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Am J Physiol Regulatory Integrative Comp Physiol 291:1567-1578, 2006. First published Aug 3, 2006;
doi:10.1152/ajpregu.00390.2006

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Homer Wheelon, M.D., physiologist, artist, and poet: origins of the tailpieces in journals of the American Physiological Society

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Submitted 4 June 2006; accepted in final form 28 July 2006

Schramm, Lawrence P., Diana C. Schramm, and F. Wilson Jackson III. Homer Wheelon, M.D., physiologist, artist, and poet: origins of the tailpieces in journals of the American Physiological Society. *Am J Physiol Regul Integr Comp Physiol* 291: R1567–R1578, 2006. First published August 3, 2006; doi:10.1152/ajpregu.00390.2006.—Since 1953, illustrations have been inserted as “tailpieces” at the ends of articles in *The American Journal of Physiology* and *The Journal of Applied Physiology*. The drawings were made by Homer Wheelon, a member of the American Physiological Society from 1919 until his death in 1960. Forty-five years after his death, Wheelon is unknown, but he contributed 32 publications to the medical literature and trained J. Earl Thomas, an important 20th century gastrointestinal physiologist. Wheelon was born into poverty in 1883 to itinerant Methodist preachers, circumstances that guided his education and career choices. Throughout his life, Wheelon exhibited a fondness and talent for art and photography and an unusual breadth of intellectual interests and knowledge. Wheelon received a bachelor’s degree from the University of Washington, then studied at the University of Oregon, Northwestern University, and St. Louis University. Earning his M.D. from St. Louis University and assuming a faculty position there, Wheelon and his graduate student, Thomas, conducted widely recognized gastrointestinal research. Returning to Seattle in 1921, Wheelon became a highly respected physician and hospital administrator, but he also found time to indulge his interest in visual art and poetry. In 1933, inspired by observing a rabbit being used in a pregnancy test, Wheelon began to write and illustrate an epic, 322-page poem, *Rabbit No. 202*, illustrations from which became the journals’ tailpieces. The present study traces Wheelon’s personal life and scientific career in an attempt to understand this complex man and the origins of his unusual poem and its drawings.

gastrointestinal physiology; Northwestern University; St. Louis University; J. Earl Thomas; endocrinology; Chauncy Leake

THE SMALL ILLUSTRATIONS (TAILPIECES) that adorn the last pages of papers in *The American Journal of Physiology* and *The Journal of Applied Physiology* have attracted the attention of most physiologists at one time or another (Fig. 1)¹.

Some of the tailpieces have clear biological significance. Some do not. Some are carefully drawn. Others are less polished. Indeed, it may not be clear to the casual observer of the tailpieces in their small format that they are the work of a single artist and were drawn in pen and ink in the style of woodcuts. In fact, all of the tailpieces were taken from a single 322-page poem, written and illustrated by Homer Wheelon, a physiologist, internist, poet, and artist. Wheelon’s interests in science, medicine, and art were broad, almost to a fault. His

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¹ Lawrence Schramm received the American Physiological Society’s Orr E. Reynolds Award in History of Physiology in 2004 for an extended version of this paper.



Fig. 1. “Animals, Conduits, for the Passage of Food,” from Homer Wheelon’s epic poem, *Rabbit No. 202*. Reduced versions of this and other drawings from Wheelon’s poem are used as decorative tailpieces at the ends of articles in *American Journal of Physiology* and *The Journal of Applied Physiology*.

poem, *Rabbit No. 202*, was not only an artistic creation, it was Wheelon’s instrument both for integrating and expressing his broad interests. This study traces the history of the tailpieces by describing Homer Wheelon’s origins and education, his considerable contributions to physiology, the creation of his epic poem, and the circumstances that led to the inclusion of some its illustrations in the journals of the American Physiological Society.

IMPOVERISHED AND ROOTLESS CHILDHOOD

George Washington Wheelon and Minerva Clark Wheelon, Free Methodist preachers, had their second son, Charles Homer

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Wheelon, on June 29, 1888, in Santa Clara, California.² “Homer,” as he was known throughout his life, spent his early years in poverty, as his parents moved from town to town in usually futile attempts to establish permanent Free Methodist congregations. They finally settled in Seattle, where Mrs. Wheelon hoped her children would benefit from the academic and spiritual environment of a Methodist school, the Seattle Seminary.³ She was correct. Wheelon earned good grades in his college preparatory curriculum. He was particularly active in the debating club, and its members were his closest friends.

In recognition of his academic record, Wheelon was chosen to give one of four senior orations at his commencement in 1907. His emotional, but poorly focused speech, *The Price of Freedom*, was a montage of anthropology, history, politics, and religion that probably confused and dismayed most of his pious Methodist audience. In that audience, however, was Lula Meacham. Lula was the beautiful, bright, high-spirited daughter of a sometime farmer, sometime Free Methodist minister, and sometime real estate agent. She was two years behind Wheelon at the Seattle Seminary. Little more than a year after Wheelon's high school graduation, he proposed to Lula Meacham, and their engagement lasted for seven trying years.

SCIENTIFIC BEGINNINGS

As a teenager, Wheelon developed a consuming fixation on an artistic career. He sketched, painted, and became a skilled photographer, experimenting with films and processing techniques. However, his artistic ambitions provoked disputes between him and his strict ministerial parents. To them, the life of the artist seemed full of disorder, temptation, and danger. Wheelon acquiesced to his parents' wishes. He was the first in his family to seek a bachelor's degree, studying liberal arts at the University of Washington. Photographs taken in his freshman year show that he had artistic talent and aspirations (Fig. 2) that his parents hoped would be relegated to the status of a hobby. Those hopes were realized. Each year in college, Wheelon became increasingly interested in science and took more courses in biology.

Early in his tenure at the University of Washington, Wheelon met Trevor Kincaid, professor of zoology and director of the University's Puget Sound Marine Station.⁴ In addition to his scientific profession, Kincaid was also a bibliophile with broad cultural interests (14). Through Kincaid's example, Wheelon likely was convinced that a career in science did not preclude a major commitment to art. With few lapses, Wheelon maintained that conviction throughout his life.

During Wheelon's senior year at the University of Washington, he began to have doubts about a career in pure science. Kincaid suggested that Wheelon apply to medical school, a



Fig. 2. Wheelon, a freshman in college, in an artist's pose. Some of the works shown are by Wheelon.

resolution to some of Wheelon's conflicts. As a physician, he would have a measure of financial security, and neither his family nor Lula Meacham's would disparage his profession. In addition, medicine, in an appropriately structured practice, might provide him with the leisure to pursue his artistic interests.

Wheelon, however, lacked several medical school prerequisites. His second mentor, John Freeman Bovard, provided a solution to this deficiency. Wheelon met Bovard while working for Trevor Kincaid at Friday Harbor the summer after his senior year at the University of Washington. Bovard had just completed his Ph.D. at Berkeley and had accepted a position at the University of Oregon in Eugene. Bovard's interests encompassed ornithology, paleontology, neurophysiology, and exercise physiology. Sharing an expansive view of science, he and Wheelon were comfortable together, and Bovard offered Wheelon a teaching and research assistantship at the University of Oregon. Wheelon accepted happily. There, he would be paid to teach while completing his prerequisites for medical school. Wheelon taught histology, organized a physiology laboratory, took physics and organic chemistry to prepare for medical school, and conducted research toward a master's degree under Bovard.

² Accounts of Wheelon's early life are drawn from descriptions written by him in middle age and transcribed by his wife, Mrs. Lula Wheelon. These written accounts were supplemented by second-hand accounts provided by Mrs. Wheelon during interviews with L. P. Schramm. All written and artistic materials upon which this research is based were collected by L. P. Schramm and, unless otherwise stated, now reside in the Wheelon-Meacham Families Papers; Acc. 3954-001-4, Special Collections Division, University of Washington Libraries. This collection also contains a more detailed and more thoroughly documented unpublished version of this paper.

³ The Seattle Seminary survives as the Seattle Pacific University.

⁴ This facility survives as the University of Washington's Friday Harbor Station, San Juan Island, Washington.

Wheelon and Lula Meacham had, by now, been engaged for three years, and his sojourn at the University of Oregon was their first significant separation. They combatted their loneliness with an extensive correspondence. Between his arrival in Eugene and their marriage approximately four years later, Wheelon wrote to Lula Meacham more than 300 fact-filled, but longing and romantic, letters. She wrote nearly 250 letters to him in return.⁵ In addition to providing a detailed record of graduate student, medical student, and nursing student⁶ life in the early 20th century, their letters suggest that he suffered serious mood swings, a characteristic that kept Lula Meacham almost continuously off balance emotionally and that eventually may have ended his life.

There is little information about Wheelon's research at the University of Oregon. Bovard suggested that he study the anatomy of the innervation of the liver, but Wheelon's brief descriptions of his efforts suggest that he received little assistance from Bovard. Foreshadowing his future research, however, he stated in a letter written during his second semester at the University of Oregon and almost manic in its enthusiasm, that he would like to "devise a means of using the X-rays for physiological purposes."⁷ At the end of the semester, however, Wheelon made one of the abrupt transitions that characterized his education. He decided to apply to medical school immediately, without finishing his master's degree and without completing the prerequisites.

Through his links to Seattle's Methodist community, he may have learned that conditions were to his advantage at the medical school of the strongly Methodist Northwestern University in Chicago. In 1911, Northwestern increased its prerequisite requirement for medical school from one to two years of undergraduate study. One effect of this change of policy was that enrollment dropped by nearly 50 percent (39). The medical school faced dire financial straits and recruited students heavily. It probably was not difficult for Wheelon to convince a Northwestern interviewer in Seattle that, despite his single semester of physics and mediocre postgraduate grades at Oregon, he would be a good risk.

In Chicago, Wheelon returned to a life of relative poverty. Having exhausted his savings on his train fare, he earned his rent and obtained his meals by waiting tables three meals a day in a café. He worked off his tuition as an assistant to yet another scientific generalist, Winfield Scott Hall, Chairman of the Department of Physiology at Northwestern University. Earlier in his career, Hall had written physiology and nutrition textbooks. However, by the time Wheelon arrived at Northwestern, Hall, a devout Methodist, was beginning to write moralistic sex education texts for boys, girls, parents, and high school teachers (16). Wheelon's duties were to conduct literature searches for two new texts, one on the male reproductive organs and the other on eugenics. In addition, he was to paint illustrations of the reproductive organs and draw charts and figures for the eugenics text. In his "remaining time," Wheelon was to help Hall conduct his laboratory research. Once again

Wheelon had found a mentor whose enthusiasm engendered excitement for research, but whose own research was poorly focused.

Wheelon complained to his fiancée that he was required to repeat at Northwestern courses that he had already taken at Washington or Oregon. Worse, the intellectual standards of some of his professors disappointed him. The stage was set for a major event in Wheelon's career—his introduction to Roy G. Hoskins. Although scientific in its nature, this was an event that would have reverberations even 40 years later, when it played a major role in the American Physiological Society's decision to use Wheelon's art in its journals.

As the first-year graduate student of Harvard's Walter Cannon, Roy Hoskins studied the relationships between the thyroid gland and several other endocrine organs. Then he took a position at the Starling Ohio Medical School.⁸ There, at Cannon's suggestion, Hoskins began to study the role of the adrenal gland in circulatory regulation, and he quickly accomplished some of his better research (19).

A contemporary hypothesis held that the constant secretion of epinephrine by the adrenal glands was necessary to maintain normal arterial pressure (10). Hoskins showed that infusions of epinephrine too small to substantially alter arterial pressure were already so large that they completely inhibited intestinal motility. He reasoned that adrenal secretions could not possibly support arterial pressure on a minute-to-minute basis if, in doing so, they disrupted digestive function. It is likely that this endocrinological research attracted Hall's attention to Hoskins.

Hoskins assumed an associate professorship in Hall's Department of Physiology at the beginning of Wheelon's second year of medical school. Hoskins, a Ph.D. but not yet an M.D.,⁹ suggested that Wheelon might serve himself better, and humanity just as well, as a medical scientist rather than as a physician. By this time, Wheelon's letters to Lula Meacham indicate that he was weary of waiting on tables. Hoskins offered him a research assistantship in exchange for his medical school tuition for the current year, an instructorship in physiology with an excellent salary the following year, and a true collaborative role, including coauthorship in their research. Wheelon happily agreed.

The research interests of Wheelon's mentors to date had been broad and unfocused, poor training for a career in 20th century physiology. Participation in a sharply focused research program would have been beneficial. Arriving at Northwestern, Hoskins' research aims appeared to meet that criterion. At Northwestern, Hoskins planned to continue his studies of the circulatory role of the adrenal gland. Rather than study the effects of epinephrine itself, however, he chose to study the effects of removing all adrenal secretions and the secretions of other endocrine organs, as well, on the activity of the sympathetic nervous system. Therefore, although the research he would share with Wheelon was "focused" on the sympathetic regulation of the circulation, that research topic, by its nature, was already extremely broad.

The goal of their experiments was to determine the effects of the secretions of the adrenal cortex, pancreas, testes, and

⁵ Boxes 5A and 5B, Wheelon-Meacham Families Papers Acc. 3954-001, Special Collections Division, Univ. of Washington Libraries.

⁶ Lula Meacham studied nursing during her engagement.

⁷ Wheelon may have just read Walter Cannon's recently published monograph describing his use of X-rays to study the motility of the gastrointestinal tract (5).

⁸ Later to become the Medical School of The Ohio State University.

⁹ Hoskins eventually earned an M.D. at The Johns Hopkins University School of Medicine.



ovaries on transmission in the sympathetic nervous system at both ganglionic and peripheral sites. Conducted in dogs, these experiments were invariably arduous, and they produced data that, although publishable, were often difficult to interpret and sometimes difficult to replicate. In defense of Hoskins' and Wheelon's experiments, they represented one of the first attempts to quantify transmission in individual segments of the sympathetic nervous system in the same animals, a challenge even with today's techniques, and many contemporary cardiovascular and endocrinological studies suffered from deficiencies similar to those in Hoskins' and Wheelon's experiments. Furthermore, when Hoskins failed to corroborate all of the results of these early experiments, he was quick to point out the discrepancies and to try to account for them (17).

If, by the end of his second year at Northwestern, Wheelon's academic and professional progress appeared to be satisfactory, his financial position had not improved. Because Hoskins was not active in the laboratory in the summer, Wheelon's instructorship at Northwestern would not begin until the fall of 1919. In the meantime, Wheelon had to earn a living. He contacted A. J. Carlson, Chairman of Physiology at the University of Chicago, who appointed Wheelon to an Assistantship in Physiology for the summer. In this position, he could support himself by teaching and by working in Carlson's laboratory rather than by waiting tables. During that summer, Carlson recommended Wheelon to Don R. Joseph, the recently appointed Chairman of Physiology at St. Louis University. Joseph was building his department and needed staff, and he offered Wheelon an instructorship in physiology at St. Louis University at a salary of \$1,200 per year, more than twice his anticipated salary at Northwestern. Joseph claimed that if Wheelon were willing to abandon his productive collaboration with Hoskins, he would still be able to conduct his own research with excellent facilities. Wheelon wrote ecstatically to Lula Meacham that his new position at St. Louis University with its higher salary would enable him, finally, to marry her.

A year later, however, married, living in St. Louis, and anxiously awaiting signs of a child, Wheelon began to doubt the wisdom of Hoskins' advice that he obtain a Ph.D. and not an M.D. He had not found a research preceptor for his doctoral dissertation at St. Louis. Instead, he had met several clinicians who were able to maintain both medical practices and research programs. Wheelon changed his course again and decided to complete his medical degree while continuing his research.

HOMER WHEELON'S AND J. EARL THOMAS' RESEARCH IN GASTROINTESTINAL PHYSIOLOGY

An important benefit of Wheelon's instructorship at St. Louis University was that, for the first time, he was assigned a graduate research assistant. With some fanfare, Joseph led Wheelon into the laboratory to make introductions. Wheelon was astonished and pleased to find that his new assistant was J. Earl Thomas, a junior (but superb) member of the Seattle Seminary's debating club during Wheelon's tenure there. Thomas had just arrived at St. Louis University to obtain his B.S. and M.D. degrees (6). Reunited, Wheelon and Thomas were not only mentor and student, they became colleagues for the next six years. Indeed, it is likely that neither Wheelon nor Thomas would have been able to establish their respective careers without this relationship.

Characteristically, Wheelon conducted a wide range of research at St. Louis University: endocrinological, circulatory, hematological, and gastrointestinal. Much of that research, although creative, resembled work with his previous mentors in its lack of focus. On the other hand, Wheelon's collaboration with Thomas, his methodical and focused student, produced the gastrointestinal research for which he is best known and which launched Thomas' outstanding career. Their collaborative research produced five articles between 1920 and 1923.

Wheelon and Thomas each brought important skills to their research. Thomas was an accomplished machinist, capable of making the delicate instruments used to record gastric, pyloric, and duodenal motility (12). Wheelon provided both the skills and the X-ray equipment necessary to directly observe gastrointestinal motility in both humans and dogs.

Perhaps as important to the collaboration of Wheelon and Thomas were their respective intellectual attributes. Wheelon was not only more experienced in research than was Thomas, he also had a more comprehensive understanding of physiology. Wheelon's experience and training had predisposed him to an expansive view of his research, as manifested, for instance, by his work in humans on the relationship between gastric content and the motor and secretory functions of the stomach (28). Thomas, on the other hand, was a more intellectually focused individual. Even as a debater at the Seattle Seminary, he had been known for his carefully crafted and well-presented arguments (6). As a scientist, he spent the majority of his career studying the regulation of gastric emptying, using extremely precise equipment and techniques of his own design (8). It is likely that Thomas, while profiting from Wheelon's perspective, was a steady hand in conducting these experiments and analyzing the data.¹⁰ Indeed, neither before nor after his collaboration with Thomas would Wheelon's interest in medical science be so highly focused.

The factors that account for an interest in gastrointestinal physiology are important, not only for understanding Wheelon's motivations, but also Thomas' motivations as he subsequently became a leader in that field, publishing approximately 200 articles (6). In fact, Wheelon and Thomas' research in gastrointestinal physiology derived from a variety of sources, both remote and proximal. Wheelon may initially have been predisposed to this field of study by his interest in X-rays. Walter Cannon had revolutionized gastrointestinal physiology through the use of X-ray observations of the gastrointestinal tract (5). Wheelon almost certainly was aware of those discoveries, and, as mentioned above, expressed enthusiasm to Lula Meacham for using X-rays in physiological research. Now, only one year after receiving his M.D. and while serving as a resident, Wheelon was also Chief of the Department of Roentgenology at St. Louis University's Bethesda Hospital, with excellent access to X-ray equipment.

In addition, Wheelon and Thomas probably received (but did not acknowledge) suggestions from senior faculty at St. Louis University. Charles Neilson, with whom Wheelon conducted and published hematological research, earlier had studied factors that affected gastric emptying (25). They also

¹⁰ In an interesting unpublished manuscript, which Wheelon and Thomas worked on in 1926 and given by Thomas to M. H. F. Friedman, Thomas' criticisms in the margins suggest that Wheelon was overinterpreting their data. Clearly, by this time, Thomas had become a seasoned scientist.

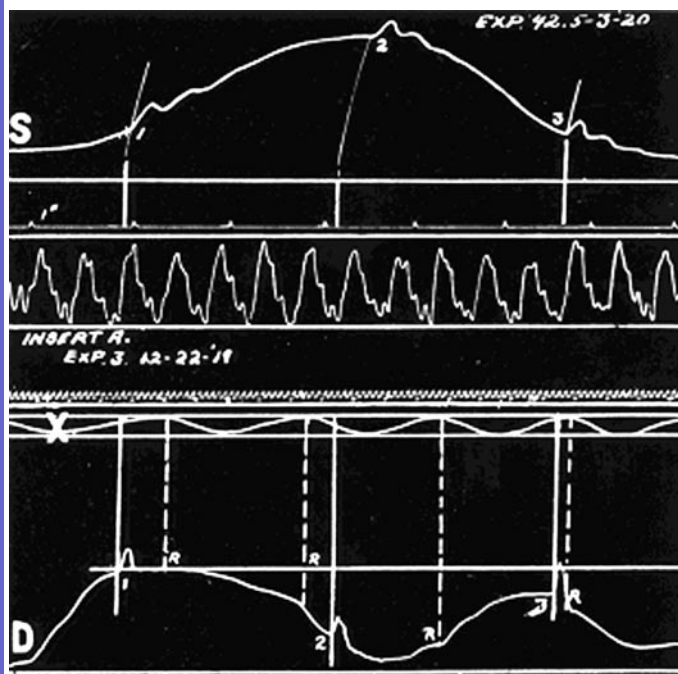


Fig. 3. High quality, unpublished kymograph records from Wheelon and Thomas' research on the relationship between the motilities of the duodenum and the pylorus.

received suggestions from Albert Kuntz, whom Wheelon knew well and who had sponsored Wheelon in an internship at Woods Hole in 1914. Kuntz had a long-standing interest in the gastrointestinal tract (22), and he and Thomas would later publish experiments on the autonomic regulation of gastrointestinal motility (22).

Most important, however, especially for an understanding of Thomas' later career, was Don Joseph's experience in Meltzer's laboratory at the Rockefeller Institute. Shortly before assuming the Chair in Physiology at St. Louis University, Joseph conducted two studies at the Rockefeller Institute, in which he used methods very similar to those adopted by and elaborated upon by Wheelon and Thomas (20, 21). In those experiments, Joseph used multiple balloons, connected via multiple catheters to kymograph tambours, to record the simultaneous motilities (pressures) of the stomach and duodenum. The hallmarks of Wheelon and Thomas' research, and of the latter's research for many years following, were the high-quality recordings (Fig. 3) of gastrointestinal activity, obtained with ingenious intragastric and intrainestinal transducers of Thomas' design and manufacture (38).

The first of Wheelon and Thomas' papers (34) is best characterized as a review, embellished with fragments of their own data. In its breadth and style, it was reminiscent of Wheelon's earlier work. The subject was broad: "The autonomic nervous system and disorders of the stomach." Factors ranging from cellular processes to the effects of stress and other psychological conditions were considered. The paper included an elegantly conceived (but unevenly executed) summary diagram by Wheelon that illustrated interactions between these levels of organization (35).

Then, in an abrupt sharpening of focus and style, Wheelon and Thomas concentrated on factors that regulate gastric emp-

tying, with little reference to extrinsic neural and endocrine factors. Ivan Pavlov had received the Nobel Prize for his work on digestive secretion in 1904, and Walter Cannon had published his influential monograph on gastric motility in 1911 (5). But then, both Pavlov and Cannon had transferred their interest from studies of the digestive tract to studies of neural and endocrine systems. Thus it had become politically safer to criticize their gastrointestinal conclusions. Whether by chance or by design, Wheelon and Thomas' gastric emptying research put them in direct conflict with one of Walter Cannon's more strongly held tenets, that acid regulated the emptying of the stomach by controlling the opening of the pyloric sphincter.

Cannon's observations had led him to a characteristically clear description of gastric emptying through the pyloric sphincter (4). According to this model, the pyloric sphincter was normally contracted during much of digestion and relaxed and opened when exposed to sufficiently high concentrations of acid. In turn, acid in the chyme stimulated secretion of digestive juices by the duodenum, and these juices, in turn, neutralized the acid in the duodenum. The resulting decrease in acidity permitted the pyloric sphincter to return to its closed state. Thus the sphincter aperiodically opened and closed, depending on the concentration of acid in its vicinity.

Although Cannon amassed a significant body of evidence and opinion in support of this model (7), to physiologists reinvestigating this issue, his view raised two questions: 1) Was the pyloric sphincter, in fact, normally contracted, relaxing, and opening infrequently to pass chyme to the duodenum? and 2) Was acid the stimulus for the opening of the pyloric sphincter? Wheelon and Thomas attacked the first of these issues and used their observations to suggest an answer to the second.

As Cannon had done, Wheelon and Thomas used X-rays to observe gastrointestinal motility, and they also made simultaneous measurements of the pressure in the antrum and the contraction of the pyloric sphincter. Soon after, they added simultaneous measurements of pressure in the duodenum. Using this combination of methods, Wheelon and Thomas observed that the antrum, pyloric sphincter, and duodenum appeared to move in a closely coupled manner and that the pyloric sphincter did not represent a barrier to the passage of chyme into the duodenum. Wheelon and Thomas concluded that, because the movements of the stomach, pyloric sphincter, and duodenum were so tightly coordinated, a local action of acid on the sphincter could not be responsible for the sphincter's relaxation (2, 36, 37).

Wheelon and Thomas's gastrointestinal research attracted significant attention. For instance, the renowned, gastrointestinal physiologist Walter Alvarez candidly admitted in one of his papers (2) that

Just as we were about to send off our report on the subject, there appeared an article by Wheelon and Thomas which described many of the phenomena which we had been studyingAs there were a few differences between our observations and conclusions and those of Wheelon and Thomas, we have spent several months more on experimental work and have rewritten our paper.

Even Walter Cannon, whose interpretations sometimes were questioned in the Wheelon and Thomas papers, responded positively to their work. For instance, on March 13, 1922, Cannon wrote to Wheelon:

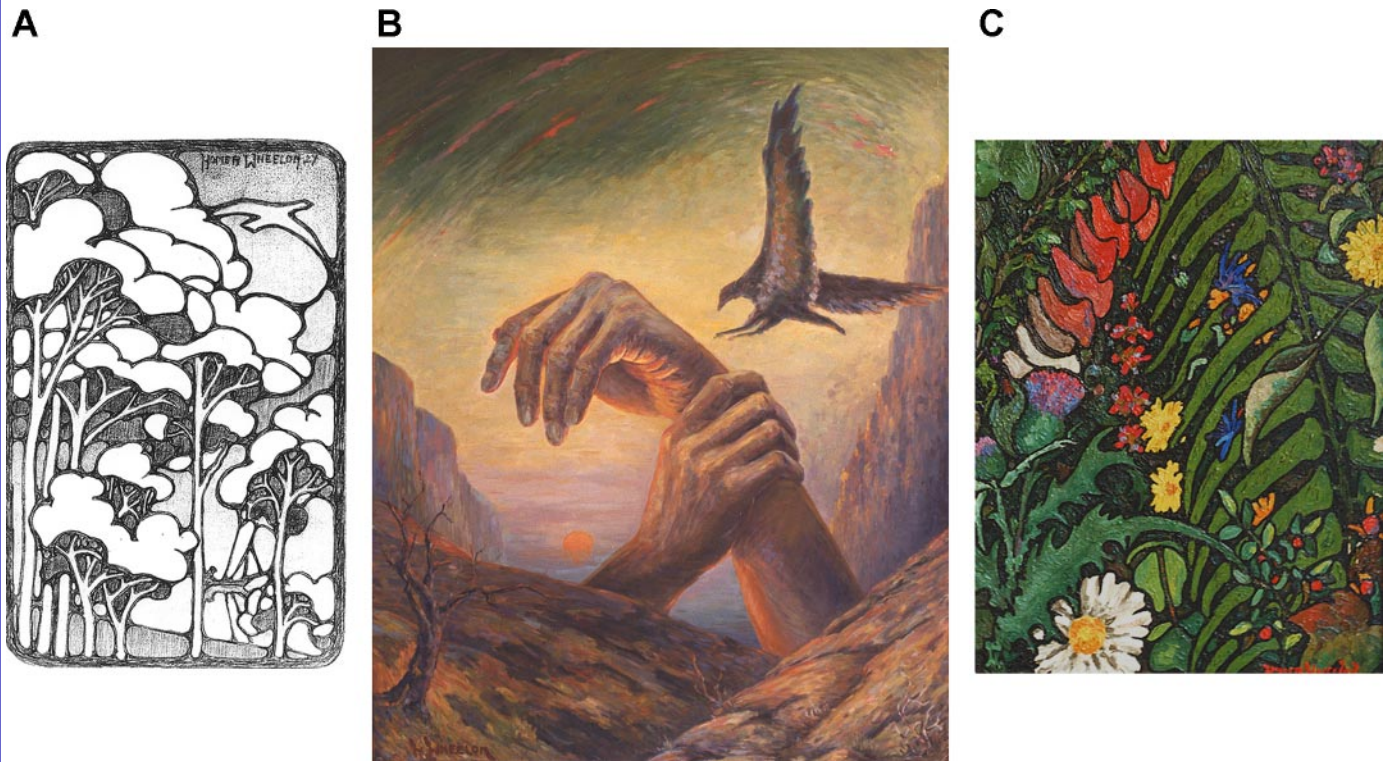


Fig. 4. Examples of Wheelon's artwork during the 1920s. A: untitled pencil drawing of trees. He drew many versions of this scene, some of which are delicately tinted. B: "Prometheus," an oil painting done in the early 1920s, it portrays Wheelon's own hands in a rendering of the Greek myth of the god who stole fire from the other gods and delivered it to humans. Unlike the Greek god, Wheelon's Prometheus is bound only by himself. C: untitled oil of ferns and flowers.

I was especially pleased to read your discussion of the relation of the gastric content to the secretory and motor functions of the stomach. I have long felt that there is a good deal of unproved assumption in the claims made for gastric analysis and the evidence that you offer is most pertinent on that point.

Wheelon and Thomas's gastrointestinal research was reviewed favorably in important textbooks of gastrointestinal physiology written by Alvarez (1) and Bockus (3). Their research was frequently cited throughout the 1920s, and it was cited as recently as 1987 (15).

SEATTLE INTERNIST, ARTIST, AND POET

Wheelon and his wife were strongly inclined to return to the Northwest after he finished his training at St. Louis University. However, he vacillated; his relationship with Thomas was an important incentive to stay. Then, in the spring of 1920, Thomas, disappointed at his prospects at St. Louis University, accepted a position at the University of West Virginia.¹¹ Without his collaborator and friend, research in St. Louis was far less attractive to Wheelon. Thus he traveled to Seattle and negotiated a partnership agreement with H. J. Davidson, director of a group practice that would eventually become, and remains, Seattle's Polyclinic.

Although return to Seattle was to mark the end of Wheelon's academic career, he was unwilling to relinquish that role entirely. He was a frequent guest lecturer at the University of

Washington. He was appointed briefly to the position of lecturer in psychology, and he may have taught abnormal psychology during the 1923–1924 academic year. He conducted clinical research (see, e.g., 30, 31). He reworked lectures and publications from his days at St. Louis University and presented them to local medical societies.¹² Over the next 20 years, he published nine clinical studies and two textbook chapters, usually related to endocrinology or endocrinological disorders.

From his youth, Wheelon had sought ways either to incorporate art into his professional life or to practice art as a parallel activity. Until he reached St. Louis, he had been successful in this objective. Then, for almost seven years, his artistic output had been limited largely to technical illustrations in his scientific publications. One reason that Wheelon joined a group medical practice on returning to Seattle was to have the freedom to indulge his cultural interests.

Returning to the city in which his artistic talent had first blossomed, Wheelon resembled a freed prisoner. He painted and photographed, exhibiting his work in regional salons and exhibitions. He worked in a broad range of media: pen and ink, pencil, watercolor, oil, and woodcut (Fig. 4).

Wheelon's artistic styles were equally varied. During the 1920s, they ranged from realistic pastoral landscapes to surrealist metaphoric paintings to pure designs. Both his realistic work and his abstractions drew praise from critics. Although many of his realistic works, mostly landscapes, were gentle and

¹¹ Thomas stayed at the University of West Virginia for only one year before returning to St. Louis University.

¹² See, for instance, the note on blood pressure variations recorded in the *Bulletin of the King County Medical Society* 6: 16–22, 1927.



unchallenging, his abstractions could be dark and even threatening.

The earliest record of public exhibition of Wheelon's art in Seattle dates to 1924 at the Ninth Annual Exhibition of the Artists of the Pacific Northwest, held at the Seattle Fine Arts Society. Although Wheelon's art eventually became highly regarded locally, nationally, and internationally, early on, his work was not universally accepted. An undated newspaper review from about 1946 recalls:

Back in 1928, Dr. Homer Wheelon's modernistic painting called "The Birth of the Finite" created something of a disturbance among old and new school painters when it was hung in the old art museum. Everything was nicely settled and since then Wheelon modernisms have been appearing in the new museum.

The same review states [original grammar and punctuation]:

His canvas called "Midgard Norse" recently won the plaque of exceptional merit at the American Physicians Art Association in San Francisco. The name and subject of this painting is taken from an old Norse folk tale dealing in a figurative way with the age old question, "Where does physical man come from—where does he go." In carrying this question into the painting Dr. Wheelon has employed to magnificent advantage his knowledge of the sciences of the body. For instance the color, pattern and composition of the picture depend to a large extent upon five human brains (don't shudder) and a cluster of body cells.

In 1947, The American Physicians Art Association invited him to submit a work to its international competition in Buenos Aires. Wheelon changed the name of "Midgard Norse" to "Brains and Clouds" and submitted it to this competition, where it won the gold medal for oil paintings.

Always an eclectic bibliophile, Wheelon read and collected books with increasing avidity. His catalog of approximately 600 titles reveals the extraordinary breadth of his interests: physical and biological sciences, clinical medicine, art, philosophy, religion, poetry, theater, fiction, history, biography, music, anthropology, archaeology, and geology. Above all, Wheelon was fascinated by William Blake's marriage of poetry and art; he collected fine, hand-colored editions of Blake facsimiles, eventually accumulating one of the largest private collections of these works in the West.

Nor were art and reading Wheelon's only activities. He passionately researched his own genealogy. He made a detailed study of American Indian mythology. He studied the incidence of endocrine disorders in local counties (31). The energy with which he pursued his avocations belied the calm, almost ascetic physician whom his patients and fellow clinicians knew. During these years, his activities encompassed an ever-enlarging intellectual scope while becoming increasingly compulsive.

By 1933, Wheelon was in a period of crisis. He found aspects of his medical practice tedious. At home, his life was in disarray because of dissension between him, Lula, and their restive, adopted, teenage son. Wheelon spent many hours in his basement study, immersed in mythology, philosophy, and Blake. On Saturday, April 15, 1933, one week before Easter, Wheelon entered the laboratory of his colleague, Dr. John Lingenfelter, a young reproductive endocrinologist and obstetrician. Lingenfelter was conducting a Friedman test (37) to determine whether one of his patients was, in fact, pregnant.

The ovaries of a virgin, female rabbit, which had previously been injected with the patient's urine, lay dissected on Lingenfelter's bench. He was searching the ovaries for corpora hemorrhagica, an almost certain indication that the rabbit had ovulated in response to hormones (at that time, poorly understood) in the pregnant patient's urine.

To Wheelon, Lingenfelter's test was a revelation. Here was a rabbit—not only one of our meekest animals, but also a symbol of fecundity, a symbol of the rebirth of spring, a symbol of Easter—being used to test for pregnancy in a human. Inspired, Wheelon embarked on his most ambitious project, writing and illustrating a poem entitled *Rabbit No. 202*. Wheelon wrote the first 121 pages between the spring of 1933 and autumn of 1934. It took him approximately six more years to finish the remaining 201 pages. In his first year of writing, whenever he was not at the Polyclinic, he lived an almost solitary existence, working alone in his study. Never having required much sleep, he worked until nearly morning, even during the week. On many weekends, Wheelon worked from Friday night to Monday morning, emerging only for occasional naps and meals. He was a man possessed.

In this long poem, Wheelon found a way to bring together his disparate cultural, scientific, and medical interests. Perhaps he was emulating his early mentors, all of whom had lived full cultural lives. Indeed, Roy Hoskins had just published an endocrinology text written for a lay readership, *The Tides of Life* (18). Whatever Wheelon's motivations, it is no surprise that, in writing a long, illustrated poem, he emulated his hero William Blake.

In the middle and late 1930s, Wheelon had less time to work on *Rabbit No. 202*. He had become an important figure in Seattle medicine. In addition to his clinical duties, he was elected several times as President of the Polyclinic, a position that carried substantial administrative duties. Wheelon also held the position of Medical Director of the Columbus Hospital. When the Columbus Hospital became the St. Cabrini Hospital, he became its first Chief of Staff. Nevertheless, he maintained a large practice of internal medicine with many loyal patients. Not surprisingly, given his inquisitive nature and academic background, he was particularly popular among the faculty at the University of Washington. Throughout this period, however, sometimes intensely and sometimes casually, Wheelon continued to work on his poem.

RABBIT NO. 202

Given its length and complexity, the format of *Rabbit No. 202* is its most easily described feature (33). The poem's 322 pages are divided into 12 chapters. Each chapter is preceded by a short prologue that summarizes the succeeding material (see the section from Part 2 quoted below). Each of the poem's 38 illustrations has a short title, in all but one case a line from the poem. Some of the illustrations interpret the poem. Others are either loosely related to the poem or, in a few cases, apparently unrelated. All but one of the illustrations were rendered in pen and ink, drawn to resemble woodcuts (Figs. 1, 5–9). The exception was a reproduction of an earlier oil painting. Some of the illustrations were original to the poem; however, in keeping with artists' frequent usage, many were illustrations that Wheelon had previously drawn, for instance as Christmas cards, and then modified.



Although the rabbit was the inspiration for Wheelon's poem, it provides only the most tenuous organizing principle. Very much like his senior oration in high school and some of his early publications, the poem rambles over an extraordinary range of topics. Consider the chapter titles: "Rabbit No. 202, Myths, Magic, Life, Science, Symbols, Theory, Confusions, Realities, Reflections, Projections, Ways." The prologue to Symbols demonstrates the breadth of material covered in just a single section of this poem.

Herein are recorded many facts as established by the "scientific process"—conclusions derived from logically arranged data collected by means of the experimental method—critical challenge of nature. Conclusions as facts, hypotheses, theories, and ultimately laws (convenient abstractions compounded from the stuff, observed phenomena). Conveniences derived through impartial observations and cold reason; abstractions symbolizing meaning . . . Symbols, the conclusions of inquisitive and believing man . . . and perchance, errors of man, that is, acceptance of symbols as such instead of that which is symbolized—knowledge without experience.

Herein also, are set down various characteristics of man and many of the results of his doings; especially those having to do with man's conclusions relative to his position in the stream designated by him as process, his discoveries (experiences) and

the use he has made of them—culture. Man laboring to solve the problem—man; gathering facts for his theories . . . Facts and theories of man.

The poem contains material ranging from a taxonomical categorization of *Homo sapiens*, and a complete short-course in reproductive endocrinology, to a gentle love poem to his wife. This is not to say that there are no organizing principles. Wheelon used both typographical and thematic schemes to unify the poem.

Structurally, Wheelon dealt with the broad range of material in the poem by using an outline form. Beginning with a central topic near the left margin, he successively indented subtopics until he had exhausted that topic. Then, he would return to the left margin and declare another central topic. A section from Part 2 of the poem (33) demonstrates this principle.

Man,
 Alleys, life, and destiny,
 Conjectures of man—
 Dinosaurs went in for mass,
 Tons of mass and armor plate;
 Flourished in the Jurassic age;
 Swarmed down the alley mass;
 Finished up as fossils.
 Tons of mass and armor plate—
 Dinosaurs wrote the history of mass in fossils . . .
 Small heads and large bellies for a day;
 Life projected through mass reduced to fossils,
 Dinosaurs and their day.
 Out of the fogs of morning,
 Into the blaze of day,
 Through the doors of night,
 Life entered,
 Unfolded,
 Then passed that way—
 Out of the fog into the night.
 Dinosaurs passed that way—
 Alleys?
 Homo sapiens, naked biped, went in for brains,
 Efficient brains and opposed thumbs;
 Hunted the woolly mastodon;
 Turned environment down the alley of brains;
 Made his own fossils.
 Efficient brains and opposed thumbs—
 Homo sapiens writing the history of brains on paper . . .
 Large heads and small bellies of today;
 Life projected through brains reduced to marks on
 paper . . .
 Man and his day—
 Life trying alleys?

Wheelon also repeated short motifs to link portions of the poem. For example, he used the lines "Running sap in trees/Urgency in seed" in discussions of spring, descriptions of the rabbit, references to female fertility and the menstrual cycle, and Christ's death and resurrection.

Perhaps the poem's most pervasive theme is the relationship between human models and symbols (including, of course, art) and the reality that these models and symbols purport to describe. A second theme is the relationship between what humans are convinced is fact and what they are willing to



Fig. 5. "Winter of Disbelief," from *Rabbit No. 202*, illustrates a portion of the poem in which Wheelon describes the origins of rites of spring, relying heavily on Frazer's *The Golden Bough* (11). The figure symbolizes the loss of faith in the early goddesses of spring, such as Eastre, as well as the annual lack of confidence that, without sacrifice from humans and intervention from gods, spring would not follow winter. The illustration is an evocation of the barrenness of both doubt and winter.

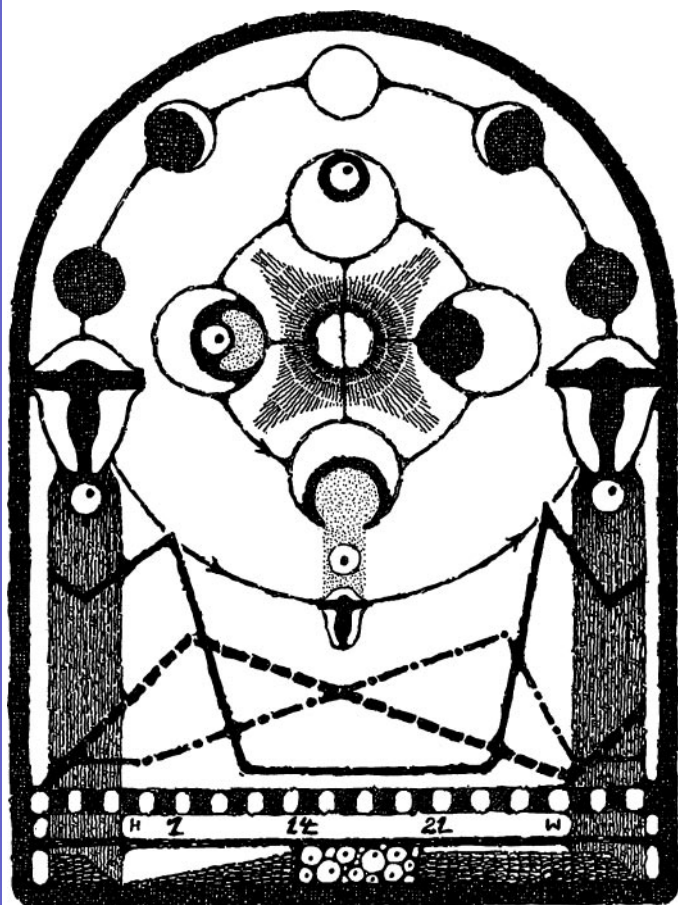


Fig. 6. “Tides of Menses,” from *Rabbit No. 202*, one of the least polished of the figures in *Rabbit No. 202*, illustrates a portion of the poem that constitutes a summary of reproductive physiology, as understood both in primitive times and in the 1930s. The cycles of the moon, at the top, are linked to the cycles of the ovary, in the center. The lower portion of the diagram is a chart of hormone levels throughout a twenty-eight-day cycle.

admit is illusion. A third theme is humans’ rationalizations for plundering the rest of the natural world.

The tone of the poem is often, but not always, critical. Wheelon was generally suspicious of human institutions and human intellectual constructs, and this skepticism pervades *Rabbit No. 202*. At the same time, his overall view of humans as individuals was optimistic. He valued the ability of humans to relate to one another when those relationships were positive and nonexploitative. Indeed, he considered companionship to be the species’ highest achievement.

The heterogeneity of *Rabbit No. 202* fits the pattern of Wheelon’s early scientific writing. He was, after all, a “compiler.” He had conducted exhaustive literature searches for Winfield Scott Hall, and when Hall did not use them, Wheelon did, as material for his own reviews and textbook chapters (26, 27, 29, 32). He compiled long lists of patients with similar diagnoses, searching for common etiological features. Until 1940, he kept an elaborate bibliography of every endocrinological article he read. His personal papers contain lists of his works of art and their locations, lists of his previous addresses, lists of illnesses, and lists of books and phonograph records.

Another reason for the poem’s heterogeneity is that Wheelon used *Rabbit No. 202* to record his thinking and to consolidate

his reading during its seven years of creation. Although the event that inspired the poem, the observation of a pregnancy test, could have had such significance only for a person of Wheelon’s erudition, the writing of the poem, once begun, motivated even more reading, more research, and more learning. On occasion, this research appears in the poem surprisingly undigested. For instance, major portions of Part One’s Chapter 2, *Myths*, are a poetic transliteration of passages from Frazer’s *The Golden Bough* (11), a work that Wheelon cited in a verse of his poem.

The poem was conceived, constructed, and eventually published in two parts. The manuscript for Part 2 of the poem has a long (eventually unprinted) introduction that contains no mention of the rabbit, nor does it promise that the themes of Part 1 will be continued. It concludes:

In a word, the immediate purpose of this second part of *Rabbit No. 202* is to bring together and present various of the meanings of man through his words, words illustrative of his ever-changing thoughts about himself and the universe as known to him. His words, symbols of his thoughts, projections of himself, wings with which to soar, or fetters to imprison!



Fig. 7. “Slow-Ascent Man,” from *Rabbit No. 202*, illustrates one of several portions of the poem that describe the evolution of humans. Most simply, it can be seen as a depiction of human evolution from the sea, represented by the swirls at the lower left. In the context of the entire poem, however, it almost certainly represents the slow, uncertain evolution of human culture, with a visual hint of the labors of Sisyphus. The hardship represented in the illustration is relieved somewhat because part of the path ascends through the confines of the drawing’s frame to freedom.



PUBLICATION OF *RABBIT NO. 202*

Six years after he had begun writing it, Wheelon began to plan for the publication of his poem. He knew that this would be difficult, and he discussed his concerns with a fellow scientist and poet, Chauncy D. Leake, Professor of Pharmacology at the University of California, San Francisco. Both were long-time members of the Phi Beta Pi Medical Fraternity, and Leake was the editor of the fraternity's *Quarterly*. Having read a portion of the manuscript, and unaware of the scale of Wheelon's epic, Leake suggested that the *Quarterly* might publish *Rabbit No. 202*. Wheelon was delighted. The *Quarterly* would stand the cost of setting the type, and Wheelon could purchase reprints at a nominal cost.

The correspondence between Leake and Wheelon concerning the publication of *Rabbit No. 202* reveals much about both men. Wheelon was honored that Leake had taken on the publication of the poem but was insistent that his aesthetic principles not be compromised by Leake's concerns for war-time paper rationing or by the costs that might be incurred by the fraternity in publishing so large a work. For Leake's part, he considered securing the poem for the *Quarterly* a coup and accommodated many of Wheelon's requests. At the same time, he did not hesitate to reject drawings that he thought were weak or superfluous or to ask Wheelon to redraw in pen and ink, woodcuts, or pencil drawings that he felt would not reproduce well.

One dramatic letter from Leake to Wheelon, dated October 14, 1940, illuminates the nature of their relationship. Apparently, Wheelon had just returned the proofs for what Leake had assumed was most of the poem. With the proofs, Wheelon sent "some" additional material. In a somewhat stiff postscript to a



Fig. 9. "Man Assumed the Burden of Fire," from *Rabbit No. 202*. A smoky drawing with an ironic title illustrates perhaps the most productive and destructive uses by humans of fire. Wheelon was obsessed with legends concerning the origins of fire. In the 1920s, he had created one of his most striking oils, "Prometheus" (Fig. 4B). Both Greek and Native American legends describing the origins of fire are recounted in the poem.

letter in which a number of publication details had been cordially discussed, Leake said,

It now dawns on me that the material you sent, after your original manuscript was in the printer [sic] hands, contains a vast section (pages 169–372) comprising part 3, Realities of Chapter 6, Symbols. This material exceeds the original manuscript as submitted by fifty per cent. It alone takes up 204 pages whereas the original manuscript was only 173 pages. I am sorry that it was not clear to me at all that you were submitting additional material. I thought you were sending only corrected material and in order not to confuse the printer or delay the work I didn't send it on. Your corrected manuscript would more than double the space allotment which was made available originally. I see no way by which we can take care of the matter at the present [sic] time since the manuscript as originally submitted is already set up in type. . .

In effect, Wheelon had submitted a "note added in proof," which was longer than the original manuscript. The problem of the additional material, which constituted the second part of the poem, was amicably resolved by its subsequent publication in two additional issues of the *Quarterly*, with Wheelon paying much of the cost.

Wheelon mailed most of the 500 reprints of the first volume of *Rabbit No. 202* to friends, colleagues, libraries, and famous physiologists around the world. The recipients of these gifts responded with hundreds of letters of praise and thanks. Others who saw the poem requested copies for themselves.

Unfortunately, by the time the reprints of the balance of the poem appeared, the United States was deeply engaged in World War II. War-time postal restrictions, combined with Wheelon's increased clinical workload, precluded a similarly ambitious mailing of the second volume. Nevertheless, *Rabbit*



Fig. 8. "Symbols Given Meaning," from *Rabbit No. 202*, illustrates a discourse on symbols and their uses by humans in music, art, and science.



No. 202 attracted attention. A 1942 review in the *Bulletin of the Medical Librarians Association* (24) stated:

Those who are interested in doctors and the poetry they write will read *Rabbit No. 202* with interest. It is an amazing document. Dr. WHEELON, the author, has surveyed the life and cosmic significance of an experimental animal that is imaginative, delightful and stimulative. This book should interest the gynecologists especially, the psychiatrists and every physician interested in the mind and body. Dr. Wheelon has talent not only for verse but a rare gift for drawing with special ability along the lines of symbolism and design. He has written a poem and has illustrated it beautifully himself. Physicians do not often reach the level of distinction in their writing that Dr. Wheelon has reached in this book.

Wheelon's correspondence indicates that he was distressed by the events of World War II, especially the attack on Pearl Harbor. Wheelon wanted desperately to be directly involved in the war effort. However, he had been left with the exhausting task of treating not only his own patients at the Polyclinic, but also those of the younger doctors who had entered the military. He had to be content with a limited contribution through appointment to the Medical Advisory Board of the Civilian War Commission.

After the war, Wheelon resumed his life of broad cultural concerns. He and his wife were important patrons of experimental theater in Seattle, and he continued to build his collection of works by William Blake. Wheelon took a strong interest in, and experimented with, Chinese poetry. Although there is no evidence that he painted or drew, he experimented with photography.

Correspondence, photographs, and interviews with Lula Wheelon and acquaintances suggest that Wheelon had been subject to large mood swings. There is no evidence that these disturbances subsided with age. As he approached 70, having given up most of his medical practice to younger members of the Polyclinic, Wheelon sometimes was bored. He attended a meeting of the Federation of Societies for Experimental Biology in Chicago in the late 1950s and apparently confused, became lost in the train station. He was in severe and almost constant pain from his long-standing battle with gout. He slept poorly. In late 1959, Wheelon's youngest brother, George, committed suicide by jumping from the 45th street viaduct in Seattle. Several months later, at an age of 71, Homer Wheelon followed his example by jumping to his death from an upper floor of the Polyclinic.

FROM A POEM'S ILLUSTRATIONS TO TAILPIECES

Although Wheelon remained a member of the American Physiological Society until his death in 1960, he published his last article in the *American Journal of Physiology* in 1922. It is not immediately obvious how, in the 1950s, the poem's illustrations came to be used as tailpieces in the *American Journal of Physiology* and the *Journal of Applied Physiology*. However, his associations with colleagues in physiology suggest a likely scenario.

Despite advising Wheelon to pursue a career in medical science rather than in clinical medicine, like Wheelon, Roy Hoskins later decided to obtain an M.D., received in 1921 from The Johns Hopkins University School of Medicine. Hoskins then assumed the Chair of Physiology at The Ohio State University School of Medicine. His first postdoctoral fellow

was Milton O. Lee, who worked in Hoskins' laboratory and served as Hoskins' editor until after World War II. Lee was on the publication board of the journal *Endocrinology* in 1936 when that journal made major changes in the format of its volume 20. Among these changes was the use of an ornamental tailpiece to occupy space at the ends of articles.

By 1953, Lee had become the managing editor of the journals of the American Physiological Society. That year, the *American Journal of Physiology* changed from a one- to a two-column format, leaving awkward spaces at the ends of some articles. From his experience with *Endocrinology*, Lee knew that he could solve this aesthetic problem by using tailpieces to occupy the blank spaces. According to Sara Leslie, who succeeded Lee as managing editor, it was left to him to propose a source for the tailpieces.¹³

Lee knew Wheelon through their mutual mentor, Roy Hoskins. Indeed, Lee had requested and received a copy of Part 1 of *Rabbit No. 202* from Wheelon in July of 1941. Lee greatly admired both Wheelon's writing and his art, and he felt that there could be no better source for the tailpieces than the illustrations from *Rabbit No. 202* (S. Leslie, personal communication). Although enthusiasm was mixed among members of the Board of Publication Trustees, the use of the illustrations was approved (H. W. Davenport, personal communication).

The tailpieces first appeared in Volume 174 of the *American Journal of Physiology*¹⁴ with a brief attribution: "Illustrations used for tailpieces are reproduced from *Rabbit No. 202* (Seattle, 1940), through the courtesy of the author-artist, Homer Wheelon."

At its meeting on November 15, 1953, the Society's Board of Publication Trustees commented favorably on the use of the illustrations. In fact, it suggested a more complete (if inaccurate) attribution: "Illustrations used for tailpieces are reproduced from *Rabbit No. 202* (Seattle, 1940), through the courtesy of the author-artist, Homer Wheelson [sic], Professor of Medicine at the University of Washington,¹⁵ and member of the American Physiological Society since 1919."

The original attribution was used in only one more volume of the *American Journal of Physiology*. The illustrations were first used two years later in volume 8 of the *Journal of Applied Physiology* without attribution.

SIGNIFICANCE

Wheelon practiced physiology as an art as well as a science. He brought to bear on his research and writing a firm grasp of an unusually broad range of physiological knowledge, resulting in important discoveries. He illustrated review articles with elegant diagrams that clarified relationships between multiple physiological systems. As important as Wheelon's scientific contributions were at the time, it is significant that, without his erudition and talent for both poetry and the graphic arts, his impact today would be limited. For today's readers of the *American Journal of Physiology* and the *Journal of Applied Physiology*, Wheelon's most enduring contributions are the artistic abstractions he made from physiology and from his

¹³ Interviewed by L. P. Schramm, May 1983.

¹⁴ This was the second volume of the journal to use the new, two-column format.

¹⁵ In fact, Wheelon was not on the university's staff.



knowledge and appreciation of our shared culture. These abstractions, the tailpieces derived from his epic poem, *Rabbit No. 202*, continue to enrich the lives of physiologists.

ACKNOWLEDGMENTS

Lula Wheelon, Homer Wheelon's widow, provided access to her private correspondence and other papers and artifacts and spent many hours relating to L. P. Schramm events in her life and Homer Wheelon's life. Lucy Lawrence, as a young woman, typed the original manuscripts of *Rabbit No. 202* from Homer Wheelon's almost impossibly illegible script. Forty-five years later, having been located by F. W. Jackson, she spent hours describing Wheelon (her internist) and helping L. P. Schramm with early drafts of this article. Wayne Hayward, one of Lula Wheelon's "house boys" while he attended the University of Washington, and John and Dorothy Conway, close friends of the family, provided insight into the Wheelons' daily lives. Dr. Toby Appel shared minutes of the American Physiological Society's meetings of the Publications Trustees. Dr. John Wiegstein, Wheelon's colleague at the Polyclinic, introduced L. P. Schramm to Lula Wheelon and provided insights into Homer Wheelon's later years at the Polyclinic. Horace Davenport provided criticism of an early draft of this manuscript, as well as insight into the history of gastrointestinal physiology. Karyl Winn of the Manuscripts and University Archives Division of the University of Washington assisted in moving the collection of the Wheelon and Meacham family papers to the University of Washington Library. Finally, and perhaps most importantly, Diana Schramm, in addition to her scholarly contributions to this work, has lived for 25 years with her husband's compulsion to understand Homer Wheelon and has provided invaluable moral support.

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