

2018 AMCA MEMORIAL LECTURE HONOREE: FRED WILLIAM KNAPP¹

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Good morning, I want to thank the Board of Directors of our American Mosquito Control Association, the program organizers, and our fine hosts here in Kansas City, and most especially thank you all for being here to honor, and perhaps learn a little more about Dr. Fred William Knapp—a true friend and career-long benefactor to our profession. Many of you, if you had not worked directly with him, became acquainted with Dr. Knapp through regional and national professional meetings such as this, the American Mosquito Control Association, the Entomological Society of America, the Livestock Insect Workers Conference, the Society for Vector Ecology, and others. Fred always attended, wholeheartedly participated, and contributed to the meetings and leadership of most of our profession's scientific and technical societies throughout his career.

It is my sincere pleasure to introduce Karen Knapp representing Dr. Knapp's family, and to express my personal appreciation to her for being here this morning, and for the numerous photographs, documents, and stories about Fred she shared with me. Although she was not able to be here today, I want to acknowledge Leah Knapp Hall, Dr. Knapp's other daughter, and to thank both Karen and Leah for sharing Fred with us, his professional colleagues and friends, for so many years.

Dr. Fred William Knapp, 86, of Nicholasville [Kentucky], husband of the late Wilma Elizabeth Maginness Knapp, passed away Thursday, July 23, 2015. He was the son of the late Fred Charles and Dora Sorensen Knapp of Princeton, Illinois. He was a United States Navy Veteran of World War II and the Korean War. He received his Bachelor of Science degree in Agronomy from the University of Illinois at Urbana-Champaign, and his Master of Science and Doctorate of Philosophy degrees in Medical Entomology from Kansas State University. He practiced his profession as a researcher and professor in the College of Agriculture, University of Kentucky from 1961 until his retirement. He was a devoted Christian and a member of Southland Christian Church. He is survived by his two daughters, Karen Kimberly Knapp of Lexington, Kentucky and Leah Elizabeth Hall of Nicholasville, Kentucky, his grandsons Noah James and Aaron William Hall

of Nicholasville, Kentucky, siblings Coyla Harris of Princeton, Illinois and Jean Smith, Carpentersville, Illinois, beloved nieces and nephews, and by his dear friend Jerri Bowen of Lexington, Kentucky. (Knapp obituary, *Lexington Herald-Leader*, July 26, 2015)

As I am certain, you all suspect that there is much more to Dr. Fred Knapp's story, and that is what I want to share with you this morning.

Fred William Knapp lived on this earth for 86 years, nine months, and ten days, during which he truly contributed to the betterment of life for the rest of us, and for future generations. He was a son, a brother, a military combat veteran, a husband, a father, a teacher, a professor and administrator, and a distinguished medical and veterinary entomologist. This morning I will of course provide more details of his academic professional career, such as his scholarly accomplishments and awards, but in addition to everything else, I want to highlight his role as a colleague, a mentor, a friend, and an inspiration to many of us that had the privilege to know and work with him.

Early childhood and formative years

Freddy Knapp was born in Princeton, IL, on October 14, 1928, to the late Fred Charles and Dora Sorensen Knapp. Fred had three sisters and two brothers. Through his formative years in Princeton, he worked summers and after school for a local farmer. As a high school student, Fred worked at the Pioneer Seed Corn Experimental Research Center in Princeton, IL, from 1944 until 1946. During his school years he earned additional pocket money by picking asparagus before and after school. Through these experiences working on the farm, Fred developed a keen interest, more precisely a lifelong passion for agriculture in the discipline's broadest sense, but especially for growing high-quality asparagus. As many of you that knew Fred well know, he turned this passion into an avocation throughout much of his later professional life and retirement, producing and selling his highly sought-after asparagus to many of the higher quality restaurants and hotels in the Lexington, KY, area.

Fred graduated from Princeton Township High School in May 1946, and entered into active duty service with the United States Navy on November 19, 1946. Knowing that Fred had served in the United States Navy, I was always eager to learn more information about when, where, and how he had served. Fred never discussed with me any of the details of his naval service, but through various

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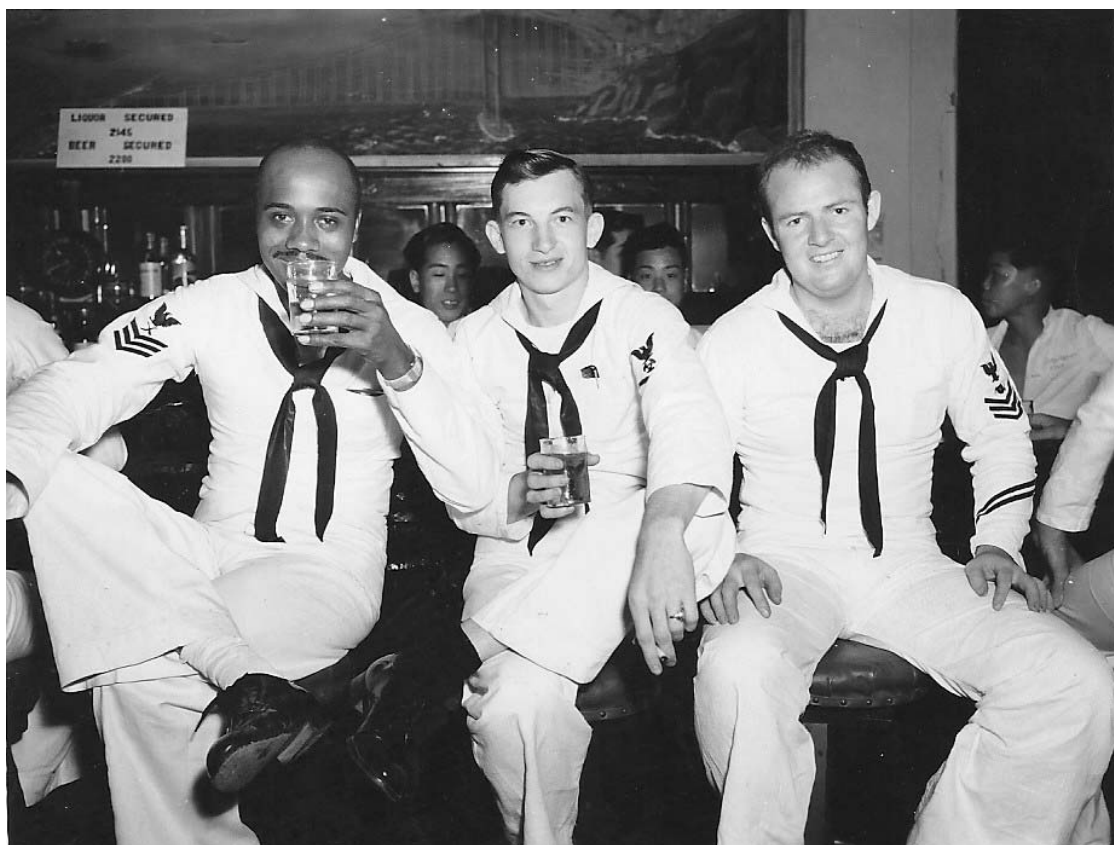


Fig. 1. Petty Officer Fred Knapp (center) enjoying a period of rest and relaxation, ca. 1950. [Photograph provided by Karen Knapp.]

sources I discovered details, and was provided several pictures from Karen, that I would like to share with you about this period of his life. I hope you find them as interesting as I do. Fred Knapp was a Machinist Mate Second Class serving on the Geary class destroyer, *USS Rowan* (DD-782).

During the period that Petty Officer Knapp was assigned to the *USS Rowan*, she played a significant role in wartime actions off the coast of Korea. On June 25, 1950, the North Korean army crossed the 38th Parallel into the Republic of Korea (South Korea). Six weeks later the *Rowan* sailed for Sasebo, Japan, to commence wartime operations off the Korean coast. On September 12, 1950, she departed Sasebo, Japan, to support a wartime amphibious landing. On September 15 she arrived off Inchon with Task Force 90 and provided naval gunfire support while the 1st and 5th United States Marines went ashore; then remained in the area until after the Allied forces had pushed back across the 38th Parallel. In mid-October the *USS Rowan* arrived with the Wonsan attack force, and in November provided gunfire support and served on plane guard duty as United Nations forces pushed to the Yalu River and then retreated. The *USS Rowan* earned four

battle stars for Korean War service, and in February 1951 she sailed for home (NHH 2018).

I do not know precisely when this photograph of Petty Officer Knapp and his shipmates was taken, but as you would expect, there is Fred, in the middle of everything, clearly enjoying a little R & R (Fig. 1). Petty Officer Knapp's total duration of naval service was five years and one day, and he was honorably discharged from the navy at the United States Naval Receiving Station, San Diego, CA, on November 19, 1951.

Professional academic foundation and mentor

Shortly after being discharged from the United States Navy, Fred returned to Illinois and began his academic studies. After two years at LaSalle-Peru-Oglesby Junior College, Fred transferred and earned his Bachelor of Science degree in agronomy and crop science from the University of Illinois at Urbana-Champaign in 1956. He then transferred to Kansas State University in Manhattan, KS, where he completed his Master of Science degree in entomology, with a minor in toxicology, in 1958.



Fig. 2. Professor Fred Knapp lecturing to students at University of Kentucky, ca. 1970s. [Photograph provided by Karen Knapp.]

Fred continued at Kansas State and earned his Doctor of Philosophy in entomology, with a minor in veterinary science, in 1961. While a graduate student at Kansas State University, Fred worked as a Research Assistant in the Entomology Department from 1956 through 1958, under the guidance of Drs. Herbert Knutson and Clifford Roan working on medical entomology and toxicology projects, respectively. He then worked as an Assistant Instructor in the Kansas State University Entomology Department during 1960 and 1961, teaching various entomology classes.

Always eager to take advantage of every opportunity that knocked, Fred gained much more than his graduate degrees while he was in Manhattan, KS—he met, courted, and married the love of his life. It so happened that Fred was seriously ill with the flu and was in hospital in 1957 or 1958, where his angel of mercy was Miss Wilma Elizabeth Maginness. She was working as a nurse's aide, and the dashing Freddy Knapp just happened to be one of her patients. They were married and enjoyed a wonderful life together for almost 50 years until Wilma passed away on November 14, 2007. Fred and Wilma were always gracious and generous hosts in their home, always making one feel welcome and at ease. In my case, as well as for many other students and postdocs, Fred and Wilma pretty much adopted us and our

families into theirs. They were both truly loved and are sincerely missed by many of us.

Professional career

The newly minted Dr. Knapp joined the faculty of the Department of Entomology at the University of Kentucky, Lexington as an Assistant Professor in 1961, and immediately went to work developing a broad-based research program and teaching courses in medical and veterinary entomology (Fig. 2). Fred's early career research, and throughout his career at the University of Kentucky, involved designing and evaluating application methods and insecticides for the control of horn flies, face flies, cattle lice, cattle grubs, and sheep bot flies. Animal self-treatment or automated application strategies were a major focus for Dr. Knapp's research. He also dedicated much of his early research efforts toward refining technologies and methodologies for aerially applying insecticides at low and ultra-low volume for controlling mosquitoes. More specifically, aerial application methods of various adulticides to control the salt-marsh mosquito, *Aedes sollicitans* (Walker), that was ravaging sections of western Kentucky. I really appreciate innovation, especially improvising existing equipment to fit one's needs, and as you can see in this picture (Fig. 3) from the *Mosquito News*

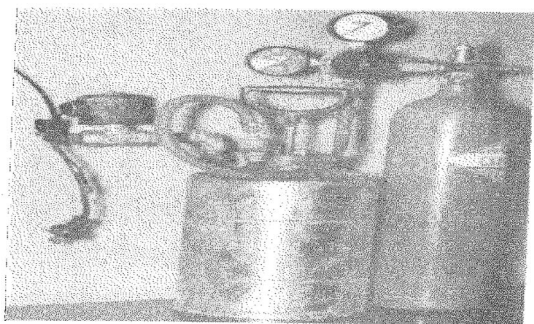


Fig. 3. Improvised ultra-low volume insecticide application system developed by Dr. Fred Knapp, as published in Knapp and Gayle (1967).

article, so did Fred (Knapp and Gayle 1967). I found another of Fred's papers particularly interesting (Knapp 1968). It reports his research team's efforts to generate a "chemical fog" infused with fenthion, and from the photographs in the article, I believe they were very successful in at least creating the fog. The "chemical fog" was created by combining silicon tetrachloride, water vapor, and ammonia to yield silicon dioxide and ammonium chloride particles. The droplet size of the fog ranged between 5–10 μm , and theoretically, fenthion binds with silicon dioxide and ammonium chloride particles and stays aloft for an extended period of time. Additionally, they reported good efficacy but concluded that the "chemical fog" method was not as effective as ultra-low volume application of fenthion. Various other papers report the findings of studies of novel approaches for both adult and larval mosquito control, ranging from various pesticides and application methods, to the use of botanical extracts and insect growth regulators for larval control (Knapp et al. 1976, Supavarn et al. 1976, Madrigal et al. 1979, Williams et al. 1979, Herald et al. 1980).

In addition to his ongoing research efforts, he also taught courses in medical and livestock entomology, as well as had agricultural extension service duties. I must admit that this photograph of Fred in his office is classic, and is definitely my favorite (Fig. 4).

Dr. Knapp received tenure and promotion to the rank of Associate Professor in 1968 and promotion to the rank of Professor in 1972. From 1990 through 2001, Fred served as the Assistant Director of the University of Kentucky Agricultural Experiment Station. In 2001 he was appointed the Interim Associate Director of Research for the College of Agriculture at the University of Kentucky, then appointed as the Interim Department Chairman of the Department of Entomology in 2002.

During 1967 through 1970, Fred moved his family to Khon Kaen Province, Thailand, where he was a member of a University of Kentucky, College of Agriculture team that helped establish the Northeast Agricultural Center at Khon Kaen, Thailand. Professor Knapp was involved in multiple studies focused



Fig. 4. Professor Fred Knapp, ca. 1965. [Photograph provided by Karen Knapp.]

on insect pests of cowpeas, mung beans, and grain sorghum (Fig. 5). Through his close work with the Thai people, friendships and professional relationships were established and nurtured over the years. Several of those relationships resulted in Thai students completing their graduate degrees in the Entomology Department at University of Kentucky. Fred and his family returned to Thailand and visited the Khon Kaen center in 1997 as guests of his former students and administrative colleagues.

Dr. Knapp had an extensive list of professional scholarly accomplishments as an academician (both in the classroom and in the laboratory), as an applied medical and veterinary entomologist, and as a well-published and highly respected scientist at the national and international levels. His many professional accomplishments and honors are too extensive to fully list here, but in summary, Professor Knapp was a prolific writer, publishing at least 12 books and book chapters, and more than 150 refereed scientific journal articles. Dr. Knapp served as major advisor and mentor to more than 25 Master of Science and Doctor of Philosophy students and sponsored eight postdoctoral fellows and visiting scholars (Table 1).

As I mentioned earlier, Dr. Knapp was passionately interested in all aspects of medical and veterinary entomology and was an Entomological Society of America Board Certified Entomologist. The list of the various professional societies and associations that he was a member of included: American Mosquito Control Association, Entomological Society of America, Kansas Entomological Society, Ohio Valley Entomologist Association, South Western Entomological Society, South Carolina Entomological Society, Kentucky Academy of Science, and a Life Member of the Thailand Agricultural Society.

Throughout his more than 42-year professional career, his medical and veterinary entomology research interests and the arthropod species that he focused on varied widely, including cattle grubs,



Fig. 5. Professor Fred Knapp conducting field research during assignment at Northeast Agricultural Center at Khon Kaen, Thailand, 1967 through 1970. [Photograph provided by Karen Knapp.]

chicken body lice, fleas, house flies, horn flies, hard and soft ticks, mosquitoes, stable flies, and the list goes on. It seems Fred was a bit ahead of his time regarding the importance of all the factors that influence and are affected by arthropods, particularly vectors of human and animal disease-causing pathogens. He also established techniques to measure the physiological responses of beef cattle to biting flies. This was a major contribution to the development of metrics to determine economic injury levels and economic thresholds for stable flies and horn flies (Schwinghammer et al. 1986, 1987; Presley et al. 1996). Dr. Knapp also edited and published a book, compiling presentations from the “Systems Approach to Animal Health and Production Symposium” convened March 31 through April 2, 1981 (Knapp 1981). The presenters at the symposium represented multiple disciplines and specialties, ranging from computer modeling and public information, to agricultural engineering and economics, to environmental studies and genetics. This systems approach recognizes that there are a very wide range

Table 1. Individuals for whom Dr. F.W. Knapp served as major thesis/dissertation advisor, or sponsored for postdoctoral fellowship or as visiting scientist.

Master of Science students	Doctor of Philosophy students	Postdoctoral fellows and visiting scholars
Vichitr Sukhapesna, 1972	Gary Crum, 1972	Greg Burg, 1986–1989
Vises Prasert, 1973	Chad Notopan, 1977	Steve Presley, 1988–1989
Piyarat Supavarn, 1974	Steve Brown, 1979	Jim Cilek, 1989–1992
Freddie Herald, 1976	Kurt Schwinghammer, 1985	Mark Estienne, 1989–1990
Bandhit Dumrugs, 1976	Jim Cilek, 1989	Shian Zhang, 1990–1993
Jeff Meyer, 1978	Bobby Joe Johnson, 1990	Fangtang Liang, 1993–1995
Gary Moneyham, 1978	Suthep Silapanuntakul, 1991	Mastura Hasim, 1994
Lisa d’Amato, 1980	John Webb, 1995	Peri Dillon, 1994–1997
Ellen Ballard, 1983	Mark Beavers, 1995	
Kurt A. Schwinghammer, 1983	Ken Blank, 2000	
Harvey Hollis, 1984		
Darcy Willis, 1993		
Ken Blank, 1994		



Fig. 6. Dr. Fred Knapp at the podium of the 2007 1st joint meeting of the Livestock Insect Workers Conference (51st annual meeting) and the International Symposium on Ectoparasites of Pets (9th annual meeting) in Lexington, KY. [Photograph provided by Nancy Hinkle.]

and multiple factors that influence livestock production and health.

Today it is referred to as the “One Health” concept, which is a holistic approach to understanding human and veterinary health due to all biotic and abiotic environmental factors that influence the maintenance and transmission of disease. I believe the common characteristic and ultimate broad objective of Fred’s research passion was to better understand the biology, and to develop mechanisms and strategies for more effectively and efficiently controlling arthropod pest and vector species to reduce human and animal disease and suffering. It is my hope that when those that succeed us in our professional endeavors reflect upon our careers and contributions, they can say the same about us.

Fred was very active in his service to our profession, not only as a member of numerous state, regional, national, and international professional societies, but as an active and engaged member of many of them (Fig. 6). An abbreviated listing of the numerous state, regional, and national professional service-related positions Dr. Knapp held includes: President of the American Registry of Professional

Entomologists—now known as the Board Certified Entomologists—in 1987; President of the Kentucky Mosquito and Vector Control Association in 1988; President of the North Central Branch of the Entomological Society of America in 1991; President of the Entomological Society of America during 1992–1993; and President of the American Mosquito Control Association in 2003–2004.

Dr. Knapp’s selfless service, expertise, and contributions to our profession were recognized and rewarded throughout his career through numerous professional scientific awards, including: the North Central Entomological Society of America C.V. Riley Award in 1985, the American Registry of Professional Entomologists Outstanding Medical/Veterinary Entomologist Award in 1985, the Cooper’s Animal Health Achievement Award in Livestock Entomology in 1989, the Entomological Society of America Recognition Award in 1991, being named a Fellow of the Entomological Society of America in 1994, the Kansas State University Distinguished Service in Agriculture Award in 1994, and being awarded the Entomological Foundation Medal of Honor in 2003.

After 42 years of faculty and administrative service at the University of Kentucky, Dr. Knapp hung up his spurs and retired to a relaxing, leisurely, and carefree existence in a tropical paradise—not really. Fred was recognized and named an Assistant Director Emeritus, and as a Professor Emeritus, and went back to work as a postretirement hire during 2003 and 2004.

Summary of accomplishments

Now that I have listed and described Dr. Knapp's numerous academic and professional accomplishments, awards, scientific scholarly contributions, and extensive service to medical and veterinary entomology, our associations and societies, I want to convey the really important and long-lasting impact of Fred on our profession—the positive influence and difference he had on those that knew and worked with him. I feel that the following quoted sentiments and related experiences by a few of Fred's many friends and colleagues do an excellent job of conveying the legacy he leaves behind.

I also want to state that Fred was a great mentor and friend. I came to University of Kentucky with an idea on using remote sensing for detecting *Aedes albopictus* (Skuse) breeding sites, such as old tires, but had no funds to pursue the work. Through his relationships and well-earned respect throughout Kentucky and academia, he was able to very quickly secure funds from the state of Kentucky as well as enter into a partnership with the late Roger Craig at Notre Dame that enabled me to conduct and complete my Ph.D. I was also the first military Ph.D. candidate UK Entomology ever had, and through his efforts (and Bobby Pass') my family and I had a tremendous experience while at University of Kentucky and Lexington. I owe so much to Fred, including my naval career and especially making it to the rank of Captain. In addition, I learned so much from Fred in not just academia/research, but also in the areas of business and most importantly having a life well-lived professionally, personally and spiritually. Whenever I alone or with the family was in Lexington, we made a point of visiting Fred and Wilma and those were wonderful and memorable times. I miss [him] and Wilma to this day. (Personal correspondence, Mark Beavers)

I will always remember his supportiveness of whatever I was cooking up regarding projects and publishing. I have never been as prolific in my publishing career as I was when I was with him from 1986–1992, as graduate student and later [as a] postdoc. He taught me the value (and focus) of developing protocols and only conducting projects where you could get a publi-

cation out of it. Eliminating the 'busy work' syndrome without anything to account for. I believe I have worked on the majority of arthropods affecting animals/pets, as well as a number of urban arthropod pests of humans while working with him. He had his fingers in a variety of projects that allowed me to grow as a research medical/veterinary entomologist. (Personal correspondence, James E. Cilek)

Fred will be dearly missed amongst the entomology community, where he will always be remembered as a man of deep integrity, gentle thoughtfulness and strong values, who was blessed with a keen and curious mind. Although I never worked directly with him, he became an early mentor to me in 2002, when I attended my first ESA meeting. . . . 'Dr. Knapp' quickly became 'Fred,' and he was brimming with information that covered an admirable time-span. Every meeting since then, whether it is ESA or AMCA or some other entomology meeting, I always made a point to look for him, and to spend time talking with him, and gleaned yet a few more morsels of wisdom and knowledge from him. He was so much more than just another dedicated entomologist and scientist—he was a bright spot at every conference. (Personal correspondence, Roxanne G. Burrus)

Fred always took care of his folks. My fondest memories of Fred were the opportunities to go out for lunch or dinner, or the summer cookouts at his house—things that revolved around eating. Fred loved a good meal and regardless the city, he knew where to go to get one. The one thing we could never figure out was why he received such fine attention from the servers. It was like they could sense that paying attention to him would be worth their effort." Additionally, I will paraphrase what Greg also told me regarding how he came to know Fred, and to do his postdoctoral work at the University of Kentucky. The newly minted Burg responded to an advertisement for a postdoctoral fellowship at University of Kentucky. Shortly thereafter Fred called him, and after a very brief introduction, asked him three questions: Do you know what a horse looks like? Will you work hard? When can you start? A few weeks later he received a letter of offer—he had the position. (Personal correspondence, Greg Burg)

Personality and character

Fred was the consummate southern gentleman, always polite, always generous with his time, and always eager to help when he could. In fact, as many of you may know, Fred was a very proud, bona fide,

Kentucky Colonel, appointed as such by the Governor of Kentucky into The Honorable Order of Kentucky Colonels. The Honorable Order of Kentucky Colonels is an independent, nonprofit charitable organization formally founded in 1932 and located in Louisville, KY. Just out of curiosity, are there any Kentucky Colonels here today?

Fred had a strong work ethic and knew how to work, I mean real manual labor—if any of you have ever hand-picked two acres of asparagus, then you know what I mean. Fred also knew how to very effectively delegate, but he was always fair and appreciative.

In closing, Fred was born in 1928 and was among the last of a great generation of men and women that survived the Dust Bowl Days, endured the Great Depression, and stopped the spread of global oppression and fascism during World War II and the Korean War. It was that generation, particularly the entomologists, microbiologists, physicians, and zoologists that invested immeasurable sweat and treasure to reduce and eliminate the scourge of mosquito- and other arthropod-vectored diseases like malaria, dengue fever, and yellow fever from the United States. I think the following quote from Gaylord Nelson best illustrates the strength of character and commitment to making the future better that Dr. Knapp and his generation possessed and demonstrated: “The ultimate test of man’s conscience may be his willingness to sacrifice something today for future generations whose words of thanks will not be heard.” I would also like to restate that Fred was very proud of his service in the US Navy from 1946 through 1951, and throughout the time I had the pleasure of knowing and working with him, he always made a special effort to engage with and support military veterans.

Today we honor Dr. Fred Knapp and are thankful for his willingness to give of himself in so many ways for future generations of medical and veterinary entomologists.

ACKNOWLEDGMENTS

I want to thank and acknowledge the many people that significantly contributed information, pictures, fond memories, and moral support as I prepared this lecture. The majority of the material that I presented was received from many of Fred’s professional colleagues and friends, his former students, mentorees, and from his family and personal friends. I express my sincere appreciation for the very generous help from Karen Knapp, Nancy Hinkle, Lee Townsend, Greg Burg, Mark Beavers, and Jim Cilek. And I thank you all, the membership of the

American Mosquito Control Association, for your kind attention.

Acknowledgment of 2018 Memorial Lecture Award

I sincerely thank the Officers and Directors of the American Mosquito Control Association for this distinct honor and pleasure, for this beautiful award plaque, and most particularly for extending to me the opportunity to honor my friend and mentor, Fred Knapp.

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