accepting the honor, there are two words that have appealed to me with equal force and signal persistency.

These words are *responsibility* and *opportunity*. The former I have tried to discharge in an earnest effort to secure papers, and arrange an equally interesting and profitable program for this sectional meeting, and the latter I try to meet in the address which follows.

This year the title of Section I is changed, and its scope enlarged. It is no longer the Section of Economic Science and Statistics, but the Section of Social and Economic Science.

This change was precipitated by a series of resolutions presented before the Brooklyn meeting of 1894. The purport of the resolutions was, that inasmuch as the stated object, no less than the true function of the American Association, is to promote the advancement of *all science*, including the science of society, it was in duty bound to aid and assist all desirable reforms, to the end that the progress of modern society, by the application of scientific principles and methods, might be advanced and its perpetuity assured.

At the same meeting an amendment to the constitution was proposed, which changed the name, as already stated, and so enlarged the field as to include all those branches of knowledge which deal with the political, commercial, economic and social life of mankind. This amendment was adopted at the Springfield meeting of last year, and we now meet for the first time as a section of social and economic science. Permit me to add that, in my judgment, the all-inclusive term 'social science' would have been sufficient, for the word 'economic' only defines a branch of the larger science already named.

We live in an era of reforms. At first man was a reformer by primal necessity. He transformed or reformed nature to meet his bodily wants. His life was a mere struggle for existence.

In time he turned his eyes inward and studied himself. He first dimly saw that there were higher ends and nobler purposes than mere sensual enjoyment. He slowly learned that his passions and appetites were created to serve and sustain, not to master and destroy.

Then, turning his eyes outward, and scanning his relation to others, he found, not justice, much less love and good will, but necessity on the one hand and advantage on the other, controlling the dealings of man with man. He met no recognition of the brotherhood of the human race. But progress is a law of our being, and we have now reached a point where ethical laws are being applied to practical life.

To this end are the various special reforms of this day and generation mainly directed. There are reforms in church and state polity, reforms in municipal government, educational reforms, prison reforms, dress reforms, reforms in eating and drinking, and numerous other special reform movements, which challenge our attention.

What the true, genuine reform spirit of our age is seeking to establish is the equality of human rights; an equality that disregards all disparities of race, sex or color, of strength, knowledge or creed; an equality that is plainly and tersely expressed in the Declaration of Independence:

> "We hold these truths to be self-evident: that all men are created equal; that they are endowed by their Creator with certain unalienable rights; that among those are life, liberty and the pursuit of happiness."

As a people we may be selfish, short-sighted and sinful, yet there is a strong undercurrent of moral obligation to live for the highest good of humanity, to cooperate with that 'power which makes for righteousness.'

Through all the folly and evils of our time there comes to every discerning ear a voice which speaks to us in no uncertain tone. Its message is this: Teach the child

and you will not be obliged to hang the man; find the vagrant orphan a home and teach him a useful trade, and you will not have to punish him as a thief, or watch him as a criminal; furnish work to all who need it, and there will be but few to support as tramps, paupers and parasites; remove temptation from the path of the weak, and you will not be obliged to punish them for having stumbled and fallen; it is better to counsel than to condemn, better to lift up than to crush down, better to be shielded by love and gratitude than to be protected by soldiers and police. Thus testifies the moral genius of our age. Let us try to understand and heed it.

The great, all-embracing reform of our age and country, one that naturally follows the banishment of human chattelhood from our soil—one that is palpably demanded by every instinct of justice and humanity—is that which will lift the industrial classes from the plane of servility to one of self-respect, self-guidance and independence. Its object is to lift the laborer, not out of labor, but out of ignorance, inefficiency and want. This great end cannot be attained at once, but the development of a truer and more profound social and economic science should help to pave the way.

The socialist has his dream of an ideal world. He believes it possible to have a social and industrial order wherein all freely serve and all are served in return; where no drones or sensualists can abide; where education is as free and common as air and sunshine; where nothing but service secures approbation, and nothing but merit wins esteem; where mental development and moral culture is the aim, as well as the possible attainment of all. Is such an order possible? What says social science?

It may be well to repeat here the question discussed by Vice-President Fernow at the last meeting of this Section.

Have we a social and economic science? Have we enough observations, facts, laws, principles, subservient to social and economic conditions, so well arranged and classified as to warrant the use of the term *science?* I believe we have. Let me not be misunderstood. I am not a teacher of such science. I rank low in the class of learners. What I know of science as applicable to society and economics is slight indeed. Yet I know there is such a science, and I believe that each succeeding year enlarges, improves and perfects it.

If some of the recent applications of this science appear shallow and seem almost to partake of the nature of quackery, this should not bar the way to our advance to the acquisition and development of a true social and economic science, which shall be neither shallow nor empirical.

In this spirit, and with no little hesitation, I present a few thoughts on 'Horticulture and Health.'

Ours is an eminently practical age. The energy of our people is mainly expended in the production, manufacture and distribution of articles that nourish the body, gratify the senses, or in some way contribute to the comfort and convenience of mankind.

Mind is steadily dominating matter, and this extension of the sovereignty of man over the material forces of the earth we call civilization.

The art of horticulture consists primarily in transforming, by means of cultivation, crude and worthless materials into substances valuable as food products, or useful in ministering to our love of the beautiful. This raw material is furnished by the soil, and such substances as may be added thereto, together with certain elements of the air.

Etymologically speaking, *horticulture* means the cultivation of a garden. The real scope of this definition depends upon

the meaning of the word *garden*. According to philology, this word comes directly from the Anglo-Saxon *gyrdan*, to enclose. It is the root of the verb *to gird*, meaning to encircle.

Gardening and horticulture, like farming and agriculture, are synonymous terms. We should remember, however, that the full scope of the meaning of a word is not determined by its derivation. This must be sought in its general use and common application. By this standard horticulture readily separates itself into four great divisions, each of which may be many times subdivided.

These principal divisions are:

I. Pomology, or fruit culture.
II. Olericulture, or vegetable gardening.
III. Floriculture.
IV. Landscape-horticulture.

The first two of the above divisions belong to the realm of industrial or domestic art. The third, floriculture, is both an industrial and a fine art. While the last, landscape-horticulture, lies wholly within the province of fine art.

Horticulture is more than a mere trade. It is more than a productive industry. Its successful practice is based upon great laws which have been deduced from the natural and physical sciences.

Many of these laws may be arrested, modified or set in motion at will.

The horticulturist, as he learns the control of these laws is largely in his own hands, becomes an enthusiastic student and investigator, and can scarcely fail to develop a love for rural life—a love that is deep and abiding. Horticulture may justly rank as a science, as well as an art. Not to speak of the science of the propagation of plants, or the science of tillage, the great fundamental principles of evolution are exemplified in horticulture as nowhere else. Over 6,000 species of plants are cultivated by the horticulturist, and these have produced almost an infinite number of distinct forms.

In these forms, with their wonderful and intricate variations, we can study the laws of genesis, and the master mind of Bailey and others are rapidly reducing the wealth of the facts found in greenhouse, garden and orchard to the semblance of an orderly, systematic and progressive science. The influence of natural and artificial selection, the effect of soil, climate and moisture upon development, the transmission of acquired characters, the formation of new species, are revealed in horticulture as in an open book. Here facts take the place of conjecture, and demonstration is substituted for theory.

In discussing the relation that horticulture bears to health, not physical health alone, but intellectual and spiritual health, have been considered. In like manner, the products of horticulture, as well as horticulture as a vocation or recreation, are taken into account. First, let us consider the effects of the use of our common garden and orchard products, as a part of an every-day diet.

There is a great deal of talk about health and diet that is equally foolish and hurtful; foolish because it subserves no good end, and hurtful because it tends to fortify the pernicious idea that our bodies are in such wretched condition as to need constant tinkering, and that some sort of self-medication is a positive duty.

Like malaria, this affection is everywhere. How shall it be treated? In the place of this widespread delusion there should be an inbuilt conviction that there are certain articles known as foods, in the choice of which and in the quantity used each one has daily opportunity to exercise the virtues of common sense and moderation. But foods are not medicines.

A medicine is something which is taken into the body to produce a certain specific and unusual effect, the object being to counteract some injurious tendency or abnormal

state. If taken when not needed, its effect is likely to be directly injurious. In order to maintain strength and vigor, and repair waste, the normally healthy body craves what is *wholesome*, not what is *medicinal*. When a thing has real medicinal value, it is almost certain to be unwholsome as a general article of diet. There is an old tradition, even now quite generally believed, although gradually fading away, that anything that affords us simple physical pleasure is dangerous, if not absolutely sinful.

So when one eats freely of fruits he does not feel justified in simply saying he does so because he finds them agreeable; he likes and craves them, but is constrained to look wise and solemnly observe that 'fruits are very healthy.' Some even go so far as the German prince, and have for each bodily ailment a different variety of fruit. The prince said, "Whenever I meet with any misfortune or affliction, and am disposed to give way to my grief, I order a young goose nicely roasted, and eat as much thereof as I can; I always find that I rise from the table far less unhappy." Let us banish the idea of making a drug store of our fruit-gardens and orchards, and cease looking upon the family fruit basket as a sort of homœopathic pill box!

"Blessed are they that hunger and thirst," can be said as truly of our bodily wants as of our spiritual necessities; not blessed because they shall be medicated, but because "they shall be filled," with what tastes good, with what gives genuine and lasting pleasure.

In satisfying our hunger for fruit, fruit that is well matured, juicy and fine flavored, we get perhaps the highest form of palate gratification with the least possible digestive effort.

Our ordinary fruits contain the following substances in greater or less proportions:

1. A large percentage of *water*.

2. *Sugar*, in the form of grape and fruit sugar.

3. *Free organic acids*, varying slightly according to the kind of fruit. For example, the predominating acid is malic in the apple, tartaric in the grape, citric in the lemon.

4. *Protein or albuminoids*, substances containing nitrogen, which resemble the white of eggs, and are its equivalent in food value.

5. *Pectose*, the substance which gives firmness to fruit, and which upon boiling yields various fruit jellies.

6. *Celluluse or vegetable fibre*, the material that forms the cell walls, and which is found in all parts of plants.

7. A very small percentage of *ash* or *mineral salts*.

The substances named above are, with the exception of cellulose, essential constituents of a perfect diet. The percentages of the different nutrients are so small, however, that most of our fruit has little actual food value. For example, the nutrients contained in the strawberry, according to analysis made at the Ohio State University, are as follows:

Carbohydrates	8.0 per cent.
Protein	.3 " "
Fat	.0 " "

It has been estimated that the minimum daily ration of nutrients for a man of average weight, in performing an ordinary day's work, is:

Carbohydrates	500 grams,	or	17.6 ounces.
Protein	118 "	"	4.2 "
Fat	36 "	"	2.0 "

A simple calculation will show that person would have to consume about 200 ounces, or 13 pounds, of strawberries daily in order to obtain the proper amount of carbohydrates from this source.

In order to secure the necessary amount of protein from the same source, a daily consumption of 1,400 ounces, or 88 pounds, of strawberries would be required.

This would be a task that even the most ardent admirer of this fruit could scarcely be prevailed upon to attempt. Take another illustration from the vegetable, rather than the fruit garden.

The nutrients contained in the tomato are as follows :

Carbohydrates	2.5 per cent.
Protein	.8 " "
Fat	.4 " "

Applying the same calculation as before will show that one would have to eat 500 ounces, or 31.2 pounds, of tomatoes each day for the requisite fat; he would have to eat 525 ounces, or 32.8 pounds, for the necessary protein, and for the carbohydrates it would require 704.4 ounces, or about 44 pounds. In other words, if one should eat 44 pounds of tomatoes every day, he would consume slightly more fat and protein than were absolutely necessary for a day's supply and just about the right amount of carbohydrates.

This demonstrates that, however valuable strawberries and tomatoes may be as a part of an every-day diet, they cannot be considered as foods. Their actual nutrient value is exceedingly low. In order to support life and maintain strength, strawberries and tomatoes must be eaten in connection with other substances which have more concentrated nutrients. Wherein does their dietetic value consist? Let us briefly consider. The qualities which render fruit and many of the more delicate garden vegetables wholesome, and cause us to have a natural apetite for and hence to enjoy them, are their acid juiciness and flavor. The juice is mainly water, but it comes to us in a grateful and refreshing form. The flavor is due in part to the organic acids already mentioned, but mainly to certain volatile oils or aromatic ethers. It is to these latter that those delicate characteristic flavors of various varieties of fruit are chiefly due.

Chemistry and physiology have taught us that, when these 'fruity acids,' oils, and ethers are taken into the body, they undergo oxidation, which process tends to lower the temperature of the blood, or at least to modify our temperature sensations, and thus correct, or allay, any slight feverishness that may exist. They also tend to keep the organs of secretion, the liver, kidneys, etc., in a healthy condition. We are justified, therefore, in saying that fruits are 'cooling, aperient and grateful.' In our climate, subject as we are to rapid changes and extremes of temperature, passing abruptly, as we often do, from an arctic winter to a tropical summer, the physical system is naturally more or less debilitated.

In this condition we are predisposed to malarial troubles, particularly if we live where the drainage is poor. Fruits and acid vegetables are found to be good correctives for this debilitated condition of the system. The free acids of fruits, especially citric and malic acids, are highly antiseptic bodies. They tend to prevent disease germs from finding a lodgment and developing in the body.

The full beneficial effects of these acids are only to be found in mature fruits. Green, unripe fruits, although they have an abundant supply of acids, are usually injurious, on account of their indigestibility. This arises, mainly, from the coarse and hard condition of the cellulose. When fruits are perfectly developed and properly matured the cellulose is soft and fine. We know that unripe fruit is not wholesome. It digests slowly, often ferments in the stomach, and is the cause of painful disorders. It is unwise to take into our stomachs that which will ferment and decompose; it is certainly no less unwise to eat over-ripe or wilted fruit, in which these destructive changes have already begun. The question is often asked whether such or such a fruit is *healthy*, even when the

question has no special reference to the condition of the fruit itself. All fruits that are eaten ought to be healthy. That is, they should be well matured, sound, and free from disease. As a rule, such 'healthy fruits' are for most of us *wholesome*, although they are neither food nor medicine.

The best results possible from the dietetic use of fruits and vegetables come from eating those that are fresh, healthy and properly matured, and which have been produced by our own skill and industry.

I am dwelling too long upon the relations of the products of horticulture to health.

Let us consider how horticulture as a vocation stands related to the physical, intellectual and moral well-being of mankind. In order to maintain physical strength and vigor, at least four things are needful. These are pure air, nutritious food, unbroken sleep and muscular exercise.

That vocation which comes the nearest to supplying these requisites of good health can scarcely be other than a desirable one. Judged by this standard, horticulture stands at the very head of the list. Its quiet, its segregation from strife and jealous rivalry, its unequaled opportunities for nature study, make it at once attractive and healthful. Blessed is he who works in greenhouse, garden or orchard. As a rule, his day's exertion ends with the evening twilight, and he rises each morning with his physical energies renewed for fresh activity. To him is given that full measure of health only vouchsafed to those who spend most of their waking hours in the free, pure air and renovating sunshine of the open country.

Health is not only wealth, but happiness, and the superior advantages of horticulture as a healthful vocation cannot be too strongly urged.

Floriculture and small fruit culture are preeminently adapted to women. There are few industries where fairer returns for capital and labor expended are more certain; few that can be so well begun with small means, and still remain capable of indefinite extension. Fine fruits and flowers are in universal demand. They are the necessities of the rich and the appreciated luxuries of the poor.

Our densely populated commercial centers, our thronged and fashionable summer resorts, are rarely, if ever, adequately supplied with them. As a rule, they take all they can get, and then look around for more. You might double the largest annual yield of good berries, or fine roses or carnations, with profit to the producers. The home market for products of this sort is signally elastic, the demand ever keeping well abreast of the supply.

The same is true of winter forced vegetables. In the light of a personal experience of over twenty years, I can confidently affirm that the vocation of horticulture, when wisely and energetically followed, is a profitable one. I believe there are few pursuits which afford as bright prospects, or as full an assurance of reward for intelligent, persistent effort, as does this.

Listen to a few facts. The vegetable forcing-houses belonging to the horticulture department of the Ohio State University have an aggregate glass area of a little less than 4,000 square feet. There are two plain structures which could be built at the present time for about $900 each. The total bench space in these two houses is a trifle more than one-twentieth of an acre. During the past five years the annual sales from these forcing-houses have averaged about $600.

The following are among the more important crops commercially grown the past year, and the receipts of each:

Lettuce	$406.10
Radishes	52.25
Beets	45.00
Cucumbers	48.50
Hyacinths	59.25
Total	$611.10

When we consider that these forcing-houses are used but little more than one-half of the year the result attained is encouraging. It should be stated that in addition to the above crops there were grown in less quantities, and chiefly for experimental purposes, parsley, peppers, egg-plant, cauliflower, string beans, onions and a few other vegetables, including mushrooms, as well as a somewhat smaller list of flowering plants.

The cultivation of the small fruits is likewise peculiarly suitable for women. It is a business for both old and young. Examples are not wanting to show signal successes attained in strawberry, currant and gooseberry culture, by women as well as men, when begun in the decline of life.

Small fruit culture is an industry that especially commends itself to poor women who are struggling to support their children in frugal independence. Almost any one can obtain control of a cottage with a half acre, more or less, of warm southward-sloping land, which can be planted with early vegetables and small fruits, in such a way as to be a source of continuous profit. If a small forcing-house can be added, and to this can be accorded that constant supervision without which no industry is likely to prosper, it will be an added source of revenue. In this way many a widow could find a healthful, congenial occupation which did not require her to spend her days away from home, or subject her to the caprices of a selfish or thoughtless employer. I believe there is no other occupation in which, for the capital invested, success is so nearly certain as in horticulture. Of every one hundred men who embark in trade, carefully collected statistics report that at least ninety fail. Why? Mainly because competition is so sharp and traffic so enormously overdone. If one hundred men endeavor to support themselves and families by merchandise in a town which affords adequate business for only ten, it is absolutely certain that a large majority must fail, no matter how able their management or how economical their living. On the other hand, the number of horticulturists in almost any community might be doubled without neccessarily dooming one to failure, or even abridging his income. If one-half of the day laborers in the country were to embark in horticulture to-morrow, I do not believe it would render the industry one whit less profitable, while it could scarcely fail to add to the health, wealth and comfort of all.

I shall have little to say regarding the relation of horticulture to intellectual health. Any true knowledge of the art or practice must be based upon science.

The horticulturist stands face to face with problems which require for their solution the amplest knowledge of nature's laws, the fullest command of science, and the best efforts of the human intellect. In this art, study and mental acquisition, together with a habit of observation and reflection, are equally essential and serviceable. However it may be with others, the horticulturist imperatively needs a knowledge of the character and constitution of the soil he tills, and the plants he cultivates, and the laws which govern their relations to each other.

Geology, chemistry and botany are the sciences which unlock for him the secrets of nature, and a knowledge of these is among the most vitally urgent of his needs.

Horticulture is an intellectual pursuit, and in its practice the strongest minds may find scope for profitable employment. The one who chooses this profession must keep his mind open and his mental faculties alert by constant observation and study. Horticulture is esteemed by all, because every useful vocation is respected in proportion to the measure of intellect it re-

quires and rewards, and never can rise above this level.

The relation of horticulture to moral and spiritual health deserves a more extended consideration. The horticulturist deals directly with nature, and finds little or no temptation to juggle or stoop to trickery. "Whatsoever a man soweth, that shall he also reap," is immediately and palpably true in his case. Nature never has and never can be cheated.

The horticulturist, acting as a horticulturist, soon comes to realize that his success depends upon absolute verity, and he is not likely to be lured from the straight path of integrity and righteousness. When he goes into the markets and becomes a trader he is subjected to the same temptations as others, and may be enticed into some of the many devious ways of rascality. The whole tendency of his vocation, however, conduces most directly to a reverence for honesty and truth. It is likewise conducive to a genuine independence and thorough manliness of character.

The horticulturist is not obliged to swallow any creed, support any party, or defer to any prejudice, in order to successfully follow his calling.

He may be a Democrat, Republican, Populist or Prohibitionist; a gold-bug or a silverite; a free-trader or a protectionist; Christian or infidel; yet his fruit and flowers will sell for exactly what they are worth. Social intolerance of adverse opinions is never directed toward him.

But it is horticulture as a *fine art* that has the most abiding influence. Who can measure the effect of the landscape horticulture of our parks and public grounds, or estimate the value of the external adornment of the home?

Horticulture is nature's best interpreter, and through this art the blinded eyes may be opened, the dormant æsthetic powers awakened, and the heart made ready for a just appreciation of the beautiful. It is well to bring art into our homes, to adorn and decorate them with painting and sculpture; but we must not forget that the sense of beauty must be cultivated before the treasures of art can be made our own. If I were called upon to point out one of the most serious weaknesses in our modern system of education, I should answer, "its failure to accustom the eyes of childhood and youth to the beautiful in nature." The beginning of all true education should be a love of nature, and *nature study* ought to be the dominant note in every educationl system.

What a wealth of beauty there is in tree and shrub and flower, a beauty of which we never tire, and which 'is its own excuse for being!' When the art of horticulture arranges trees and shrubs, flowers and lawn, so as to present an expressive picture to the eye, the beauty is multiplied, and this development of the beautiful is the end and aim of all landscape horticulture.

The claims of horticulture in answering our spiritual needs are no less than they are in answering our physical necessities.

In the first and most essential of human arts we are beginning to recognize one of the last and most useful of human sciences.

How and *where* and *when* can this art and science best do its appointed work?

It is a part of my social creed that there need be, and should be, no paupers who are not infantile, imbecile or disabled. Yet the world is full of men and women doing nothing, mainly because they don't know how to do anything. To correct this, youth should be a season of instruction in some trade or useful art, as well as in letters and various sciences. There should be a blending of labor with study, of training with teaching, so as to preserve health of body and vigorous activity of mind.

The pupil or student should be enabled to nearly or quite make his way through high school, academy and college, and go forth qualified to face adversity and maintain a healthful independence. One step toward the accomplishment of this desired end would be the introduction into our country schools of manual training in horticulture. The land required could be easily secured, and the necessary equipment in the way of tools, seeds, etc., would not be expensive.

The work undertaken in these training schools should embrace the cultivation of fruits, vegetables, flowers, shrubs and trees. In connection with the above the various operations of propagating plants by seeds, cuttings, budding, grafting, etc., should be thoroughly taught. The collection and planting of weeds, the breeding of the more common injurious insects and the use of remedies, the study of bees and useful birds, a practical acquaintance with our native trees and shrubs, and other similar subjects, might form a part of the instruction and training.

The introduction of such a course would mean an improvement of our schoolhouse grounds, and the adornment of these would have an elevating effect upon the whole community.

If we have beautiful school buildings, with beautiful surroundings, the inference is almost irresistible that we shall have teachers and pupils of greater refinement. To develop all the faculties of body and mind is the aim of modern education. Manual training in horticulture can signally aid in securing this end.

I sincerely hope that the obvious advantages of forming horticultural colonies will be widely and rapidly improved. It would correct the unhealthy congestion of our towns and cities. In no other way can so many be provided with homes, regular employment and good living. By a horticultural colony I mean the association of from one hundred to five hundred families, in the purchase of a suitably located tract of land, embracing about one acre for each individual. The location, which should be reasonably near some large commercial center, and the purchase of this land should be intrusted to the most capable and honest members of the association. It should be carefully surveyed and divided into a few small lots, centrally located, for the necessary mechanics and merchants, but mainly into areas of from one to ten acres for horticulture. Ample reservations of the best sites should be made for a schoolhouse, town hall and public park. The streets should be embowered with shade trees, and every owner of a lot or garden should be encouraged to beautify and adorn it.

I believe such a cooperative effort would secure a modest but comfortable home for any family that could contribute from $300 to $500. If the contribution ranged from $500 to $1,000 a proportionally better home could be secured. Some of the advantages of such colonization over the isolated system of taking up a homestead may be summarized as follows:

First. One tenth of the land required under the old system would be found abundant.

Second. It could be far better selected with reference to markets, and more suitable allotments for fruits, garden vegetables, floriculture, nursery, etc., could be made.

Third. Few draught animals and little expensive machinery would be required.

And, finally, man's social and gregarious instincts would be satisfied.

While ignorance and miseducation ruin thousands, I believe that poverty resulting from involuntary idleness sends more men and women to perdition than any other cause.

Horticulture may never become a universal panacea for destitution and crime, yet I have a joyful trust that thousands will

be awakened by it to a larger and nobler conception of the true mission of labor, and by its practice, along the path of simple, honest, persistent work, life may be made easier, and men and women healthier and happier.

William R. Lazenby.
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Columbus, Ohio.

SECTION I.—SOCIAL AND ECONOMIC SCIENCE.

The sessions of the Section of Social and Economic Science had rather more interest and attendance this year than usual from the reopening of the question, voted upon the previous year, of an appropriate title, the new proposition being one of nearly identical meaning, but not so clearly defined in the word Sociology. As first used by Comte (not a very respectable paternity, by the way) and adopted by Spencer, sociology is confined to human societary evolution, a species of linear succession in the unfolding of psychology. Giddings, in his recently issued Principles of Sociology, bases it on the 'consciousness of kind,' a basis broad enough to include the societary institutions of animals, especially certain insects. The fact that several American universities have established chairs of sociology, and the name already includes quite a bibliography with the adjunct of a monthly periodical (although the Europeans are still rather shy of the name) brings into prominence the need of some appropriate title for that branch of knowledge which is concerned with demography, vital statistics, polity, economics, ethics, government, crimes, punishments, education, etc. The determination of this point brings up the underlying one of the need of some recasting of the departments of science concerned in psychical development. New classifications continually appear, in greater or less conformity with the broader views made possible by modern research. It is apparent that we are on the threshhold of a New Physics' which threatens to overlap that of the new Astronomy on the one hand and the new Chemistry on the other; and also to invade the domain of Psychology, with all the portentous consequences implied thereby. So of anthropology (another of Comte's progeny) of indefinite extent, as at present outlined, embracing archeology, ethnology, mythology and folk lore, somatology and psychology. Is sociology properly a branch of anthropology; or should it merely, for convenience of consideration, to be erected into a quasi-independent science?

Popular interest in the deliberations of the Section of Economic Science was this year enhanced by the pending National Presidential election and the political partisan platform issues, especially the 'gold *vs.* silver' controversy, which occupies so large a space in the newspaper and periodical press discussions, as if it were a new subject recently dropped into our economic life. Bimetallism is really an old debate which has been within a generation intensified by the nearly concurrent action of (1) the sale of the German indemnity silver after 1871; (2) the suspension of free coinage (at $15\frac{1}{2}$ to 1) by the Latin Union; (3) the dropping of the silver dollar from the legal tender United States coins in 1873; (4) the fall in market value of silver by the increased output of United States mines, due to richer ores, better machinery and superior methods of extraction; (5) the cessation of silver absorption in Asiatic population—one-third of the human race—due in part to the introduction of railroads and telegraphs, and in part to the supply of ready-made jewelry and silverwares, formerly composed of hoarded coin and reconvertible into coin; (6) the law of redundancy or 'glut,' which operates to send down the price of the whole product, and (7) the widespread agitation and discussion of the value of silver as a unit measure of value which has resulted in