"There Were Giants in Those Days:" A Symposium on the founders of the Indiana Academy of Science

Survey of the Lives and Careers of Three Charter Members of the Indiana Academy of Science: Theophilus A. Wylie, Richard Owen and Harvey W. Wiley

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Seventy-one persons, all men, were the founders of the Indiana Academy of Science and are recorded as the charter members. They include Theophilus Wylie, Richard Owen and Harvey Wiley. The first two were outstanding faculty members at Indiana University and the latter had a signal role in the development of chemistry at Purdue University during its first decade. However, in 1883, two years before the Academy of Science was founded, Wiley left Purdue and the state of Indiana to become chief chemist in the Chemical Division of the United States Department of Agriculture. Six years before the founding, Owen retired from the University, becoming professor emeritus, and one year after the founding Wylie became Professor emeritus. Both Owen and Wylie were the same age and in the year the Academy began to function they were each 75 years of age. Wiley was 34 years younger. Thus by 1885 Wylie and Owen had become virtually too old and preoccupied with other interests to be actively involved in the development of the new Academy. But Wiley, although he no longer lived in Indiana, gave support in various ways almost as long as he lived.

T. A. Wylie

Theophilus Wylie was a scholar of the old school who devoted practically all his productive life to Indiana University and the Bloomington community. His only publication of substantial merit was his "Historical Catalogue" (1) that covers the record of Indiana University from its founding in 1820 to 1890. From 1837 until his death in 1895 he was connected with the institution and lived in Bloomington except for the years 1852-54 when he was on the faculty of Miami University. He retired in 1886. His knowledge and understanding of chemistry and physics was self-taught. Because his education and family background had prepared him in theology and the classics he remained deeply interested in theology and in preaching throughout his life. He came to the struggling university as Professor of Natural Philosophy and Chemistry. Most of his years on the faculty were devoted to these subjects, but at one time or another he served in various other capacities.

As his colleague and friend Judge David Banta stated (2) at the time of Dr. Wylie's death in 1895:

> "No other man in the State ever had so long in one place a teaching service as he, and few in this or any other State, found so warm a place in his students' hearts. No more scholarly man was ever connected with the institution than was Dr. Wylie."

Perhaps the best characterization of Wylie and his status toward the end of his teaching was written by one of his students (3), of the class of 1876. In part he wrote:

> "He was a gentle, lovable man, affectionately called 'Pap' Wylie by our class, perhaps because his son Brown was a member. We had one year of Olmstead's *Philosophy* (physics), a truly formidable book, packed with knotty

mathematical problems as well as mechanics, sound, light, heat, and electricity. Chemistry had been made a separate department under Dr. Van Nuys. Our last year was spent in the study of astronomy. Although Kirkwood was an astronomer of first rank and Wylie was not I am sure that so far as instruction goes, we fared better under the latter. He had nearly every desirable quality that a teacher could have."

In addition to his teaching and willing participation in various responsibilities of the University, in private Wylie devoted time to sketching and painting. His diaries contain many excellent sketches that illustrate concepts and appearance of things of special interest to him. These included flowers, sun spots, rings of Saturn, and the constellations. An impressive picture by Wylie of the old campus had been proudly on display in University Chancellor Wells' office for many years.

Theophilus Wylie and Daniel Kirkwood, as well as Richard Owen, were close friends during especially the time that they were together as faculty colleagues. Kirkwood was four years younger than the other two, who were less than a year apart in age. It is remarkable that Wylie and Kirkwood died only a few days apart (4). Both are buried in Rose Hill cemetery in Bloomington. Owen is buried in the old cemetery at New Harmony.

Wylie began to keep a diary in 1832. It was continued until 1892, three years before he died (5). This unheralded record of 60 years obviously was not written with the intention that any part would become available to scholars or the public. It was his way to make habit serve him periodically in quietly recording ideas, observations, and experiences that he needed to think about at the time or for future reference. His personal and unfettered notations constitute a wealth of on-the-scene reporting that at least greatly complements other sources of information and ideas about the time in which he lived. Unfortunately the volumes covering about eighteen years apparently have been lost and were never in the possession of the University Archives.

Although Wylie recorded various important observations about the University's move to the present campus in 1885 there is no reference to the Indiana Academy of Science which held its first meeting in the same year. However, in August 1881 he wrote fairly extensively concerning his attendance at the national meeting of the American Association for the Advancement of Science in Cincinnati. The meeting lasted eight days and he was there for everything.

The tragedy of the great fire at I.U. on 12 July 1883 was starkly described at some length in the diary. Apparently the burning of the ten year old Science building was caused by lightning, but at first this was not realized by Wylie. He and his family lived in the now historic Wylie house which is a little more than two blocks from the site of the building. His first entry in the diary following the disaster was on July 15. With obvious heaviness of heart he wrote in part:

> ". . . about 10 O'C the college bell rang the alarm of fire. I immediately ran through the rainstorm . . . & found the New College building afire . . ."

After recording the lamentable losses, he wrote:

> "The fire seemed to have originated in my room thus I will be more implicated perhaps than any other as the occasion of the loss . . . I feel that it is more than I can bear."

From out perspective it was perfectly obvious that this major loss on a campus already too small should be followed by rebuilding on a new site—one that would permit continuing growth and development. But Wylie and several of his colleagues saw no need to take such a bold and, in their view, expensive step. To the great credit

of the Board, by a narrow vote, steps were quickly taken to move the University to the present site, then called Dunn's woods.

During the many months of active decision making and building on the new campus Wylie's thoughts were frequently expressed in his diary. Finally on 5 September 1885 he wrote:

> "College opened in the new building, last Thursday—new arrangement, new studies, new teachers, new modes of teaching give me much anxiety."

Concerning the high honor of being memorialized in the naming of the larger of the first two buildings, the diary is notably diffident. On the recommendation of President Moss in 1884 the larger building was named Wylie Hall "in honor of the first President of the University and of the present Professor of Physics." The laying of the cornerstone and naming occurred on 10 June 1884 during Commencement week. The only reference to this in the diaries is in two entires, the first as follows:

> "Last night I acted as chaplain—to morrow have something to do—& the next day at the laying of the cornerstone."

At the bottom of the page he had written some time later "Strange I was not more particular about the cornerstone as I rep^{d} the Faculty." Then 5 days after the laying of the cornerstone and the Commencement that followed he simply wrote "Commencement over." The rest of the entry was largely concerned with family matters.

Many issues such as possible conflicts between science and religion were thought about and commented by Wylie. Always his views and analyses were thoughtful and showed that he had an inquiring mind. For example, in April 1886 concerning a lecture on evolution by Professor John M. Coulter then of Wabash College, he wrote:

> "An eloquent lecture which held the audience. Darwin presented as the leading man in the Science of Biology. Prof. C. took a correct view of evolution, *me judice*. He did not ignore the Deity. It was God's mode of creating."

Such views were frequently expressed to students and colleagues on campus and in the community.

Respect and appreciation for Wylie was not limited to Indiana. Miami University gave him an honorary D.D. degree and such degrees were also awarded by Monmouth College and Princeton University. His Alma Mater the University of Pennsylvania awarded him an honorary LL.D. degree.

Richard Owen

When Col. Richard Owen joined the Indiana University faculty on 1 January 1864 he was 54 years of age but teaching was not new to him. His notable years in military service and surveying were in addition to his teaching of elementary school pupils, soldiers in a military institute, and his public lecturing. By the end of 1863 the prospects for victory in the Civil War seemed assured. He and his family had been for years the core of the New Harmony community and there were already strong bonds with Indiana University. As his biographer Victor Lincoln Albjerg wrote in 1946 (6):

> "He was primarily a scholar, a philosopher, and a humanitarian, and when Indiana University offered him a professorship in the natural sciences, he put away the military toga and donned the academic gown."

Soon he beloned to the outstanding group which became known as the "Big Four." The others were Professors Ballantine, Kirkwood, and Wylie (3).

During his first four years he was Professor of Natural Philosophy and Chemistry.

From 1867 to his retirement in 1879 the title was Professor of Natural Science and Chemistry. As stated by Wylie (1),

> "During these fifteen years he gave instruction principally in Geology, Mineralogy, and Chemistry, and during vacancies in the Modern Language Department he taught German and French."

During the first several years on the faculty he accepted other responsibilities outside Indiana in making geological surveys. Much of Owen's training in geology was obtained through his experience in surveys for the federal government in which his noted brother David Dale Owen was the director. His formal education, all in Europe, focused on natural sciences, especially chemistry and physics (6). Nearly all his published work was on geological subjects. As indicated in the titles, none of the publications had any particular reference to chemistry. However Owen was the first teacher of chemistry, physics, or geology at Indiana University to publish scientific papers.

Concerning Owen's effectiveness as a teacher there are very credible analyses by some of his students, his biographer Professor Albjerg, Wylie, and others. Professor Albjerg compared him favorably and at length with the best. In part he wrote (6):

> "As a class room manager he was superb. He maintained an atmosphere of dignity and scholarship. Raucous hilarity springing from demagogic stimuli was entirely absent. To him the classroom was not a place for entertainment, light bantering, or exhibition of the instructor's personality, but rather for the revelation of a theory or the exposition of a principle . . ."

One of Owen's great interests for nearly a decade was the location and development of a land-grant college following the enactment of the Morrill Act in 1862. Shortly after joining the faculty at Bloomington he drafted a comprehensive plan for the organization of an agricultural and normal school to function in connection with Indiana University (6). He travelled and spoke extensively throughout Indiana in favor of his plan.

Of course it is a matter of record that the "Indiana Agricultural College," was located at Lafayette. Its new Board of Trustees designated Owen to be the first president. But neither the Board nor President Owen moved promptly to organize the new university. He remained in residence on full time service at Indiana University. One year later he returned to Lafayette and gave the Board his tentative plan on the purpose and organization of the institution. Much objection to his plan arose. In the meantime the Board at Indiana University gave him the additional responsibility of being the curator of the exceptionally valuable Owen Cabinet or Museum to be housed in the planned Science Building, which was completed in 1873. He promptly resigned from Purdue.

A major turn in Owen's thoughts and practices concerning religion soon occurred after he joined the faculty at Bloomington. He became devoutly and rationally religious. As his biographer wrote (6), "he was permeated with a deep spirituality." Wylie wrote in his history of the university (1) that ". . . he professed his faith in the Divine Savior and became a member and an office-bearer in the Presbyterian Church." Also, Wylie frequently commented in his diary regarding Owen's chapel talks. In those years the daily chapel services were a significant feature of campus life. Owen's talks were generally Bible-based and admonitory concerning uprightness in living and in personal responsibility for health and good citizenship. His Sunday School class was a discussion group which considered a variety of topics such as religion, morality, economics, politics, ethics, frivolity, and family relations.

In 1879, owing to his impaired hearing, Dr. Owen retired and returned to New

Harmony where he worked primarily on seismology (7). Also he kept up an active correspondence with many professional friends in this country and abroad. The many topics included views on socialism, tornadoes, geology, and physics. He lectured extensively and he was in demand as a commencement speaker. Occasionally he preached in the New Harmony Methodist Church and he conducted the funeral services of many residents, some of whom were his close friends. Occasionally former colleagues from Bloomington visited in the Owen home. Among them was David Starr Jordan after he had become President of Indiana University (6).

Owen participated in absentia at the first scientific meeting of the Indiana Academy of Science. In the first published report on the meeting, Prof. A. W. Butler stated (8):

> "In the absence of Dr. Richard Owen the secretary read that gentleman's sketch of work accomplished for natural and physical science in Indiana. It was an exhaustive paper, treating of scientific research in this State from the earliest period to the present."

If there are current concerns that some papers in the Academy's programs are extraordinarily long it needs to be noted, as reported by Butler, that the "reading (of Owen's paper) took up a great part of the afternoon exercises, and was discontinued until further along in the session, to allow the presentation of other papers."

Among the high honors to Owen was the naming of Owen Hall for him and his brothers Robert and David. This occurred on 10 June 1884 at the time the cornerstones for this building and Wylie Hall were put in place (1,7). Also, in 1874 he received an honorary degree, LL.D., from Wabash College.

Another honor of high distinction was initiated in 1985 by the Indiana University Department of Geology. This is the Richard Owen Award (9). It is to be presented annually to two distinguished alumni from the Department.

Harvey W. Wiley

Harvey W. Wiley, unlike T. Wylie and R. Owen, was born in Indiana. The beginning was in humble, rural circumstances, in Jefferson county. However his father, like the fathers of T. Wylie and R. Owen, was much interested in education, both for himself and others. As Wiley wrote in his autobiography the father "even mastered Greek, at least sufficiently to read the New Testament in the original."

In 1867, when he was 23, Harvey Wiley graduated from Hanover College, which was only five miles from his home. His education had been interrupted by his limited service with the 137th Indiana Volunteers in the Civil War.

The upward bound graduate taught for a term in a Hoosier public school (Lowell) and in free time he read medicine with a local doctor in whose home he had a room. After the term ended he spent several months in Kentucky. While there he read medicine and served a physician as a medical apprentice. During the following year he taught in the preparatory department at Northwestern Christian University, now Butler University. His interest in medicine was advanced by the opening of Indiana Medical College, a new proprietary school in Indianapolis. He taught chemistry in the morning hours and studied medicine in the afternoons and evenings. Soon, in 1871, he received a Doctor of Medicine degree.

There were frustrations concerning the professional direction he should take. Resolution of the uncertainties began to occur when in the same year he attended a meeting of the American Association for the Advancement of Science held that year in Indianapolis. His career as a scientist dates from that time. He gave up any interest in practicing medicine. Before the end of 1871-72 he was teaching chemistry in both the Indiana Medical College and at Northwestern Christian University.

Wiley's interest in chemistry, kindled at Hanover, led him to enroll as a special chemistry student at Harvard in September 1872. After three months he returned to the Indiana Medical College to teach his classes for almost four months. Then he resumed his studies in chemistry at Harvard having been assured that if he passed all the special examinations he would be given a degree. The examinations were in general chemistry, chemical philosophy, French and German, mineralogy, qualitative and quantitative analysis. At the Harvard commencement exercises in June 1873 he received the B.S. in chemistry cum laude. His total time at Harvard had been less than six months.

Soon the rising chemist was named professor of chemistry and mineralogy at Northwestern Christian. In addition, he agreed to teach chemistry at the Medical College. He overworked and almost died. After months of convalescence in August 1874 he was named Professor of chemistry at Purdue, the first teacher of chemistry in that new institution. This fruitful connection continued until 1883 when he moved to Washington, D.C.

Wiley's only known connection with Indiana University occurred briefly about one week following his graduation from Harvard. At Bloomington, as a representative of the Indiana Medical College, he made a presentation to the Board of Trustees of the University which expressed the desire of the Medical College to continue its modest affiliation with the University. Such affiliation was continued in varying degrees of effectiveness until 1909 when Indiana University took full responsibility for all medical education in Indiana.

While in Bloomington on this mission in 1873 Wiley attended the laying of the cornerstone of the new building, Science Hall.

At Purdue one of Wiley's first notable actions was the encouragement and direction of students in the preparation of many chemical compounds as a part of their training. A collection of the compounds was made and exhibited by Wiley at the World's Fair in Philadelphia in 1876 (11).

Coincidentally, T. Wylie attended the Fair, which was the centennial of this country's birth. Also, he had supervised the preparation of an exhibit sponsored by Indiana University.

At Purdue Dr. Wiley emphasized laboratory work as the principal feature of instruction in chemistry. His focus in teaching was on analytical chemistry. This was parallel with the action of Dr. T. C. Van Nuys who was the first full time chemist at Indiana University. Van Nuys began his connection with Indiana University in 1874, immediately after the first adequate chemical laboratories had been provided. His strong emphasis was also on analytical chemistry.

Before moving to Washington Wiley had gained a reputation as a sound and practical specialist in the efforts to establish a domestic sugar industry. Although his responsibilities were largely on the technical side, the strong political forces that operated gave him problems. The extensive efforts to develop sorghum as a good sugar source failed, but a useful side effect was the improvement of sorghum as feed for farm animals. Also, much progress was made in the cultivation of sugar beets. A solid contribution was the introduction of chemical methods in research, development, and quality control (12).

For a long time in Washington Wiley gave much attention to the development of analytical methods largely to control the adulteration of foods. Bulletins from his laboratories reported in detail the normal characteristics of food products, dealt with appropriate analytic methods, and described common adulterations. His publications became the technical foundation of the developing pure food movement. A major support for the movement was Wiley's establishment of the Association of Official Agricultural Chemists (AOAC). The resultant three-volume treatise "Principles and

Practice of Agricultural Analysis" won widespread recognition of it as a standard works on methods.

In these endeavors Wiley became a vigorous participant in the strengthening of the new American Chemical Society. A major step in making it truly national and strong occurred in 1892 when Wiley became president of the Society. His leadership was so strong and effective that he served two terms.

Through the basic advances he had made in promoting the development and use of improved and uniform analytical methods exact knowledge instead of guesswork was possible in greater degree in the establishment of food standards and deviation from the standards. In 1895 Wiley headed a Committee on Pure Food Legislation. Some of the states, especially New Jersey, had begun to enact good legislation. But bills prepared by the Committee and introduced in the Congress were quietly opposed with strength and made no progress.

As summed up by his principal biographer (12):

> "With a shrewd sense for publicity, Wiley tested the effects of chemical food preservatives on the health of a panel of volunteers, the 'Poison Squad.' He spoke at countless meetings, recruited workers and allies, sought to consolidate support for specific proposals, and worked closely with Congressional leaders, supplying information and helping to draft legislation. He deserves the lion's share of the credit for the Pure Food and Drugs Act of 1906."

Although the new law and mechanisms for its enforcement had grievious imperfections, at long last, food safety was being promoted on a national level. Wiley quickly became embroiled in controversies concerning enforcement. Finally in 1912 he resigned from the government and changed to the private sector where he campaigned on behalf of food and drugs safety. As director of the *Good Housekeeping* Bureau of Foods, Sanitation, and Health he continued his long term battles.

One of the signal honors in memory of Dr. Wiley was the issuance of a United States commemorative postage stamp on which his picture was prominent. This occurred in 1956, the 50th anniversary of the passage of the Pure Food and Drugs Act. Wiley appears to be the only member of the Academy ever so honored.

In 1985 *Good Housekeeping* magazine established the Harvey Wiley Award to recognize outstanding accomplishments in public policy, consumer education, and research related to nutrition and health.

All of H. Wiley's relations with the Indiana Academy of Science occurred after he had moved from Indiana. Although he obviously was interested in the Academy and scientific matters in Indiana, the Academy is neither mentioned in his autobiography nor in the definitive biography by Anderson. Of course the very succinct record of his several connections are in Daily and Daily's excellent *History of the Indiana Academy of Science*. (13).

In addition to Wiley's contributions to the Academy in 1902 as its president, he addressed the organization several times. At the celebration of the 25th Anniversary of the Academy in 1909 Wiley gave an address on "Recent Progress in Chemistry." In 1916 the Academy participated in the celebration of the centennial of the State. Wiley spoke on "The Early History of Chemistry in Indiana." (11) He returned in 1921 and in 1925 to address Spring meetings and in 1923 to speak at the fall meeting. Apparently his last expression of interest in the Academy was in 1927, three years before his death. This was a letter of greetings read at the spring meeting which was held at New Harmony.

Wiley was obviously in failing health and judgment at least a year before he died. Almost from the time "his" Pure Food and Drugs Act was passed in 1906 he continuously found fault with its enforcement. In his latter years he became less tactful,

dogmatic, and embittered. Much of this was expressed in 1929 in his book "The History of a Crime Against the Food Law." The book was acrid in tone and word. Some times great contributors to science and its applications do not relax and retire soon enough. That was Wiley's problem.

After his death the dedicated reformer and Veteran of the Civil War was buried amongst a host of other veterans in Arlington National cemetery.

History has proved that Theophilus Wylie, Richard Owen, and Harvey Wiley were giants in earlier days and Indiana continues to benefit from their lives and work.

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