SCIENCE

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IDEALS RELATING TO SCIENTIFIC RESEARCH[1]

ONE object of this society, according to its constitution, is to establish "fraternal relations among investigators in the scientific centers." These relations imply changes in ideals as the body of the investigators grows and as its members take higher and higher views as regards social obligations. Our rapid scientific development in recent years may be compared with the great strides in our financial development. It has frequently been necessary during this period to enact laws with a view towards higher financial ideals and more just financial relations. Practises which appeared tolerable when indulged in on a small scale became intolerable when their influences began to extend to wider circles.

Hence it seems natural to inquire whether our rapid scientific development has not been attended by practises which appear more and more objectionable. It is also of some interest to look into the future with a view to learning whether some of our scholarly practises, which do not meet with open disapproval at present, are likely to become intolerable when our scientific life has become much more vigorous and when our universities have become much larger and more influential. At any rate, the investigator likes to look at facts from a variety of different angles, and he realizes the need of considering also surrounding atmospheric conditions.

Ideal research is free search. On the other hand, fraternal relations imply fraternal obligations. The great army of in-

[1] Read before the Illinois chapter of the Society of the Sigma Xi, May 20, 1914.

vestigators is composed mainly of generals. Only a few are willing to serve in any other capacity after announcing by means of a doctor's degree or by some scientific publication that they have learned to walk alone. It is true that many of them were supported by the kindly hand of their teacher during this first walking exhibition and some of these never learn to walk alone; but, nevertheless, they too often want to be generals or nothing in the army of the investigators.

The difficulty of learning to walk alone as an investigator seems to vary very much with the different sciences. In mathematics, for instance, the man who has just reached his doctor's degree in an American or in a German university can not be expected to have completely acquired this art,[2] while some of the newer sciences seem to present the strange phenomenon of babies born with walking capabilities. These wide differences may be expected to diminish with the more extensive scientific developments and with the growth of fraternal relations between investigators.

The question arises whether the independence of the separate investigators is an ideal condition and whether this condition should be maintained in view of the rapid increase of the number of investigators. Our scientific army seems to have adopted Indian war tactics to the extent that each man is selecting his own tree and is firing at the cohorts of ignorance from his sheltered position. In a new and undeveloped country this may be proper and may lead to the best results, but it is at least conceivable that as time goes on the army of scientists has to be reorganized along different lines in order to secure the most effective work. The Committee of One Hundred on Scientific Research recently appointed by the American Association for the Advancement of Science may be a step towards such a general reorganization.

[2] *Cf.* M. Bôcher, Science, Vol. 38 (1913), p. 546.

In some of the sciences special reorganization has already been started. By way of illustration we need only to refer to the recent work of the Astronomische Gesellschaft, which, by international cooperation, secured accurate observations of the positions of one hundred and sixty-six thousand stars. Such organizations tend to limit, along certain lines, the independence of the investigator, and hence they affect our ideals, at least as regards some investigators. It remains, however, still true that ideal conditions for an investigator involve a large measure of freedom, just as the most effective higher teaching implies opportunities to digress from beaten paths.

Probably most of the effective scientific investigation is a result of the fact that some student has taken the time to digress from the beaten paths at various points, and finally he came into regions of unexpected fertility. Love of knowledge, not love of renown, is the ideal incentive for investigation. The ideal investigator is not the man who says to himself "I am going to become an investigator" but rather the man who becomes deeply interested in a subject and is unable to find in the literature the things he is anxious to know. He is thus forced by a desire for more knowledge to become an investigator.

In some subjects there is a type of investigators who have been forced by a kind of laziness to become investigators. I refer here to the student who finds it easier to sit and think than to get up and consult the literature. In fact, some people have gotten into the thinking habit so thoroughly that it appears generally easier for them to think than to do even as much manual labor as to pick up a book and read. Investigators of this type have sometimes developed into comparatively ignorant men with great reputations, and some of them have done very much to advance knowledge.

It does not appear likely that this class of investigators will occupy a prominent place in the future. It is only about 150 years ago that Frederick the Great asked Lambert, as a new member of the Berlin Academy, what science he understood especially well, and he received the reply "all of them." Frederick the Great then asked how he secured all this knowledge, and Lambert answered "by myself like the noted Pascal."[3] While these answers could scarcely be justified at the time of the founding of the Berlin academy, they would be much less appropriate in our day, and there is an ever-increasing need of using the results of others in research. Fortunately the means of arriving at these results are also improving. While the investigator becomes continually more dependent upon others he has the advantage of securing, by means of known results, a much wider freedom as regards fruitful subjects exposed to investigation.

In recent years the term graft has received a large amount of public attention. This is probably partly due to a rapid change in our ideals as regards political and financial standards. Our ideals as regards scholarly standards are also changing very rapidly, and it appears natural to inquire whether the term *scholarly graft* is not destined to receive more public attention unless some of our university practises are changed.

The fact that scholarly practises frequently improve with more light has been emphasized recently by results from the publications of the Carnegie Foundation for the Advancement of Teaching, as well as from the publication of a classification of educational institutions on the part of the U. S. Bureau of Education. Many other similar efforts have recently been made. One of the most important of these, as far as scientific subjects are concerned, is the work entitled "American Men of Science." It is a hopeful sign that such works have become possible. Naturally some institutions, as well as some men, have not welcomed this type of light, and slight injustices could scarcely have been avoided.

The history of the system of the honorarium in European universities furnishes many instances of injustice, and emphasizes the fact that even in good universities there is danger as regards the development of graft. The German universities have been very conservative as regards changes along this line, but in 1897 it was decided that one half of the honorarium over 3,000 Marks (in Berlin over 4,500 Marks), should, in general, be paid into the state treasury. In April, 1909, it was decided that the professors outside of Berlin were to receive, as before, all of the honorarium up to 3,000 Marks; but, if the total honorarium exceeded this amount, 75 per cent. of the sum between 3,000 Marks and 4,000 Marks, and only half of that beyond 4,000 Marks, was to be paid to the professors.

Two of the most serious charges against the practise of paying all of the honorarium to the professors were that it tended to influence some of the most noted men to give the most elementary lectures in the popular subjects, and that some professors who happened to be on the commission of examiners were tempted to make it very uncomfortable for the students who had not taken the courses offered by these professors. At any rate the system led to very great inequalities in the incomes of different professors and it was the source of many suspicions on the part of students and others.

Our American universities have thus far been comparatively free from gross scholarly graft, but it seems desirable to look at ourselves at times in a critical spirit in order to check tendencies which might

[3] *Jahresbericht der deutschen Mathematiker—Vereinigung*, Vol. 23 (1914), p. 1.

otherwise develop into gross irregularities. High ideals as regards public actions are not likely to prevail in a society where the discussion of public practises is in disfavor, since fear of exposure is one of the most useful instruments to regulate public practises.

One of the most common university practises which is at least closely related to graft is inefficient teaching. Too many of us neglect our obligations to our students. These obligations include a vigorous scholarly development on the part of the teacher. In the cases where an instructor gives graduate courses these obligations also include a vigorous growth in research ability, but they are not confined to such development and growth. This is, however, the side to which we shall pay most attention on this occasion.

Probably one reason why many of us do not consider more seriously our obligations to our students is based on the fact that there has been a rapid improvement during recent years as regards the teaching duties of the American university instructor. Too many of us have not learnt to use our freedom as rapidly as it has come to us. When an instructor has been oppressed with fifteen or twenty hours of instruction per week, in addition to directing graduate work, and finds this yoke of oppression gradually lifted, he does not always assume promptly the new obligations which this freedom implies.

It is, however, important for the younger members of our profession, and especially for those who are just now entering our ranks, to realize that holding a university position unworthily is a kind of scholarly graft which might perhaps be known as the incompetency graft. It seems very likely that with the improvement of conditions there will come higher ideals, and that in the future a higher degree of efficiency will be demanded than could reasonably have been demanded in the past.

A kind of scholarly graft which is still too common is connected with the assignment of subjects for graduate theses. Some instructors, on meeting a problem which involves an unusual amount of drudgery, seem to regard it as legitimate to lay such a problem aside until they can find a student who will take it as a thesis subject. There is no surer way to kill all research ambition on the part of the student, nor is there a surer way to secure his permanent disrespect for the teacher and the subject.

It is simply another expression of the ignoble spirit which leads some men to regard the young and helpless as their legitimate prey. The teacher who does not do his best to find attractive and far reaching theses subjects for his graduate students is certainly not ideally qualified for a position in the graduate school. The use of graduate students to promote the interest of the teacher is simply a type of scholarly graft which we may call the promoter graft. Moreover, it is one of the most despicable types in existence in view of the fact that it affects those who have not yet formed strong scholarly habits.

The promoter graft presents itself in many other forms. One of the most common of these is an undue emphasis on the work done by the teacher himself. What is still more pernicious is to offer courses mainly with a view to learning a subject or with a view to writing a paper on a particular subject. It is difficult to prescribe proper limits along these lines. Research enthusiasm can generally be conveyed to students most effectively by the man who is himself profoundly interested in his subject, and who knows exactly how far the subject has been developed. Work along the border line between the known and the unknown has the greatest fascination, espe-

cially for the young man who never before experienced the joy of knowing beautiful and general results which have never been published.

It is, however, essential that these new results should be both beautiful and general in comparison with the many elegant things which have been found out by others. The great danger is that an instructor will find mainly non-interesting and trivial results in comparison with the many important known results which his students have not yet mastered. In view of the great differences in research capacities of university professors it is very difficult to give limits as regards the amount of original work which may properly be incorporated into our graduate courses.

All of us could doubtless point to clear instances where students have suffered greatly on account of injustice along this line. The extreme cases of the promoter graft are almost as vicious as the extreme cases of the incompetency graft. In many instances the former are the more difficult to correct since a large amount of the knowledge in the subject concerned is essential for judging the merits of such a question. Moreover, in view of the comparative infrequency of these cases the public has not yet been educated to denounce them with sufficient severity.

In recent years there has been a rapid increase in the number of scholarships and felowships in our American universities. About twenty years ago G. Stanley Hall published, in Volume 17 of the *Forum*, an article in which he gave a list of the scholarships and fellowships which were then available for graduate work in our universities. By comparing this list with those which are now available, we shall note a remarkable change.

Those who are always looking for some kind of graft have found a fruitful field of operation in these scholarships and fellowships. It has not been uncommon for a professor to appropriate a large part of the time of the students who were picked with a special view to their promise to develop into research men, and who needed all their time for their scholarly development. Fortunately these plunders are becoming less common and our attitude towards scholarships and fellowships is improving. In some universities it is almost ideal.

These scholarships and fellowships have, however, some unfortunate features since they frequently attract young people to institutions and to departments which can offer very few other attractions for the graduate student. The student who is thinking of doing research work can not be warned too strongly in reference to the scholarship and fellowship traps set by various institutions which are poorly equipped for graduate work. Fortunately, many of the best equipped institutions also offer such inducements, and the most capable and most cautious students are not apt to suffer. On the contrary, such students frequently derive a great amount of good from the assistance thus received.

There is no doubt about the fact that a graduate student who comes to a university under the influence of financial assistance from the university is often inclined to consider the channels of this influence. Hence he will generally not feel quite as free, as the one who is not thus encumbered, to act independently as regards his courses or the sources where he seeks information about them. This tends to increase administrative influence at the expense of the influence of scholarship, and often leads to what deserves the name of administrative graft.

While graduate scholarships and fellowships may tend somewhat toward graft, it is not implied that they offer a very serious problem along this line. They merely call

for precaution and proper warning. The average graduate student who holds a scholarship or fellowship needs greater encouragement to become independent and to develop high scholarly ideals. The atmosphere should not create the feeling that further assistance is likely to depend on whether he takes a course with the head of the department or with some other member of the department who may have unusual administrative influence.

A large university makes many demands on the faculty for committee work and for other incidental services. It often happens that some professors fail to do their just share of such work. In the cases where this work appears useless they are to be commended for expressing in this way their disapproval. On the other hand, there is much very useful and necessary work outside of the class room, and those who are unwilling to do their full share of such work belong to a class of grafters who might appropriately be called shirking grafters.

All tendencies towards scholarly graft which have been considered thus far are generally represented in an ordinary faculty. Probably most of us have excellent illustrative examples in mind even if we fail to see where we might ourselves contribute to the list of illustrations. It may, however, be more agreeable to proceed to consider a type of graft which relates to the future American university which has at least twenty thousand students. We shall thus have the advantage of a university faculty whose members we may praise or censure with perfect freedom.

I desire to call your attention to the serious text-book graft in this future American university. Whenever a new administrative head[4] of a large department is elected he is practically beseiged by the agents of publishers of text-books. These publishers want him to write text-books for the thousands of students in his department. They care little about the merits of the books. The fact that these books will be used in this university for several years, at least, and that they can be sold at a high price is a sufficient guarantee to publishers.

Moreover, it might happen that such a man would actualy write as good books as those placed on the market by other publishers. In this case there would be a fair chance that by judicious advertising the sale of the text-books, written by our new administrative head, might become extensive, and this would mean so much more profit for the publisher.

Administrative heads of departments in our large future universities have an additional advantage in the fact that publishers will not assume the risk of publishing college text-books unless they are written or edited by such administrative heads. The smaller institutions are thus practically compelled to use the text-books written by the men in the larger universities and this reduces competition.

There are other very serious elements in this situation. Ostensibly these text-books are written on the supposition that they meet local needs better than any of those already on the market. There are fifty men in the department who have to teach the books written by the administrative head and all of these fifty men agree that these books meet local needs admirably. That is, they are perfectly agreed on this point as long as there is no change in the administrative head. If, perchance, one would hold a different view, his influence in the

[4] Heads of departments are determined by the scholars in the field represented by the department. It seems as foolish for the administrators of the university to appoint heads of the departments as it would be for state legislatures to fix by law the value of π. Administrative heads can, of course, be appointed by the administrators of the university.

department would soon reveal his error and thereafter he could also see the situation in the true light.

In the small colleges a teacher will be inclined to call the attention of his students to points of view which appear to be an improvement over those set forth in the text. In fact, they will often call attention to other text-books in which special subjects are treated in a more satisfactory way. In the future large universities under consideration there are no temptations to indulge in any speculations which would imply that the text-book could be improved except perhaps as regards typographical errors or mistakes in the answers.

The fifty teachers using the same book are not tempted to waste their time and energy by comparing other text-books with the one in use. They are not tempted to discuss with each other in a free way such trivial questions as those involved in a study of the order in which various parts of the subject should be treated. All of these questions have been settled for them by the text-books which they are practically compelled to use and they have plenty of time for thoughts along other lines.

One of the main advantages of this situation still remains to be mentioned. The students are highly impressed by the fact that local men are wise enough to write such books as they are using. They actually have seen once or twice the authors of their text-books, and the university which has such men on its faculty secures thereby a strong claim for eminence and useful service. This fact naturally appeals to the university administration and helps to block the way towards reform.

Finally, a hopeful element appears in this situation. Some crank begins to call attention to the fact that injustice is being done. Being a crank he keeps on enumerating such things as follows: Is it reasonable to suppose that an elementary text-book written by the administrative head of a department including fifty teachers should meet the views of these teachers as well as one selected by them from all the others on the market? Would it not be well to exclude by law text-books written by local men in those cases where a considerable number of different men are expected to teach classes by means of the same text-book?

Statements like these, and conditions enumerated above, naturally appeal to people whose sensitiveness to questions of graft has been greatly increased through decades of newspaper agitation, and our crank has an easier task than one might have supposed. He receives newspaper support, and legislative support follows. Laws are enacted which restore the freedom of discussion of text-books even in these large future universities. In view of the fact that these laws are enforced, this text-book graft becomes a thing of the past. As a result, the really meritorious college text-book lives longer and is consequently sold to the student at a more reasonable price.

Whether this glimpse into the future university is justified by the present trend can not be considered here. Our aim was to call attention to the dangers whose seriousness naturally appeals to us in different degrees. It is scarcely necessary to add that these dangers are national in scope. Whatever view we may have of them it seems clear that we should consider their bearings as behooves those engaged in research.

Text-book writing is sometimes attended at present by a feature which appeared to be too unjust to attribute to our future large university. It has often happened in large undergraduate classes that mimeographed notes which could scarcely be deciphered by the students were substituted

for an excellent text-book while a mediocre text-book was being written. Such procedures call for the strongest condemnation, especially since those who are being abused in this way are not in position to defend themselves properly.

Having exhibited a few tendencies towards scholarly graft the question arises whether a study of such matters is likely to promote scientific research. As a matter of fact an affirmative answer to this question is necessary to justify the preceding remarks on an occasion of this kind. Scientific research is based on a profound conviction that truth is desirable, and such research seems to thrive best in an atmosphere where all truths are welcome and where all honest efforts to arrive at the truth are respected.

This society is based, in part, upon the theory that there are wide differences as regards scholarly achievements among the faculty as well as among the students. It calls for observations as regards scientific achievements and for a public expression of conclusions relating to such achievements. These things are intimately connected with the questions considered above and hence these questions seemed appropriate even if they affect only indirectly our main interests.

In financial circles there seems to be a tendency to welcome the most searching scrutiny on the part of the public. Our scholarly methods should be freely open to the same kind of scrutiny. Practises which suffer thereby would be apt to become worse and to suffer more severely through a later investigation. It seems also very desirable that we should institute such investigations from within before they are suggested by a dissatisfied public.

There is a general impression that scholars are too poorly paid and that we should not interfere with the efforts which some of them are making to increase their incomes. On the other hand, the fact that a rule of the University of Paris provides that no professor shall be able to increase his salary beyond twenty thousand francs by accepting numerous teaching positions, shows that in a leading intellectual center it has appeared desirable to limit the professor whose financial ambitions interfere with what appear to be the highest university interests.

In view of the fact that there is such a large army of men engaged in scientific investigation it is reasonable to expect to find in our own ranks a great variety of types of mind. Many of us doubtless believe that some subjects which have found a place in respectable society as regards subjects of learning are practically graft-subjects. Subjects where the brilliant advances of one generation dwindle repeatedly into nothing through the scrutiny of the following generation, must convey a strong odor of graft to a scientific mind. This is true in spite of the fact that these subjects frequently relate to things about which we would all sincerely wish to have more light.

One object of a university course should be to lead the mind of the young towards useful channels of thought and to warn them against those subjects whose main capital is wasting the time of the student by discussing things about which we know nothing; or, what is still worse, by cultivating the dishonest state of mind which delights in pretentions of knowledge where there is no knowledge. The greatest foe of knowledge is the pretended knowledge which can not now be disproved, and the greatest danger which besets the students who are seekers of truth is the net of glittering but baseless generalities which are sometimes spun out before their eyes under the name of undergraduate university instruction.

Fortunately our own society is dealing with subjects where progress is permanent and where sham progress finds little room. It is true that these subjects reach into those of a different type and that Barnums and Ringling Brothers sometimes arise in our midst, but they do not represent the normal phase of our subject. We are living in houses built of strong material and hence we should not be afraid to throw stones at all appearances of graft. Our progress in the past has been largely due to an honest admission of unknown elements in our subjects. We have represented these by symbols and thus developed an algebra, which has led to marvelous advances.

This algebra of science naturally does not appeal to those whose mental caliber is such that they can enjoy only fiction, but it is this algebra which has made possible many of the conveniences of our fiction readers. It is an interesting sight when men use the telephone and the electric railway to call and to attend meetings for the purpose of belittling the value of science. These things are, however, becoming more rare, and one of the important duties of the scientific investigators is to maintain high ideals within their own ranks. These permeate the atmosphere which surrounds their work, and a favorable atmosphere is one of the essentials for vigorous scientific development.

Another important reason for maintaining the highest ideals among investigators is based upon the fact that the career of the investigator offers many excellent openings for the crook, and this constitutes one of the most alarming features as regards the permanent dignity of our profession. In fact, few other lines of work can offer more opportunities to those inclined to indulge in unfair practises. We all agree that some of the most important investigations require long periods of years, and that the investigator who has proven his ability should not be required to give an accurate account of how he is spending his time.

What a splendid opportunity these conditions afford to the crook. He too likes to be free from giving an accurate account of himself, and if he can deceive his superiors for a period of years by creating the impression that he will soon do something that is very important, he may have arrived at a position of independence before the truth becomes known. That such things are happening around us, few would probably be inclined to deny. When the lot of the investigator was a much harder one there were few temptations for the crook in this field, but with the improvement of conditions these temptations increase, and those who desire to be honest can not welcome too heartily the most searching investigation as regards our outward research practises.

There seems to be a growing respect for scientific investigations, and it is our duty to maintain this respect. With the increase of funds devoted to investigation, there naturally goes a growing interest in investigators and consequently a growing scrutiny of their practises. As these funds come more largely from the masses we are becoming more subject to waves of popular opinion. History furnishes many instances of how these waves may become agitated by disclosures of irregular practises. Hence a deep loyalty to the highest interests of scientific investigation carries with it a deep interest in the improving ideals of the investigators.

Unless these ideals are kept relatively high and a large number of useful discoveries continue to result from investigations, there seems no good reason to assume that scientific investigation can permanently maintain its position. The vicissitudes of

scholars in past ages serve to remind us of sad possibilities, and they should serve to spur us to the noblest efforts. The greatest danger which besets investigation is corruption within the ranks of the investigators. It still remains to be proven that the lot of the investigators in pure science can be made permanently attractive without supplementing them by crooks.

We all rejoice in every new evidence of the benefits derived from scientific discoveries. Those which reach every corner of our land are especially fraught with significance in view of their widespread effect in inspiring general confidence in the value of scientific investigation. Hence we have good reason to rejoice at this time on account of the important rôle scientific sanitation played in the digging of the Panama Canal. Such evidences have been so numerous in recent years as to create a new danger: viz., the unthinking mass may become too easy a prey to the extortioner who may use these facts to secure an undue amount of money from them. Oppression even in the name of promotion of science can not be countenanced by those interested in the permanent service of our subject.

In closing, I desire to call your attention to the fact that one of your serious duties is to make people forget that you were elected as members of the Sigma Xi, just as people ought to forget that you are a graduate of a college or that you have the doctor's degree. If, when you think of a man who is over forty years old, the thing that is prominent in your mind is that he graduated from Harvard or that he took his doctor's degree at Paris, it is almost certain that the man does not amount to much. If our future attainments do not overshadow our local university distinctions we have not been a success.

Your entrance into this society should overshadow the honors achieved through your good work in the high school; but compared with your future achievements, these present honors should sink into insignificance. A few years ago we thought of President Wilson as the president of Princeton, but to-day we think of him as president of the United States. Those of us who think of both of these types of positions as political achievements will naturally think of the latter achievement first. As far as the former position implies scholarly achievements, it can, of course, not be compared with the latter.

In purely scholarly achievements the comparison is simpler, and, in this case, we should always view with suspicion the man of forty who is still regarded as a Harvard or a Yale product; or who is still distinguished by the fact that he has a Ph.D. from a noted institution. I can not help thinking of such a man scientifically as still a babe in long dresses. Desirable as these distinctions may be in early years, they are only of temporary prominence as regards the man who actually is worthy of them. To avoid misunderstanding, I desire to emphasize the fact that I believe very heartily in such scientific distinctions as those which are attached to your election to this body. I sometimes think we have too few opportunities to mark in a public way, the various steps towards higher and higher scientific attainments. The fact which I desired to make perfectly clear is that our eyes should always be fixed on still higher attainments. There are too many intellectually satisfied people among us—too many whose scientific achievements could no longer be verified if they had not been securely established on parchment with India ink.

We welcome you into a society which stands for infinite progress in fields of infinite riches, a society which recognizes that our fathers knew less than we do and that

our children will know more than we know, a society which aims to establish fraternal relations among its members and which recognizes that hearty and continued co-operation is essential if we would succeed in securing those rich rewards of mind and body which past scientific discoveries lead us to expect to find in the unexplored regions. G. A. MILLER

THE FOUNDATION OF THE GEOLOGICAL SOCIETY OF AMERICA[1]

THERE was an "American Geological Society" in 1832 at New Haven, Conn., but it faded out in the glare of the chemical and physical sciences which bloomed brilliantly at that time in New Haven. I have not been able to get any detailed information concerning it.

About the same time was organized the Geological Society of Pennsylvania, 1832. At a meeting of February 22, 1832, the officers were John R. Gibson, president, Nicholas Biddle, vice-president; Stephen S. Long, vice-president; Henry S. Tamer, treasurer; Peter A. Browne, corresponding secretary; George Fox, recording secretary.

This society sent out a circular signed by John Gibson and George Fox announcing the organization and asking assistance in getting information and specimens. The organ of publication was Featherstonhough's *Monthly American Journal of Geology.*

This society seems to have aimed to develop the geology of Pennsylvania specially, but its plan of operation covered other states. It came quickly into competition with the Philadelphia Academy of Science. Its transactions were published in Featherstonhough's *Journal,* at first, but as that *Journal* passed through only one volume, it is unknown to me whether the society survived long after the death of the *Journal.* It appears that there was close sympathy between them, and it may be presumed that Mr. Featherstonhough was the instigator and prime mover of both.

[1] Response by Professor N. H. Winchell at the banquet of the Geological Society of America, Princeton, N. J., January 1, 1914.

There may have been other local geological societies in the country since 1832 whose records have not been published, but I have not heard of any.

The period of discussion and gestation prior to the birth of the present Geological Society of America extended from August, 1881, to August, 1888, *seven years.*

A few weeks before the 1881 meeting of the American Association for the Advancement of Science, at Cincinnati, Professor Chamberlin called on the speaker at his home in Minneapolis. The Western Society of Naturalists had been organized several years earlier, and one of its annual meetings was announced to take place at some point in the Mississippi Valley. In the conversation which took place in my parlor the suggestion was made by the speaker that the geologists of the western part of the country ought to be organized into a Mississippi Valley Geological Society. Professor Chamberlin immediately fell in with the idea, and it was agreed by us that the project should be broached at the approaching meeting of the American Association for the Advancement of Science at Cincinnati. But this idea expanded, in conversation with geologists at that meeting, into greater dimensions, and it was resolved to organize the geologists of America in a general society.

The first informal meeting embraced those present at Cincinnati and was held in the room of Section B, at 5 P.M., August 18, 1881. A committee was chosen to draft a constitution, consisting of George C. Swallow, of Missouri; N. H. Winchell, of Minnesota; S. A. Miller, of Ohio; Wm. J. Davis, of Kentucky; John Collett, of Indiana, and H. S. Williams, of New York.

On meeting the committee elected Winchell chairman and Williams secretary, and Miller was designated to draft a constitution for the proposed society. This constitution was presented the next day at an adjourned meeting of the committee, but after considerable discussion it was finally decided that it was best to defer more definite action to the next meeting of the American Association, and that meantime the committee prepare and distribute