Transactions of the Wisconsin Academy of Sciences, Arts and Letters. volume XVI, Part II, No. 6 1910

Madison, Wis.: Wisconsin Academy of Sciences, Arts and Letters, 1910

https://digital.library.wisc.edu/1711.dl/B44YAM2CN6YXH8B

TRANSACTIONS

OF THE

WISCONSIN ACADEMY

OF

SCIENCES, ARTS, AND LETTERS

VOL. XVI, PART II, NO. 6

MADISON, WISCONSIN

1910

CONTENTS

The annual half-volume of the Transactions is issued by the Wisconsin Academy of Sciences, Arts, and Letters in six numbers, under the editorial supervision of the Secretary.

The price of this part is 35 cents.

PRESIDENT'S ADDRESS, 1909.

SOME FACTORS IN THE PROGRESS OF SCIENTIFIC RESEARCH.

By Louis Kahlenberg.

The search after knowledge of the material things of the universe has been in progress since the appearance of man on the earth. To minister to his daily needs in the way of food, drink, clothing and shelter required an acquaintance with many of the most important properties of plants, animals and substances of mineral character. So the struggle against hunger, thirst, inclement weather, sickness, wild beasts and enemies of his own species led man to the acquisition of a large number of fundamental facts. These, at first handed down to succeeding generations by word of mouth, were gradually more and more preserved in some kind of written form, and thus taught and transmitted to others. In this early stage of the acquisition of knowledge of material things the imagination and the religious superstitions of man played a large part. This is true especially of his efforts to conquer his enemies and to protect himself against the ravages of disease. For example, to imagine that a sick person was one possessed of an evil spirit was very common; and it was, of course, quite natural that the treatment of disease should have been directed to the methods of scaring out, coaxing out, or otherwise removing that evil spirit from the patient. And thus the appeasing and control of evil spirits and the gaining of the favor of kindly ones was coupled with the treatment of disease; in other words, medicine and theology had much in common in their origin,

and the priest and the medicine man were generally one and the same person. But the stubborn fact that disease is frequently readily eradicated by resorting to definite physical treatment with herbs or substances of animal or mineral origin gradually gained ground, took the place of the exhortations to remove evil spirits, and formed the basis of the science of medicine. That the early attempts to cure disease should have been extremely crude is most natural, and that they should have been influenced by superstition and religious views for a long time was to have been expected. It must be remembered that even in the days of George Washington it was still reputable practice to administer to patients such things as iron from the nails of the coffins of criminals, serpents' excrement, parts of vipers, and pulverized skull bones of murderers as specifics for certain diseases. Was it not the great chemist and apothecary Carl Wilhelm Scheele, a contemporary of Washington, who first had the courage to banish such things from the shelves of his shop. And are we at the present day quite emancipated from the idea of the treatment of disease by mental effort alone? The notion that our bodily ills are controlled by our psychical condition is thus very old indeed, and its persistence is not to be wondered at or even lightly regarded, for after all it contains a considerable element of truth, of which every truly successful modern physician is cognizant, and of which, directly or indirectly, he avails himself in ministering to his patients.

It is in the study of medicine that many of our natural sciences like botany, zoology, and chemistry really had their origin. The heavenly bodies excited wonderment and study even in earliest times, and so astronomy had its beginnings in the remote past. Nor was it strange that our forefathers should have fancied definite connections between their daily affairs, their diseases, the progress made by their crops, and the movements of certain heavenly bodies. Does not to the minds of some to the present day the particular phase of the moon have considerable to do with choosing the time for planting the seed so as to insure a good yield? Mathematical computations also

began very early, being necessitated by the construction of shelter and various implements and contrivances that were required for transportation and communication. This work naturally also led to the beginnings of the sciences of physics, mineralogy and the study of the earth, geology. Though in early times all of the natural sciences were very closely linked with the study of medicine. Mathematics naturally developed rather independently of the other sciences, and it has consequently reached a higher stage of perfection at the present time. Astronomy too as a science is much further along in its development than are the other natural sciences, which comes from the fact that the distances between the heavenly bodies are relatively very great, so that practically only the masses of the stars and the distances between them enter into the laws governing their movements. When it comes to a study of the chemical composition of the heavenly bodies and the processes that are going on in the various orbs we are still greatly handicapped, even though progress made in this direction by use of the spectroscope and the art of photography is very gratifying in a way.

The abstract subject of mathematics really reached a high degree of perfection before even the beginnings of the natural sciences as such were laid. Nor is it difficult to see why this should have been so. The development of mathematics really presented much less difficulty than did the development of experimental sciences; nor did mathematics have to contend with superstition, which stood in the way of the growth of medicine and the natural sciences in general. The slowest of all to develop was agricultural science in its various phases of horticulture, raising of grain, animal husbandry and dairying. And thus it is that the pursuit of exact and systematized knowledge in abstract mathematics and astronomy occupied more attention and reached a higher stage of perfection before the science of physics and its applications, engineering, were developed. Again, the sciences that grew out of the study of medicine were of still later growth, and finally, agricultural pursuits on the basis of carefully systematized knowledge represent the most

recent development of all, though the tilling of the soil and animal husbandry were practiced as arts from very early times. It is true that for its development upon a thorough scientific basis agriculture must make use of the other natural sciences, particularly chemistry, botany, physics, bacteriology, zoology, and physiology. But this was really not recognized until relatively recently. Indeed, agriculture was commonly regarded as a very ordinary, simple pursuit, calling for but very little knowledge. Moreover, this notion is still rather widespread, and the bulk of our farming is yet going on in an empirical way. There can be no question but that the fact that the tilling of the soil was looked upon as much lower in dignity than the practice of medicine, law, theology, engineering, teaching, trading or manufacturing has stood against its development upon a scientific basis in the past, and indeed still stands against it at the present time. The farmer works long hours to produce the food and other materials the world requires, and for his labors he is really not fitly compensated in money or the conveniences and enjoyments of life. Labor saving machinery has helped greatly in doing the work of tilling the soil and thus the inventor, the manufacturer and laborer in the city have aided work in farming very directly. Nevertheless, when all has been said, the farmer still plods on with severe physical labor for long hours without receiving the compensation that is really due him. He cannot form combines and unions to raise his pay. The professional men, and particularly those engaged in the management of transportation, manufacturing, and other major business operations, acquire under existing conditions much more than their fair share of the world's goods and conveniences.

While the study of the progress of knowledge of the material things about us and the laws that govern the changes they undergo has contributed greatly to man's physical well being, it has also had a most profound effect upon his ways of thinking and looking at things in general. It has emancipated his spirit by pointing out the errors of his preconceived notions of the universe and the relative position of the earth and man therein,

and has opened the true path to the acquisition of real facts and laws.

After all, the fundamental laws of nature are few and comparatively simple, though the phenomena controlled by the laws are frequently extremely varied and complex. We recognize the far reaching character of the laws of mechanics, of the conservation of mass, of the conservation and transformation of energy, and of the proportions in which substances unite chemically. We know that under these general laws there are special laws and principles governing limited groups of phenomena; thus, for instance, we have the laws of conduction of electricity, of electrolysis, of propagation of wave motion, of reproduction, which, however, are all subject to the few great general laws. Yet we must recognize that all these laws have been discovered by experimental study and observation. Newton's laws of motion were discovered only about two hundred years ago. The law of conservation of mass was discovered about a century ago, and the laws of conservation and transformation of energy were formulated as recently as the middle of the nineteenth century. We have, furthermore, acquired the far reaching and fundamental ideas that certain chemical substances, the so-called elements, can neither be decomposed nor synthesized, and that living beings always spring from living beings and cannot be produced artificially from dead mineral material. These latter notions, too, have come to us only recently, that is, within the last century. The idea that complex living forms have gradually evolved from simpler ones, and that, indeed, the principle of evolution applies to the universe itself is also of very recent origin. When we reflect that laws are simply general statements of fact, and that our most fundamental laws have been discovered within the last hundred years, it certainly must dawn upon us that there is great probability that the laws we have discovered are not the only ones of fundamental and far reaching character that obtain, and that some more general law may still await discovery.

Each of our natural sciences has already accumulated a very respectable body of facts, to master which requires special

and continuous application. In every treatise on science we find a description of facts, a generalization of these facts into laws and principles, and a presentation of certain views and opinions closely linked with hypotheses and theories. By no means all scientific writers seek to distinguish clearly between what is fact or law on the one hand and what is theory or opinion on the other. Indeed, it is unfortunately true that many are not able to distinguish fact from hypothesis, which comes about to a certain extent, because many facts are spoken of and described in the language of some hypothesis. In this way much confusion results. The rising generation of students too is often mislead and their ardor is dampened by teaching hypotheses and notions or opinions as though they were facts and laws, or at least on a par with the latter in importance. Nothing can be more harmful to secure clear, logical, scientific thinking; nothing stands more in the way of scientific research.

Research means inquiry, it means hard, earnest work. It can only be done by a vigorous, enthusiastic human being that is truly cognizant that he does not know it all, and that the existing state of our knowledge is unsatisfactory. One who has made his mind up as to just how natural phenomena come about, one who is cocksure of the explanation of what goes on, has no incentive to inquire further. So a person imbued with a theory or notion to the point where he expounds that notion and begins a propaganda in favor of it, is drifting away from the true frame of mind of a scientific inquirer after truth. In order to further scientific research there is one thing necessary above all others, namely, the enlisting of the flower of our youth in scientific pursuits. We need to get vigorous, able, enthusiastic young men and women to catch the true spirit of scientific inquiry. We need to write our textbooks and shape our lectures, classroom and laboratory work not merely to expound facts, laws, and existing theoretical notions, but rather to inspire the student to further inquiry. In other words, while we teach what is known and what the existing opinions and theories are, we must constantly do this in such a way as to get the student to study further. Our ideal must be the development of an independent thinker and inquirer.

Theories, hypotheses and notions are very helpful when rightly used. They have a very important function in suggesting new avenues of attack by experiment and observation. But it must also be pointed out that theories and hypotheses suggest by implication that certain things are impossible and that it would be a foolish waste of time to look for such things, which are often quite possible. Thus, theories are frequently a hindrance and a stumbling block. And yet they often take such complete possession of men that they amount to convictions and can not be shaken by any means whatever. They then become what we might well term scientific creeds. So it was believed by the great Stahl that when substances burn a subtle principle, phlogiston, flies out of them. He expounded this enthusiastically in detail, and gained a great many ardent disciples who tenaciously stuck to his view, and defended it. Even the discoverers of oxygen themselves, the great Scheele and Priestley, were followers of Stahl and defended the phlogistic view of combustion as long as they lived, holding that Lavoisier's idea that combustion in the air consists of union with oxygen was untenable in spite of the quantitative experiments on increase of weight during combustion which the latter described. Thus we see that scientists and theologians are not made of different clay when it comes to adhering tenaciously to preconceived notions, expounding these and making disciples. Think of the idea of evolution of Darwin and how Huxley fought for it through thick and thin, and are we after all so cocksure of the matter at present? It took some time to establish the notion that a chemical element is a substance that has defied both analysis and synthesis. Later it was generally taught, and not infrequently the so-called chemical elements are looked upon as undecomposable substances rather than as undecomposed ones. Furthermore, it is quite safe to say that practically no serious efforts are being made to resolve any of the long known elements into something simpler. The very fact that these substances have been placed in the table of elements, has drawn attention away from efforts to decompose them; and some of the recently reported transmutations of Ramsay

having been shown to be unfounded, are not calculated to encourage further efforts in this line. The notion that living beings always spring from living beings and not from inanimate matter is so deeply rooted that probably no biologist is attempting to synthesize any living forms, however simple. May we hope that out of the intensive work of Otto Lehman, the great molecular physicist, this seeming impossibility may yet be accomplished? Up to 1828 it was thought that the chemical products of plant and animal metabolism could only be produced by the life process; and yet when Woehler synthesized urea the spell was broken, and soon many other organic compounds were synthetically prepared, whose artificial synthesis was thought to be quite impossible.

In biological lines, the great advances in modern surgery stand out preeminently. These were made possible by the development of bacteriology, which pointed out the way to secure aseptic conditions under which alone major surgical operations have any chance for success. For many years biologists have engaged in studying the anatomy of living forms and classifying them. This work has given the biological sciences the name descriptive sciences. While this study of form is of great importance, and while it has always been closely associated with the study and description of functions, that is with physiology, the latter has of recent years come into the foreground more and more. It is recognized that the great problem in botany is not so much to describe new forms of plant life as to discover what goes on within a plant, even the commonest weed by the wayside, as it lives. Experimental physiology, the crowning glory of biological studies, is slowly but surely coming into prominence, and great things are to be expected of it, though its path of progress is a difficult one. Think of the foundation in chemical, physical, physico-chemical and biological studies that its successful pursuit presupposes. We ask how nourishment passes from the alimentary tract into the blood, and how the various glands of the body manufacture the various secretions in each individual case from one and the same fluid, the blood; and meanwhile chemists and phy-

sicists are still debating the explanation of such a simple process as the solution of a lump of sugar or of salt in water. But the experimental physiologist works on undismayed even though he be obliged to blaze his own way in chemical and physical matters. This is after all as it should be, for hesitation and delay, because a cognate science can not furnish all information needed to go ahead, can not be tolerated long. Has not the law of conservation of energy itself been discovered by a young physician, Julius Robert Mayer, and may we not expect advances in physics and chemistry in the future from those who are primarily engaged in physiology? From the study of the structure and function of the cell we have much to expect; but the study of the functions of aggregations of cells as they make up the various organs and the organism as a whole must not be neglected, and even those who strenuously believe in the cell theory of living beings must needs bear in mind the necessity of macroscopic study of function. In the progress of experimental physiology lies our hope of finally placing the treatment of disease upon a truly scientific basis. Bacteriology has taught us of the existence of micro-organisms that produce disease and pointed out the methods of combatting these parasites, but it remains for experimental physiology to point out the way in which many of our bodily ills may be cured without resorting to the surgeon, by simple and effective means in unearthing which the physiologist, pathologist and therapeutist require the efficient and sympathetic aid of the chemist in particular. Furthermore, the work in experimental physiology lies at the very basis of scientific agriculture. The principles of biological growth and function are general in character, and the work of the physician and the scientific farmer is really based upon laws that are identical. I take it that it will commonly be conceded that above all things upon the scientific horizon at the present day experimental physiology is of utmost importance for our welfare. The progress of surgical treatment in which America has had such a large share deserves due recognition and respect of all. But the successful combatting of ills of the body without the use of the knife is a

grander achievement which still awaits solution. In this work our rich store of anatomical knowledge gathered since the days of the great and courageous Vesalius will doubtless be required, nor will the work of the histologist, cytologist and chemist play a minor rôle in its development.

In the arts and industries there are great problems that await solution. The question of the storing of the energy of the sun, of using wind and water power to better advantage, so as not to continue the terrible waste of our fuel supply, has recently been brought home to us stronger than ever. The fact that our rich agricultural lands must receive careful treatment, so that their fertility may be conserved from year to year, is apparent. And is it too much to expect that with careful work the yield of our soils may be doubled as to both quantity and quality? All our soils should be systematically studied as to what treatment is required to produce the best crops for which they are adapted. And in animal husbandry do we not realize that the grade of our horses, cows, sheep, hogs and poultry may be greatly improved by proper methods of breeding?

In the improvement of our means of communication we have but begun. What other view could we possibly take? Were not the invention of the steam engine, dynamo, telegraph, telephone, wireless telegraphy and telephony all made within the last century? It would be presumptuous to suppose that our possibilities in these directions are approaching exhaustion. That aerial navigation will eventually develop into a safe, rapid method of transportation who can doubt, though the difficulties and dangers connected with it appear very great at present?

In our methods of construction we are using less and less wood and metal every year and turning to our supply of siliceous materials. Where lightness and great strength are required metal is still indispensable. But the supply of iron is limited and the tendency will be to seek to use other materials in its place wherever possible. This has already begun. The chemistry of silicates and other compounds of silicon has been studied for a long time, and yet the uses to which compounds of silicon have been put have not been greatly increased. Here

is a fertile field for study. May we not expect too that textile fabrics, clothing, and especially paper will be prepared in part, if not entirely, of mineral materials that are not inflammable and subject to decay, and still possess those highly esteemed qualities which characterize fabrics of organic origin. Improvements in the preparation and conservation of foods have also been progressing, though radical changes made in these lines have hardly been great or startling. The methods in use have been in the way of gradual improvements rather than changes of revolutionary character.

But it would be wrong to dwell unduly upon the material conquests which scientific inquiry has brought about directly or indirectly, and to consider merely the outlook for the future of further work in this line. Food, drink, clothing, shelter, and all the imaginable physical conveniences that the pursuit of science and its applications may shower upon us, though exceedingly important, are neither all nor even the main thing to be achieved. The ever growing horizon of human thought, the better understanding between man and man, and nation and nation, follows the pursuit of the truth. About the connection between things material and psychic phenomena we are still quite in the dark, though even here we live in hopes that the veil may some time be lifted as the result of patient inquiry.

And what are the factors that determine the progress of scientific research at present? First and foremost of all, it is necessary to get strong, able, industrious and enthusiastic young men and women to take up this work. A large share of our very best native talent must be diverted to carry on scientific researches. How is this to be done? The answer is in two ways: (1) keen interest in scientific inquiry must be aroused, and (2) there must also be placed before the future scientist a prospect for a comfortable living. Usually the desire to prepare for a vocation that will be certain to yield the means for a good livelihood is uppermost in the minds of young persons preparing themselves for life's work, and with the rank and file this will perhaps always be so. But for the one that rep-

resents the timber out of which real investigators are made this will not necessarily be the case. The endowment of institutions of scientific research will no doubt do much to foster inquiry; but men cannot be properly trained except through the influence of educational institutions of proper type and scope. In practice the work of enlisting men and women in scientific pursuits falls almost entirely upon universities, from which special research laboratories draw their supply of investigators. For this reason the universities are really the prime factor in scientific advances. A university professor by failing to enlist students of proper caliber to make the pursuit of science their life work, seriously hampers the progress of scientific research. It is well known that bright students who choose medicine, engineering, law or a practical career in business generally become engrossed with these pursuits and are unavailable for scientific researches. It is also true that the financial outlook in these lines is very alluring as compared with that of the one who chooses a career as scientist, and so in fact, science loses a large proportion of those that are by nature fitted to do research work. A person preparing himself for scientific work outside of the professions of medicine and engineering still very commonly has to associate himself with an educational institution—a university, technical school, or college. The life of a teacher is, however, not specially attractive to many of excellent native ability, for the work is hard and the salary is relatively small. And so the university professor has a difficult task before him in recruiting the ranks of future investigators. It is, moreover, a question whether the pensioning of university professors and thus making them quasi objects of charity will really serve to draw more promising men into university careers.

Now it must be realized that much excellent scientific inquiry is going on outside of the walls of the laboratories of universities and technical schools, but this work quite commonly deals with problems of applied science and is not directed toward the unearthing of new principles. This means that it is really not calculated to open up new avenues of research.

This is the difficulty, too, with specially endowed research laboratories which are generally created to foster a certain specific line of work. And though the attempt is generally made to conduct such work along as broad lines as possible, the specific reports of progress required from time to time necessitate that the work be after all rather narrow and specific in scope. Whenever sums of money are granted to carry on scientific researches, it is common to have the one who is to do the work outline it sharply, or what is to be done is even prescribed for him. Now much real valuable and helpful scientific work can be done and has been done in this way; but this work is after all what might be termed routine in character. The determination of physical constants by new, or at any rate somewhat improved methods; the extension of this or that principle in certain directions; the testing of the validity or usefulness of certain modes of procedure in specific cases; the exploration of some new territory, etc., are all types of work that can very successfully be done in this way. The deepening and widening of our knowledge along lines already somewhat familiar by means of methods that are fairly well in hand and simply require some amplification, can successfully be carried on thus. But real creative scientific work that opens up new avenues is not done in this way. A certain amount of leisure, a perfect freedom from all restraint as to choice and definiteness of outline of the problem in hand, and no thought as to just how the work is to be done and when the results must needs be reported, are quite essential for real creative scientific work. These conditions cannot be obtained at the present time so far as I am aware, outside of the walls of a great university. No man of positive creative genius in scientific lines can afford to hamper his work and force it into avenues that are definitely to be laid out beforehand, in order to secure financial aid to carry out what he really wants to accomplish. Work that can be laid out in advance and passed upon by a commission as to its value and feasibility is necessarily only routine in character, valuable though it be. For this reason it is very likely that the greatest fundamental scientific discoveries of the future will be made at universities where the proper atmosphere for bring-

ing forth creative results exists. The idea of engaging professors who are to do a certain limited amount of teaching and then devote the remainder of their time to research of their own choosing is the best way of securing real creative work. It shows the remarkable insight of William F. Vilas when he provided in his will for the establishment of such professorships at Wisconsin. But that he should have foreseen that this is the best method to advance research is really not to be wondered at, for he was himself a man of great energy, originality and creative power. Only such a one can really comprehend what is essential to conditions for productive work that is not mediocre in character. There is, of course, great danger of making a mistake in securing a person who is to carry on researches of the highest order. The leisure and freedom from all restraint will almost certainly be abused by some, especially by those who are really unfit to do work of the highest order. Nevertheless, to make progress the risk of securing the proper persons for creative scientific work must be run, just as such risks are taken in securing individuals to carry on important lines of work in business and other vocations. In choosing persons for positions in which work of the highest order is to be done, it would be folly, however, to select any but those that have already demonstrated that they are industrious and have accomplished something that shows genuine independence of thought and creative genius.

Those whose minds are already made up, have no desire to investigate, consequently open-mindedness is a prime quality characterizing a successful scientific investigator. Independence, fearlessness and self reliance, which must, however, never reach the stage of self-conceit, are further indispensable attributes of the successful scientific man of the first order.

That teaching develops the power to think clearly and to express one's thought in simple language that is readily comprehended, there can be no doubt. And so it is to be regarded as an advantage rather than a hindrance to one engaged in researches to do a limited amount of teaching. Moreover, the duty to lead, instruct and inspire the rising unsophisticated

generation, and to discuss scientific questions with them so as to stimulate thought and originality of manner of viewing phenomena, when well done, reacts as a powerful stimulus upon the teacher himself, renewing his youth as it were, spurring him on to new endeavor and in fact often leading to suggestions culminating in new ways of attacking difficult problems. Think, for example, of the laboratory of Justus Liebig, who himself was a man of real creative power, and personally conducted many researches, was he not helped in his work by the large numbers of enthusiastic, industrious young men that thronged about him and afterwards carried on further the work of their great master? His compelling eye and energetic manner drew students to him as if by magic spell. Truly such a teacher is practically always acting in accord with the immortal lines of Coleridge, which he put into the mouth of the Ancient Mariner—"The moment that his face I see I know the man that must hear me, to him my tale I teach." Then there is Michael Faraday, that great experimental genius whose simple, direct mode of attacking and solving experimental difficulties will ever remain as a model. Did not he seem to long to give expression to his thoughts to others, did he not almost yearn to teach? Let his lectures on the life history of the tallow candle speak for themselves. He exemplified, too, the proper type of mind of a scientific man. To him facts and laws were of utmost importance, while hypotheses and theories were but tools that lasted for a day. Preconceived notions he always regarded as an enemy to real scientific progress. He was no worshiper of authority in scientific matters. He calmly dared to describe his experiments and draw the conclusions to which they led, though these conflicted with those of so-called authorities. The disdain with which the great Berzelius dared to characterize Faraday's work upon which he based his well-known law of electrolysis is known to all; yet Faraday was undismayed, and future years revealed he was indeed in the right.

In America we are now entering an era of financial prosperity. Our vast natural resources though by no means com-

pletely exploited, are sufficiently well developed, so that we ought to take a greater part in scientific inquiries of the first order. The lack is not that there are insufficient funds to do this. In fact there is an abundance of money. What we want is the men that can do this work and that love to carry it on mainly for the sake of the good that will come from it to all, and for the sake of the joy there is in doing the work itself. Scientific work of creative character will ever be characterized by the spirit of that great discoverer of chemical facts, Carl Wilhelm Scheele, when over a hundred years ago he said: "Es ist ja nur die Wahrheit welche wir wissen wollen, and welche Freude bereitet es nicht sie erforscht zu haben." In lines like iron and steel, transportation, industrial operations on a gigantic scale, and operative surgery America is already taking the lead. Why are we so slow to take rank in scientific matters? The answer is that we are not yet showing the initiative and independence of action here that we ought to. Our scientists are still leaning too heavily upon what is said and done by our friends across the water. There is still too much of the spirit of hero worship and not enough of independence of thought and action and direct recourse to carefully observed facts as the ultimate court of appeals in matters scientific. But we shall gradually get over this, though the process will be far more rapid if we can but divert more of our best talent to scientific work, instead of having it go so largly to those lines that promise great financial returns. Endowments for research by individuals, learned academies and other institutions will greatly aid the work, which must be placed upon a pedestal so as to command the highest respect of all. But teaching, learning and research must ever go hand in hand and the one who engages in the highest type of scientific research cannot afford to have mercenary ideas uppermost in his mind. He must go whither the truth would lead him, and while he ought to be given an abundance of the world's goods so as to make him comfortable through life, he will ever find the pleasure of his researches his greatest reward.

SOME PERSONAL RECOLLECTIONS OF ABRAHAM LINCOLN.

My deep interest in Mr. Lincoln came, first, of his manifestations of opposition to any further extension of slavery over the territories of the United States—an opposition in which I believe I shared as sincerely as any American; for, while a student and medical professor in Cincinnati, in the early fifties of the last century, I had ofttimes looked across the Ohio River to the shadows on the Kentucky side, and now and then, by sympathy, felt the smart of a driver's lash on Freedom's shore; there, too, had earnest part in forming the great political party solemnly sworn to resist extension of the damning curse of human bondage, and thence had gone out, as one of Freedom's advocates on more than a hundred 'stumps," in Ohio, Indiana, Illinois, and Wisconsin.

Meanwhile, I had, with profound interest, so watched the masterly discussions of Mr. Lincoln with Douglas, in northern Illinois, and so marked him for his destiny, that, in the winter of 1858-9, being then in command of agricultural affairs in Wisconsin, I went down to Chicago to congratulate him and, if possible, secure him for delivery of the annual address at the next state fair, to be held at Milwaukee in September, 1859.

We spent half the night together, in his chamber, reviewing the past and outlining a possible, even probable future—an evening so deeply interesting that, after fifty years, the discussions and incidents are still almost fresh enough for recital in detail. Even then the dark clouds of a coming conflict hovered near enough to make one anxious; but in the minds

of both, even civil war, with carnage widespread and fearful, seemed not so dreadful as a further extension of human slavery over half a continent by consent of possessors whose immediate ancestors had themselves been freed from British oppression, not half so terrible, at great cost of blood and treasure. There was yet hope that the resolute champions of the curse would stay their demands, but the prospect was sadly faint, for even then the need of preparing for the worst was painfully felt.

I need hardly say that my conviction of the greatness of Mr. Lincoln, already gained by a reading of his discussions of the all-engrossing questions of the time, was yet further deepened by that night's experience and study of the homely, robust statesman before me, and that, with a glad heart I bore away, at midnight, his promise to be with us, in Milwaukee, at the appointed time.

When, at the moment of departure, he was asked to let me know the time of his leaving Chicago, so that I could meet him on his arrival in Milwaukee, he merely said, with his characteristic simplicity: "Oh, don't trouble yourself on my account; I'll be at the Newhall in good time, all right." And so he was, some eight months later.

But it so happened that his actual arrival was at midnight, and that the room intended to be reserved for him had, by the blunder of a clerk, been given to a man and his wife who were already in bed and asleep. There was no remaining vacant room in the house, and the clerk, having been stoutly arraigned by the landlord, was in distress of mind; seeing which, Mr. Lincoln, with a smiling countenance and comforting words, said: "Oh, my dear sir, don't be unhappy on my account. I see there is vacant space enough right here, at the end of the counter. Just bring a cot and clothes-rack, with sheet for a screen, and I'll sleep like a top." The thing was done, and the distinguished guest, after a cheerful and hearty "Good-night, gentlemen," handsomely retired.

Of course I was prompt to fulfill my promise to come down in good time to breakfast with him, but he was a little tardy, so that when, having heard a little stir behind the screen, I

ventured to tap gently on the frame, word came out at once, "Come in!" But, on passing 'round, I found him not only half dressed, but shaving himself, and so encumbered that, instead of moving his chair for a greeting of his visitor, having recognized my voice, he turned his head squarely back and saw me, with his lathered face inverted and considerably broadened by a smile. Of course I was quick to retire and wait.

The breakfast disposed of, we were soon on our way to the Fair grounds, for Mr. Lincoln said he wanted to see what sort of farmers, gardeners, and mechanics the Badgers made.

The address was to be at 11:00, and meanwhile we made ourselves very busy, going the rounds of all the departments. It soon became apparent that, notwithstanding his modest disclaimer of knowing much of practical affairs besides wood-chopping and rail-splitting, he did know much of many things in country life; that he was in fact capable of critical judgment of horses, cattle, sheep, and other domestic animals, as well as of most products of the soil.

The address was listened to by many thousands, some say thirty thousand, not a few of whom had made special efforts and sacrifices that they might see and hear the man who, from the depths of poverty and laborious service in wood and field, had risen to a foremost place in the legal profession and in statesmanship. Perhaps no address more practical, useful, and entertaining was ever delivered on any such occasion. It dealt with the necessary relation between education and labor, as well as with the economy of thorough work in farming especially, and was so enlivened by humorous hits that it was at once highly entertaining and of enduring value. It was in fact so admirable, and so deepened my conviction of his eminent fitness for leadership, that then and there I began to speak of him as the man for next President of the United States—fit for a superior service in statesmanship at any time, but pre-eminently fit for such a crisis as then seemed surely very near—in due time I went to Chicago, to help nominate him, and thereafter gave myself to platform service in many of the Northern states, and to the end of the campaign.

How nobly, how grandly he transcended the highest expectations of his most sanguine admirers is too well known for historic proof. No greater demand for a national guide and guardian was ever made, or more nobly and wonderfully met in any part of the world. It is certain that, for measure of endowment and balance of powers, the supreme founder and father of the Republic alone can be compared with Lincoln, its preserver and the emmancipator of millions of a down-trodden and most wretched race.

Intellectually, Mr. Lincoln was remarkable for the habit of close and critical attention to whatever engaged his thought; for such power of discrimination and comparison as made him clear-headed; such power of logical analysis as made him quick to detect a flaw and expose a fallacy, on which account his opponent in debate ofttimes found himself floundering ere he knew he was on the wrong side, and painfully subject to such withering sarcasm, if he deserved it, as Mr. Lincoln knew so well how to use; remarkable also for such readiness to discover the relations of things as made him far-sighted and hence either courageous, even bold and daring, or prudent, as the occasion might justify or demand.

On the side of the sensibilities I was happy to find, after a further acquaintance, that I had myself underrated him. His rugged, stalwart frame was at first suggestive of a probable sternness of spirit and manner. But, as I came nearer, I was charmed by the delicacy, even tenderness, and all-abounding sympathy of a great and beautiful soul—qualities that made him a lover of the beautiful in nature; that prompted him, on entering the great round tent at the Wisconsin State Fair, with its magnificent display of fruits and flowers, to take off his hat, for a salute, with a grace that won the hearts of all who were present, saying: "How beautiful! Eden transferred!;" that made him too glad for utterance when he signed the immortal Emancipation Proclamation and saw the shackles fall from millions of his fellow-men, and again when, after one of the most fearful conflicts in human history, he knew the Republic saved and foresaw a Union grander and more glorious

than had been dreamed of in all the past, a thing of destiny; qualities, too, that made him so impressionable by others, so sensitive in soul, that he almost never failed to judge rightly the men with whom he had to do, and enabled him to draw into the service of his country so great a galaxy of men of genius, devotion, and heroic virtue.

Morally, Mr. Lincoln was nothing less than an embodiment of virtue, truth, and justice. Those who knew him best believed him incapable of wilful wrong. He so loved truth that he was ever in earnest search of it, and anxious to make it known; and it was the cherishing of a profound love of justice, and his exalted aims and aspirations that made him ever ready, even glad, to do and die for his country.

As for the will, he was resolution itself—never halting or hesitating in his course. Because he felt himself right, and knew the right must win, there was fixedness of purpose. He never just hoped for a final victory; he saw it coming, and, though deeply sad over the dreadful fate of so many martyrs, yet, after all, whenever the future of the Republic was referred to, his noble face was illumined. It was this high assurance of a determined soul that made it easy for him to say to me, one dark morning, when I had gone to the White House, with anxious sympathy, because great armies of Confederate troops had boldly crowded into Pennsylvania and were threatening both Harrisburg and Philadelphia, "Never mind, Dr. Hoyt, you may be sure we'll trot them out of there very soon and make them glad to get home again."

It was this fixedness of purpose and his unfailing confidence that enabled him to preserve his calmness, so that he was rarely disturbed in spirit and never really agitated. His face and voice and daily life were ever giving expression to an unwavering trust in God.

And thus it is that we are amply justified in pronouncing Abraham Lincoln one of the very noblest and grandest of men in all human history.

Washington, D. C.

WISCONSIN ACADEMY OF SCIENCES, ARTS, AND LETTERS.

LIST OF OFFICERS AND MEMBERS, CORRECTED TO AUGUST 1, 1910.

OFFICERS.

President,

SAMUEL PLANTZ, Lawrence College, Appleton.

Vice-President of Sciences,

SIGMUND GRAENICHER, Public Museum, Milwaukee.

Vice-President of Arts,

JOHN G. GREGORY, Milwaukee.

Vice-President of Letters,

D. C. MUNRO, University of Wisonsin, Madison.

Secretary,

ARTHUR BEATTY, University of Wisconsin, Madison.

Treasurer,

ROLLIN H. DENNISTON, University of Wisconsin, Madison.

Librarian,

WALTER M. SMITH, University of Wisconsin, Madison.

Curator,

CHARLES E. BROWN, Madison.

Council,

The President, Vice-Presidents, Secretary, Treasurer, and Past Presidents retaining their residence in Wisconsin.

Committee on Publication.

SAMUEL PLANTZ, Appleton, *President.*
ARTHUR BEATTY, Madison, *Secretary.*
BENNET M. ALLEN, Madison.

Committee on Library.

WALTER M. SMITH, Madison, *Librarian.*
GEORGE W. PECKHAM, Milwaukee.
GEORGE WAGNER, Madison.
R. G. THWAITES, Madison.
S. E. CULVER, Stevens Point.

Committee on Membership.

ARTHUR BEATTY, Madison, *Secretary.*
HENRY L. WARD, Milwaukee.
LEWIS A. YOUTZ, Appleton.
WINNIFRED TITUS, Milwaukee.
J. B. OVERTON, Madison.

Past Presidents.

HONORABLE JOHN W. HOYT, M. D., LL. D., Washington, D. C., 1870–75.
DR. P. R. HOY, M. D.,* 1876–78.
PRESIDENT A. L. CHAPIN, D. D.,* 1879–81.
PROFESSOR ROLAND D. IRVING, Ph. D.,* 1882–84.
PROFESSOR THOMAS C. CHAMBERLIN, Ph. D., Sc. D., LL. D., Chicago, Ill., 1885–87.
PROFESSOR WILLIAM F. ALLEN,** 1888–89.
PROFESSOR EDWARD A. BIRGE, Ph. D., Sc. D., LL. D., Madison, 1889–90.
LIBRARIAN GEORGE W. PECKHAM, LL. D., Milwaukee, 1891–93.
PRESIDENT CHARLES R. VAN HISE, Ph. D., LL. D., Madison, 1894–96.
PROFESSOR C. DWIGHT MARSH, A. M., Ph. D., Washington, D. C., 1897–99.
PROFESSOR CHARLES S. SCHLICHTER, M. S., Madison, 1900–1902.
DR. JOHN J. DAVIS, M. D., Racine, 1903–1905.
PROFESSOR LOUIS KAHLENBERG, Ph. D., Madison, 1906–1909.

*Deceased. ** Deceased December 9, 1899. Professor Birge elected to fill unexpired term.

HONORARY MEMBERS.

CHAMBERLIN, Thomas Chrowder, Hyde Park, Hotel, Chicago, Ill.

A. B. (Beloit); Ph. D. (Wisconsin, Michigan); LL. D. (Michigan, Beloit, Columbian, Wisconsin); Sc. D. (Illinois). Head of Geological Department and Director of Walker Museum, University of Chicago, Consulting Geologist U. S. Geological Survey; Consulting Geologist, Wisconsin Natural History Survey; Geological Commissioner, Illinois Geological Survey; Editor, *Journal of Geology.*

GARLAND, Hamlin, New York, N. Y.

Vice-President, International Institute of Arts and Letters. Chairman of Cliff-Dwellers, of Chicago.

JORDAN, David Starr,
President of Stanford University, Stanford University, Cal.
82 Oxford Road, Ann Arbor, Mich.

M. S., Cornell University, 1872; M. D., Indiana Medical College, 1875; Ph. D., Butler College, 1878; LL. D., Cornell University, 1886, Johns Hopkins University, 1902, Illinois College, 1903; Instructor in Botany, Cornell University, 1871-72; Professor of Natural History, Lombard University, 1872-73; Principal of Appleton (Wis.) Collegiate Institute, 1873-74; Lecturer in Marine Botany at Penikese, 1873-74; Teacher of Natural History, Indianapolis High School, 1874-75; Professor of Biology, Butler College, 1875-79; Instructor in Botany, Harvard Summer School, Cumberland Gap, 1875-76; Assistant to U. S. Fish Commission, 1877-81; Professor of Zoology, Indiana University, 1879-85; President of Indiana University, 1885-91; President of the California Academy of Sciences, 189*-98, 1901 03, 1908; U. S. Commissioner in charge of Fur Seal Investigations, 1896-98, of Salmon Investigations, 1904; International Commissioner of Fisheries, since 1908; President of the American Association for the Advancement of Science, 1903-09

TRELEASE, William, Botanical Garden, St. Louis, Mo.

B. S. (Cornell); S. D. (Harvard); LL. D. (Wisconsin, Missouri, Washington University). Director of Missouri Botanical Garden; Engelmann Professor of Botany, Henry Shaw School of Botany, Washington University; President, Academy of Science of St. Louis; Secretary, The Round Table, St. Louis; Honorary President, Engelmann Botanical Club, St. Louis; Chairman, City Plan Committee, Civic League, St. Louis; Vice-President, Board of Commissioners, Tower Grove Park, St. Louis.

WHEELER, W. M., Forest Hills, Boston, Mass.

Ph. D. Professor of Economic Entomology, Harvard University.

WHITMAN, Charles Otis, University of Chicago, Chicago, Ill.

A. B., A. M. (Bowdoin); Ph. D. (Leipzig); LL. D. (Nebraska). Head Professor of Zoology, University of Chicago; Director of Marine Biological Laboratory, Woods Holl, Mass.

LIFE MEMBERS.

BIRGE, Edward Asahel, 744 Langdon St., Madison.

A. B., A. M. (Williams); Ph. D. (Harvard); Sc. D. (Western University of Pennsylvania); LL. D. (Williams). Professor of Zoology and Dean of the College of Letters and Science, University of Wisconsin; Secretary of Commissioners of Fisheries, Wisconsin; Director and Superintendent, Wisconsin Geological and Natural History Survey; Member, Wisconsin State Board of Forestry; Wisconsin Conservation Commission; Senator, Phi Beta Kappa.

DAVIS, John Jefferson, 504 Monument Square, Racine.

B. S. (Illinois); M. D. (Hahnemann). Physician.

FLINT, Albert Stowell, 450 Charter St., Madison.

A. B. (Harvard); A. M. (Cincinnati). Astronomer, Washburn Observatory, University of Wisconsin.

HOBBS, William Herbert,
820 Oxford Road, Anna Arbor, Mich.

B. S. (Worcester Polytechnic Institute); A. M., Ph. D. (Johns Hopkins). Professor of Geology, University of Michigan.

HOYT, John Wesley, Washington, D. C.

A. M. (Ohio Wesleyan); M. D. (Cincinnati); LL. D. (Missouri). Chairman of the National Committee of Four Hundred to Promote the Establishment of the University of the United States.

MARSH, Charles Dwight,
3430 Brown St., N. W., Washington, D. C.

A. B., A. M. (Amherst); Ph. D. (Chicago). Physiologist in Bureau of Plant Industry, United States Department of Agriculture.

PECKHAM, George Williams, 646 Marshall St., Milwaukee.

LL. D. (Wisconsin). Librarian, Public Library.

SHARP, Frank Chapman, 27 Mendota Court, Madison.

A. B. (Amherst); Ph. D. (Berlin). Professor of Philosophy, University of Wisconsin.

SKINNER, Ernest Brown, 210 Lathrop St., Madison.

A. B. (Ohio); Ph. D. (Chicago). Assistant Professor of Mathematics, University of Wisconsin.

SLICHTER, Charles Sumner, 636 Frances St., Madison.

B. S., M. S. (Northwestern). Professor of Applied Mathematics, University of Wisconsin; Consulting Engineer.

VAN CLEEF, Frank Louis, 39 Fort Greene Place, Brooklyn, N. Y.

A. B. (Oberlin, Harvard); Ph. D. (Bonn). Chief of Sixth Division and Translator in Office of Commissioner of Records, Kings County.

VAN HISE, Charles Richard, 772 Langdon St., Madison.

B. Met. E., B. S., M. S., Ph. D. (Wisconsin); LL. D. (Chicago, Yale, Harvard, Williams, Dartmouth). President, University of Wisconsin; Consulting Geologist, Wisconsin Geological Survey; President, Board of Commissioners, Wisconsin Geological and Natural History Survey; President, Wisconsin State Board of Forestry.

ACTIVE MEMBERS.

ALLEN, Bennet Mills, 710 Conklin Place, Madison.

Ph. B. (De Pauw); Ph. D. (Chicago). Assistant Professor of Anatomy, University of Wisconsin.

ALLEN, Charles Elmer, 2014 Chamberlin Ave., Madison.

B. S., Ph. D. (Wisconsin). Professor of Botany, University of Wisconsin.

ALLEN, Florence Eliza, 219 Lathrop St., Madison.

B. L., M. L., Ph. D. (Wisconsin). Instructor in Mathematics, University of Wisconsin.

ALLEN, Ruth Florence, 450 Charter St., Madison.

A. B., A. M. (Wisconsin). Assistant in Botany, University of Wisconsin.

ARZBERGER, Emil Godfrey,
4233 Shenandoah St., St. Louis, Mo.
Ph. B. (Wisconsin). Research Fellowship, Missouri Botanical Garden.

BANZHOF, H. L., 120 Wisconsin St., Milwaukee.

BARDEEN, Charles Russell, 25 Mendota Court, Madison.
A. B. (Harvard); M. D. (Johns Hopkins). Professor of Anatomy, and Dean of the Medical School, University of Wisconsin.

BARRETT, S. A., Public Museum, Milwaukee.
B. S., M. S., Ph. D. (University of California). Anthropologist; Curator of Anthropology, Public Museum, Milwaukee.

BARTH, George P., 302 21st St., Milwaukee.
Physician.

BEATTY, Arthur, 1824 Jackson St., Madison.
A. B. (Toronto); Ph. D. (Columbia). Assistant Professor of English, University of Wisconsin.

BEEBE, Murray Charles, 211 Langdon St., Madison.
B. S. (Wisconsin). Professor of Electrical Engineering, University of Wisconsin.

BLACKSTONE, Dodge Pierce, 921 Wisconsin St., Berlin.
A. B., A. M., C. E. (Union).

BLAIR, Emma Helen, 131 W. Gorham St., Madison.
B. S., A. M. (Ripon and Wisconsin). Joint Editor of "The Philippines, 1493-1898," and Editor of "The Indian Tribes of the Upper Mississippi Valley."

BLEYER, Willard Grosvenor, 625 Langdon St., Madison.
B. L., M. L., Ph. D. (Wisconsin). Assistant Professor of Journalism, University of Wisconsin.

BOWLES, James F. B., Canal Zone, Isthmus of Panama.
Chemist.

BRADLEY, Harold Cornelius, 701 Langdon St., Madison.
A. B. (California); Ph. D. (Yale). Assistant Professor of Physiological Chemistry, University of Wisconsin.

BRAUN, Adolph R., 832 38th St., Milwaukee.

Graduate of National German-American Teachers' Seminary, Milwaukee. Teacher of Modern Languages, Milwaukee High School.

BRINCKLEY, William Joshua, 505 John St., Appleton.

A. B. (Salina); B. S., A. M. (De Pauw); Ph. D. (Austin). Professor of Biology, Lawrence University.

BRITTINGHAM, Thomas Evans,
640 North Henry St., Madison

Lumberman; Chairman, State Park Board; Vice-Chairman, Wisconsin Conservation Committee; Chairman, Forest Hill Cemetery Commission.

BROWN, Charles E., 1609 Monroe St., Madison.

Secretary and Curator, Wisconsin Archaeological Society; Chief, State Historical Museum.

BROWN, Charles Newton, 271 Langdon St., Madison.

LL. B. (Wisconsin). Lawyer.

BROWN, Eugene Anson, 152 East Johnson St., Madison.

M. D. (Hahnemann). Physician and Surgeon; Secretary of Board of Federal Pension Examiners, Madison District.

BROWNE, Edward Everts, Waupaca.

B. L., LL. B. (Wisconsin). District Attorney, Waupaca County; State Senator, 21st Senatorial District; Vice-President, Wisconsin State Bar Association.

BRUES, Charles Thomas,
Bussey Institution, Forest Hill, Boston, Mass.

B. S., M. S. (Texas). Instructor in Economic Entomology, Harvard University.

BRUNDAGE, Albert H.,
375 Gates Ave., Brooklyn Borough, New York City.

Emeritus Professor of Toxicology and Physiology, Marquette University; Physician.

BUEHLER, Henry Andrew, Rolla, Mo.

B. S. (Wisconsin). Geologist; State Geologist of Missouri.

BURGESS, Charles Frederick, 1601 Adams St., Madison.

B. S., E. E. (Wisconsin). Professor of Chemical Engineering, University of Wisconsin.

BURNETT, Earle Smead, 620 Frances St., Madison.

B. S., M. E. (Wisconsin). Experimental Investigator in Engineering Physics, University of Wisconsin.

BURRILL, Alfred C., Milwaukee.

S. B. (Harvard). Public Lecturer, Public Museum, Milwaukee.

CAIRNS, William B., 2010 Madison St., Madison.

A. B., (Ph. D. (Wisconsin). Assistant Professor of American Literature, University of Wisconsin.

CHANDLER, Elwyn Francis, University, N. D.

A. B., A. M. (Ripon). Professor of Mathematics, University of North Dakota; Assistant Engineer, United States Geological Survey.

CHAPIN, Robert Coit, 709 College St., Beloit.

A. B. (Beloit); Ph. D. (Columbia). Professor of Economics and Secretary of the Faculty, Beloit College.

CHASE, Wayland J., 141 Summit Ave., Madison.

A. B., A. M. (Brown). Associate Professor of History, University of Wisconsin.

CHENEY, Lellen Sterling, Barron.

B. S., M. S. (Wisconsin). County Superintendent.

CHRISTMAN, Arthur Henry, Menomonee Falls.

B. S. (Wisconsin).

CLAS, Alfred Charles,
Flat 2, St. James Ct., 815 Grand Ave., Milwaukee.

Architect (Ferry & Clas), 419 Broadway, Milwaukee; Member, Board of Park Commissioners.

CLAWSON, Arthur Brooks, Washington, D. C.

A. B. (Michigan). Department of Agriculture, Washington.

COFFIN, Victor, 22 Mendota Court, Madison.

Ph. D. (Cornell). Assistant Professor of European History, University of Wisconsin.

COMSTOCK, George Cary, Observatory Hill, Madison.

Ph. B. (Michigan); LL. B. (Wisconsin); Sc. D. (Michigan); LL. D. (Illinois; Professor of Astronomy, Director of Washburn Observatory and Director of Graduate School, University of Wisconsin; First Vice-President Astronomical and Astrophysical Society of America.

COOL, Charles Dean, 1818 Madison St., Madison.

Instructor in Romance Language, University of Wisconsin.

CULVER, Garry Eugene, 1103 Main St., Stevens Point.

A. M. (Denison). Professor of Physical Science, State Normal School.

DANIELLS, William Willard, 515 North Carroll St., Madison.

M. S., Sc. D. (Michigan Agricultural). Professor Emeritus of Chemistry, University of Wisconsin.

DEAN, Alletta F., The Hamilton, Madison.

Ph. B., Ph. M. (Wisconsin). Instructor in Biology, Madison High School.

DEARBORN, Walter Fenno, 218 West Gilman St., Madison.

A. B., A. M. (Wesleyan); Ph. D. (Columbia). Assistant Professor of Education, University of Wisconsin.

DENNIS, Alfred Lewis Pinneo, 518 Wisconsin Ave., Madison.

A. B. (Princeton); Ph. D. (Columbia). Professor of European History, University of Wisconsin.

DENNISTON, Rollin Henry, Science Hall, Madison.

Ph. G., B. S., Ph. D. (Wisconsin). Assistant Professor of Botany, University of Wisconsin.

DERNEHL, Paul Herman, 717–718 Majestic Building, Milwaukee.

B. S. (Wisconsin); M. D. (Johns Hopkins University). Physician.

DESMOND, Humphrey J., 120 Wisconsin St., Milwaukee.

B. L. (Wisconsin); A. M. (Notre Dame). Lawyer; Regent, Marquette University.

DIETRICH, Otto, 730 Grand Ave., Milwaukee.

Ph. D. (Halle). Director, Milwaukee University School.

DODGE, Robert Elkin Neil, 15 W. Gorham St., Madison.
A. B., A. M. (Harvard). Assistant Professor of English, University of Wisconsin.

DOWLING, Linnaeus Wayland, 2 Roby Road, Madison.
Ph. D. (Clark). Assistant Professor of Mathematics, University of Wisconsin.

DOWNES, Robert Hugh, 53 West Algoma St., Oshkosh.
B. L. (Wisconsin).

DYKE, Le Grand Grandis, 414 N. Henry St., Madison.
Student at University of Wisconsin.

ELLIOTT, Edward Charles, 407 Wisconsin Ave., Madison.
B. S., A. M. (Nebraska); Ph. D. (Columbia). Professor of Education, University of Wisconsin.

ELLSWORTH, William H., 3302 Wells St., Milwaukee.
President, Ellsworth and Thayer Manufacturing Company.

ELY, Richard Theodore, 205 Prospect Av., Madison.
A. B., A. M. (Columbia); Ph. D. (Heidelberg); LL. D. (Hobart). Professor of Political Economy, University of Wisconsin.

ERICKSON, Frank Morton, 529 Woodside Ave., Ripon.
A. B. (Wabash); A. M. (Chicago). Dean, and Professor of Greek, Ripon College.

ERLANGER, Joseph, 301 Johnson Court, Madison.
B. S. (California); M. D. (Johns Hopkins). Professor of Physiology, University of Wisconsin.

FALGE, Louis, Manitowoc.
B. S. (Wisconsin); M. D. (Rush). Physician; Vice-President, Wisconsin Archaeological Society.

FARLEY, John Herbert, 482 South St., Appleton.
A. M. (Lawrence). Professor of Philosophy, Lawrence College.

FERRY, George Bowman, 19 Prospect Ave., Milwaukee.
Architect (Ferry and Clas).

FINGER, William, 297 12th St., Milwaukee.
Insurance, Loans and Real Estate Broker.

FINKLER, Adolph, 612 Commerce St., Milwaukee.
Secretary, Albert Trostel and Sons Company; President, Board of Trustees, National German-American Teachers' Seminary; President, Board of Trustees, German-English Academy.

FISCHER, Richard, 119 East Johnson St., Madison.
Ph. C., B. S. (Michigan); Ph. D. (Marburg). Assistant Professor of the Theory and Practice of Pharmacy, University of Wisconsin; State Chemist, Wisconsin.

FISH, Carl Russell, 625 Mendota Court, Madison.
A. B. (Brown); A. M., Ph. D. (Harvard). Associate Professor of American History, University of Wisconsin.

FLING, Harry R., 601 Jackson St., Oshkosh.
A. B. (Bowdoin). Professor of Biology, State Normal School.

FROST, William Dodge, 310 Bruen St., Madison.
B. S., M. S. (Minnesota); Ph. D. (Wisconsin). Associate Professor of Bacteriology, University of Wisconsin.

GAY, Lucy Maria, 216 North Pinckney St., Madison.
B. L. (Wisconsin). Assistant Professor of Romance Languages, University of Wisconsin.

GIESE, William Frederick, 2022 Jefferson St., Madison.
A. B., A. M. (Harvard). Associate Professor of Romance Languages, University of Wisconsin.

GILBERT, Edward Martinius, Superior.
A. B. (Wisconsin). Instructor in Biology, State Normal School.

GILMAN, Albert G., Ripon, Wis.
Professor of Chemistry, Ripon College.

GORDON, Mrs. George, 1144 Humboldt Ave., Milwaukee.

GRAENICHER, Sigmund, 116 Harmon St., Milwaukee.
Ph. D. (Basel); M. (Munchen). Curator, Public Museum.

GREGORY, John Goadby, 717 Jefferson St., Milwaukee.
Associate Editor, Evening Wisconsin.

GRIGGS, Horace William, Portage, Wis.
Roundhouse Foreman, C., M. & St. P. Ry. Co.

HAASE, Ewald, 621 Farwell Ave., Milwaukee.
Secretary, Milwaukee Gas Light Company.

HABERSTICH, Félicie M., 411 Murray St., Madison.
Diploma, Academy of Neuchatel; A. M. (Coates).

HAERTEL, Martin Henry, 1104 West Johnson St., Madison.
Ph. B. (Chicago); Ph. D. (Wisconsin). Instructor in German, University of Wisconsin.

HAESSLER, Luise,
Whittier Hall, 1230 Amsterdam Ave., New York, N. Y.
A. B. (Chicago). Instructor in German, Normal College of the City of New York.

HAESSLER, Herbert, 828 Booth St., Milwaukee.
Student, University of Wisconsin.

HALL, Edward Bennington, 747 N. Main St., Springfield, Mo.
B. S. (Drury). Assistant Professor, Geology and Mineralogy, Drury College, Springfield.

HANCOCK, Edward Lee, La Fayette, Ind.
B. S., M. (Wisconsin). Assistant Professor of Applied Mechanics, Purdue University.

HARDENBERG, Christian Bernhardus, Philadelphia, Pa.
A. B., A. M. (Wisconsin). Harrison Fellow in Zoology, University of Pennsylvania.

HARPER, Robert Almer, 444 Charter St., Madison.
A. B. (Oberlin); Ph. D. (Bonn). Professor of Botany, University of Wisconsin.

HARTLEY, H. T. Jackson, Washington, D. C.
Assistant, U. S. Biological Survey.

HARWOOD, Mary Corinthia, 121 Thorn St., Ripon.
B. L., M. A. (Lawrence). Professor of French and German and Dean of Women, Ripon College.

HEEDLE, John R., 822 W. Johnson St., Madison.
Student, University of Wisconsin.

HOHLFELD, Alexander Rudolph, 104 Breese Terrace, Madison.
Ph. D. (Leipzig). Professor of German, University of Wisconsin; Member of Executive Council, Modern Language Association of America; Member of Board of Administration, National German-American Teachers' Seminary, Milwaukee.

HOLLISTER, Albert Henry, 17 Langdon St., Madison.
Pharmacist.

HOLMES, Samuel Jackson, 2002 Madison St., Madison.
B. S., M. S. (California); Ph. D. (Chicago). Assistant Professor of Zoology, University of Wisconsin.

HUBBARD, Frank Gaylord, 277 Langdon St., Madison.
A. B. (Williams); Ph. D. (Johns Hopkins). Professor of the English Language, University of Wisconsin.

HUTTON, Andrew J., Box 378, Waukesha.
Superintendent, Wisconsin Industrial School for Boys.

INGERSOLL, Leonard R., 810 Oakland Ave., Madison.
B. S. (Colorado College); Ph. D. (Wisconsin). Associate Professor of Physics, University of Wisconsin.

JANSKY, Cyril M., 2018 Madison St., Madison.
Associate Professor of Electrical Engineering, University of Wisconsin.

JASTROW, Joseph, 222 Langdon St., Madison.
A. B., A. M. (Pennsylvania); Ph. D. (Johns Hopkins). Professor of Psychoolgy, University of Wisconsin.

JENKS, Judge Aldro, Dodgeville.

JOHNSON, Arden Richard, 1010 Webster Ave., Chicago, Ill.
B. S., M. S. (Wisconsin). Professor of Chemistry, De Paul University, Chicago, Ill.

JOHNSON, Warren Seymour, Milwaukee Club, Milwaukee.
Mechanical Engineer.

JOLIVETTE, Hallie M., Madison.

JONES, Lewis R. Madison.

Professor of Plant Pathology, University of Wisconsin.

JUDAY, Chancey, 610 Lake St., Madison.

A. M. (Indiana). Biologist, Wisconsin Geological and Natural History Survey.

KAHLENBERG, Louis, 234 Lathrop St., Madison.

B. S., M. S. (Wisconsin); Ph. D. (Leipzig). Director of the Course in Chemistry and Professor of Chemistry, University of Wisconsin.

KIMBALL, Mather Dean, 900 Summit Ave., Milwaukee.

A. B., A. M. (Northwestern).

KIND, John Louis, The Irving, Sterling Court, Madison.

A. B., A. M. (Nebraska); Ph. D. (Columbia). Assistant Professor of German, University of Wisconsin.

KING, Franklin Hiram, 1540 University Ave., Madison.

KOELKER, William F., 422 North Henry St., Madison.

Ph. D. (Berlin). Instructor in Organic Chemistry, University of Wisconsin.

KREMERS, Edward, 1720 Jackson St., Madison.

Ph. G., B. S. (Wisconsin); Ph. D. (Gottingen). Director of Course in Pharmacy and Professor of Pharmaceutical Chemistry, University of Wisconsin.

KREY, A. C., Madison.

KRUEGER, Henry, 385 27th Ave., Milwaukee.

Principal, Twelfth District School, No. 1.

KUHN, Harry, Toledo, Ohio.

Clerk, with Franc, Heyn and Company.

KUTCHIN, Mrs. Harriet Lehmann,
804 Chestnut St., Missoula, Mont.

A. B. (Ripon); A. M. (Northwestern). Engaged in zoological research.

LAIRD, Arthur Gordon, 21 Mendota Court, Madison.

Ph. D. (Cornell). Assistant Professor of Greek and Comparative Philology, University of Wisconsin.

LANNERD, Willard, 1750 Grand Ave., Racine.

B. S. (Purdue). Instructor in Science and Mathematics, Racine High School.

LEITH, Charles Kenneth, 240 Langdon St., Madison.

B. S., Ph. D. (Wisconsin). Professor of Geology, University of Wisconsin; Non-resident Professor of Structural and Metamorphic Geology, University of Chicago.

LEITZKE, Reinhard, Hustisford.

Taxidermist.

LEONARD, William Ellery, 222 Langdon St., Madison.

A. B. (Boston University); M. A. (Harvard); Ph. D. (Columbia). Assistant Professor of English, University of Wisconsin.

LENHER, Victor, 158 Summit Ave., Madison.

Ph. D. (Pennsylvania). Professor of Chemistry, University of Wisconsin.

LIBBY, Orin Grant,
409 South Sixth St., Grand Forks, N. D.

B. L., M. L., Ph. D. (Wisconsin). Professor of History, University of North Dakota; Secretary, State Historical Society of North Dakota.

LIGHTY, William Henry, 2006 Monroe St., Madison.

Ph. B. (Cornell). Secretary of Correspondence-Study Department, University of Wisconsin.

LLOYD-JONES, Thomas R., Madison.

B. S. (Wisconsin). Principal, Fond du Lac High School.

LUENING, Eugene, Madison.

Professor of Music, University of Wisconsin.

LUTMAN, Benjamin Franklin,
120 Colchester Ave., Burlington, Vt.

A. B. (Missouri); A. M., Ph. D. (Wisconsin). Professor of Botany (pro tem.), University of Vermont.

MARQUETTE, William George, 542 West Johnson St., Madison.
Ph. G. (Northwestern); B. S., Ph. D. (Wisconsin). Instructor in Botany, University of Wisconsin.

MARSHALL, Ruth, Rockford, Ill.
B. Sc., M. S. (Wisconsin); Ph. D. (Nebraska). Head, Department of Biology, Rockford College.

MARSHALL, William Stanley, 139 East Gilman St., Madison.
B. S. (Swarthmore); Ph. D. (Leipzig). Associate Professor of Entomology, University of Wisconsin.

MARTIN, Lawrence, 222 W. Gilman St.. Madison.
A. B. (Cornell); A. M. (Harvard). Assistant Professor of Physiography and Geography, University of Wisconsin; Associate Editor, Bulletin American Geographical Society; Member, Geological Society of America, Association of American Geographers, Wisconsin Geological and Natural History Survey, United States Geological Survey.

MASON, Max, 152 W. Gorham St., Madison.
B. S. (Wisconsin). Professor of Mathematics, University of Wisconsin.

MAURER, Edward Rose, 167 Prospect Ave., Madison.
B. C. E. (Wisconsin). Professor of Mechanics, University of Wisconsin.

MCALLISTER, Fred, Madison.

MCGILVARY, Evander Bradley,
1902 Arlington Place, Madison.
A. B. (Davidson); A. M. (Princeton); Ph. D. (California). Professor of Philosophy, University of Wisconsin.

MCKENNA, Maurice, 114 Third St., Fond du Lac.
Lawyer; President, Bar Association of Fond du Lac County.

MCLEOD, Andrew Fridley, Chicago, Ill.
Ph. D. (Wisconsin). Instructor in Chemistry, University of Chicago.

MCMINN, Amelia, 172 21st St., Milwaukee.
B. S. (Wisconsin). Instructor in Biology, Milwaukee West Side High School.

MEACHEM, John Goldesbrough, Jr., 745 College Ave., Racine.
M. D. (Rush). Physician.

MEAD, Warren J., 1811 Jefferson St., Madison.
Assistant Professor of Geology, University of Wisconsin.

MERRILL, J. A., Superior.
S. B. (Harvard). Professor of Geography, State Normal School.

MERRILL, Mrs. Sherburne S., 3355 Grand Ave., Milwaukee.
First Vice-President, Wisconsin Humane Society; Second Vice-President, Woman's Club of Wisconsin; President, Public School Art League.

METZDORF, William, St. Francis.
Professor of Natural Sciences, St. Francis Seminary.

MEYER, Balthasar Henry, 1937 Arlington, Place, Madison.
B. L., Ph. D. (Wisconsin). Professor of Political Economy, University of Wisconsin; Chairman, Railroad Commission of Wisconsin.

MILLER, William Snow, University Club, Madison.
M. D. (Yale). Associate Professor of Anatomy, University of Wisconsin.

MITCHELL, Irving N., 2921 Cedar St., Milwaukee.
Ph. B. (Michigan). Professor of Biology, State Normal School.

MONROE, C. E., 512 Van Buren St., Milwaukee.
A. B. (Oberlin College);; LL. B. (Michigan University). Lawyer.

MORRIS, William Augustus Pringle, Howard Place, Madison.
A. B. (Hamilton). Lawyer.

MUNRO, Dana Carleton, 630 Frances St., Madison.
A. B., A. M. (Brown). Professor of European History, University of Wisconsin.

MUTTKOWSKI, Richard Antony,
914 North Pierce St., Milwaukee, Wis.
Assistant, Department of Invertebrate Zoology, Public Museum; Secretary, Wisconsin Natural History Survey.

NADER, John, 302 West Main St., Madison.
Architect and Civil Engineer.

NAYLOR, Wilson Samuel, Appleton.
Professor, Lawrence College.

NEILSON, Walter Hopper, 114 Garfield Ave., Milwaukee.
M. D. (Rush). Dean of the Medical Faculty and Professor of the Principles and Practice of Medicine and Clinical Medicine, Milwaukee Medical College.

NICHOLS, Susie Percival, Shelbyville, Kentucky.
B. S. (Cornell); Ph. D. (Wisconsin).

OLIN, John Myers, 762 Langdon St., Madison.
A. B., A. M. (Williams); LL. B. (Wisconsin). Lawyer; Professor of Law, University of Wisconsin.

OLIVE, Edgar William, 821 9th Ave., Brookings, S. D.
B. S., M. S. (Wabash); A. M., Ph. D. (Harvard). Professor of Botany, South Dakota Agricultural College.

O'SHEA, M. Vincent, 140 Langdon St., Madison.
B. L. (Cornell). Professor of the Science and Art of Education, University of Wisconsin.

OTIS, Daniel Henry, 1717 Madison St., Madison.
M. S. (Kansas Agricultural). Assistant to the Dean of the College of Agriculture and Professor of Farm Management, University of Wisconsin.

OVERTON, James Bertram, 512 Wisconsin Ave., Madison.
Ph. B. (Michigan); Ph. D. (Chicago). Assistant Professor of Botany, University of Wisconsin.

OWEN, Edward Thomas, 614 State St., Madison.
A. B., Ph. D. (Yale). Professor of French and Linguistics, University of Wisconsin.

PARKER, Fletcher Andrew, 14 W. Gilman St., Madison.
Professor Emeritus of Music, University of Wisconsin; Vice-President, Music Teachers' National Association.

PARKINSON, John Barber, 516 Wisconsin Ave., Madison.
A. B., A. M. (Wisconsin). Vice-President and Professor Emeritus of Constitutional and International Law, University of Wisconsin.

PATZER, Otto, Seattle, Wash.

B. L., M. L., Ph. D. (Wisconsin). Assistant Professor of French, University of Washington.

PAULY, Hugo Albert, 1066 19th St., Milwaukee.

B. S. (Wisconsin). Superintendent of Schools, Milwaukee County.

PEABODY, Arthur, 630 Frances St., Madison.

B. S. (Illinois). Supervising Architect, University of Wisconsin.

PELTIER, George L., Grand Rapids.

PENCE, William David, 168 Prospect Ave., Madison.

C. E. (Illinois). Professor of Railway Engineering, University of Wisconsin; Engineer, Wisconsin State Board of Assessment and Wisconsin State Railroad Commission.

PERELES, James Madison, 529 Astor St., Milwaukee.

LL. B. (Wisconsin). Lawyer; President, Milwaukee Public Library; Chairman, Wisconsin Free Library Commission; President, Citizens' Trust Company.

PERELES, Jennie W. (Mrs. J. M.), 529 Astor St., Milwaukee.

Secretary, Milwaukee Flower Mission and Mission Kindergarten.

PERELES, Nellie W. (Mrs. T. J.), 535 Astor St., Milwaukee.

PERELES, Thomas Jefferson, 535 Astor St., Milwaukee.

LL. B. (Wisconsin). Lawyer; Vice-President, Milwaukee Law Library and Citizens' Trust Company.

PERISHO, Ellwood Chappelle, Vermillion, S. D.

B. S., M. S. (Earlham); M. S. (Chicago). Professor of Geology, University of South Dakota; State Geologist, South Dakota.

PERROW, Eber Carle, 456 W. Mifflin St., Madison, Wis.

A. B., A. M., Ph. D. (Harvard). Instructor in University of Wisconsin.

PHILLIPS, James David, 1010 Grant St., Madison.

B. S. (Illinois). Professor of Drawing, University of Wisconsin.

PLANTZ, Samuel, 545 Union St., Appleton.

A. M. (Lawrence); Ph. D. (Boston); D. D. (Albion); LL. D. (Baker). President, Lawrence College.

PORTER, William, 735 College Ave., Beloit.

A. B., A. M., D. D. (Williams). Professor Emeritus of Latin, Beloit College.

POST, Harriet L., 1182 Humboldt Ave., Milwaukee.

M. D. (Woman's Medical College of New York Infirmary). Instructor in Biology, East Side High School.

PRETTS, William Walter, Platteville.

B. S. (Wisconsin); M. D. (Northwestern). Physician and Surgeon.

PULS, Arthur John, Wells Building, Milwaukee.

B. L. (Wisconsin); M. D. (Heidelberg). Physician; Ex-Regent, University of Wisconsin.

PUTNEY, Frank Howell, 215 Wisconsin Ave., Waukesha.

Lawyer; President, Waukesha Gas and Electric Company; Vice-President, Waukesha National Bank.

REED, George Matthew, 809 Virginia Ave., Columbia, Mo.

A. B. (Geneva); A. M., Ph. D. (Wisconsin). Assistant Professor of Botany, University of Missouri.

REED, Mary, Oconomowoc.

RICE, Ole S., Madison.

B. S. (Wisconsin). Library Clerk, Office of State Superintendent of Public Instruction.

RUENZEL, Henry Gottlieb
2710 McKinley Boulevard, Milwaukee.

Ph. G. (Wisconsin). Pharmacist; Member, State Board of Pharmacy.

SAGE, Adolphus H., 130 Elm St., Oshkosh.

B. S. (Cornell). Teacher of Physics, State Normal School.

SALMON, Edward Payson, 618 Church St., Beloit.

A. M. (Beloit). Congregational Minister; Second Vice-President, Board of Trustees, Beloit College.

SAMMIS, J. L., Madison.

Assistant Professor of Dairying, University of Wisconsin.

SANBORN, John Bell, Wisconsin Building, Madison.

B. L., M. L., Ph. D. (Wisconsin). Lawyer; Treasurer, Wisconsin State Bar Association; Lecturer, University of Wisconsin Law School; Member, Wisconsin Council, American Bar Asssociation.

SANFORD, Albert Hart, 1052 Clark St., Stevens Point.

B. L. (Wisconsin); A. B. (Harvard). Instructor in History and Civics, State Normal School.

SCHINNER, Augustin F., 628 Bay St., Superior.

D. D. Bishop.

SCHLUNDT, Herman, Columbia, Mo.

B. S., M. S., Ph. D. (Wisconsin). Professor of Physical Chemistry, University of Missouri.

SCOTT, Jonathan F., Brunswick, Me.

SCOTT, Winfield G., 1109 Park Ave., Racine.

Director, Private Testing Laboratory.

SECRIST, Horace, 318 Lake St., Madison.

M. A. (Wisconsin). Instructor in Political Economy, University of Wisconsin.

SEIFERT, Paul A., Gotham.

Ac. De. (Academy of Forestry, Tharandt, Saxony). Taxidermist.

SEVERIN, Henry Herman Paul, 941 Grove St., Milwaukee.

B. A., M. A., Ph. D. (Wisconsin). Fellow in Zoology, University of Wisconsin.

SHELDON, Nina Mary, 421 Watson St., Ripon.

A. B. (Ripon). Fellow in English, Ripon College.

SHEPHARD, William Henry,
1512 Dupont Ave., N., Minneapolis, Minn.

Ph. B., A. M. (Wisconsin). Instructor in History, North High School.

SHERMAN, Helen, 176 Mason St., Milwaukee.

B. S., A. M. (Wisconsin). Instructor in Botany, Milwaukee-Downer College.

SHERMAN, Lewis, 176 Mason St., Milwaukee.
B. S., A. M. (Union); M. D. (New York). Physician and Pharmacist.

SIEKER, William Christian, 164 Wisconsin St., Milwaukee.
B. S. (Wisconsin). Secretary and Treasurer, Manthey-Sieker Company.

SLAUGHTER, Moses Stephen, 633 Frances St., Madison.
A. B., A. M. (De Pauw); Ph. D. (Johns Hopkins). Professor of Latin, University of Wisconsin.

SMITH, Erastus Gilbert, 649 Harrison Ave., Beloit.
A. B., A. M. (Amherst); A. M., Ph. D. (Gottingen). Professor of Chemistry, Beloit College.

SMITH, Hugh Allison, 1804 Madison St., Madison.
A. B., A. M. (Missouri). Professor of Romance Lnguages, University of Wisconsin.

SMITH, Walter McMynn, 112 Langdon St., Madison.
A. B. (Wisconsin). Librarian, University of Wisconsin.

SMYTHE, Sidney T., Delafield.
A. B., A. M. (St. Stephen's); B. D. (Nashotah); D. D., Ph. D. (Hobart). President, St. John's Military Academy; Member, Committee on Canons, Protestant Episcopal Church.

SNOW, Benjamin Warner, 135 West Gilman St., Madison.
Ph. D. (Berlin). Professor of Physics, University of Wisconsin.

SQUIER, George Hull, Trempealeau.
Dairyman.

STARR, William J., 135 Marston Ave., Eau Claire.
LL. B. (Columbia). Member, Board of Commissioners of Fisheries, Wisconsin; President, Eau Claire Public Library.

STEIDTMANN, E., Madison.

STICKNEY, M. E., Granville, O.
Denison University.

STODDART, Charles William, 1602 Jefferson St., Madison.
A. B., A. M. (Columbia); Ph. D. (Wisconsin). Assistant Professor of Soils, University of Wisconsin.

STOUT, Arlow Burdette, 924 Clymer Place, Madison.
A. B. (Wisconsin). Instructor in Botany, University of Wisconsin.

TALBERT, George A., Ripon.
B. S., M. S. (Ohio Wesleyan). Instructor in Biology, Ripon College.

TELLER, Edgar Eugene, 3321 Sycamore St., Milwaukee.

THOMAS, Carl C., 633 N. Frances St., Madison.
Professor of Steam Engineering, University of Wisconsin.

THORKELSON, Halsten Joseph Berford,
1526 W. Washington Ave., Madison.
B. S., M. E. (Wisconsin). Associate Professor of Steam Engineering, University of Wisconsin.

THWAITES, Reuben Gold, 11 East Gilman St., Madison.
LL. D. (Wisconsin). Secretary and Superintendent, State Historical Society of Wisconsin; Vice-Chairman, Wisconsin Free Library Commission; Secretary and Editor, Wisconsin History Commission; Member, American Library Institute; Councillor, American Library Association.

TITUS, Winifred, Milwaukee.
B. S., M. S. (Wisconsin). Professor of Chemistry, Milwaukee-Downer College.

TOOLE, William Alexander, Pansy Heights, Baraboo, Wis.
Pansy Specialist.

TOWNSEND, De Wayne, Oconomowoc.

TURNEAURE, Frederick Eugene, 166 Prospect Ave., Madison.
C. E. (Cornell). Professor of Engineering and Dean of the College of Engineering, University of Wisconsin.

TURNER, Frederick Jackson, 629 Frances St., Madison.
A. B., A. M. (Wisconsin); Ph. D. (Johns Hopkins); LL. D. (Illinois); Litt. D. (Harvard). Professor of American History, Harvard University; President, American Historical Association; Member, Massachusetts Historical Association; American Antiquarian Society; Colonial Society of Massachusetts; Wisconsin Historical Society; Mississippi Valley Historical Society, etc.

TYLER, Abram Ray, 920 College Ave., Beloit.

A. G. O. (American Guild of Organists). Professor of Music and College Organist, Beloit College.

UIHLEIN, August, 332 Galena St., Milwaukee.

President, Second Ward Savings Bank; Secretary, Joseph Schlitz Brewing Company.

UPDIKE, Eugene Grover, 148 Langdon St., Madison.

B. S., M. S., D. D. (Lawrence). Pastor, First Congregational Church, Madison.

VAN VLECK, Edward Burr,
519 North Pinckney St., Madison.

A. B., A. M. (Wesleyan); Ph. D. (Gottingen); LL. D. (Clark). Professor of Mathematics, University of Wisconsin; Editor, *Transactions of the American Mathematical Society.*

VIEBAHN, Charles Frederick, 703 Western Ave., Watertown.

Superintendent of Schools and Principal of High School.

VOGEL, Guido Charles, 583 Cass St., Milwaukee.

B. S. (Wisconsin).

VORHIES, Charles Taylor, 818 West Johnson St., Madison.

B. S. (Iowa Wesleyan). Assistant in Zoology, University of Wisconsin.

VOSS, Ernst Karl Johann Heinrich,
218 W. Gilman St., Madison.

Ph. D. (Leipzig). Professor of German Philology, University of Wisconsin; Vice-President, Germanic Museum Association.

WADMOND, Samuel C., Delavan.

Vice-President, Jackson and Jackson Company, Delavan; Secretary of Board, Aram Public Library, Delavan.

WAGNER, George, 1901 Jefferson St., Madison.

Ph. C. (Michigan); A. B. (Kansas); A. M. (Michigan). Assistant Professor of Zoology, University of Wisconsin; Ichthyologist, State Geological and Natural History Survey.

WARD, Henry Levi, Milwaukee Public Museum, Milwaukee.

Director, Milwaukee Public Museum; Vice-President, Wisconsin Natural History Society.

WATT, Homer A., Madison, Wis.

A. B. (Cornell U.); A. M., Ph. D. (Wisconsin). Instructor in English, University of Wisconsin.

WHEELER, Leverett C., Wauwatosa, Wis.

Lawyer. Patent Work.

WEIDMAN, Samuel, 410 North Henry St., Madison.

B. S., Ph. D. (Wisconsin). Geologist, Wisconsin Geological and Natural History Survey.

WEST, George A., 97 Wisconsin St., Milwaukee.

Lawyer; President, Board of Trustees, Milwaukee Public Museum.

WHITBECK, Ray H., Madison.

Assistant Professor of Physiography and Geography, University of Wisconsin.

WHITCOMB, Annabell Cook (Mrs. Henry F.), 721 Franklin St., Milwaukee.

President, Board of Directors, Boys' Busy Life Club.

WHITSON, Andrew Robinson Route 7, Madison.

B. S. (Chicago. Professor of Soils and Drainage, University of Wisconsin; Field Agent, United States Department of Agriculture.

WINCHELL, Alexander N., Madison.

Professor of Geology, University of Wisconsin.

WINSLOW, John Bradley, 131 Langdon St., Madison.

A. B., A. M. (Racine); LL. B., LL. D. (Wisconsin). Justice, Supreme Court of Wisconsin; President, Board of Visitors, University of Wisconsin; Trustee, Racine College.

WOLFF, Henry Charles, 1035 University Ave., Madison.

B. S., M. S. (Wisconsin). Instrucor in Mathematics, University of Wisconsin.

WOLL, Fritz Wilhelm, 408 N. Charter St., Madison.

B. S., Ph. B. (Christiania); M. S., Ph. D. (Wisconsin). Professor of Agricultural Chemistry and Chemist to the Agricultural Experiment Station, University of Wisconsin.

WRIGHT, Clement Blake Bergin, 284 Martin St., Milwaukee.

A. B., A. M. (Toronto); B. D. (Nashotah); Ph. D. (Kansas City); Clergyman; Canon, Milwaukee Cathedral; Secretary, Diocese of Milwaukee; Librarian, Diocesan Library; Examining Chaplain; Editor, Church Times.

YOUNG, Karl, Madison.

Associate Professor of English, University of Wisconsin.

YOUTZ, Lewis Addison, Appleton.

Ph. B., M. S. (Simpson); Ph. D. (Columbia). Professor of Chemistry, Lawrence College.

ZIMMERMAN, Oliver Brunner,
201 Kelley St., Charles City, Ia.

B. S., M. E. (Wisconsin). Mechanical Engineer, with Hart-Parr Company; Honorary Vice-President, Wisconsin Audubon Society.

CORRESPONDING MEMBERS.

ABBOTT, Charles Conrad, Trenton, N. J.

M. D. (Pennsylvania).

ARMSBY, Henry Prentiss, State College, Pa.

B. S. (Worcester Polytechnic); Ph. B., Ph. D. (Yale); LL. D. (Wisconsin). Director of Institute of Animal Nutrition; Expert in Animal Nutrition, United States Department of Agriculture.

BASCOM, John, Park St., Williamstown, Mass.

A. B., A. M. (Williams); D. D. (Iowa); LL. D. (Amherst, Williams, Wisconsin). Greylock Commissioner.

BENNETT, Charles Edwin, 1 Grove Place, Ithaca, N. Y.

A. B., Litt. D. (Brown). Professor of Latin Language and Literature, Cornell University.

BRIDGE, Norman, Auditorium Building, Los Angeles, Cal.

A. M. (Lake Forest); M. D. (Northwestern, Rush). Emeritus Professor of Medicine, Rush Medical College. Physician.

BUCKLEY, Ernest Robertson, Rolla, Mo.

B. S., Ph. D. (Wisconsin). Mining Geologist; President, American Mining Congress.

CAVERNO, Charles, Lombard, Ill.

A. B., A. M. (Dartmouth). Professor Emeritus, Ripon College.

CHANDLER, Charles Henry, New Ipswich, N. H.

A. B., A. M. (Dartmouth); LL. D. (Colorado). Clergyman, retired.

COULTER, John Merle, University of Chicago, Chicago, Ill.

A. B., A. M., Ph. D. (Hanover); Ph. D. (Indiana). Professor of Botany and Head of Department, University of Chicago.

CROOKER, Joseph Henry,
820 South St., Roslindale, Boston, Mass.

D. D. (St. Lawrence, Nashville). Minister, Unitarian Church.

DAVIS, Floyd,
317 Iowa Loan and Trust Building, Des Moines, Iowa.

Ph. B., C. E., E. M. (Missouri); Ph. D. (Miami). Analytical and Consulting Chemist.

EATON, Edward Dwight, Beloit.

A. B., A. M. (Beloit); B. D. (Yale); LL. D. (Wisconsin); D. D. (Northwestern, Yale). President, Beloit College.

ECKELS, William Alexander, Easton, Pa.

A. B., A. M. (Dickinson); Ph. D. (Johns Hopkins). Associate Professor of Greek, Lafayette College.

FALLOWS, Samuel, 2344 Monroe St., Chicago, Ill.

A. B., A. M., LL. D. (Wisconsin); D. D. (Lawrence, Marietta). Presiding Bishop, Reformed Episcopal Church; President, Board of Managers, Illinois State Reformatory.

HENDRICKSON, George Lincoln,
68 Trumbull St., New Haven, Conn.

A. B. (Johns Hopkins); L. H. D. (Western Reserve). Professor of Latin, Yale University.

HODGE, Clifton Fremont, 3 Charlotte St., Worchester, Mass.

A. B. (Ripon); Ph. D. (Johns Hopkins). Professor of Physiology and Neurology, and Professor of Biology in the Collegiate Department, Clark University.

HOLDEN, Edward Singleton,
United States Military Acadamy, West Point, N. Y.

B. S., A. M. (Washington); Sc. D. (Pacific); LL. D. (Wisconsin, Columbia). Astronomer; Librarian, United States Military Academy, West Point.

HOSKINS, Leander Miller, 365 Lincoln Ave., Palo Alto, Cal.

M. S., C. E. (Wisconsin). Professor of Applied Mathematics, Leland Stanford Jr. University.

IDDINGS, Joseph Paxon, 5730 Woodlawn Ave., Chicago, Ill.

Ph. B. (Yale). Professor of Petrology, University of Chicago; Geologist, United States Geological Survey.

KINLEY, David, Urbana, Ill.

A. B. (Yale); Ph. D. (Wisconsin). Dean of the Graduate School and Professor of Economics, University of Illinois.

LEVERETT, Frank, 312 N. Thayer St., Ann Arbor, Mich.

B. Sc. (Iowa Agricultural). Geologist, United States Geological Survey; Lecturer in Geology, University of Michigan.

LURTON, Freeman Ellsworth, Fergus Falls, Minn.

B. S., M. S. (Carleton); A. M. (Upper Iowa); Ph. D. (Gale). Superintendent of Public Schools; Member, Board of Directors, Fergus Falls Public Library.

LUTHER, George Elmer,
262 South College Ave., Grand Rapids, Mich.

Cashier, People's Savings Bank; Treasurer, Historical Society of Grand Rapids.

MARX, Charles David, Palo Alto, Cal.

B. C. E. (Cornell); C. E. (Karlsruhe). Professor of Civil Engineering, Leland Stanford Jr. University.

MCCLUMPHA, Charles Flint,
56 Church St., Amsterdam, N. Y.

A. B., A. M. (Princeton); Ph. D. (Leipzig). Treasurer, McClumpho Company; Member, Fort Johnson Club; Treasurer, Amsterdam Free Library; Historian, Montgomery County Historical Society; Member, New York State Historical Society.

MOOREHOUSE, George Wilton,
2069 East 96th St., Cleveland, O.

B. L., M. L. (Wisconsin); M. D. (Harvard). Physician to the Dispensary of Lakeside Hospital and Western Reserve University.

NEHRLING, Henry, Palm Cottage Experiment Garden, Gotha, Orange County, Fla.

PEET, Stephen Denison, 438 57th St., Chicago, Ill.

A. M., Ph. D. (Beloit). Clergyman; Editor, *American Antiquarian and Oriental Journal.*

POTTER, William Bleecker, 1225 Spruce St., St. Louis, Mo.

A. B., A. M., M. E., Sc. D. (Columbia). Mining Engineer and Metallurgist.

POWER, Frederick Belding, 535 Warren St., Hudson, N. Y.

Ph. G. (Philadelphia College of Pharmacy); Ph. D. (Strassburg). Director of Wellcome Chemical Research Laboratories, London, England.

SALISBURY, Rollin D., 5730 Woodlawn Ave., Chicago, Ill.

A. M., LL. D. (Beloit). Professor of Geographic Geology, Head of the Department of Geography and Dean of the Graduate School of Science, University of Chicago; Geologist, United States Geological Survey and State Geological Survey of New Jersey.

SAWYER, Wesley Caleb, 725 Asbury St., San Jose, Cal.

A. B., A. M. (Harvard); A. M., Ph. D. (Gottingen). Professor of French and German and Lecturer on Teutonic Mythology, University of the Pacific.

STONE, Ormond, University Station, Charlottesville, Va.

A. M. (Chicago). Director of the Leander McCormick Observatory and Professor of Practical Astronomy, University of Virginia.

TOLMAN, Albert Harris, 5750 Woodlawn Ave., Chicago, Ill.

A. B. (Williams); Ph. D. (Strassburg). Associate Professor of English Literature, University of Chicago.

TOLMAN, Herbert Cushing, Nashville, Tenn.

A. B., Ph. D. (Yale); D. D. (Nashville). Professor of Greek, Vanderbilt University; Canon, All Saints' Cathedral.

TOWNLEY, Sidney Dean, Ukiah, Cal.

B. S., M. S (Wisconsin); Sc. D. (Michigan). Astronomer in Charge of International Latitude Observatory; Lecturer in Astronomy, University of California; Editor of Publications, Astronomical Society of the Pacific.

VAN DE WARKER, Ely, 404 Fayette Park, Syracuse, N. Y.

M. D. (Albany Medical and Union). Surgeon, Central New York Hospital for Women; Consulting Physician, St. Ann's Maternity Hospital; Senior Surgeon, Women's and Children's Hospital; Commissioner of Education, Syracuse.

VERRILL, Addison Emery,
86 Whalley Ave., New Haven, Conn.

B. S. (Harvard); A. M. (Yale). Professor of Zoology, Yale University; Curator of Zoology, Yale University Museum; President, Connecticut Academy of Arts and Sciences.

WINCHELL, Newton Horace,
501 East River Road, Minneapolis, Minn.

A. M. (Michigan). Geologist and Archaeologist.

YOUNG, Albert Adams,
531 South Claremont Ave., Chicago, Ill.

A. B., A. M. (Dartmouth); B. D. (Andover). Clergyman.

MEMBERS DECEASED.

Information of whose decease has been received since the issue of Volume XVI.

AGASSIZ, Alexander, March 27, 1910, at Sea.

A. B., S. B., LL. D. (Harvard). Director of the Museum of Comparative Zoology Emeritus, and Director of the University Museum, Harvard University.

BAETZ, Henry, 1910, at Milwaukee.

Ex-Treasurer, State of Wisconsin. Retired.

BARNES, Charles Reid, February 24, 1910, at Chicago, Ill.

A. B., A. M., Ph. D. (Hanover). Professor of Plant Physiology, University of Chicago.

BLAKE, William Phipps, 1910, at New Haven, Conn.

A. M. (Dartmouth); Ph. B. (Yale). Professor Emeritus of Geology and Mining, University of Arizona; Director, Arizona School of Mines; State Geologist, Arizona.

BONES, Katherine Herkimer, September 17, 1907, at Racine.

Ph. B. (Chicago). Teacher of English and Sciences, Genoa Junction High School.

BURKE, John F., December 24, 1907, at Milwaukee.

GILMAN, Daniel Coit, Baltimore, Md.

A. B., A. M. (Yale); LL. D. (Yale, Harvard, William and Mary, Princeton, St. John's, Columbia, North Carolina, Toronto, Wisconsin, Clark). President Emeritus, Johns Hopkins University.

HARRIS, William Torrey,
November 15, 1909, at Providence, R. I.

A. M. (Yale); Ph. D. (Brown, Jena); LL. D. (Missouri, Yale, Princeton, Pennsylvania). Officer de l'Instruction Publique, France; Editor, Journal of Speculative Philosophy; Editor-in-Chief, Webster's International Dictionary of the English Language

HIGLEY, William Kerr, 1908 at Chicago, Ill.

Ph. M. (Michigan). Secretary, Chicago Academy of Sciences; Editor, *Birds and Nature.*

HOLLAND, Frederic May, May 17, 1908, at Concord, Mass.

A. B. (Harvard). Retired Clergyman.

NICHOLSON, Dexter Putnam, April 28, 1908, at Appleton.

B. S., M. S. (Lawrence). Professor of Geology, Lawrence University.

ROGERS, Augustus J., November 2, 1907, at Milwaukee.

Ph. B. (Cornell). Principal, South Division High School.

PROCEEDINGS OF THE ACADEMY, RULES, REGULATIONS, ETC.

THIRTY-EIGHTH ANNUAL MEETING

(Held in conjunction with the Wisconsin Archeological Society, the Wisconsin Mycological Society, the Wisconsin Natural History Society, and the Wisconsin Section of the American Chemical Society.)

MILWAUKEE, WISCONSIN, February, 13–14, 1908.

The Academy met in the lecture room of the Public Museum. The following program was carried out:

THURSDAY, FEBRUARY 13.

9:00 A. M.

Business session of the Academy.

9:30 A. M.

Joint meeting of the Academy and the Natural History Society.

1. "The early development of the wings of the caddis-fly." *William S. Marshall.*
2. "A note on the dog-like mammals of Wisconsin." *George Wagner.*
3. "On Entomostraca from the southern states." *E. A. Birge.*
4. "Regeneration in *Thyone briareus.*" (By title.) Ellen *Torelle.*
5. "Some recent codes of nomenclature." *Howland Russel.*
6. "Observations on the habits of Wisconsin Crabronidae." *George P. Barth.*

7. "A revision of the North American spiders of the family Attidae." (By title.) *G. W.* and *E. G. Peckham.*

8. "A rapid melanistic and subsequent partial albinistic change in a caged robin." *Henry L. Ward.*

9. "On the interpretation of certain tropisms of insects." *Charles T. Brues.*

10. "Modern exhibitional tendencies of museums of natural history and ethnography designed for public use." *Henry L. Ward.*

11. "The scientific development of taxidermy and its effect upon museums." *George Shrosbree.*

12. "The North American species of *Cyclops.*" (By title.) *C. Dwight Marsh.*

13. "An operculated gastropod from the Niagara formation of Wisconsin." *E. E. Teller.*

14. "A graphic comparison of the alteration of rocks by weathering with their alteration by hot solutions." *Edward Steidtmann.*

15. "Physiography of Northern Wisconsin." (Illustrated by lantern slides.) *S. Weidman.*

2:00 P. M.

Joint meeting of the Academy and the Wisconsin Section of the American Chemical Society.

16. "Purity and volatility of antimony produced by precipitation." *L. A. Youtz.*

17. "The gravimetric determination of tellurium." *V. Lenher.*

18. "Some modified forms of simple apparatus." *L. A. Youtz.*

19. "On glycyl derivatives of aromatic amido acids." *W. F. Koelker* and *C. C. Le Febvre.*

20. "An experimental study of the dissolution of metals in acids." *Arden R. Johnson.*

21. "Chemical constitution as a factor in solubility." *L. Kahlenberg.*

22. "On the validity of Faraday's law at low temperatures." *W. G. Wilcox.*

23. "On the interaction of dry ammonia and hydrochloric acid gases in presence of benzine vapors." *David Klein.*

24. "On the solubility of methane in various solvents." *A. S. McDaniel.*

25. "Hypermetamorphosis among Hymenoptera." *S. Graenicher.*

8:00 P. M.

Joint meeting of all the societies.

26. "The archeological wealth of Wisconsin." (Illustrated by lantern slides.) *A. B. Stout.*

27. "What place should the science of biology occupy in public education?" *Ellen Torelle.*

28. "Some phases of the pure food question." *Richard Fischer.*

FRIDAY, FEBRUARY 14.

9:00 A. M.

Business session of the Academy.

9:30 A. M.

Joint meeting of the Academy, the Mycological Society and the Natural History Society.

29. "Nuclear division in the vegetative cells of *Gentiana detonsa.*" *R. H. Denniston.*

30. "The blepharoplast in the development of the antherozoid in ferns." *Ruth F. Allen.*

31. "Variations in macrospore formation in *Smilacina stelleta.*" *Fred McAllister.*

32. "Nuclear division and spore formation in *Geoglossum.*" *Hallie D. M. Jolivette.*

33. "Nuclear structure and nuclear division in *Chrysomyxa ledi.*" *R. A. Harper.*

34. "The development of the male cells of a moss." *C. E. Allen.*

35. "The vegetation of Twin Island." (By title.) *Ruth Marshall.*

36. "The flora of Racine and Kenosha counties." (By title.) *S. C. Wadmond.*

37. "A list of the popular names of the plant families represented in Northeastern America, with their Latin equivalents in alphabetical form." (By title.) *Herbert Clowes.*

38. "The mechanics of the tornado." *George W. Colles.*

39. "Squalls and high winds on the Madison lakes." *James L. Bartlett.*

40. "Some effects of sleet storms in the Ozarks." (Illustrated by lantern slides.) *E. R. Buckley.*

2:00 P. M.

Joint meeting of the Academy and the Archeological Society.

41. "Local historical and archeological museums." *Reuben G. Thwaites.*

42. "The Calumet." *George A. West.*

43. "Rude stone implements from the Congo Free State." *Frederick Starr.*

44. "Judgments used by the aborigines in selecting materials for their utensils and weapons." *George L. Collie.*

45. "Archeological work in Wyoming." *Harlan I. Smith.*

46. "The trade beads of Wisconsin." *Publius V. Lawson.*

47. "The tabular mounds of Wisconsin, their purpose and authorship." *George H. Squier.*

48. "Mounds in the vicinity of McFarland, Dane County." *W. G. McLachlan.*

49. "The occurrence of perforated pottery-disks in Wisconsin." *Charles E. Brown.*

50. "Pebble netweights." *George A. West.*

51. "A comparison between animal figures in the effigy mounds of Wisconsin and animal figures in the early architecture of various nations." *Stephen D. Peet.*

52. "A Mandan village site." *Herbert C. Fish.*

53. "Banner, or ceremonial stones." *C. H. Robinson.*

54. "The progress of archeological science in Wisconsin." *Warren A. Moorhead.*

55. "A treatise of the year 1528 by Johannes Landtsperger." (By title.) *E. K. J. H. Voss.*

7:00 P. M.

Dinner for members of all the societies and their friends, at the Plankinton House.

Items of business were transacted as follows:

THURSDAY, FEBRUARY 13.

Morning Session.

The meeting was called to order by President L. Kahlenberg, who announced that in view of the small attendance and the small amount of business to be transacted, the business meeting would be postponed until Friday afternoon.

Mr. H. L. Ward, vice-president of the Wisconsin Natural History Society, was called to the chair.

The program for the session was then carried out as printed, except that papers numbered 3 and 5 were read by title. Paper number 13 was read by the secretary in the absence of the author.

Afternoon Session.

The meeting was called to order by President Kahlenberg.

The program as printed was carried out, except that paper number 25 was read by title. Paper number 17 was read by Mr. Walton, paper number 20 by Mr. Bradley, paper number 23 by Mr. Kahlenberg, and paper number 24 by Mr. Walton.

Evening Session.

The meeting was called to order by President Kahlenberg.

Papers numbered 26 and 27 were presented, the latter being freely discussed. Paper number 28 was omitted because of the absence of the author.

FRIDAY, FEBRUARY 14.

The meeting was called to order by President Kahlenberg.

The treasurer's report was presented by Mr. Denniston. The chair appointed, as an auditing committee, Messrs. Stout and Peckham.

The secretary's report was read. Upon motion of Mr. Peckham, it was accepted and placed on file.

The report of the exchange committee was read by Mr. Wagner, accepted and placed on file.

Upon motion of Mr. Davis, the exchange committee was authorized to continue its work for another year.

The report of the committee on membership was read by the secretary. Upon motion the following-named persons, recommended by the committee, were unanimously elected to active membership, the secretary being instructed to cast the ballot of the Academy therefor.

Henry L. Banzhaf, Milwaukee.
Rolland C. Cooke, Milwaukee.
Hiram Delos Densmore, Beloit.
Walter O. Gloyer, Madison.
Aldro Jenks, Dodgeville.
Hallie D. M. Jolivette, Madison.
Frederick William Mackenzie, Madison.
Lawrence Martin, Madison.
Fred McAllister, Beloit.
John Langley Sammis, Madison.
Edward Steidtmann, Madison.
Malcolm Enos Stickney, Granville, Ohio.
Alexander Newton Winchell, Madison.

Upon motion of Mr. Wagner, it was voted that the committee on exchanges be authorized to arrange with the University Library for the deposit in the University Library of such Academy books as may seem desirable, it being understood that the ownership of such books shall remain with the Academy.

The chair appointed Messrs. Marshall and Davis as a committee on resolutions.

Bennet M. Allen was nominated to fill the vacancy in the office of secretary. Upon motion of Mr. Davis, the secretary was authorized to cast the ballot of the Academy for Mr. Allen.

This concluding the business of the morning, the session adjourned, and the joint session for the reading of papers was called to order by Dr. Lewis Sherman, President of the Wisconsin Mycological Society.

The program as printed was carried out, excepting that papers numbered 30, 32, 33 and 39 were read by title.

Afternoon Session.

The meeting was called to order by Mr. Ellsworth, president of the Wisconsin Archeological Society.

The program as printed was carried out, excepting that papers numbered 47, 48 and 51 were read by title. Paper number 43 was read by Mr. Brown, number 45 by Mr. Knox, number 46 by Mr. Brown, number 52 by Mr. Stout, and number 53 by Mr. Wenz.

A special business session of the Academy was called to order at 4:30 by President Kahlenberg.

The report of the auditing committee, showing that the treasurer's report had been found correct, was presented by Mr. Stout. Upon motion, the report was adopted and placed on file.

The report of the committee on resolutions was presented by Mr. Davis. Upon motion, the following resolutions, presented by the committee, were unanimously adopted:

Resolved:—

"1, That the Wisconsin Academy of Sciences, Arts and Letters expresses its appreciation of the co-operation of the Wisconsin Archeological Society, the Wisconsin Mycological Society, the Wisconsin Natural History Society and the Wisconsin Section of the American Chemical Society in bringing about and carrying through the first combined meeting of the Scientific Societies of the state and thus placing Wisconsin in line with recent tendencies in scientific organization;

"2—, The Academy tenders its thanks to the citizens of Mil-

waukee for the interest they have shown in this meeting and to the objects for which these Associations stand;

"3—, To the Milwaukee Public Museum and Library for kindly courtesies and the excellent facilities furnished for these meetings.

"Dr. C. E. Allen being obliged to tender his resignation as Secretary, the Wisconsin Academy of Sciences, Arts and Letters wishes to express its deep appreciation of the very efficient and extremely valuable service he has rendered during his term of office and to express its profound regret that these official relations are now to be terminated."

The meeting then adjourned.

THIRTY-NINTH ANNUAL MEETING

In conjunction with the Wisconsin Section of the American Chemical Society, Madison, Wisconsin, February 11-12, 1909.

FEBRUARY 11TH.

Morning Session.

The meeting was called to order at 9 a. m. by President Kahlenberg. After the reading of general announcements for the meetings, the remainder of the morning session was turned over to the Wisconsin Section of the American Chemical Society, the following papers being read:

1. The replacement of metals by one another in non-aqueous solutions. 10 minutes. *Chas. B. Gates.*

2. The physical constants of ethyl tri-borate. 10 minutes. *Robert K. Brewer.*

3. Analysis of some Wisconsin zircons. 5 minutes. By title. *R. D. Hall.*

4. The liberation of hydrochloric acid from sodium chloride by weak dibasic acids. 10 minutes. *R. B. Dunlevy.*

5. Osmotic experiments with collodion membranes. 10 minutes. *J. Howard Mathews.*

6. The constitution of Purple of Cassius. 5 minutes. *Victor Lenher.*

7. The stearate separation of the rare earths. 10 minutes. *C. W. Stoddart.*

8. Equilibra in the systems—silver bromide—pyridine and silver iodide—pyridine. 10 minutes. *Louis Kahlenberg.*

9. On an improved method of determining vapor pressures of water and of aqueous solutions. 10 minutes. *Francis C. Krauskopf.*

10. The metallic tellurites. 10 minutes. *Edw. Wolesensky.*

11. Growing animals on a ration containing phosphorus, only in the inorganic form. 10 minutes. *E. V. McCollum.*

12. An unexpected case of "Ringspaltung." 5 minutes. *Edward Kremers.*

13. An improvement in the method for making nitrosochlorides. 10 minutes. *Edward Kremers.*

FEBRUARY 11TH.

Afternoon Session.

The first part of this meeting was given over to the transaction of business, the first action taken being the appointment by the president of a nominating committee. It was constituted as follows:

E. B. Skinner, Chairman; E. A. Birge, C. R. Van Hise, J. J. Davis, E. B. Hutchins, C. E. Allen, Geo. Peckham.

The following nominations for honorary membership were made:

W. M. Wheeler, William Trelease, Hamlin Garland, D. S. Jordan.

Upon recommendation of the Executive Committee it was voted to increase the pay of the Secretary from $75.00 to $100.00.

The following papers were presented:

Afternoon Session, 2:30 o'clock.

Business session of the Academy.

Reading of papers.

14. The radioactivity of some spring waters at Madison, Wis. 5 minutes. *Herman Schlundt.*

15. An apparatus for density determinations. 10 minutes. *W. J. Mead.*

16. The effect of temperature on the magnetic properties of electrolytic iron. 10 minutes. *E. M. Terry.*

17. Magnetic rotation in iron cathode films. 10 minutes. *L. R. Ingersoll.*

18–19. The evidence for temperature seiches. A hitherto unconsidered factor in lake temperatures. 20 minutes. *E. A. Birge.*

20. The bird stones of Wisconsin. 10 minutes. *Chas. E. Brown.*

21. The Roddy six-nation wampum belts. 5 minutes. *Chas. E. Brown.*

22. The Mandan village sites of the upper Missouri. 10 minutes. *Arlow B. Stout.*

23. The origin of the sex-cells of Amia and Lepidostens. 10 minutes. *Bennet M. Allen.*

February 11th.

Morning Session.

The meeting was opened by the reading of the report of the secretary, after which the report of the treasurer was read. Dr. J. J. Davis and Mr. H. L. Ward were appointed as an auditing committee and subsequently reported that they had examined the accounts of the treasurer and found them correct.

Mr. Wagner next made a report for the library committee and submitted the list of exchanges. It was announced by Mr. Wagner that steps had been taken toward combining the Academy Library with the University of Wisconsin Library. Upon motion of Mr. Wagner the society authorized the Librarian to dispose of duplicate sets of books by sale or otherwise.

The Nominating Committee reported the following nominations for office during the ensuing term:

President—Samuel Plantz.

Vice-President of Sciences—S. Graenicher.
Vice-President of Arts—John G. Gregory.
Vice-President of Letters—Dana C. Munro.
Secretary—Arthur Beatty.
Treasurer—R. H. Denniston.
Librarian—W. M. Smith.
Curator—C. E. Brown.

Committee on Publication: Samuel Plantz, Arthur Beatty, Bennet M. Allen.

Committee on Library: W. M. Smith, Geo. W. Peckham, Geo. Wagner, R. G. Thwaites, G. E. Culver.

Committee on Membership: Arthur Beatty, Henry L. Ward, L. A. Youtz, Winifred Titus, J. B. Overton. The society adopted the above nominations of the Nominating Committee, and instructed the Secretary to cast the ballot of the society in their favor.

It was moved and carried that the Exchange Committee be reappointed as previously constituted.

Mr. C. E. Brown made a statement regarding the purchase of the Baraboo "man" mound. He also moved that a committee be chosen by the Academy to assist a similar one of the Wisconsin Archeological Society in marking the sites of Indian mounds. The chair appointed C. E. Allen, R. G. Thwaites, F. C. Krauskopf.

Resolutions (1) recommending measures for the conservation of natural resources were presented by Dr. J. J. Davis and passed by unanimous vote of the Academy. It was further resolved that copies of these resolutions be placed in the hands of the Governor, members of the State Board of Forestry, members of the Legislature, and the Public Press.

A like distribution was next voted for a series of resolutions introduced by Mr. Ward and protesting against a proposed amendment of the game laws providing for an extension of the open season for the shooting of ducks. (2) The following papers were then read:

Morning Session, 9:00 o'clock.

Reports of officers and committees, and general business.

Reading of papers.

24. A census of the flora of a typical Dane County marsh meadow. 10 minutes. *Arlow B. Stout.*

25. A new Arrhenurus from Wisconsin. By title. *Ruth Marshall.*

26. The mildews of the cereals. By title. *George M. Reed.*

27. A simple undescribed saprophytic fungus. 5 minutes. *J. B. Overton.*

The secretary next read a paper contributed by J. W. Hoyt, and giving an account of his personal recollections of Abraham Lincoln. The academy then adjounrned.

The Afternoon Session. FEB. 12TH.

The Academy was called to order at 2:30 in room 42 Science Hall. The following papers were read:

28. Some light reactions of Pilobolus. 10 minutes. *Ruth Allen* and *Hallie Jolivette.*

29. Some European biological stations. 15 minutes. (Illustrated.) *C. Juday.*

30. On the persistence of insect types as illustrated by fossil Hymenoptera from the Tertiary formations. 15 minutes. (Illustrated.) *C. T. Brues.*

31. The cell-structure of Closterium Ehrenbergii. 10 minutes. *B. F. Lutman.*

32. On the polarity of certain cells in mosses. 10 minutes. *C. E. Allen.*

33. The individuality of chromosomes in somatic cells of Gentiana detonsa. 10 minutes. *R. H. Denniston.*

34. Studies on the Tremellineae of Wisconsin. 15 minutes. By title. *E. M. Gilbert.*

35. On a probably new species of whitefish from Wisconsin. 5 minutes. *George Wagner.*

36. Relations expressed by the passive voice. 15 minutes. *Edward T. Owen.*

37. Popular studies at Paris in the thirteenth century. 10 minutes. *D. C. Munro.*

38. Labor and manufactures in Massachusetts, 1860-70. 10 minutes. *J. F. Scott.*

39. John of Salisbury's attitude toward the classics. 10 minutes. *A. C. Krey.*

40. The present geologic work of Wisconsin rivers. 10 minutes. By title. *S. Weidman.*

At the conclusion of the reading of papers the committee on membership reported favorably upon the four men who had been nominated for honorary membership at the first session of Academy—Feb. 11th, and recommended for active membership the following:

Bowles, J. T. B., Madison, Wis.
Brundage, Albert H., Milwaukee, Wis.
Burrill, Alfred C., Milwaukee, Wis.
Chase, Wayland J., Madison, Wis.
Heddle, John R., Madison, Wis.
Ingersoll, Leonard R., Madison, Wis.
Krey, A. C., Milwaukee, Wis.
Mason, Max, Madison, Wis.
Mead, Warren J., Madison, Wis.
Toole, W. A., Baraboo, Wis.
Thomas, Carl C., Madison, Wis.
Young, Karl, Madison, Wis.
Scott, J. F., Madison, Wis.

The Academy then adjourned until the next annual meeting.

Resolutions.

Whereas, an earnest and active movement is being made by the people of the United States for the conservation of the natural resources of the nation and

Whereas, Wisconsin can gain much fro msuch a movement within its borders, and

Whereas, while the iron, lead and zinc of the state are being freely given without hope of replacement, there are other natural resources that may be husbanded and increased by estab-

lishing harmonious relations with natural forces now acting, therefore be it

Resolved: That the Wisconsin Academy of Sciences, Arts and Letters gives its hearty approval of this movement as being for the benefit of the agricultural, commercial and industrial interests of the state, and be it further

Resolved: That the Academy at this time, earnestly recommends to the people of the state and their legislative and executive representatives the carrying out of the wise plans of the State Board of Forestry for the preservation and increase of the forest resources of the state and the conservation and control of its lakes and streams.

WHEREAS, the preservation of the game of a region is a duty that the citizens of any community owe to posterity and

WHEREAS, the molestation of the birds of any region at the time when they are arriving from the spring migration and have recently or are about to mate and to select the locality in which they will nest and rear their young, strongly tends to drive them away from and prevent their nesting in said region, and

WHEREAS, the spring shooting of ducks tends to drive these birds from their natural breeding grounds in this state and works towards the ultimate extinction of the species, therefore

Resolved, that the Wisconsin Academy of Sciences, Arts and Letters looks with disfavor upon Assembly bill No. 188, recently introduced into the Legislature, legalizing the hunting of ducks in the month of April.

Resolved, that the Secretary be directed to transmit a copy of this resolution to both houses of the legislature and to the governor of the state.

BENNET M. ALLEN,
Secretary.

FORTIETH ANNUAL MEETING.

Held in conjunction with the Wisconsin Archeological Society, the Wisconsin Mycological Society, and the Wisconsin Natural History Society, Milwaukee, Wisconsin, February 17–18, 1910.

The meetings were held in the Lecture Room of the Public Museum. The following program was presented:

THURSDAY, FEBRUARY 17.

Morning Session, 10:30 o'clock.

Reports of Officers and General Business.

Presentation of papers.

1. A New Type of Thermostat for Use in Physical Chemistry. *Arden R. Johnson.*
2. The Chemistry of Boron, and Some New Organo-boron Compounds. *Arden R. Johnson.*
3. The Electro-Chemistry of Radio-active Elements. *Arden R. Johnson.*
4. The Walden Inversion: A Critical Review. *A. F. McLeod.*
5. The Walden Inversion: Some Recent Experimental Results. *A. F. McLeod.*
6. Terpenes as Oxygen Conveyers. *Edward Kremers.*
7. The Velocity of Light in Metals. *L. R. Ingersoll.*
8. The Story of the Return from the Dead in Popular Tales and Popular Ballads. *Arthur Beatty* and *Stith Thompson.*

Afternoon Session, 2:00 o'clock.

Presentation of Papers.

9. An Ordinance of the City Council of Frankfort, referring to dress, marriage festivals, baptismals, and such like things, of the year 1598. *Ernst Voss.* An abstract.
10. Some Specimens of a Forthcoming Translation of Lucretius. *William Ellery Leonard.*
11. The Teacher of Literature. *William Ellery Leonard.*

12. Early London Pageants. *Homer A. Watt.* With lantern slide illustrations.

13. The Recent Shakespeare Discoveries. *Homer A. Watt.* With lantern-slide illustrations.

14. Southern Folk-Songs. *E. C. Perrow.*

15. F. H. Bradley on the Concepts of Change and Relation. *J. H. Farley.*

FRIDAY, FEBRUARY 18.

Morning Session, 9:00 o'clock.

Presentation of Papers.

16. The Stickleback of Lake Superior. *George Wagner.*

17. A Fossil Rhinoceros from Wisconsin. *George Wagner.*

18. The Computation of the Time of Rising and Setting of the Moon. *A. S. Flint.*

19. Franco-American Study of a Waning Prehistoric Industry. *C. H. Doerflinger.*

20. A Boulder Effigy on the Upper Missouri. *Arlow B. Stout.*

21. The Early Harbor History of Wisconsin. *Ralph G. Plumb.*

22. Notes on Certain Archaelogical Features of Southwestern Wisconsin. *Richard Herrmann.*

23. The Classification of Wisconsin Stone Axes. *George L. Collie.*

24. Notes on Tennessee Antiquities. *Mary E. Stewart.*

25. Classes and Distribution of Wisconsin Banner Ceremonials. *Charles E. Brown.* By title.

26. Grooved Pebble Sinkers of Wisconsin. *Frank Gordon.*

27. Gun-flints. *W. B. Hinsdale.*

28. Some Features of Californian Indian Folk-lore. *S. Barrett.*

Afternoon Session, 2:00 o'clock.

Presentation of Papers.

29. French Literature in American Magazines, prior to 1800. *Charles D. Cool.*

30. A Simple Method of Determining the Energy of Baker's Yeast. *W. D. Frost.*

31. A Consideration of the Nesting Habits of Some Fossorial Wasps. *George P. Barth.*

32. Close Relations of Certain Flies to Flowers of the Compositæ. *Sigmund Graenicher.*

33. Vitalism and the Ultimate Divisibility of Living Matter. *Charles T. Brues.* To be presented by *Richard A. Muttkowski.*

34. The Chief Sense of Guidance and the Origin of the Tent-Building Habits of the *Ant Cremastogaster lineolata* Say. *Alfred C. Burrill.*

35. The Nomenclature of Types and its Practical Application. *Richard A. Muttkowski.*

36. Apogamy in *Aspidium falcatum.* *Ruth F. Allen.*

37. Embryo-sac Development and Polyembryony in *Smilacina racemosa.* *Fred McAllister.*

38. A Comparison of Mitoses in Mosses with those in the Seed Plants. *C. E. Allen.*

39. The Grass Flora of Milwaukee County, Wisconsin. *Charles T. Brues* and *Beirne B. Brues.* By title.

40. The Structure of the Peridium in Certain Slime Molds. *R. A. Harper.*

41. Nuclear Phenomena in the Root-tip of *Dolichos multiflorus.* *R. H. Denniston.*

42. Experiments on the Sex Ratios in Hemp. *F. J. Pritchard.*

MORNING SESSION, FEBRUARY 17.

The meeting was called to order, with Mr. Henry L. Ward in the chair. Upon motion, the reading of the minutes of the last meeting was dispensed with. Mr. George Wagner presented the report of the Exchange Committee; and it was moved that the report be accepted.

The reading of papers was then taken up; at which point President Samuel Plantz took the chair. The reading of the papers proceeded as announced on the programme.

Afternoon Session.

The papers were presented as announced on the programme, except that No. 15 was read by the Secretary.

MORNING SESSION, FEBRUARY 18.

The papers were presented as announced on the programme, except that Nos. 22 and 24 were read by title, and Nos. 20, 21, 26, and 27 were read by Mr. C. E. Brown. No. 28 was presented before No. 25.

The Treasurer presented his report; and the Chairman appointed an auditing committee, consisting of Mr. George Wagner and Dr. J. J. Davis, who reported that all the accounts were correct.

The Committee on Membership presented the subjoined names as new members, and upon motion the Secretary was instructed to cast the ballot of the meeting for them:

Barrett, Samuel A., Milwaukee.
Barth, George P., Milwaukee.
Cool, Charles D., Madison.
Dyke, Le Grand G., Madison.
Gilman, Albert G., Ripon.
Haessler, Herbert, Madison.
Jackson, Hartley H. T., Washington.
Jansky, Cyril M., Madison.
Leonard, William E., Madison.
Luening, Eugene, Madison.
Martin, Lawrence M., Madison.
Muttkowski, Richard A., Milwaukee.
Naylor, Wilson S., Appleton.
Perrow, Eber Carle, Madison.
Secrist, Horace, Madison.
Watt, Homer A., Madison.
Whitbeck, Ray H., Madison.

Afternoon Session.

The changes in the programme were; Nos. 30, 36, 37, 38 and 42 which were read by title.

Mr. Henry L. Ward introduced a resolution in support of

a bill in the 61st Congress, for the protection of migratory birds in the United States; and the Secretary was instructed to send a copy of the resolution to each Senator and Representative from Wisconsin to the United States Congress:

There has been introduced by Mr. Weeks in the House of Representatives of the 61st Congress of the United States, a bill "To protect migratory birds in the United States" known as H. R. 10276, by the terms of which "geese, swans, brant, ducks, snipe, plover, woodcock, rain, pigeons and all other migratory birds which, in their northern and southern migrations, pass through or do not remain permanently the entire year within the borders of any State or Territory shall hereafter be deemed to be within the custody and protection of the Government of the United States, and shall not be destroyed or taken contrary to regulations hereinafter provided for."

These provisions are that the Department of Agriculture shall adopt suitable regulations prescribing and fixing closed seasons and declaring penalties for the violation of these regulations.

Nothing contained in this bill is to interfere with laws of the States and Territories for the protection of game localized within their borders nor to prohibit their enacting laws to render efficient the regulations of the Department of Agriculture provided under this statute.

This proposed law if enacted would remove one of the greatest obstacles to the efficient protection of birds, particularly game birds, by rendering the laws in force in all states uniform as to conditions, the absence of which uniformity now constitutes one of the strongest arguments used by those who desire spring shooting. Therefore

Resolved, That the Wisconsin Academy of Sciences, Arts and Letters favors the passage of Bill H. R. 10276 to protect migratory birds in the United States and requests the Wisconsin members of Congress to vote for this bill and to use their influence to secure its passage and

Resolved, That the Secretary of the Academy be instructed to mail a copy of these resolutions to each Senator and Representative from Wisconsin to the United States Congress.

Mr. C. E. Brown introduced a resolution of congratulations to Professor F. W. Putnam of the Peabody Museum, Harvard University, on his distinguished services to the science of Anthropology; and Mr. S. A. Barrett introduced a similar resolution congratulating Professor E. B. Tylor, of the University of Oxford, on his distinguished services to the science of Anthropology.

Resolved, That the Wisconsin Academy of Science, Arts and Letters at its annual meeting in Milwaukee, February 17th to 18th, 1910, send to Professor Frederick Ward Putnam, D. S., its greeting, and upon the occasion of his recent retirement, under the Carnegie Foundation, from active instruction as Professor of Antropology of Harvard University and of the University of California, the Academy herewith transmits its congratulations to him upon his long career of active service in the interests of the science of anthropology, and

Resolved, That the secretary of the Academy be instructed to see that a copy of this resolution is sent to Professor Putnam, and that the resolution be placed upon the minutes of this meeting and published in the regular Transactions of the Academy.

Resolved, That the Wisconsin Academy of Sciences, Arts, and Letters at its annual meeting in Milwaukee, February 17th to 18th, 1910, send to Professor Edward Burnett Tylor, D. C. L., F. R. S. its greeting, and, upon the occasion of his retirement as professor of Anthropology in the University of Oxford, and as director of the Pitt-Rivers Museum, the Academy herewith transmits its congratulations to him upon the completion of his long career of active service in the interest of the science of anthropology, and

Resolved, That the secretary of the Academy be instructed to see that a copy of this resolution is sent to Professor Tylor, and that the resolution be placed upon the minutes of this meeting and published in the Transactions of the Academy.

Mr. S. A. Barrett introduced a resolution to the effect that the Academy would look with favor upon the establishment of a Wisconsin branch of the American Folk-lore Society, and would co-operate with it in the study of folk-lore in Wisconsin. It was moved and voted that this resolution be laid over until

the next meeting of the academy, and that the resolution be printed in the preliminary notice of the next meeting.

Resolved, That for the furtherance of the study of Folk-lore in any and all of its various phases, the Wisconsin Academy of Sciences, Arts and Letters would look with favor upon the formation of a Folk-lore Society in the State of Wisconsin under, if practicable, the auspices of, and as a branch of the American Folk-lore Society, which is the national society organized in America for the general study of Folk-lore in all its branches throughout America.

Now in view of the fact that the above named national organization is devoting its entire energies to the study of Folk-lore in all parts of America and that its members are engaged in active research along the lines of Folk-lore, and that there now exist various sections of this society known as state branches, and further,

That this national society and its various branches are now publishing a journal of world wide circulation, known as the Journal of American Folk-lore, the sole purpose of which is the publication and dissemination of knowledge of American Folk-lore, and that this valuable publication is sent by the American Folk-lore society to each of its members, both those of the general society and those of the branches and further,

That since it is the desire of this Academy to foster all branches of science, arts and letters, and especially where these are within the State of Wisconsin, therefore be it

Resolved, That the Wisconsin Academy of Sciences, Arts and Letters will be pleased to co-operate with such an organization founded for the study of Folk-lore in Wisconsin.

Mr. C. E. Brown moved that the President of the Academy appoint a committee of five to consider ways and means of bringing about closer affiliations between the Academy and the related State societies. This motion was put to a vote and carried. The president later appointed Arthur Beatty, Chairman, George P. Barth, Charles E. Brown, Louis Kahlenberg, and Dr. Lewis Sherman.

The meeting then adjourned.

ARTHUR BEATTY,
Secretary.

REPORT OF THE SECRETARY.

The last published report of the Secretary gave the number of active members as 189, honorary members, 6, life members, 12, and corresponding members, 43; with a total of 250.

The present membership of the Academy is as follows:

Honorary Members	6
Life Members	12
Active Members	244
Corresponding Members	40
Total	302

Since the last report, twelve members have died. Their names will be found at the end of the List of Members, under the heading of Deceased Members.

The plan of publishing the Transactions in six numbers each year has been carried on for two years. If the plan seems to carry out the intentions of those who devised it it will be continued, at least until one more effective is formulated.

It is a pleasant thing for the Secretary to note the liberal policy of the printing commissioners in furnishing the necessary plates to illustrate the papers of the Academy in a fitting manner.

ARTHUR BEATTY,
Secretary.

TREASURER'S STATEMENT.

1909	*Receipts.*	
Feb. 5, Balance		$23 17
Received for dues		196 00
Received for duplicate Journals		25 00
Received for Transactions		2 00
Received for Separates and Plates		17 50
Received for bonds matured		400 00
Received for interest on bonds		119 00
		$782 67
	Disbursements.	
Postage (Treasurer)		$5 00
Paper, labels, etc., for mailing Trans.		7 70
4 City Street Improvement bonds		416 00
Extra separates and plates		15 50
John Conohan (for running engine)		1 00
B. M. Allen (Bal. due secretary 1908)		25 00
Arthur Beatty (Secretary's allowance 1909)		100 00
Geo. Wagner (Postage, Journals, etc.)		62 25
Express (Plates)		60
Safety deposit box		3 00
Printing, (Programs, etc., 1909 Meeting)		24 25
Shipping and Wrapping Trans.		30 10
		$690 40
Feb. 14, Balance on hand		$92 27

Feb. 18, 1910.

The undersigned auditing committee have examined the Treasurer's books and vouchers, and find the same true and correct.

J. J. DAVIS,
GEORGE WAGNER.

REPORTS OF THE EXCHANGE COMMITTEE.

MADISON, WISCONSIN, February 10, 1909.

To the Wisconsin Academy of Sciences, Arts and Letters:

The Committee on Exchanges herewith presents its annual report. As in previous years its chief efforts have been toward adding to the number of organizations with which we exchange publications, and to complete, so far as possible, the incomplete sets on our shelves. The result for the year has been as follows:

New exchanges added	26
Missing volumes received	212
Missing numbers received	686
Sets completed	13
Vols. completed	32

Very material aid in this work was gained by exchanging some of our duplicates with the Library of Congress, from whose duplicates we have obtained many much needed volumes and parts.

The work of cataloguing our library, and shelving it with the University Library is now actively under way, and progressing rapidly. This work has involved the study of a complicated series of problems in Library Science, for which no library seems as yet to have found an entirely satisfactory solution. In the transfer of our book, proper arrangements have been made so that Academy property can be easily identified. There have developed, however, a number of duplicate sets, of which a single set would seem to serve all possible purposes. We suggest that this Committee be given authority to dispose of such sets by sale, and to use the funds thus secured for purchasing other needed books. The sale of duplicate parts this year has yielded $17.50. As in years past, a sum of $40 from outside has also been at the disposal of the Chairman.

Beside this, the sum of $82.25 (including the above $17.50) was expended from the Academy funds to purchase needed works. This has enabled us to secure a number of needed volumes, and to complete two sets: Sitzungsberichte der K. Sächsischen Gesellschaft der Wissenschaften, Verhandhugen des Botanischen Vereins der Provinz Brandenburg.

The most needed books at present are the missing volumes of the Proceedings of the Royal Society of London and it is the hope of this committee that they may be purchased the coming year. It means an expenditure of about $50.

From certain statements overheard this last year, it seems not unnecessary to state at this time, that no money appropriated to the uses of this Committee has ever been paid to any one as a remuneration for services.

We recommend that this committee be continued for another year, and that there be appropriated for its use such sums as in the opinion of the executive committee may be available.

Respectfully submitted,

WALTER M. SMITH,
EDWARD KREMERS,
GEORGE WAGNER.

APPENDIX.

The following are the addresses added to our Exchange List since its publication in Vol. 15; those marked with a star come to us through the Geological and Natural History Survey:

Charleston, S. Carolina: The Charleston Museum.

Chili, N. Y.: The Oologist.

Columbus, Ohio: The Ohio Naturalist.

Philadelphia, Pa.: Wagner Free Institute of Science.

Springfield, Mass.: Springfield Museum of Natural History.

Sao Paulo, Brazil: Sociedad Scientifica, Museo Paulista.

Amani, German East Africa: K. Biologisch-Landwirthschaftliches Institut.

Modderfontein, Transvaal: South African Ornithologists' Union.

Colombo, Ceylon: Colombo Museum.

*Melbourne, Australia: National Museum.

Sidney, Australia: Royal Anthropological Society, New South Wales Naturalists' Club.

Tokyo, Japan: Imperial Central Agricultural Experiment Station, Tokyo Mathematico-Physical Society.

Budapest, Hungary: Ungarische Ornithologische Centrale.

Wien, Austria: Verein zur Verbreitung Naturwissenschaftlicher Kenntnisse, Naturwissenschaftlicher Verein der Universität.

Ghent, Belgium: Vlaamsch Natur en Geneeskundig Congres.

*Amiens, France: Academie des Sciences, des Letters, et des Arts.

Macon, France: Academie de Macon.

*Semur, France: Société des Sciences Historiques et Naturelles.

Berlin, Germany: K. k. Botanischer Garten.

Bernburg, Germany: Herzoglich-Anhaltische Versuchsstation.

Geestemünde, Germany: Verein für Naturkunde an der Unterweser.

Hamburg, Germany: Hamburgische Wissenschaftliche Anstalten, Botanische Staats-Institute.

München, Germany: Gesellschaft für Morphologie und Physiologie.

Schwabach, Germany: Entomologische Blätter.

Stuttgart, Germany: Verein für Vaterländische Naturkunde, Entomologische Zeitschrift (Internationaler Entomologischer Verein).

*Glasgow, Scotland: Philosophical Society of Glasgow.

Ferrara, Italy: Accademia delle Scienze Mediche Naturali.

Portici, Italy: R. Scuola Superiore di Agricoltura, Laboratorio di Zoologia generale e agraria di R. Scuole Superiore di Agricoltura.

Amsterdam, Netherlands: Genootschap ter Bevoordering Natuur— Genes— en Heelkunde.

Saratow, Russia: Société des Naturalistes.

Geneva, Switzerland: Association pour la Protection des Plantes.

New Societies added to our exchange list:

Warren Academy of Sciences, Warren, Pa.
Pomona Journal of Entomology, Pasadena, Cal.
Le Naturaliste Canadien, Quebec.
Direccion de Estadistica General, Montevideo, Uruguay.
Société Scientifique et Station Zoologique, Arcachon, France.
Kaiser Gesundheitsamt, Berlin.
Botanical Society, Liverpool, England.
Fisheries Board for Scotland, Edinburgh.
Geografiska Förening i Finland, Helsingfors.
Société Entomologique Russe, St. Petersburg.
Société Neuchateloise de Geographie, Neuchatel.
Societas Entomologica, Zürich.

MADISON, WIS., U. S. A. February 10, 1910.

To the Wisconsin Academy of Sciences, Arts, and Letters:

Gentlemen: Your Committee on Exchanges begs to present their annual report. The work of securing new exchanges, as well as completing (by requests to the publishing societies), the sets on our shelves, has been continued with the following results:

Volumes received	135
Parts of volumes received	191
Sets completed	8
Volumes completed	32
New exchanges	12

The committee has again had at its disposal $40 from outside sources, $38.95 of this have been spent, $2.40 on custom house charges, the rest on books, with the following result:

Volumes purchased	14
Parts purchased	68
Sets completed	4
Volumes completed	14

A considerable number of duplicates have been sold, the amount realized appearing in the Treasurer's report.

Five dollars of the funds of the Academy have been spent in postage and stationery for this committee. An order for the volumes needed to complete our set of the Proceedings of the Royal Society of London has been placed. The books are in transit, but have not yet arrived. Their cost is about $45.00, and the Treasurer should be instructed to set aside that amount from last year's funds to pay for the same.

The consolidation of our Library with that of the University, authorized two years ago, has made good progress during the year. Most of our books have now been catalogued and shelved with those of the University on similar subjects. A special bookplate for the Academy books has been printed, and placed in all bound volumes. We do not hesitate in saying that the value of our library, by this consolidation (and the attending completion of sets and elimination of duplicates) has at least doubled. We hope in another year to have this work substantially completed.

We offer the following recommendations: That this Committee on Exchanges be continued for another year; that it be allowed such sums as may be realized from the sale of duplicate material; and that it be further granted such further sum as in the opinion of the Executive Committee may be available.

Respectfully submitted,

EDWARD KREMERS,
WALTER M. SMITH,
GEORGE WAGNER,
Chairman.