SCIENCE

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MSS. intended for publication and books, etc., intended for review should be sent to the Editor of SCIENCE, Garrison-on-Hudson, N. Y

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. SECTION I, SOCIAL AND ECONOMIC SCIENCE.

THE St. Louis program comprised four regular sessions, in addition to that of the delivery of the retiring vice-president's address by Mr. H. T. Newcomb, on 'Some Recent Phases of the Labor Problem' (SCIENCE, January 8, 1904). This address was made the basis of discussion at the first regular session, which was occupied with papers and discussions on the labor problem generally. The second session, on economic aspects of the new agriculture, was held jointly with the Society for the Promotion of Agricultural Science. The third session dealt with the status of instruction in social and economic science in schools, colleges and universities; and the fourth included papers on commerce, finance and government. All the sessions were presided over by Hon. Simeon E. Baldwin, of the Yale Law School, New Haven, Conn. The other officers were as follows:

Secretary—John Franklin Crowell.

Councilor—Marcus Benjamin.

Sectional Committee—Simeon E. Baldwin, vice-president, 1904; John Franklin Crowell, secretary, 1904–08; H. T. Newcomb, vice-president, 1903; Frank H. Hitchcock, secretary, 1903; E. L. Corthell (one year), Carroll D. Wright (two years), B. E. Fernow (three years), Frank R. Rutter (four years), Wm. R. Lazenby (five years).

Member of General Committee—Allen Ripley Foote.

The following papers were contributed:

Functions of Forestry in the New Agriculture: Thos. H. Sherrard, Bureau of Forestry, Department of Agriculture, Washington, D. C.

Mr. Sherrard's paper dealt with the problem of forest culture, as it related to farming rather than to lumbering, and showed the work of the Bureau of Forestry to this end. Instead of a struggle to win tillable land from the forests the farmer is more often confronted with the difficulty of obtaining building material for his house and wood for his home use. With the growing appreciation of the urgent need for forest preservation, the demand for better methods for handling wood lots to secure their permanency takes a more and more important place. How important is conservative management of wood lots from the standpoint of national economy may be seen from the fact that from one third to one half of the forests of this country are in the hands of farmers. In the new agriculture, the spirit of which is to use every part of the land, forestry has an important place. Just as the new agriculture requires the highest possible production along other lines, so with equal reason it demands that the wood lot should be managed to produce as much wood as possible. The Bureau of Forestry in the Department of Agriculture in the past five years has introduced practical forestry upon over a million and a half acres of private forest land, with applications for assistance covering five and a half million acres.

In principle forestry is an exceedingly simple matter, but its application requires the trained man. The warp and woof of forestry is silviculture—the science of guiding forest growth so that it will best meet the individual need.

The manner of treating these applications involves an examination of the tract by an agent, a report on the same and a recommendation of a working plan if deemed advisable. The Bureau makes the working plan. In the case of large tracts the expense of the field work, necessary to the preparation of the working plan, and the cost of its execution, is borne by the owner. In the case of wood lots with an area not exceeding two hundred acres, the expenses are borne entirely by the Bureau. The purpose of the woodlot work is twofold. *First,* to assist the individual owner, in applying such management to his woodlands as will make them most productive and profitable. *Second,* to encourage, by examples of forest management, a more general understanding of the simple principles underlying forestry. In almost every case owners have asked help of the bureau, because they have a very definite problem of their own to solve. A large proportion of men counting on permanent ownership of their land have wished to know how and where to cut their annual supply of cord wood and such material as they require, so as constantly to improve the value and productiveness of their woods.

Improvement in Farm Management: W. H. Hays, Minnesota State Agricultural Experiment Station, St. Anthony, Minn.

Referring to the 838,591,774 acres in this country, of which 414,498,487 acres were under cultivation and 424,093,287 acres not yet under cultivation, the problem of farm management is, How can the nation and the state assist so that these separate farms and farm-houses may be so well managed that they shall not be supplanted by a system of estates with their centrally located farmsteads and their peasant-like employees? Shall our government and states provide simply higher institutions of agricultural learning to educate managers of large estates, and thus follow the present tendency to centralize industrial work under a few managers? Or shall the

government and the state aid in providing technical education to the great mass of farmers so that the practical farmer can sustain himself and maintain a strong position in life? Technically educating the whole of the farmers and making it possible for each to remain in the life-school of independent business experience, by means of consolidated rural schools, agricultural high schools and the central college—is the answer, which has been worked out to some extent so successfully in Minnesota. (See *Review of Reviews*, October, 1903.) The cost as compared with the present developing systems of schools might be larger, but the immediate economic benefit from enlarged farm production would several times over pay the increased cost.

The next problems are to accumulate the facts, the philosophies and the processes which a scheme of education should teach, and to reduce them to pedagogical form. The teachers and experimenters of America have worked out many of the details of farm management, but have not vigorously taken up the farm as a whole. The soils, the crops and the stock, and the manufacture of farm crops into finished products have been investigated as individual features. These investigations of the parts have reached that degree of development where it seems practicable to take up the problem of managing the farm as a whole. In fact, a few teachers and experimenters have in a preliminary way blocked out some of the more general problems.

There is imperative need of facts as to the relative value per acre of the several crops adapted to a given farm; the cost of labor, seeds, buildings and machinery required for each crop; the amount of its beneficial or injurious effect on the land; the time of year when it requires labor; the desirability with which it dovetails in with other crops and with the care of live stock; and the value per acre of each crop when marketed, or manufactured into meat, milk, sugar or other finished product before marketing. A knowledge of how to arrange the sequence and the proportions of the best paying crops into the most profitable combination of crop rotation with live stock is a necessity.

Economic Functions of Live Stock: CHARLES F. CURTIS, Iowa State College, Ames, Iowa.

The fertility of the soil as part of the nation's working capital returns an annual dividend proportionate to the intelligence of methods employed. However large the crop, not more than one per cent. of the soil's total supply of plant-food is exhausted by a single crop. Otherwise one generation might impoverish another completely by robbing the soil of its resources. Maintenance of fertility is secured by rotation of crops, by chemical fertilizers and by bacteriological methods. But by none of these has the virgin strength of the soil been maintained over long periods except as plant production has been associated with animal husbandry. By selling products (butter) and restoring by-products we take from the soil but one tenth of fertility lost by a grain crop. Grain growing and animal husbandry are complemental industries, the one a summer industry and the other a winter industry.

Thus the latter is necessary to furnish continuous employment for farm labor throughout the year, the demand being greatest during the winter months when there is a cessation of field work, and lightest during the summer when the field work is most exacting. The live stock industry is, therefore, admirably adapted to supplement grain growing in its labor relations.

Then again, it contributes to a more economical use of plant food that may be

added to the soil through feeding stuffs than by any other means. If fertilizing material must be bought for the farm, it can, under all ordinary conditions, be bought in vastly cheaper form as feed stuffs and utilized as such, and the residue applied to the soil, than by purchasing fertilizers outright. The very best of fertilizers are often obtained in this way without any direct outlay. The use of feed stuffs, rich in fertility, may even return a handsome profit as a separate proposition, and thus fertilizing constituents come on to the farm under most advantageous circumstances. The British and the European farmers buy large quantities of our flaxseed and corn by-products. They figure that they are the gainers even if they do not make any profit on their feeding operations with these products, and they are. Until recently the packing house by-products, including dried blood and tankage in various forms, have practically all gone direct to the land as fertilizers. To-day these products are serving a most important purpose as feed stuffs, and the time is near at hand when practically every pound of this material will first be utilized as stock food, and later returned to the soil. The returns are so much greater and so much more economical in this way as to put the purely commercial fertilizer farmer out of business in the space of a few years at the outside, where other conditions are similar.

It is true that fertilizers can not all be bought in the form of stock foods. In some cases it may not be practicable to combine stock raising with the system of agriculture being practised. These conditions are the exception, however, and they do not apply to the distinctive and most productive agricultural regions of our country.

If the seven southern states that annually expend $20,000,000 for commercial fertilizers, would stock their farms, feed their cottonseed meal, instead of exporting it, buy other feed stuffs rich in plant food, rotate with the legumes and practise the best known methods of cultivation in soil tillage, they would in a short time be independent of the fertilizer dealers, and save the vast expenditure which is now such a drain upon the resources of that section of country.

The information, which has gone out recently with scientific endorsement from high authority, to the effect that soil fertility may be maintained indefinitely without resort to fertilizers of any kind, might be viewed with grave alarm if it were to be taken literally. Likewise the doctrine that the deficiencies in soil constituents must be determined by chemical analysis and supplied by chemical fertilizers is equally pernicious. The manifest tendency in regions where farmers rely upon commercial fertilizers, like the tendency where men rely on stimulants, is to use them to excess, and when they are not necessary or profitable.

Agricultural Economics: H. C. Taylor, University of Wisconsin, Madison, Wis.

"The modern farmer produces primarily for the market. This is the chief characteristic of modern commercial agriculture as distinguished from the self-sufficing agriculture of earlier times. * * * The well-being of the modern farmer does not depend, therefore, upon his capacity to produce for himself the things which he wishes to consume, but upon his capacity to win profit in agricultural production. To win the largest net return is then the goal of modern commercial agriculture; and if the economist wishes to make himself useful to the farmer he should undertake, first of all, to solve this problem." This principle was applied to the selection of land, to the selection of crops for the field system by groups of competing and

non-competing crops, to the size of the farm best suited to the farmer, and to the questions of ownership, tenantry and forms of rental.

Where intensive culture is desired, the renting of land on the shares naturally gives way to a cash rent system which requires careful regulation if the best interests of all are to be conserved. As competition for the use of land grows more and more keen all of these questions become of vital importance to the farmer, and of real significance to the country as a whole. The study of the past experience and present practises of older countries, England and Germany, for example, is helpful; but it is of vital importance that the student of these problems be thoroughly familiar with conditions at home.

Evolution of Agriculture in the Middle West and its Social and Economic Significance: EUGENE DAVENPORT, State College of Agriculture, Urbana, Illinois.

This paper, after describing agricultural conditions in the west and pointing out radical changes both in the farm and in the farmer, concluded as follows:

1. Agriculture is eminently profitable and the farmers are not to be reckoned as among the poor of the earth.

2. Farming, as now being organized, is not exhausting the fertility of the soil, but is on a permanent basis and, therefore, the future of the industry and its people is practically assured.

3. That it is raising the value of lands at a rapid rate, thus making the man and not the acre the unit of farm value, the acre being worth its capitalized income.

4. That it is becoming too difficult an occupation, especially on the better lands, for men of inferior ability lacking in special knowledge and training.

Relation of the Family to the Labor Problem: REV. JOHN W. DAY, Church of the Messiah, St. Louis, Mo.

We must recognize the importance of the part played by the home in the making of the labor problem and the influence it may have in the working out of the problem. The reply made by John Mitchell to the inquiry whether the 'lives of the wives and children' of the men he had condemned as traitors to the laborers' cause because they worked independently of the union, ought to be made unendurable, was:

'I think those wives and children had better ask their fathers.'

In this significant reply there is the assumption of a superior loyalty than that to the family. The union claimant asserts therein that the real interest of the family lies in absolute subordination to the union. The union disclaims responsibility for any harm that may come to the outside family through its action. The welfare of the family can only be considered through its subjection to the union organization. 'Let the fathers answer that question' means that the family can not command their central loyalty, that the union acknowledges no duty to the family as such, but only to the family as a part of itself. The union thus becomes the modern feudal lord whose protection the family must obtain in vassalage and may disregard only at its peril.

It is obvious that where this principle is accepted the influence of the family in the unionist conflicts will be to sharpen feeling and heighten purpose. A motive stronger than loyalty to a class, stronger than trade fidelity, stronger than patriotism, is thus vitally connected with any cause the union may espouse. This must be an unreasoning attitude, and must have the unequaled force of sentiment. The association of ideas is immediate and inseparable, and the strength of the union must be

multiplied by the family feeling existing among its members. The potency of the feeling thus intensified is incalculable. It must always be borne in mind in estimating the power of the union.

As this is one of the strongest bonds of union loyalty, so it is the most serviceable weapon of defense and attack. The social expression of the boycott is the evidence of this. So entirely are the currents of family feeling identified with union loyalty that even when the family is divided against itself the stream often follows the union branch rather than the family direction. A mother whose son lay dead in her house could declare without compunction that it served him right to be killed for working outside the union. The compulsion of family interest forces compliance where personal interest alone would not avail. This leverage, when possessed by the union, is of mighty and varied application.

Nor does the suffering borne chiefly by the family in protracted strikes seem to counteract this tendency. Those who have been nurtured in the atmosphere of the unionized family are likely to endure hardship in the spirit of martyrdom, and the blows of pain but weld a firmer bond of sacrificial devotion. Whatever protest there may be is absorbed by a loyalty tried as by fire.

Only the last pinch of necessity can compel yielding for the sake of the family, and such compulsion does not modify the intense feeling which springs from the amalgamation of the sentiment of home protection with union preservation.

The modifying influence of the family in the conflicts of labor unions with employers is chiefly to be found in connection with non-union labor. When wives and children ask fathers who have decided that they have the highest right to the exercise of industrial liberty whether their lot is to be made unendurable, the answer is likely to be one that unionists will not hear with indifference.

What considerations specially warrant the expectation that this modifying influence will be increasingly potent?

The elevation of the family into a position of central interest is a feature of the times. The wider range of comforts within reach of industrial families; the influences of refinement and culture through public school education, through libraries and by the press; the multiplied points of contact between families hitherto socially separate, of which the social settlement work is a remarkable manifestation and a sure prophecy; the stimulus to family pride through the operation of the principles of modern democracy; the intrinsic purifying of the family ideal, of which even its apparent contradiction in freedom of divorce is partly an evidence, since in spite of license and often by means of liberty the welfare of the family does not suffer and even improves so far as it is given a natural rather than an artificial root; the suggestions conveyed more imperatively through family influences than by any other toward thrift, good habits, and affectionate ambitions; these are influences which, when gained by independent industry, will work mightily toward mitigating the constraints which hamper true industrial development.

They are influences of intrinsic primacy and, while held in check by an arbitrary and mechanical structure, which lacks some of the essential elements of vital organization, they will inevitably gain their legitimate ascendency and compel reconstruction.

Let the laboring man see the real preeminence of the family, and value at its possible worth his own fireside, let the family be made by all the helps of civilization such that he must see its supremacy, and he will have a rallying cry

for a new reformation. When the welfare of their wives and children really becomes the chief concern of their supporters, the unions whose leaders insolently claim infallibility of judgment and indisputable rights of disposition will learn over again the lesson long ago forced upon an intolerant and intolerable ecclesiasticism.

They will learn that the natural rights of man are first in right, and will at the last be first in fact, that nothing can stand against the right and duty of a man to exercise his private judgment, to work out his own industrial salvation, and to set before every other loyalty the loyalty to the highest and most sacred of human obligations.

Mutual Insurance for Prevention of Strikes: EDWARD ATKINSON, Boston, Mass.

It is commonly believed that laborers are organized, using that term in its application to working people, male and female. This assumption is without any foundation in fact. There are to-day over 30,000,000 male and female working people, including farmers and farm laborers, earning their living for compensation in money, or, according to the common expression, mostly 'wage earners.' They are, as a body, without organization. On the other hand, a small fraction have organized what are commonly called trades unions.

It is not probable that five per cent. of the working people of this country belong in all these unions combined. They are not federated or organized for any common action and as they rarely fail to antagonize one another they may be said to represent the disorganization of labor rather than its organization. On the other hand, large amounts of capital are organized in corporations, trusts and combinations.

It is not to be inferred from this statement that any exception is taken to the organization of trades unions. They are a natural outcome of modern conditions of industry and are due in a large degree to the displacement of the individual manager of mills and workshops by the corporations. Trades unions are schools, but they are as yet primary schools, in the study of social economy. As their members become individually more and more competent to manage their own affairs, they cease to adopt violent and aggressive methods; they witness more and more the evils of strikes and boycotts, and they are now passing into the next stage above the primary school, which will by and by qualify them for the high school course in the organization of labor.

Neither is it intended to affirm that all capitalists or greater employers act with intelligence in dealing with workmen. Strikes, boycotts, violence, force and lockouts are often indications of the ignorance on the part of workmen and of ignorant capitalists. Therefore they are evil. They have destroyed the harmony or community of interest which in the nature of things exists in the relation of labor and capital, which harmony and community of interest can only be disturbed by lack of intelligence on the part of laborers and capitalists alike, one or both.

Is there any way in which the necessary harmony between capital and labor can be brought into effect by capitalists and workmen? Possibly there may be. Manufacturers and employers of labor in many branches of industry and in many parts of this country are now planning to combine for mutual insurance against a loss by strikes. When a great factory of any kind is stopped by a strike, what are called the fixed charges run on; only the wages are saved. The officers, the heads of departments, many of the highest class of employees, who seldom belong to a trades union, must be continuing the service and

must be paid. The taxes, the general expenses and the cost of insurance and other charges continue.

In a rough-and-ready way one may take as a standard proportions which are almost an example of general average. We find the cost of materials which are converted in the factory or workshop into finished forms ready for final sale comes to fifty or sixty per cent. of the total cost of the finished product. The fixed charges come to about five per cent. The wages of the workmen come to from twenty to thirty per cent., seldom more. The plan for this organization of capitalists is that each shall make a small annual contribution or premium, so called, to a mutual insurance company, which shall assure to each member so many dollars during the term of a strike, at the rate of about five per cent. of the value of the total product for one year. Other similar combinations prove that such an organization for mutual insurance against loss by strikes would be simple, sure and safe at a very small ratable charge each year upon each member.

It may be here remarked that the middle body of non-union workmen, the most competent and capable of the number, may be the victims of a lockout on the part of the employers or of a strike on the part of the union. They may be ground between the upper and the nether millstone, with no fund except their own savings, and with no organized body to protect them by legal or other service against the abuses either of the employers or of the unions. As the oppression of trades unions has become plain, we witness what may be called the beginning of an organization of free laborers in many parts of the country. Workmen are now combining to bring to the support of their individual rights the funds that they may subscribe, and to do what is yet more important, to organize and direct public opinion in support of the free laborers.

What next? It would be a very plain and simple work for the corporations or individual owners of capital, who are now organizing and combining for mutual insurance against loss by strikes, to call upon the non-union workmen or free workmen of the country to join in that organization —each workman to contribute such small premium as will be required and to assure to himself such number of dollars a day as his contributions will warrant during the term during which the free laborers are deprived of work by the strike on the part of the trades unions. If this organization of labor and capital for mutual insurance and support were once established, many of the workmen, who are now joined in the trades unions because there is no other place where they can go, would leave them to join the mutual union of the free laborers and the free employers. In this way the antagonism of laborer and capitalist would be displaced by the mutual service of labor and capital.

When Labor is King: Alisan Wilson, Washington, D. C. Read by title.

Status of Social and Economic Science in High Schools: W. J. S. Bryan, Principal, St. Louis High School.

To ascertain what work is done and what estimate is placed by high school men upon the value of the study of social and economic science in high schools, letters were written to the principals of seventy-five representative high schools. They were asked to answer four questions:

1. What instruction in social and economic science is given in your school?

2. In what grades is such instruction given?

3. How many pupils are engaged in such study?

4. In your opinion what is the value of such instruction and what should be its place in the course of study of secondary schools?

Answers were received from fifty-six schools. Replies to the first question show that in twenty-one schools no instruction is given; that in twenty-one, political economy is taught; in four, civics; and that in nine, such instruction is given only incidentally.

The amount of time given to such study is forty weeks in thirteen schools; twenty weeks in fifteen schools; ten weeks in two schools.

From the answers to the second question it is learned that in twenty-one schools instruction is given in the fourth year; in ten schools in the third and fourth years; in three in the third year; and in one in the second year.

In the fifty-six schools named instruction in social and economic science is given to 1,152 pupils specifically, and to 2,681 incidentally.

The fourth question elicited interesting replies. From these expressions of opinion it appears that there is considerable diversity of views, ranging from pronounced disapprobation to emphatic approval. Twenty-four are of the opinion that it is a very valuable subject, second to none. The general opinion favors the last year of the four years for the study, on account of maturity of the pupils and their awakening interest in the problems of the day, and also on account of their previous acquisition of knowledge essential to apprehension of the present stage of civilization, domestic, economic, political, religious, educational.

The great service of social science will be the discovery and statement of the laws of association in obedience to which men may live together in a state of freedom and attain the fullest individual development. In the secondary schools originality of thought is not to be expected. To rediscover and verify and apply the laws discovered and announced by science of every kind is the immediate task of secondary pupils. More they must not be expected to do. The complex social organism with its fivefold execution, the family, society, the state, the church, the school, furnishes a subject of study that demands sustained attention, concentration of mind, apprehension of principles, familiarity with history. If this study of institutions be undertaken late in the course, when the effect of previous years is apparent in power of concentration and the vigor of grasp, it may be made extremely profitable. It is only by a study of institutional life around us that we awake to a consciousness of our relation to our material, social and spiritual environment. The world of the individual is commonly limited by sight, hearing and touch. The debt of obligation to the great institutions through which he is made partaker of all the results of centuries of struggle and trial and sacrifice and suffering is not realized.

To give a youth rational conceptions of the presuppositions of present social conditions and spirituality of ideals is to render him and society a much-needed service. A teacher who is imbued with the importance of the subject will make opportunity for its introduction, but its close relation to history is apparent. The evolution of institutions is the theme of history. After a course in general history sufficient time should be given to a systematic study of the evolution of institutions whose existence conditions the life of to-day, that it may appear from what beginnings and through what modifications social order has been developed. From this study of institutions doubtless there will come a more intelligent comprehension of the process of civilization, a juster appreciation of present conditions, and a sincere and earnest desire to contribute to their betterment and to serve the cause of social elevation.

Status of Instruction in Social and Economic Science in Normal Schools: Henry W. Thurston, Chicago Normal School, Chicago, Ill.

Special reports from forty-three representative normal schools in twenty-seven different states show that ten of them have courses in sociology, seventeen in economics and twenty-two in civics.

In practise there is yet no agreement among normal school men that a course even in elementary civics—to say nothing of economics and sociology—is needed by teachers in elementary schools.

Still there is a large and influential body of opinion in favor of the study of all three of these social sciences by even those teachers whose work will be confined to the lowest grades. Some of the reasons of this opinion are:

1. Economics and civics are needed to enable a teacher to teach specific work in these subjects in the lower schools, but to teach geography, history and current events properly, the economic and political elements in these subjects being so fundamental, are necessary.

2. As the individual can not come to a knowledge of himself and his own powers except through his social relations, the teacher must know those social conditions that are fundamentally necessary to the normal development of his pupils.

3. The individual hungers for intelligence and efficiency in the world of human institutions as well as in the world of things.

4. A democratic society needs a greater and greater social and ethical efficiency on the part of all its citizens.

5. The civilization of any age tends to educate its young in the direction of its own greatest needs, hence we are in the midst of a movement toward a better social education of our children whether we will or not.

Among the more immediate steps toward better social education the following are suggested:

1. Such an agreement among normal and their tributary high schools that courses in at least civics and economics may be prescribed in one school or the other for all prospective teachers.

2. Normal schools should keep pace with other professional schools in lengthening their courses and raising the standards, including social education, for teachers.

3. Where courses can not be lengthened some way of emphasizing the opportunities and duties of teachers in the social education of their pupils must still be found.

4. There is need of greater intercommunication among normal school teachers in order that the best things in any school may become contagious in all.

Work of the College in the Formation of Social and Economic Opinion: Robert J. Sprague, Knox College, Galesburg, Illinois.

From figures comparing colleges and universities as represented by their graduates in congress, it was concluded that the university had evidently given a greater stimulus to the study of economics and social science than the college had. This result was attributed to the comparative slowness of the college in providing departments of social and economic science. College extension work was advised in the locality to establish an educational unity between town and college as to which the narrow sectarian spirit of the college and community often stands in the way. Evening classes open to adults and supported by the municipality afford excellent opportunity and present a new line of duty in smaller cities and towns especially, where such facilities are lacking. Finally, the cooperation of the newspapers is one of the most helpful agencies to the work of the

college in molding and enriching public opinion in social and economic lines. Each college should have at least a good teacher of economics and social science, who, with a good working library, could readily meet these requirements.

Status of Instruction in Social and Economic Science in Universities: J. H. HAGERTY, Ohio State University, Columbus, Ohio.

The first thing that is to be noticed is the crude, imperfect and illogical classification of the so-called social sciences. So indefinite is our classification and so imperfect our nomenclature that a layman has hard work to discover the difference between socialism and sociology, political economy and civilization, and does not know what anybody means when he says 'political science.' There are three distinct lines of instruction in most universities, but they are so confused in their classification as sometimes not to be readily discovered. These are politics, economics and sociology. Frequently all of these are classified under 'sociology,' again under 'economics' and again under 'political science.' In reality the terms 'social science' and 'political science' should never be used, but 'sociology' and 'politics' instead. A brief classification of the special sciences would bring them under the following main heads: I., ethics; II., economics; III., politics, and IV., sociology. There should be a thorough classification and an orderly arrangement of the social sciences in each university. This would give a pedagogical as well as a scientific unity to the work.

Another very important condition noticeable in American universities is a tendency toward the applied sciences, or a tendency to study the facts of human society more and to engage in less speculation about them. In political economy, for instance, investigators and instructors dwelt almost entirely on the theories and principles of the subject. Now they are recognizing that human society is a laboratory of economics and sociology and they are inclined to do laboratory work. It is somewhat different in the study of sociology, for being a very young science it is yet passing through the period of controversy, speculation and theory. An investigation of the courses presented in fifteen of the leading universities of the West, classified as nearly as could be under theoretical and applied sciences, shows that in economics the number of applied is twice as many as the number dealing in pure theory, while in sociology the ratio of theoretical to practical is that of three to one. Economics, then, is tending toward the status of a natural science based upon classified phenomena.

There is a tendency for instruction in the social sciences to fit people for the practical affairs of life. Some of the universities have gone so far as to establish schools for commercial education, especially for the fitting of students for the business world. While many of these schools or courses are rather crude or padded, they strongly indicate the trend of economic study. The time will come when men will be prepared for the business world just as definitely as they are now prepared for law, medicine, engineering or pedagogy. In the same manner the study of politics will prepare individuals for the political administration of affairs. Sociology very early began to prepare experts for the administration of charitable and correctional affairs, and this is what ought to have occurred many years ago in the study of the social sciences.

While one should not ignore the value of the study of theory or of principles, years of time have been wasted over the fine-spun theories of wages, interest, rent, value, etc., which might have been used profitably in finding out the actual conditions of human

society, bringing students in touch with the same, and thus improving these conditions.

Politicians and business men have always pointed to the economist as a speculative dreamer, and we must admit that in the past there have been sufficient grounds for such accusation. But he is rapidly emerging into a clear-headed thinker on practical affairs. And just in proportion as he demonstrates this ability he is recognized by the business and political world.

*Public Purposes for which Taxation is Justifiable**: Allen Ripley Foote, State Chamber of Commerce, Columbus, Ohio.

Taxation for absolutely necessary purposes includes legislation, administration and the judicial activities of government. The limitations of legislative powers appear in making provision for educational, sanitary, charitable and police functions.

Both custom and law have settled in quite a definite way what are necessary public purposes in behalf of these functions. But by the arts of sophistry there has appeared the claim that an authorization to perform a function implies an authorization to do whatever may be necessary to the proper performance of the function. Take the function of education to illustrate. To teach children teachers must be employed. They must have houses in which to teach. They must have books and blackboards. Materials of many kinds must be used to construct the houses. Other materials must be used to furnish them, keep them clean and warm. Does it follow that since all of these things are necessary for the proper performance of the educational function that it is justifiable for the government to raise money by taxation for the purpose of making brick, cutting lumber, making glass, making hardware, operating coal mines, equipping and operating printing and book-binding establishments, etc.? We think not. In all the government does there is a fundamental principle that needs affirming with emphatic distinctness, the application of which will correctly determine the limitation that should be placed upon legislative power in declaring what is a necessary public purpose for which taxation is justifiable. *Every function that is commercial should be performed by private enterprise.*

Everything the government may require for the performance of its functions, that is in character identical with a service that is being performed by the people for each other in their industrial vocations, should be obtained by the government by contract with private persons, firms and corporations engaged in supplying each service for private use. This will prevent the government from monopolizing any private industry, or from withdrawing the public demand from the general market. Under the correct application of this principle the government will continue to construct its buildings by contract, to buy books, supplies and coal. It will continue to contract for the transportation of mails, the lighting of streets and the transmission of intelligence. A correct application of this principle will prevent the encroachment of governments upon the domain of private enterprise, industry and commerce. Every such encroachment is a perversion of government from the fundamental purpose for which it is instituted, the promotion of the general welfare. The need of an emphatic declaration of this principle is clearly apparent when account is taken of the efforts being made in this country, mostly for purposes of political patronage and prestige, to embark municipalities in undertakings that hitherto have been conducted by private enterprise. The need of constitutional limitations on legislative power is shown

* Title of paper read by Mr. Frederick N. Judson (no copy available) and discussed by Mr. Foote.

by an opinion rendered by Judge Holmes, now of the United States Supreme Court, when requested by the General Court of Massachusetts to interpret its powers in these respects. This opinion is quoted in Judson's 'Taxation' (1903), page 426, footnote 1, as follows:

"I am of the opinion that when money is taken to enable a public body to offer to the public without discrimination an article of necessity, the purpose is no less public when the article is wood or coal than when it is water or gas or electricity or education, to say nothing of cases like the support of paupers or the taking of lands for railroads or public markets. I see no ground for denying the power of the legislature to enact the laws mentioned in the question. The need or expediency of such legislation is not for us to consider."

Services of Commercial Organizations in the Social and Economic Development of Cities: WILLIAM FLEWELLYN SAUNDERS, Secretary Business Men's League, St. Louis, Mo.

Of these organizations there are nearly a thousand in the United States. The high-grade modern business organizations, through the volunteer service of their officers and members and the paid work of their secretaries and experts, are doing work which is systematic, thorough and of great value to the purposes of science. Their fundamental usefulness is in preventing the deplorable waste of fine individual power that would occur without them, either by the dissipation of energy through lack of organization or by the friction arising from the exertion of the force along different lines of individuals having the same general purpose. They organize and systematize commercial experiences; they reduce to uniformity the variety of business practises; they apply accepted principles of trade to local conditions; they collect statistics; they promote beneficial legislation and prevent harmful legislation; they prevent litigation and waste of community energy; they mold public opinion on economic questions; they generally develop the associative efficiency of citizenship.

No commercial organization could enter practical politics further than influencing legislation, without great injury to its usefulness as a business organization, and it should lay stress upon the necessity of these organizations confining themselves to commercial work.

Some Recent Developments in Representative Government: GEORGE H. SHIBLEY, Bureau of Economic Research, Washington, D. C.

The referendum and initiative are systems whereby the people possess a right to a direct vote on legislative questions. Far-reaching results are observed by those who for years have been studying the workings of the system in Switzerland and in this country. The system is well established in several countries, is being rapidly extended, with scarcely a reversion, then only temporarily, thus demonstrating that it is part of the evolutionary process—a world tendency.

Where the people take to themselves the right to a direct ballot, the results are exceedingly important. The final power is in the people through the right to a direct ballot, by means of the optional referendum and direct initiative. It follows that the party machine or boss can no longer enact legislation. The elected representatives simply recommend. This ensures the termination of legal privilege, thereby rendering it unprofitable for monopolists to invest money in politics, thus leaving the people free to nominate and elect men who really represent their interests. In short, representative government is restored and

politics becomes a life-work—a profession, and of the highest order.

All this is seen in Switzerland where the optional referendum has existed in federal affairs for twenty-nine years, and the direct initiative since 1891.

The striking changes which this system effects are seen most clearly in the executive department of the Swiss government. The final power being in the people, has freed the heads of departments from subservience to the instructions of a party convention. Stated another way, through the optional referendum each public question goes to the people *after* it has been considered by the heads of departments and by congress, *thus leaving these officials free to recommend whatever their best judgment dictates.* They are more independent, and probably more effective, than are the officials in our mammoth private corporations, for these heads of departments are absolutely dependent for their positions on the autocratic general manager, who is a changing factor. Not so in the Swiss government. The expert heads of departments are continued in office from term to term. For the past thirty years not a member of the Swiss cabinet has been obliged to retire. Yet there is no fossilism, for changes can be made by congress, and the subordinate officers, being more independent than in private corporations and subject to promotion for ability, propose changes. Uniform accounting opens up the keenest kind of competition.

In the general field of legislation there is absolutely no corruption under the referendum and initiative, owing to the final power in the people, and as the legislators represent the people's interests, scarcely a bill is ordered to a vote of the people. In South Dakota and Oregon not a bill has yet been referred.

The order of development in systems of government is from one-man power to party government; which in the course of centuries becomes thoroughly autocratic and is the political basis of the trusts and other forms of industrial monopoly. The next higher system is the transfer of final legislative power from the party machine to the people. It is the people's rule in place of trust rule. But in framing the legislation the people act through representatives, who are uninstructed, and thereby the highest and best forms of legislation are proposed to the people, who usually accept these bills without a direct vote.

Wall Street and the Country: Charles A. Conant, Treasurer, Morton Trust Company, New York. (*Atlantic Monthly,* February, 1904.)

What is the meaning of the recent flotation of industrial enterprises in Wall Street and their significance in the economic development of the country? The offer of new financial projects is the natural result of the great fund of saved capital seeking investment, and the merits of new methods of investment must be determined by the question whether they survive the tests of time and competition. Only those can survive which have in them real elements of benefit to the community. In so far as methods of investment are diversified there is greater inducement to capital to enter the market and to place itself at the disposition of far-sighted men for productive use. Speaking of such forms of organization as the security-holding company and the voting trust and of the ultimate result of such developments, the system of the security-holding company permits far-sighted men, for instance, who are willing to postpone present dividends to future wealth, to study the needs of a growing community, and to promote its growth by building traction lines in advance of the public demand instead of waiting for such a demand to become imperative. It enables

the managers of a great trunk line to put an end to transfers of passengers at state boundaries and local terminals, and to run the palatial trains across the continent upon harmoniously adjusted schedules, which, far from being 'in restraint of trade,' have done more to promote it than all the laws for preventing combination or all the suits begun in pursuance thereof. The system of the holding company undoubtedly increases the power of the big financiers, but it enables them in many cases to go forward with far-sighted plans for meeting the certain expansion of local traffic in our imperial city, or of international traffic between the grain fields of Minnesota and the markets of Asia, which would be difficult or impossible under the old system of petty competing organizations governed by the restricted vision of some neighborhood magnate.

America has a great destiny to perform in the industrial development of the world. She can perform it only by applying to every part of the machinery of production, transportation and exchange the principle of the greatest economy of effort to obtain the greatest sum of results. The opportunity for every man to rise by his talents from the lowest to the highest place, the right to reap and hold the rewards of one's labor without excessive taxation or vexatious visitation, the privilege of transferring property on the stock exchanges without the fetters imposed on such transactions in Europe, and the freedom to extend new methods of economy and combination in trade and finance across the continent, untrammeled by local tariffs and state boundaries, are among the weapons which give our country its great advantages in dealing with older competitors.

The new methods and the new projects are going through the test of fire to-day, and some of them are being consumed. The tests which weeded out the badly organized and incompetent of the early stock companies, which drove to the wall the 'wildcat' banks of ante-bellum days, and which wiped out dividends and stock rights in badly managed railways, are now being applied to the new forms of organization which have been the growth of the past decade. But the stronger and better organized of these new corporations are likely to meet these trials without disaster or to modify their methods to conform to the teachings of experience, until there remains to the financial world a valuable residuum of new methods for giving flexibility to capital and promoting its transfer promptly and efficiently from the industries where it is not needed to those where it will render its highest service.

Social and Economic Significance of Street Railway Traffic in Cities: E. DANA DURAND, Bureau of Corporations, Department of Commerce and Labor, Washington, D. C.

This paper embodied many of the results of the census inquiry on street railways (1902), covering a period of twelve years since 1892. In this period trackage had grown from 8,123 miles to 22,589 miles. Passengers carried were about three times the world's population. In 1902 the number of rides was 170 times the country's urban population. In some of the larger cities the number of street car rides exceeded 250 per capita annually.

Among developments cited as characteristic were the substitution of electrical power, the extension of trackage outside of city limits as suburban and interurban lines, consolidation among urban lines and improvement in street railway service generally.

The social and economic significance of these agencies appears in their capacity as distributors of population to and from centralized localities, in which industries

and mercantile activities are grouped in propinquity. The street railways make possible the centralization of the retail trade, and widen the range of recreation and amusement of most people. Yet they have not reached their limits of usefulness to the artisan and the well-to-do. Too much of the time of these users is consumed on street railways and the charge is as yet too high, the average cost of carrying a passenger in the United States being 2.9 cents, not counting profits.

Discussions. The following participated in the discussion of one or more of the above papers: Lee Meriwether, St. Louis; W. M. Bryant, St. Louis High School; J. H. Scarborough, Warrensburg (Mo.) Normal School; Joseph A. Wright, St. Louis; Frederick N. Crunden, St. Louis; Carroll D. Wright, Washington, D. C.; William H. Lynch, Mountain Grove, Mo.

JOHN FRANKLIN CROWELL,
Secretary.

WASHINGTON, D. C.

THE ASTRONOMICAL AND ASTROPHYSICAL SOCIETY OF AMERICA.

THE fifth meeting of this society was held in St. Louis, Mo., during convocation week, in affiliation with the American Association for the Advancement of Science. All the sessions were held at the Central High School, where rooms were occupied conjointly with Section A.

The first session of the society was held on Tuesday afternoon, December 29, at which officers were nominated to be voted for at the annual election the next day.

On Wednesday morning a joint session was held with Section A, for the reading of papers, and on Wednesday afternoon the reading of papers was finished and the annual election of officers held.

The members of the society were served lunch at the High School by the local committee on both Tuesday and Wednesday at noon.

The meeting was the smallest ever held by the society, there being less than twenty members present. Ten new members were elected.

The officers elected were:

For 1904.

President—Simon Newcomb.
First Vice-President—Geo. E. Hale.
Second Vice-President—W. W. Campbell.
Treasurer—C. L. Doolittle.

For 1904–5.

Councilors—E. C. Pickering, R. S. Woodward.

Geo. C. Comstock and W. S. Eichelberger were elected members of the Council of the American Association for the Advancement of Science from the Astronomical and Astrophysical Society of America.

PAPERS PRESENTED.

G. W. HOUGH: 'The Prediction of Occultations of Stars by the Moon.'

W. W. CAMPBELL: 'The D. O. Mills Expedition.'

G. C. COMSTOCK: 'The Sun's Motion Relative to a Group of Faint Stars.'

F. W. VERY: 'The Absorption of Solar Radiation by the Sun's Atmosphere.'

SEBASTIAN ALBRECHT: 'Borelly's Comet.'

W. S. EICHELBERGER: 'The Pivots of the nine-inch Transit Circle of the U. S. Naval Observatory.'

M. S. BRENNAN: 'A Short Sketch of the Progress of Astronomy in the United States.'

H. C. WILSON: 'The Eros Parallax Photographs at the Goodsell Observatory.'

ABSTRACTS OF PAPERS.

The D. O. Mills, Expedition: W. W. CAMPBELL.

The observing station of the D. O. Mills expedition from the Lick Observatory to the Southern Hemisphere was completed in October. It is located on the summit of San Cristobal in the northeastern suburbs of Santiago, Chile. Its elevation above the city is about 950 feet, the altitude of Santiago above sea level being 1,800 feet. The distance from the center of the city is about two miles.

The expedition is in charge of acting as-