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An Interpretative History of the Proceedings of the Iowa Academy of Science

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The Proceedings of the Iowa Academy of Science was first published in 1887 and has continued yearly except for 1905. Business reports and contributed papers constituted most of the volumes. Publication of symposia has become more popular in recent years. Financial and mechanical problems have caused strains at times, but these have largely been solved after publication became independent of the State Printer.

INDEX DESCRIPTORS: Proceedings of the Iowa Academy of Science, History, Scientific Thought.

Auguste Comte (1798-1857) believed that a science is not completely known if we are ignorant of its history (Cohen 1985). This was echoed somewhat by Ross (1918) in his presidential address to the Iowa Academy of Science, "It is impossible to write the history of a people without recording directly or indirectly the history of their scientific achievement." In this treatment, I make no attempt to duplicate any more than necessary the approach of Hanson (1975) whose comprehensive history of the Academy contained much on the Proceedings. The Proceedings of the Iowa Academy of Science serves, to a large extent, as the history for many scientific disciplines in the state. Although science in Iowa started long before the Academy was formed, the formation of the Academy indicated that there was a critical mass of interested persons for such an undertaking. The Proceedings made a permanent record of business matters plus articles on science, most of which were related to Iowa. It is human nature to collect, catalog, study, and document observations and results of critically performed experiments, as well as some quick and dirty ones. It is that insatiable yearning for knowledge that drives many persons into academia, formally or informally. For scientists in Iowa, the Proceedings have been a main outlet for things Iowan. All types of persons are represented: the professional and the amateur, for vocation or avocation or both, the dabbler and the perfectionist, the environmentalist and the exploiter, the philosopher and the pedestrian, the organized and the unorganized, the detailed collater and the trivialist, the erudite and the superficialist, the flawed and the flawless, the esoteric and the generalist, the prolific and the once-in-a-lifetime appearance, the florid and the stilted, the sung and the unsung, all in their own way have contributed to scientific knowledge. The Proceedings have been their stage.

The Publication Record

Ninety-six issues of the Proceedings were published through 1986. Volume one covered seven years (1887-1893) in four parts; part one 1887-1889, part two 1890-1891, and parts three and four, 1892 and 1893, respectively. Volume 93 was for 1986. Thus, there is not a perfect correlation of the number of sessions of the Academy and the volumes or issues published. There have been some gaps in meetings and publication. The 18th Annual Meeting was held April 14-15, 1904 in Iowa City. The corresponding volume was number 11 for 1903. A meeting was held in Iowa City on December 14-15, 1904, but evidently was only an executive meeting (see Vol. 11 for 1903). The 19th Annual Meeting was held on April 20-21, 1905. Its corresponding volume was number 12 for 1904. There was no volume for 1905. The 20th Annual Meeting was held at Ames on April 20-21, 1906; its corresponding volume was number 13 for 1906. There were no general meetings in 1943 and 1945, but executive meetings were held in Cedar Rapids and Iowa City, respectively. Papers were invited for those years and published in the normal sequence of volumes.

The first time that papers were published by sections was in 1917 (Vol. 24), and consisted of geology and allied subjects, home economics, physics, zoology and allied subjects, botany, and chemistry in that order. A cumulative index for volumes 1-25 (1887-1918) was published in Vol. 25 (1918) and an index for volumes 1-50 (1887-1944) was published in Vol. 51 (1944).

The longest paper was "Notes and Reflections about the Astronomical Theory of Shooting Stars" by Schiaparelli (1867) of Florence, Italy, and translated by C.C. Wylie and J.R. Naiden in Vol. 50 (1943).

The Proceedings has served as a publication outlet and a record of the Academy's business. As J.C. Gilman noted in his reports of the secretary, the Proceedings were considered by many as a repository for minor publications. Doubtless, this was and is true to a degree. But there should be a repository for new records of biota and paleontological, geological, and archeological findings, among others, in Iowa. The Proceedings is one of the logical outlets for these reports.

Editorship

It is axiomatic that there cannot be a good journal without good editors, quality manuscripts, and institutional support. The Proceedings have fared variously in these regards. Editors usually served a thankless job. They are acknowledged with thanks in Table 1. The secretary of the Academy served as editor of the Proceedings from 1887 through 1925. The office of editor was established in 1926, the name being changed to Editor-in-Chief in 1982. In the early years of the Proceedings there probably were few, if any, outside reviews. Sloppy writing seemingly has always been the bane of editors. Lees, in 1917 wrote "It is in the power of every contributor to the Proceedings . . . to assist in the work by seeing to it that his paper is correct in all its details. Such a paper is a joy to the editor, and to the printer as well." He later (1920) suggested that there should be a policy whereby papers would be submitted to an editorial committee for approval before being published. Again Lees (1924) admonishes sloppy writing, "No true scientist should for a moment allow himself the laxness in research that some of us manifest in our literary effort — or lack of effort. Remember that easy writing makes hard reading." Even as late as the 1960s, most editing was done by the section chairs. Until 1971 (Vol. 78), except for invited speakers or major addresses, research papers published in the Proceedings were enlargements of papers given during paper sessions at the annual meetings. Paper quality was greatly improved when manuscripts were submitted for external review, a procedure begun about 1971.

A change in the physical appearance in 1971 increased the visibility and content of the Proceedings. Before 1971 the Proceedings were printed annually by the State of Iowa, but there were complications and not all solutions were satisfactory. A main complaint was the delay in publication, sometimes over two years. Also, the number of pages was often restricted. Financial support by the state terminated with Volume 77 and the Academy had to bear full financial responsibility

Table 1. Editors of the Proceedings of the Iowa Academy of Science.

Editor	Years
R.E. Call	1887-1891
H. Osborn	1891-1897
H.F. Bain	1898
S.W. Beyer	1899-1900
A.G. Leonard	1901-1902
T.E. Savage	1903-1904
L.S. Ross	1906-1913
J.H. Lees	1914-1924
P.S. Helmick	1925
W. DeRyke	1926
G.H. Coleman	1927-1928
J.H. Lees	1929
G.H. Coleman	1930-1931
F.W. Nichols (Mrs.)	1932-1941
L.R. Wilson	1942-1947
F.G. Brooks	1948-1955
D.G. Mobberley	1956-1958
T.E. Rogers	1959-1961
P.A. Meglitsch	1962-1964
H.S. McNabb, Jr. (acting editor)	1965
P.A. Meglitsch	1966-1971
T.E. Rogers	1972-1977 (in part)
N.R. Lersten	1977-1982
M.D. Bachmann (Mrs.) and R.W. Bachmann	1983-1987

thereafter (Meglitsch 1971). Although termination of state support was regretted, autonomous publication by the Academy allowed for better control of the Proceedings. The page size was enlarged from 22.8 × 15 cm to 28 × 21.5 cm, and a double column format was used. There was better control of reproduction quality, including photos, than existed before. Publication became quarterly, which allowed for more rapid publication of manuscripts. Under the new arrangements, manuscripts were accepted irrespective of any presentation of a paper at an annual meeting. Beginning with volume 87, abstracts to be given at the next annual meeting of the Academy were published as inserts in the forthcoming March issue.

GENERAL CONTENT OF THE PROCEEDINGS

Dedications

The following issues have been dedicated to people.

1974. Professor C.J. Alexopoulos. 81:1-40

1981. John D. Dodd. 88:49-100.

1983. Robert W. Hanson 90(3).

A presentation of the Calvin Portrait was made at the 34th Annual Meeting held in Iowa City in 1920. Papers and speakers were by T.H. Macbride, L.H. Pammel, M.F. Arey, B. Shimek, A.O. Thomas, and E.R. Harlan. These were published in the committee reports.

Special Issue

Pohl, Marjorie C. 1985. Louis H. Pammel: Pioneer Botanist A biography. 92:1-50.

Although not a special issue, volume 82 for 1975 commemorated the centennial of the founding of the Academy. Special historical papers were included.

Publication of Symposia

Publication of symposia generally was a relatively late occurrence. Four papers on genetics were published in volume 48 (1941) and grouped to suggest a symposium, although they were not listed as such. The following symposia were published:

1920. Symposium: Some results of current research in the psychological laboratory of the State University of Iowa. 27:227-239. (Abstracts only.)
1981. Perspectives on Iowa's declining flora and fauna — A symposium. 88:1-47.
1982. Understanding the significance of creationism: Historical and cultural perspectives — A symposium. 89:45-61.
1984. Iowa's driftless area A symposium. 91:1-46.
1985. Iowa's loess hills A symposium. Part I. 92:157-219.
1986. Iowa's loess hills A symposium. Part II. 93:78-166.

Papers Collated by Discipline

My collations that follow (Table 2, Figs. 1-4) are interpretations not to be considered totally accurate, but decisions of the moment in many instances. It did not seem logical to categorize articles by sections as listed in the Proceedings, a procedure that terminated with volume 77 in 1970. Before then papers were usually included in the most appropriate discipline at the time. As the dichotomy of sessions increased, with some deletions over time, it was evident that rigid categories could not be maintained. Thus, throughout, articles were collated by broad categories, and subdivided as seemed appropriate. A repeat of the collations, by me or others, would not be identical to that presented here. Decisions to include an article emanating from a department of Fisheries and Wildlife in the conservation or zoology category, for example, were arbitrary. My best judgment, certainly not infallible, was based on scanning the article. Abstracts are not included, but admittedly, it was difficult to discern in many of the earlier issues what was an abstract and what was not.

The aforementioned trivia, collated in Table 2, although interesting, are really not important, they simply reflect the research activity, and nonactivity, in the Academy. Far more important are the

Table 2. Total papers by discipline, excluding abstracts, published in the Proceedings, Vols. 1-93.

Discipline	Total Articles
Agriculture	2
Agronomy and soil science	137
Animal husbandry	9
Anthropology	1
Archeology and paleontology	122
Astronomy	16
Bacteriology	78
Botany (includes forestry and horticulture)	937
Chemistry	379
Climatology	5
Conservation	223
Dairy science	4
Engineering (often put with physics)	2
Entomology	187
Genetics	14
Geology	511
Mathematics and statistics	80
Physics	206
Physiology and medicine	28
Plant pathology (includes some parasitic fungi)	108
Psychology	387
Social science	1
Teaching (across disciplines)	99
Zoology	646
Obituaries	329
Miscellaneous	77

merits of the publications, the people behind them, and their impact on science. Doubtless certain persons were driving forces behind the visibility of some disciplines, and the lack of leadership in Academy publications in other disciplines. This does not imply that scientists not active in the Academy were not active at the national and international levels, because many members known internationally publish little if at all in the Proceedings. Many persons, such as Charlotte King and Ada Hayden, probably did not receive the recognition they deserved, partly because they lived in a more chauvinistic period than now. If many of the publications in the Proceedings were not profound, and probably none revolutionary, nearly all gave an extension of our scientific knowledge.

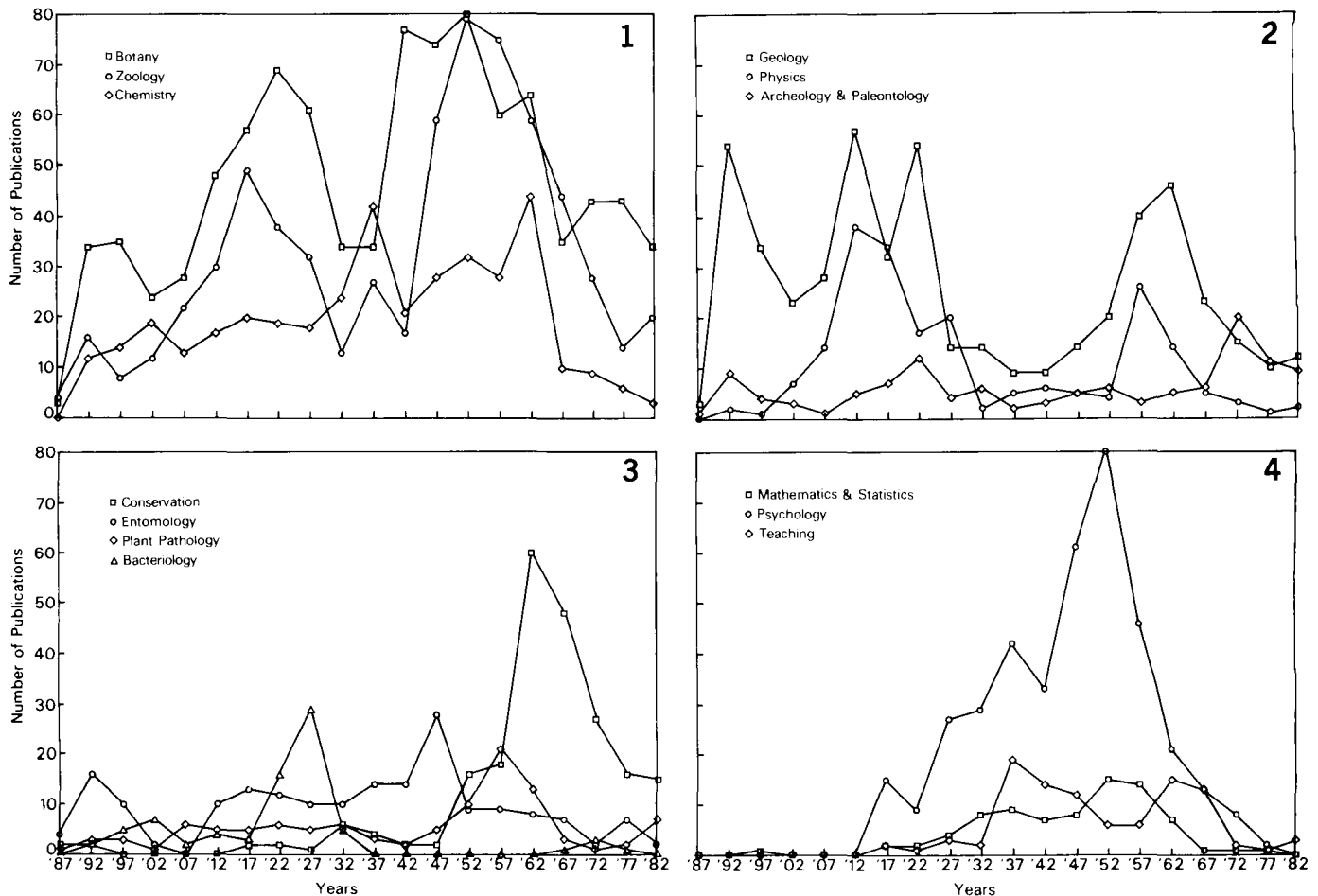
THE ACADEMY AND SCIENTIFIC THOUGHT

Although the date can be debated, many people believe that modern science began about four hundred years ago, about the time of Copernicus (Cable 1934, Cohen 1985). New minds were challenging old traditions, prejudices, and religious dogma. Copernicus in the 1500s put forth the disturbing news that man was not as anthropocen-

tric as many people believed. Kepler (1571-1630) followed with his work on planetary motions, and Francis Bacon's (1561-1639) thoughts on inductive reasoning and the scientific method were beginning to be heard. He recognized that laws and theories were not verifiable, but falsifiable. Newton published his *Principia* in 1687. Galileo's (1564-1642) work on the telescope, motion, and experimentation was changing science forever. Linnaeus published his *Systema Natura* between 1735 and 1758. Pasteur was developing vaccines, and Lavoisier (1743-1794) was changing the thinking in chemistry.

Bohr, Einstein, Freud, Pasteur, Planck, and Wallace were still living when the reorganized Iowa Academy of Science was formed in 1887. Darwin had died just five years before, and Faraday and Maxwell a few years a before that. Agriculture was fairly primitive in 1887. Farm machinery was still in the early stages of development, and horses, along with men, were the chief sources of labor.

In accepting this assignment, I was interested more in the scientific thought of Academy members in response to broad scientific developments that were occurring at the time than in the mostly descriptive reports that are the actual contents of the Proceedings. I wanted to relate significant scientific events, such as the development of hybrid



Figs. 1-4. Fig. 1. Number of publications in botany, chemistry, and zoology at five year intervals from 1887 through 1986. Fig. 2. Number of publications in archeology and paleontology, geology and physics at five year intervals from 1887 through 1986. Fig. 3. Number of publications in bacteriology, conservation, entomology, and plant pathology at five year intervals from 1887 through 1986. Fig. 4. Number of publications in mathematics and statistics, psychology, and teaching at five year intervals from 1887 through 1986.

corn or Sputnik to the type of papers found in the Proceedings. This attempt was met with varying degrees of success, probably because scientists in many fields publish more often in their national journals. True, there were many papers on corn, as one would expect in Iowa, but they were mainly on anatomy, histology, germination, diseases, and physiology, among other topics. There seemed to be little, if anything, on the impact of hybrid corn that developed after the turn of the century. Most references to the broad aspects of scientific thought were contained in the presidential and invited addresses that were published.

Although many addresses expounded on the speakers specialty by describing the physical, materialistic, and historical aspects of their disciplines, many were philosophical. Most presidential address topics were not controversial to the audience, and thus, in a great measure, we were talking to ourselves. Norton (1900) stressed the dependency of advancement of man's progress on science. Several speakers stressed that scientists should be better promoters of science to the lay public, partly with the view to project the uses and importance of science, and partly to give a better understanding of science and scientists (Hauber 1956). This theme repeated itself many times. Smith (1925): "The technical training required of the scientist nowadays is so great that the gap between him and the ordinary man on the street is gradually widening to an alarming degree. It is tending to make effective social contact and understanding very difficult." He also stressed the need for students to think. Davis (1939): "Science to the great mass of people is mysterious and terrifying." Kadesch (1949): "But there are many intelligent persons who still do not understand the spirit and purposes of science, nor comprehend its methods." Cole (1982): "Science may not be worshipped overtly, but technology generally is. . ." McClenon (1940), in his presidential address, however, discussed how the advancement of science preceded human progress in many areas, such as navigation, transportation, industry, and agriculture. Hauber (1956) pointed out that there were few scientists like Macbride and Nutting at the University of Iowa who could talk with laymen and be understood.

It is only natural that much of the Academy's events, concerns, and publication should be largely provincial. Geologists were studying the rocks, measuring the extent of glaciers and their roles in landscapes, and, along with paleontologists, were studying the fossil forms of life. Modern-day Linneaus were cataloging and adding new taxa to the biota. Scientists and naturalists, now known as ecologists, were studying the dynamics of the flora and fauna. In spite of this provincialism, Iowa scientists were not oblivious to new streams of inquiry. Most references to the broad aspects of this scientific thought were contained in the presidential and invited addresses that were published. Many national scientific events and interests were barely mentioned in the Proceedings. Little mention was made of Einstein, although Morehouse (1922) does pay tribute to Einstein when he writes, "No discussion of this subject, however inadequate, should be concluded without some recognition of Einstein's 'Theory of Relativity'." Planck and the quanta, along with related aspects of physics at the time were reviewed by Weld (1928). Many of the greats such as Cuvier, Liebig, Lyell, and others were mentioned only incidentally. There were four special papers on genetics published in 1941 that seemed to serve as a symposium. Also, Werkenthin (1922) devoted a few pages to Mendel and geneticists of his time.

Darwin's *Origin of Species* was published 16 years before the first organization meeting of the Iowa Academy of Science. His work had not gone unnoticed, however, as evidenced by the first paper published in the Proceedings, an abstract on "Animal Intelligence" (Parker 1887). In speaking of the ". . . quasi-intelligence of brutes. . ." Parker wrote that this ". . . without the disturbing influence of reason, renders Darwin's theory of the building up of instincts a possible and credible solution." A few pages later, one senses the

reservations of the thought that, "While recognizing the validity of protective, ornamental and typical coloration, as defined by Darwin, Wallace, Belt and others, the writer claimed that a very considerable amount of coloration in animals remained unexplained." (Todd 1887). In his presidential address W.S. Hendrixson (1899) states, "Probably the greatest doctrine of all science after that of gravitation is Evolution.", in which he realized that the concept of evolution was brewing for some time. Later in the same article he makes a somewhat contradictory statement: "The greatest influence that science has contributed to thought since the time of Copernicus and Newton is that of evolution. . . No other idea has attracted such universal attention, and has found such wide application and exerted such profound influence in altering the point of view in all departments of thought. It is the greatest discovery of this and perhaps of any century." This was six years before the monumental papers of Einstein in 1905. Perhaps physicists later would argue the point of Hendrixson, but such things are probably pointless because good comparisons cannot be made. The results of evolution and relativity were revolutions in the purest sense. They changed the course of scientific thought as few others have. As with many new radical proposals, Darwin's work was discredited by some. It had, however, gained sufficient acceptance that it prompted T.H. Macbride and L.H. Pammel to write "Resolutions on Darwin" (1909). The resolutions were incorporated into the minutes of the twenty-third annual session of the Academy, and opened with, "It is fitting that the Iowa Academy of Science should, in some way, spread on the minutes of the proceedings, its estimate of what science owes to the work of Charles Darwin, the centenary of whose birth occurred on the 12th of February, 1909.", and concluded with "No other scientific work perhaps so influenced the thought of his day or of our day as his epoch-making work on the 'Origin of Species,' published in 1859." Written in 1909, inclusion of the word "perhaps" is fortunate. Otherwise, the sentence could be mainly heuristic and subject to challenge by supporters of Freud and the 1905 papers of Einstein.

CONTROVERSIAL ISSUES AND THE ACADEMY

Creationism

Probably no national issue has received more concern by the Academy than that of the rise of creationism. Whereas conservation was long a local and national issue, it certainly was not as controversial as creationism. The conservation movement was relatively quiet, persistent, and innocuous, although vocal pro and con at times. Creationism, however, struck at the heart of scientific thinking and was not to go unchallenged. The result was a symposium, "Understanding the Significance of Creationism: Historical and Cultural Perspectives — A Symposium" published in 1982. The symposium was unique in that none of the four main speakers were biologists or geologists, the main disciplines in which the theory of evolution developed (Weinberg 1982). The creationism issue was not so much due to a controversy within the Academy as to one outside. The creationist movement, and those who were for or against it, was larger in the context of the Proceedings than the impact of Darwin, but certainly his impact was central to the topic. The creationists movement often went under the guise of scientific creationism, which, as has often been pointed out, is not a science and is a loose use of terms.

Long before this movement in the 1960s-1970s, and still continuing, objections to the loose use of science terminology were put forward. Norris (1895) had few kinds words for choice of words and sloppiness of methods and their acceptance by the public. On the word "science" he wrote, "We have seen in this generation the revival of an old imposter, that travesty on religion and science, the so-called Christian science." Macbride (1898), in a floridly written article, also decried the improper use of "science." He wrote, "Thus we have 'occult science,' strange contradiction of terms! and 'estoric science'

and 'mystic science' and 'monistic science,' 'spiritualistic science,' 'theosophic science,' and I know not what. Surely science has difficulties and perplexities of its own to deal with, sufficient that it may be allowed to protest against the imposition of such a burden of unheard-of accumulated rubbish." Fairchild (1924) stressed the need for thinking and logical reason.

Social Science

Another controversy, although generally subdued, occurred concerning whether or not social science is a science, at least as practiced. Norris (1895) in my opinion in one of the best and strongest presidential addresses given, had rather strong feelings on sociology as a science. "There is no true science of sociology yet formulated. The dictum of the social reformer is the baldest empiricism . . . Why then advocate social schemes to which not even the angels in heaven could conform much less men of flesh and blood? If sociology is ever to be established on a rational basis it must take man as he is, and as he has been, a creature of bone and sinew, ever striving for better conditions and never presenting phenomena that are independent of natural laws. Sociology can be made a science only by laborious patient endeavor." Hill (1903), in perhaps a partial rebuttal, stated that social science is studied in all colleges and universities. "The data desired are compiled and used. Inter-society and inter-collegiate debates, upon popular questions, are frequently held. The most learned men available are asked to be present and serve as judges . . . In the study of social science, statistics are indispensable." Bates (1907), echos this in a scripture quoting article, "Sociology is a science as to its methods and principles. Research in history is as scientific in its methods and plans as research in chemistry." But, Hart (1922) writes, "The term 'social science' appears to be taken seriously neither by scientists nor by sociologists. Conditions in social research have justified that lack of confidence, but an increasing group has set about the systemic collection of data on specific social problems and is reaching results capable of objective verification." Later, McClenon (1940) came to the defense of psychology, stating, ". . . modern psychology has established itself as a full-fledged science." Although psychologists were especially active in publishing in the Proceedings between 1917 and 1967, if Freud was mentioned I missed it. I found no references to him or his theories in the general addresses. Assuming that I missed no references to Freud, is there a message that psychologists of the time did not consider psychoanalysis scientific?

One social trend documented pictorially in the Proceedings was the hirsute facial condition of many male scientists in the early days of the Academy, giving way to the glabrous condition in the mid-twentieth century, and if one looks around, returning, in a large degree, to the hirsute condition during the last couple of decades.

Conservation

One concern that has continued over time is conservation in the state. Reports were not given every year, especially in the early years. The first conservation committee report was in Volume 26, 1919, by Pammel. A major thrust occurred in 1944 (Vol. 51) when the conservation committee, under the leadership of John M. Aikman, published their report on "Present Status and Outlook of Conservation of Iowa." This included reports by different persons on State Parks and Preserves, Birds and Mammals, Fisheries, Antiquities, Water Supply, Forests, and Soil and Water Conservation. Extensive reports by the conservation committee were made by G.O. Hendrickson (1953-1959), K.D. Carlander (1960-1964), and A.O. Haugen in 1965. All committee reports ceased publication in the Proceedings in 1966 (Vol. 73).

The Nitrite Controversy

Although not a major issue within the Academy, members of the Academy were involved in a position paper on the subject of nitrites. Through an executive order by Governor Ray in 1977, a Governor's

Science Advisory Council was established to investigate and advise on scientific issues requested by the Governor. Several members of the Academy served on this Council. The Academy was involved in the organizational framework of the Council with Robert W. Hanson being the liaison officer of the Academy to the Council. Hanson (1979) summarized the background of the Council as related to nitrites and published the Position Paper as submitted to the Governor based on the question, "Should nitrite be banned as an additive in cured meat products?"

THE PASSING PARADE

Reading obituaries, if morbid, can also be enlightening. Three-hundred-twenty-nine obituaries appeared in the Proceedings through 1986. Few obituaries were published after 1965. Deceased members are now respected by a reading of their names and a moment of silence given at the annual meetings, with only an occasional obituary appearing in the Proceedings. The passing of the obituaries is regrettable, but practical. As I leafed through every issue of the Proceedings, some people whose names I had heard but never knew, as well as people of whom I had never heard, came alive. I realize the contributions they made to their profession and the Academy: Charles Rollin Keyes (geology), Charles Reuben Keyes (archeology), Henry Conard (botany), Charlotte King (botany and plant pathology), Ada Hayden (botany), etc. Not all persons eulogized made a great impact on their science or the Academy. Unfortunately, many who probably were highly deserving of recognition were omitted. Pammel (1912) gave brief biographical sketches of charter members of the Academy. Wagner (1979) published a useful index to biographical notes through 1979. Some sketches were encomiums that reflected hero worship with some journalistic extravagance thrown in. Others were hardly more than vital statistics of persons who deserved better. So little is usually said in an obituary to give much insight into the person. An example is Dr. Parish. Although her obituary (Vol. 62:81) provides a thumbnail sketch, Horner's treatments (1975, 1987) provide a far greater view of the kind of person she seemed to be. Because of her quiet generosity, I view Dr. Parish as a person worth knowing. Treatments of Pammel (Pohl 1985) and Parish (Horner 1975, 1987) give more insight to these persons than is usually known. Certainly there were other Pammels and Parishes.

Histories of some sciences, including Iowa local pioneers and contemporary people, were published in the centennial issues (Volume 82) of the Proceedings. Many persons who made valuable contributions to science had little, if any, formal training in their speciality, as evidenced by several in paleontology (Anderson and Furnish 1983). Similar persons in other disciplines must be worth documenting.

REFLECTIONS

Some scientists in Iowa, even today, frown on the Academy and the Proceedings as being mostly trivial. I am convinced, however, that by changes through the years, the Proceedings has become a highly respected journal. The quality of publications has consistently continued to improve, especially after the manuscripts began to be reviewed critically.

When an *ad hoc* Publications Committee in 1986 issued a survey to the membership on ways to improve the Proceedings, the importance of maintaining and even improving quality was among the items receiving the strongest support. Although to me the content of the Proceedings is more important than the title, a change in the name from the Proceedings to Journal also received strong support, and has been approved by the Board. The new name is being instituted with this issue.

Even though the pages of the Proceedings might contain little of the original thoughts of the great minds of the last four centuries, they do serve as a record of, on a smaller scale, the interesting and exciting smaller universes of some Iowa scientists. A fossil from some prehistoric age, a bacterium causing leaves to fall, a fungus parasitizing a nematode, a proof to a mathematical equation, a new cultivar released for the market, the chemical composition of a meteorite, a newly discovered insect — possibly of economic importance in the state, all excite the imagination, add to our knowledge of surroundings and ourselves. Some discoveries are of immediate practical benefit to man, some have delayed significance, and some can possibly never be of monetary benefit. But maybe knowledge is sought for nothing more than knowledge. Nobel Laureate Fridhof Nansen wrote "The history of the human race is a continual struggle from darkness towards light. It is, therefore, to no purpose to discuss the use of knowledge; man wants to know, and when he ceases to do so, he is no longer man." Out of the millions of students being taught today's knowledge there may emerge another Newton, Mendel, Poincare, Lyell, or a Neumann.

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