The history and evolution of Marek's Disease Symposia from 1978 to 2026.

K.A. Schat, College of Veterinary Medicine, Cornell University. Ithaca NY 14853.

Introduction.

Since 1978 virologists, immunologists, vaccinologists, and poultry veterinarians have met at 2- or 4-year intervals to discuss progress on Marek's disease (MD) research and since 2012 also on other avian herpesviruses with an emphasis on infectious laryngotracheitis virus (ILTV). I have been fortunate to be a participant in all fourteen symposia, the five molecular workshops and plan to participate in the fifteenth symposium. The purpose of this article is to provide a historical overview of these symposia and workshops. The first section provides basic information about dates, locations, number of participants, number of oral presentations and posters, and number of countries represented at the symposia and workshops. The second section provides information on the different meetings and specific events that occurred during the meetings, which are partly based on documented events and partly on my memories. This history will not dwell on specific scientific presentations, because most of these have been published in the different proceedings or in scientific journals.

Basic information

The first symposium occurred in 1978 in West Berlin with eighty-one participants. It took 6 more years before the second symposium was held in Ithaca in 1984. This symposium was also the start of the four-year cycle for the symposia until 2012, when it was decided to have the symposia at 2-year intervals. In 1995, Dr. Meihan Nonoyama and others started the Molecular Workshop series because they felt that the rapid developments in the molecular biology of Marek's disease virus could not wait for the 4-year cycle. Subsequent workshops were organized two years after each Symposium until the symposia switched to a two-year cycle because the content seemed similar for the two types of meetings.

Each symposium and workshop, except the first symposium, was organized by a national committee with support provided by an international advisory committee. Obtaining industry support was the responsibility of a fundraising committee. This will still be the procedure for the next two symposia which are planned for 2026 and 2028 in Namur, Belgium and in Sapporo, Japan, respectively.

Tables 1 and 2 summarize the locations and dates of the Symposia and Molecular Workshops as well as the number of participants, number of papers and posters presented, and the number of countries represented. Table 3 details which countries were represented at the Symposia and Molecular workshops. Several of the Symposia attracted participants from all continents. Participation from Africa and South America was often limited to only one or two scientists. Participation from Asia was mostly with scientists from China, Israel, and Japan, while participation from other countries was more incidental. It is important to stimulate increased participation from these parts of the world.

Table 1. Overview of the 15 International Symposia on Marek's Disease and Avian Herpesviruses

Symposium			Number of		
No	Location[a]	Dates of meeting	Participants[b]	Presen-tations[c]	Countries
1	West Berlin, West Germany	Oct 31-Nov 2, 1978.	81	36	12
2	Ithaca, NY, USA*	July 23-26, 1984.	111	41	20
3	Osaka, Japan	Sept 12-16, 1988	127	61	12
4	Amsterdam, The Netherlands	Sept 20-24, 1992	NA[d]	66	14[e]
5	East Lansing, MI, USA*	Sept 7-11, 1996	234	82	20
6	Montreal, Canada*	August 20-23, 2000	161	57 (17)	28
7	Oxford, England	July 10-14, 2004	106	55 (23)	19
8	Townsville, Australia	July 6-10, 2008	81	66	16
9	Berlin, Germany*	June 24-28, 2012	117	66 (22)	21
10	East Lansing, MI, USA*	July 20-23, 2014	143	53 (31)	19
11	Tours, France*	July 6-9, 2016	159	51 (41)	24
12	Yangzhou, China*	July 29-Aug2, 2018	208	44 (34)	18
13	Guelph, Canada[f]	June 1-3, 2021	119	71	18
14	St. Louis, MO, USA*	July 12-14, 2024	162	48 (27)	25
15	Namur, Belgium	June 29-July 2, 2026	?	?	?

[a]The asterisk indicates participants came from all continents excluding Antarctica.
[b]Based on the list of participants published in the proceedings or programs, actual numbers may be higher.
[c]Oral presentations include invited speakers and State-of-the-Art type presentations, the number in parenthesis are posters.
[d]Not available. The Symposium was part of the XIX World's Poultry Congress. To my knowledge there was no separate list for MD symposium participants.
[e]Based on the papers published in the proceedings and does not reflect the number of countries represented in the MD section of the XIX World's Poultry Congress.
[f]The meeting in Guelph was a virtual meeting due to the Covid pandemic.

Table 2. Overview of the five Molecular Workshops on Marek's Disease

Molecular workshop			Number of		
No	Location	Dates of meeting	Participants	Pre-sentations[c]	Countries
1	St. Petersburg, FL, USA	Jan 6-8, 1995	41	28	7
2 [a]	Smolenice Castle, Slovakia	August 8-11, 1998	53	23	11
3 [b]	Limassol, Cyprus	Oct 6-11, 2002	114	35 (4)	20
4	Newark, DE, USA	August 5-8, 2006	78	47 (6)	12
5	Athens, GA, USA	Oct 17-20, 2010	106	55 (8)	13

[a]Number of participants based on the group photo. No of countries and presentations based on Proceedings published in Acta Virologica, 43:73-204, 1999.
[b]Joint meeting with the Avian Immunology Research Group. Numbers for participants and countries represented are for the joint meeting. Number of papers and posters presented: Marek's disease meeting only.
[c]Oral presentations include invited speakers and State-of-the-Art type presentations, number in parenthesis: posters.

Table 3. Countries represented at the International Symposia and Molecular Workshops.

Continent	Country	Symposium														Molecular Workshop				
		1	2	3	4[b]	5	6	7	8	9	10	11	12	13	14	1	2	3	4	5
Africa	Egypt					v				v								v		
	Ghana		v																	
	Morocco				v															
	Nigeria				v		v				v	v	v	v	v					
	South Africa		v																	
Asia	P.R China			v	v	v	v	v	v	v	v	v	v	v	v		v	v	v	v
	Hong Kong														v					
	India		v		v		v	v	v	v	v	v	v	v	v					v
	Indonesia		v												v					
	Iran		v				v													
	Israel	v	v	v	v	v	v	v	v	v	v	v	v	v		v	v	v	v	
	Japan	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	
	Korea		v	v			v								v					
	Malaysia						v								v					
	Pakistan							v												
	Philippines						v					v								
	Saudi Arabia														v					
	Singapore														v					
	Taiwan			v	v		v				v									
	Thailand						v						v	v	v					
	Türkiye			v		v						v						v		
	UAE														v					
Australia	Australia		v			v	v	v	v	v	v	v	v	v	v			v		v
Europe	Belgium	v								v	v	v	v	v	v		v	v		
	Croatia																	v		
	Cyprus																	v		
	Denmark	v				v	v											v		
	Finland												v							
	France	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v		v
	Germany[a]	v	v	v	v	v	v	v	v	v	v	v	v	v	v		v	v	v	v
	Hungary		v			v		v	v	v		v	v	v				v	v	v
	Ireland	v																		
	Italy	v	v	v		v	v	v		v		v		v	v			v		
	Netherlands	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	Poland						v	v	v	v	v								v	v
	Romania		v																	
	Slovakia				v	v	v			v						v	v	v		
	Russia					v	v	v	v	v	v	v	v					v	v	
	Serbia					v														
	Spain					v	v			v	v	v		v						
	Sweden									v										
	Switzerland							v				v								
	UK	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
N-America	Canada	v	v		v	v	v	v	v	v	v	v	v	v	v			v	v	v
	Guatemala						v								v					
	Mexico		v									v								v
	USA	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
S-America	Argentina					v	v	v	v	v	v	v							v	v
	Brazil		v				v	v	v			v			v					
	Chile													v						
	Columbia											v	v		v					
	Peru						v				v				v					

[a]West-Germany until 1992

Full length proceedings of the symposia were published starting with the first symposium in 1978 and ending with the sixth symposium in 2000. After that time only the abstracts were published with two exceptions. Thirty-five papers of the 2012 symposium were published in a supplement of Avian Diseases as suggested by the American Association of Avian Pathologists as part of their sponsorship contribution. The proceedings of the second Molecular Workshop were published in Acta Virologica. A list of the proceedings and abstract books is provided at the end of the document. The reasons for stopping the publication of full-length proceedings were two-fold: the need to publish in peer-reviewed journals, which is important for career advancement and the amount of work and cost involved in producing the proceedings.

The First Symposium in West-Berlin (1978)

The highly successful series of International Symposia on Marek's disease started in 1978 with the symposium entitled "Resistance and Immunity to Marek's disease." This symposium, organized by Drs. Monreal, Biggs and Payne with financial support from the European Economic Community, was held in the historic Reichstag Building (Fig. 1) in West Berlin from October 31 to November 2. Eighty-one scientists representing eleven countries participated in this meeting. Fortunately, I was able to participate in this meeting five months after receiving my PhD thanks to travel support provided by Dr. Manfred Krasselt of Laboratory De Zeeuw in The Netherlands. For a young, budding scientist, it was a fascinating meeting where all the "Big" names in Marek's disease research were present discussing exciting new scientific information. The setting of the meeting was luxurious with imposing tables and chairs, while the windows were providing a direct look over the wall into East Berlin.

Fig. 1. The Reichstag Building. Photographed in 2012 during the 8th International Symposium. Photo credit: K.A. Schat.

The second symposium in Ithaca, NY (1984)

About 5 years later, Bruce Calnek and I were discussing the impact of the Symposium in West Berlin, which led to the desire to have another one. An organizing committee was formed consisting of Drs. Calnek (Chair), Nazerian, Schat, Spencer, and Witter. The meeting was called "International Symposium on Marek's disease" and a tradition was born with subsequent symposia organized at four-year intervals and since 2012 at two-year intervals. In addition to the regular presentations and review papers there were also four workshops including one on recombinant Marek's vaccines with Peter Biggs as moderator. This workshop was clearly looking to the future! It was not until 1992 that the first papers on recombinant MD vaccines were presented at the fourth International Symposia on Marek's disease. Around the same time,

papers on recombinant MD vaccines appeared in scientific journals. For the first time, the meeting attracted participants from Africa, Asia, Australia, Europe, North and South America!

The third symposium in Osaka, Japan (1988)

Dr. Shiro Kato and Dr. Teiji Horiuchi, assisted by a large organizing committee consisting of twenty researchers, organized the symposium, which was held in Osaka. The symposium was officially a satellite meeting of the XVIII World Poultry Congress and commemorated the 50th anniversary of Osaka University. Dr. Kato (Fig. 2) mentioned in his welcome speech that the first two symposia were not named the First and Second International Symposium. By calling the symposium in Osaka the Third International Symposium on Marek's Disease Dr. Kato hoped to encourage the organization of similar meetings in the future. His hope has certainly been fulfilled with the 15th International Symposium planned for 2026 in Namur, Belgium, while the 16th Symposium is scheduled to return to Japan in 2028. Outside of the excellent scientific presentations, the symposium in Osaka will be remembered by the participants by the very interesting and specific aspects of being in Japan. After the welcome speech by Dr. Kato, the Congress started with invited reviews on Epstein-Barr virus and varicella-zoster virus. Afterwards we had the ceremonial opening (Fig. 3) and reception. In addition to the official banquet, there was an excursion to the National Museum of Ethnology followed by a visit to the Takarazuka Grand Hotel with hot spring baths and a Japanese style party. The hot spring baths was interesting with separate bath areas for women and man because bathing suits were not provided.

Fig. 2. Dr. Kato welcoming the participants. Photo credit: Proceedings 3rd Symposium.

Fig. 3. Ceremonial opening of the 3rd International Symposium on Marek's disease. From left to right Drs. P.M. Biggs, T. Horiuchi, S. Kato, B.W. Calnek and G.F. de Boer. Photo credit: Proceedings 3rd Symposium.

After we had sampled the different baths, some were hot while other were cold, we were provided with towels and Japanese style bathrobes (Fig. 4). Most of the participants were wearing the Japanese bathrobes. The dinner was served sitting on cushions on the floor with a small table in front on which the food was served. (Fig. 5). The Japanese style party was certainly a unique experience for the non-Japanese participants.

Fig. 4. Drs L.N. Payne, K.A. Schat, J. Fabricant, E.D. Heller and E. Vielitz in their Japanese bathrobes before going to dinner. Photo credit: K.A. Schat.

Fig 5. Dinner Japanese style. From right to left: Drs. V. von Bülow, E. Kaleta, J. Fabricant, C. Fabricant, B. Calnek, Mrs. Calnek, Dr. P. Biggs, and perhaps Mrs Joan Witter and Dr. R. Witter. Photo credit: K.A. Schat.

The symposium included an exposition devoted to Dr. Józseph Marek with several documents and photos taken by Dr. Kato during his visit to Budapest in 1986 (Fig. 6 and 7). Dr. Kato has given the originals to me. The original photos are stored at the AAAP archives together with this document.

Fig. 6. The house where Dr. Marek lived in Budapest. Photo credit: Dr. S. Kato.

Fig. 7. Bronze statue of Dr. Marek at the "Phylaxia" in Budapest. Photo credit: Dr. S. Kato.

The fourth symposium in Amsterdam (1992)

The fourth symposium was organized by Dr. G.F. de Boer with major assistance from Dr. Suzan Jeurissen. The symposium was held in the RAI building in Amsterdam as part of the XIX World Poultry Congress. RAI stands for "Rijwiel and Automobiel Industrie" (Bicycle and Auto Industry).

The participants also spent one of the symposium days at the Central Veterinary Institute in Lelystad. During the session in Lelystad, Dr. Bruce Calnek presented the first Dr. Bart Rispens Memorial lecture, which was sponsored by the Dr. Bart Rispens Memorial Award Fund. Mrs. Will Rispens was present during the lecture. She was recognized by Dr. Schat, Chair of Dr. Bart Rispens Memorial Award Fund and presented with a bouquet of flowers.

In addition to the oral presentations, an exposition on the history of Marek's disease and Dr. Józseph Marek was part of the meeting. Posters provided information on the history of the nomenclature of Marek's disease virus, citation classics in Current Contents, and information about the facilities of the Houghton Poultry Research Station (UK) and the Avian Disease and Oncology Laboratory in East Lansing, Michigan, etc. In addition, photos related to Dr. Marek, provided by Dr. Kato, were displayed. Fig. 8 and 9 were part of the exposition, showing a young Dr. Marek and a panoramic view of the Royal Hungarian Veterinary College in 1899. Unfortunately, the source of both photos is not recorded.

Fig 8. Dr. Marek, circa 1900.

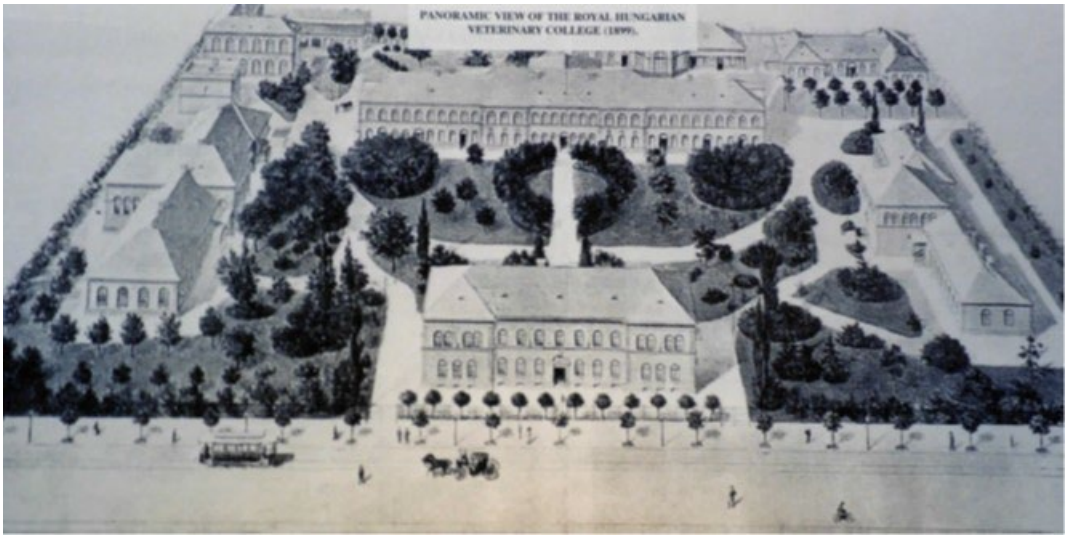

Fig. 9. The Royal Hungarian Veterinary College in 1899 where Dr. Marek studied and worked.

The fifth symposium in East Lansing, Michigan (1996)

Drs. Dick Witter and Leland Velicer (co-chairs) organized the fifth symposium (September 7-11) with the assistance of a large group of colleagues. During the symposium, Dr. Peter Biggs presented the second Bart Rispens Memorial Lecture and Dr. Roizman provided a keynote lecture on herpes simplex virus. An interesting aspect of this meeting was the special session on the Legacy of the 1960s: a decade of progress in Marek's disease. A booklet describing 45 researchers involved in Marek's disease research during the 1960's with information on their education, professional employment until 1996, their major role or contribution to Marek's disease, and how they first became involved with Marek's disease, was distributed to all participants. Thirty-seven of this group were present at the meeting (Fig. 10). Absent for several reasons were Drs. Roger Chubb, Tony Churchill, Caswell Eidson (deceased in 1983), Maurice Hilleman, Hendrik Maas, Bart Rispens (deceased in 1973), Martin Sevoian, and Frank Siccardi. The legacy workshop was recorded and can be found at https://app.screencast.com/SlbEqpqKkxzSy and at the History Website of the American Association of Avian Pathologists using this link.

The sixth symposium in Montreal, Canada (2000).

This symposium started for me in 1996 during the XX World Poultry Congress in New Delhi, India with a request from the World Poultry Science Association (WPSA) to organize the 6th International Symposium on Marek's disease in Montreal. I agreed to bring the proposal to the Marek's disease International Advisory Committee (MDIAC) after an email exchange with Dr. Lloyd Spencer (Canada) in which he happily approved the idea that I would organize the Symposium in Montreal. The attraction to the WPSA was that it would bring together the XXI World Poultry Congress with the 2000 Poultry Science Annual meeting and the International Symposium on Marek's disease. The commercial Congress Organizer (cCO) working with the WPSA promised to organize the Symposium. After approval was received from the MDIAC a committee consisting of Drs Krushinskie, Morgan, Parcells, Spencer, and Schat (Chair) was responsible for organizing the

scientific aspects of the Symposium. It turned out that the cooperation with the cCO was problematic and frustrating for me not being in Montreal until one day before the start of the Symposium.

Fig. 10. Participants of Legacy of the 1960's celebration organized by Dick Witter (Chair), Carol Cardona, Robin Morgan, and Robert Silva. Carol was chairing the session. Robin Morgan started her research on MD in the 1980's and Ton Schat mentioned his time with Bart Rispens and Henk Maas in 1970. All rows: from left to right. **Front row:** Bernard Lasalle, Fabio Lombardini, Antonio Zanella, Leland Velicer, Lucy Lee, Kevyan Nazerian, Hitoshi Kawamura, Catherine Fabricant, Randall Cole, Jim Payne, and Elwood Briles. **Second row:** Willie Reed, Takhesi Mikami, Roy Luginbuhl, Egon Vielitz, Julius Fabricant, Bruce Calnek, Ben Burmester, Peter Biggs, Carl Weston, Walter Hughes, Oscar Fletcher, and Carol Cardona. **Third row:** Ruud Hein, Robin Morgan, Daniel Gaudry, Stanley Kleven, Erhard Kaleta, Jim Arthur, Samuel Schmittle, Howard Stone, Lloyd Spencer, Donald Zander. **Fourth row:** Ton Schat, Morris Cover, Hiram Lasher, Graham Purchase, Joe Beasley, Vicco von Bülow, William Baxendale, Richard Witter, and Stephen Hitchner.

The Symposium did attract a fair number of participants from the WPSA and PSA membership and in that sense the combination was a success. Dr. Dick Witter presented the third Bart Rispens Memorial lecture during a joint session with the World Poultry Congress. Dick gave, of course, a sublime presentation entitled "Marek's disease vaccines – Past, present, and future (Chicken vs Virus - A battle of the centuries) for an audience of >800 participants in the 3 meetings. During the MD Symposium, Dr. Donald Ganem presented the keynote lecture on Kaposi sarcoma and human herpesvirus 8.

On a sad note, two of our Marek's disease researchers had passed away before the proceedings were published. Dr Kanji Hirai passed away on September 14, 2001, and Dr. Leland F. Velicer died on December 27, 2000. The proceedings were dedicated to Drs. Hirai and Velicer with the following statement:

"Dr. Hirai and Dr. Velicer will be remembered forever for their kindness, their willingness to help other scientists and their major contributions to the knowledge of Marek's disease as well as other diseases."

The seventh symposium in Oxford, England (2004)

Dr. Venugopal Nair (Fig. 11) on behalf of the organizing committee (Dr. Fred Davison, Dr. Margaret Carr, and Jo Dearing) welcomed about one hundred scientists at the St. Catherine College in Oxford for the 7th International Symposium. The symposium was organized jointly by the Institute of Animal Health (IAH) and the Office of International des Epizooties (OIE), now known as World Organization of Animal Health (WOAH). During the welcome reception, the Morris dancers showed their traditional English folk dances. One of the interesting and typical English aspects of the meeting was the presence of the Master of Ceremony of the St. Catherine College. He oversaw official aspects of the Symposium. For example, arranging the participants in the garden for the photo of the participants (Fig. 12) and introducing the head table guests during the official banquet, while the other participants were standing along the seats at the tables on the floor. It was embarrassing for me to be at the head table. Professor Peter Biggs gave an after-dinner speech on the history

Fig. 11. From left to right: Master of Ceremony of the St. Catherine's College, Oxford University, Dr. Pat Wakenell (aka The Poultry Princess), Dr. Venugopal Nair and his wife Geetha Menon. Photo credit: CD Proceedings of the 7th International Marek's disease Symposium, St Catherine's College, Oxford, England, 10-14 July 2004.

of Marek's disease. A social highlight was the visit to the beautiful Blenheim Palace (*https://www.blenheimpalace.com*), blessed with nice weather (Fig. 13). Professor Paul- Pierre Pastoret, Director of IAH, opened the Symposium and was followed by Dr. Mark Parcells with the keynote presentation on the molecular aspects of Marek's disease pathogenesis. Invited talks were presented by Dr. Jim Kaufman on genetic resistance to Marek's disease as examined with inbred chicken lines at Compton, Professor A. Nash with Herpesvirus cousins: lessons for MDV research, Dr. Hsing-Jien Kung on oncogenes and oncogenic herpesviruses, and Dr. Klaus Osterrieder discussing MDV vaccines – Looking to the future.

Fig. 12. The Master of Ceremony of St Catherine College arranging the participants for the group photo. Photo credit: CD Proceedings of the 7th International Marek's disease Symposium, St Catherine's College, Oxford, England, 10-14 July 2004.

Fig. 13. Visit to the Blenheim Palace, July 14, 2004. Photo credit: CD Proceedings of the 7th International Marek's disease Symposium, St. Catherine's College, Oxford, England, 10-14 July 2004.

The eighth symposium in Townsville, Queensland, Australia (2008)

The Symposium in Townsville was for several participants the third meeting in Australia within an 18-day period. The marathon started with the 10th Avian Immunology Research Group Conference at the Sea World Nara Resort in southern Queensland (June 24-27). This was followed by the XXIII World's Poultry Congress of the World Poultry Science Association in Brisbane, the capital of Queensland (June 30-July 4). Continuing traveling north the marathon ended in Townsville for the last International Symposium solely devoted to Marek's disease. Dr Graham Burgess welcomed us to the 8th Symposium for the opening reception at the Reef HQ, which was the largest living coral reef aquarium until it closed in 2021 for renovation. It is not clear if or when it will be reopened. It was a wonderful location with and colorful fish sharks swimming overhead while the delegates enjoyed snacks and drinks. Another highlight was the visit to the Billabong Sanctuary (https://www.billabongsanctuary.com.au) where we were treated to some local dishes including crocodile snacks (very tasty) and lectures about some iconic Australian wildlife species such as koalas and wombats. In addition, there was a fashion show for nice necklaces (Fig. 14).

Dr. Burgess in his welcome message wondered how the meeting would go. To quote: It is amazing the changes that have occurred since we last met in Oxford four years ago. We are facing the problem of the Rispens vaccine having been so successful that the industry appears to have taken Marek's disease for granted." Fortunately, eighty-one participants representing sixteen countries were present at the meeting. Keynote lectures were presented by Dr. Chris Morrow (Marek's disease: the current situation), Dr. Shane Burgess (Genetic resistance and host genomics), and Dr. Ben Kerr (The evolution of pathogen virulence in metapopulation networks). Thank you, Dr. Graham Burgess, for organizing the great meeting in the tropical city of Townsville in Queensland.

Fig. 14. The visit to the Billabong Sanctuary. A. Caregiver with a wombat, B. Caregiver with a friendly koala, C. Dr. Joan Schrader trying a snaky necklace. Photo credit K.A. Schat.

The ninth Symposium in Berlin, Germany (2012)

After 34 years some of us (Drs. Gerben de Boer, Ginette Dambrine, Lucy Lee, Ton Schat, Egon Vielitz and Dick Witter, see Fig. 15) returned to Berlin to participate with approximately 110 other scientists in the ninth International Symposium on Marek's disease. Instead of the Reichstag building in 1978, we met at the Freie Universität in Berlin. In the opening comments, Drs. Osterrieder and Kaufer mentioned the motto of the meeting "Unification" for two reasons. For two reasons: Firstly, having the meeting back in Berlin closed the circle but no longer in a divided country with the Wall gone since 1989. The second reason is that for the first time, the Symposium included all avian herpesviruses. One of the highlights of the Symposium was the recognition of Dr. Lucy Lee for her scientific achievements over the years. Dr. Dick Witter started the presentation of the award, which was a great surprise for Lucy (Fig. 16, 17). See appendix 1 for the text of the presentation by Dr. Witter. In addition to this award, it was also the first time that the K.A Schat Award for best presentations by graduate students was presented (For details see the section "**The K.A Schat Award for best graduate students and postdocs presentations"**). The scientific program organized by Drs Osterrieder and Kaufer with support from their crew (Fig. 18) featured three invited speakers (Drs. Elliott Kieff, Thomas Mettenleiter and Peter Stäheli) and a series of State-of-the Art presentations in addition to excellent regular presentations and posters. The official banquet was at Sanssouci Castle, the former summer Palace of Frederick the Great, King of Prussia (1712-1786). See https://www.visitberlin.de/en/sanssouci-palace for details. of the castle. Somehow, I became the "Press photographer" during the meeting (Fig. 19). Fig. 20 shows the group in front of the conference center.

Fig. 15. Thirty-four years after the first Symposium. We met again but in a unified Berlin. From left to right Drs. Vielitz, Witter, Lee, de Boer, Dambrine and Schat. Photo credit: K.A. Schat.

Fig 16. Dr. Lucy Lee is surprised when Dr. Witter started his presentation. Photo credit: K.A. Schat

Fig. 17.A. Dr. Dick Witter introducing the Award, B. Dr. Klaus Osterrieder presenting the award to Dr. Lucy Lee, C. The happy recipient with the Award. Photo credit: K.A. Schat.

Fig. 18. Drs. Osterrieder and Kaufer with their crew. Photo credit: K.A. Schat.

Fig. 19. Drs. Osterrieder and Kaufer (trying) to control the Press. Photo credit: K.A. Schat.

Fig. 20. The participants in front of the Congress Center. Photo collection K.A. Schat.

The tenth Symposium in East Lansing, Michigan (2014)

The symposium coincided with the 75th anniversary of the Avian Disease and Oncology Laboratory (ADOL), formerly known as Regional Poultry Research Laboratory (RPRL) which was a great opportunity to get many of the past and current associates of ADOL for a photo (Fig. 21). Another highlight of the meeting was the panel discussion "Perspective on Marek's disease breakthroughs since the 1960s" moderated by John Dunn and Robin Morgan featuring Jagdev Sharma Egon Vielitz, Dick Witter, Peter Biggs, Bruce Calnek, and Ton Schat (Fig. 22). Individual panel members were also interviewed while videotaped. For example, Bruce Calnek interviewed by Dick Fulton and Hsing-Jien Kung interviewed by Robin Morgan (Fig. 23A and B). The panel discussion can be accessed with the following link https://app.screencast.com/0MnhEIsSieEZ7 and at the History Website of the American Association of Avian Pathologists using this link..

Fig. 21. Dick Witter with current and past ADOL associates at the 75th anniversary of ADOL.

Fig. 22. Left to right: Panel members Jagdev Sharma, Egon Vielitz, Dick Witter, Peter Biggs, Bruce Calnek, Ton Schat. Moderators John Dunn and Robin Morgan.

Fig. 23. A: Dr. Bruce Calnek interviewed by Dr. Mick Fulton, B. Dr. Hsing-Jien Kung interviewed by Dr. Robin Morgan.

The eleventh Symposium in Tours, France (2016)

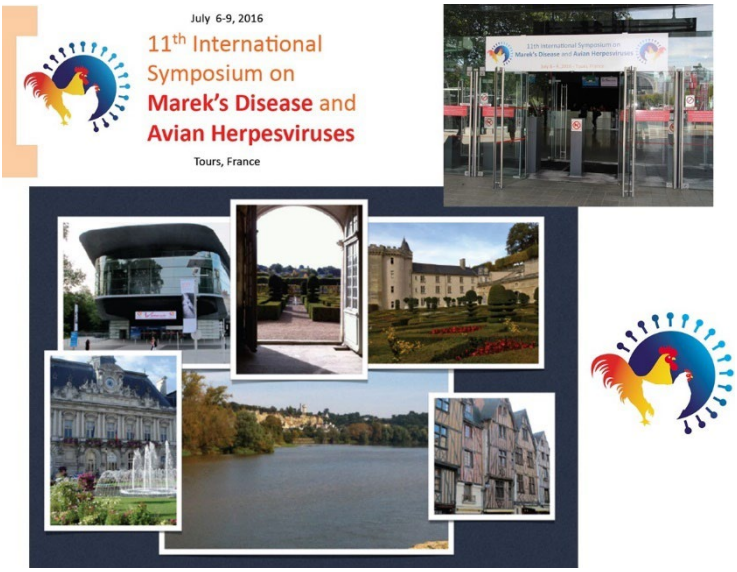

Fig. 24. Cover page of the Proceedings.

On July 6 Caroline Denesvre, Michel Bublot and Jean-Francois Vautherot welcomed us to the Symposium in the wonderful city of Tours, located on the river Loire. The city was originally named Caesarodunum by its founder, Roman Emperor Augustus (63 BC –AD 14). In addition to the 3 keynote presentations by Drs Biek from the University of Glasgow (Unraveling virus transmission in structured host populations), Helenius from ETH Zurich (Early steps in virus infection), and Delecluse from the German Cancer Research Center in Heidelberg (Mechanisms of neoplastic transformation that results from an infection with Epstein-Barr virus), 48 oral presentations were given and 42 posters were displayed. In my memory, the social aspects of the meeting were exceptional with a very nice welcome reception (Fig. 25), the reception and dinner at the Town Hall (Fig. 26). The richly decorated Town Hall was designed by Tours native architect Victor Laloux and completed in 1904. the gala dinner was held at the Château de Villandry (www.chateauvillandry.fr) (Figs. 27, 28). The stairs outside the castle provided the opportunity for a photo of the participants (Fig. 29). Michel Bublot and I were the photographers at the meeting. The organizers used the photos for a slideshow with many composites. Participants of the 2016 Symposium may request a copy of the slideshow by contacting me at kas24@cornell.edu. Thank you, Caroline, Michel, and Jean-Francois for this wonderful meeting.

Fig. 25. The welcome reception

Fig. 26. The reception and dinner in the Town Hall

Fig. 27. The formal garden with the castle in the background.

Fig. 28. The castle.

Fig. 29: The symposium participants at the castle.

The twelfth Symposium in Yangzhou, China (2018)

Professor Aijian Qin welcomed the participants to the 12th International Symposium in Yangzou, a beautiful city with a long history of over 2500 years (http://www.yangzhou.gov.cn/english/yzgov_en_index.shtml). The local organizing committee, consisting of Professors Qin, Cui and Liu (Fig. 30) had done an excellent job organizing the meeting, which attracted over two hundred participants (Fig. 31A and B). Professor Jun Han of the China Agricultural University presented the first keynote lecture entitled "The function of glycoprotein E of herpes simplex virus requires coordinated assembly of three tegument proteins on its cytoplasmic tail. The second keynote lecture "Kaposi sarcoma herpesvirus (KSHV)-model system for cancer biology research" was presented by Professor Päivi Ojala from the University of Helsinki.

Fig. 30. From left to right Professors Zhongping Liu, Aijian Qin, and Zhizhong Cui.

An unexpected, ad-hoc meeting was organized to celebrate the many accomplishments of Dr. Lucy Lee or Fang Zhu Sheng (1931-2017) with an emphasis on the training of many Chinese scholars. Participants in the meeting were asked to describe how they had interacted with Lucy and how these interactions had impacted their careers. During the meeting, a book describing her life and illustrated with many photos was presented to the participants (Fig. 32). Her life story was written by Dr. Dick Witter based on many interviews he had with her. The book has the story in Chinese and English. The text can also be accessed through the AAAP History website (https://www.aaap.info/assets/documents/bio_lucy_lee_2012.pdf).

Fig. 32. The cover front page of the book describing the life of Dr. Lucy Lee. Photo credit: K.A. Schat

The afternoon of the last symposium day was used for some sightseeing with visits to the Slender West Lake (Fig. 33), Ge Yuan Garden and Dongguan Street. The latter showed several stalls with calligraphy and the different sources of deep-fried food consisting of scorpions, beetles, spiders, and other creepy-crawly invertebrates (Fig. 34). As far as I know, only Mark Parcells was trying some of these "delicatesses" (Fig. 35).

Fig. 31A, B. The participants in the 12th International Symposium. Photo credit: Dr. Aijian Qin.


Fig. 33. The visit to the Slender west Lake and the Ge Yuan Garden with some rain. Photo credit: Dr. Michel Bublot.



Fig. 34. The walk on Dongguan Street showed some interesting deep-fried delicatesses. Photo credit: Dr. Michel Bublot.


Fig. 35. Mark Parcells was hungry and this delicatesse smelled good. However, the taste was mediocre. Photo credit: Dr. Michel Bublot.

The thirteenth Symposium in Guelph, Canada in 2020 became a zoom meeting in 2021.

The 13th Symposium was scheduled to be held in Guelph in 2020. Dr. Shayan Sharif and his crew were working hard to organize the Symposium and looking forward to welcoming delegates from five continents to Guelph in the summer of 2020. Late 2019, a new disease affecting humans was reported in China, which became known as COVID-19 caused by SARS-CoV-2, a coronavirus. The virus spread quickly around the world and the WHO declared the outbreak a pandemic in March 2020. Most of the world went in lock-down mode around that time restricting non-essential travel. It became clear that it would be impossible to have the meeting in the summer of 2020 or even in 2021. The way of communication changed from in-person meetings to zoom meetings during 2020-2021 with in-person meetings slowly starting again in the summer of 2022. In consultation with the International Advisory Committee, Shayan decided to go ahead and organize the Symposium as a zoom meeting (June 1-3, 2021). The organizational planning of the meeting was complicated with participants residing on five continents (Fig. 36). Hopin was selected as the online platform. Due to the time differences, two sessions were offered one for participants in North American and European time zones (NA/EU) and one for the Asian and Australian time zones. Submitters of papers were asked to prepare video presentations, which were then made available on You Tube or Bilibili for the Chinese participants. Each session had a live discussion of the presented papers, but participants in the discussion were asked to watch the videos prior to the live discussion. In addition, there were two live keynote presentations by Drs. Wolfgang Hammerschmidt (Research Unit Gene Vectors, Helmholtz Zentrum Muenchen, German Research Center for Environmental Health and German Center for Infection Research, Munich, Germany) dissecting the "First days in the life of human B-lymphocytes infected with Epstein-Barr virus" and Blossom Damania (University of North Carolina at Chapel Hill) describing the "Modulation of cell signaling pathways by KSHV." Dr. Helen Sang (The Roslin Institute, University of Edinburgh) presented a pre-recorded keynote lecture entitled "Applying genome engineering in the chicken to the understanding of host/pathogen interactions." Live industry-oriented papers were presented by Drs. Michel Bublot (Boehringer Ingelheim, France) on "Applied aspects of Marek's disease vaccination," and Guillermo Zavala (Avian Health International, LLC) on "Current status of Marek's disease and infectious laryngotracheitis and strategies for control."

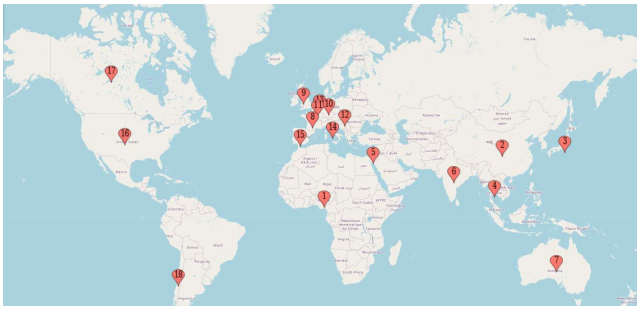

Fig. 36. Participants were spread all over the world.

In conclusion, Dr. Shayan Sharif did an incredible job in organizing the 13th International Symposium under extraordinary circumstances. THANK YOU, Dr. Sharif and your local crew!

The fourteenth Symposium in St. Louis, MO, USA (2024).

After the 2021 "zoom symposium", it was not clear who would organize the 14th symposium. Carlos Loncoman of the Universidad Austral de Chile offered to organize the meeting in Valdivia in Southern Chile. The meeting was planned as a hybrid in person/zoom meeting. Unfortunately, early January was the only time that the facilities would be available. The fundraising committee indicated that a) European researchers would prefer their ski vacations, and b) Valdivia would be

a long way to go with a zoom option as an alternate way to participate. It became clear that fundraising would be very problematic and the meeting in Valdivia was cancelled without a new location or time proposed. On a certain moment in early 2022, Laura, my spouse, asked "What is happening with the MD symposium and my answer was "I do not know." Her response was "Why don't you organize the symposium, I can help." My response was: "Have done that, been there." But it got me thinking and I contacted John Dunn and Maricarmen Garcia to float the idea to involve the American Association of Avian Pathologists (AAAP) in the organization of the symposium in conjunction with the AAAP Annual meeting. In 2018, the Conference on Necrotic Enteritis was organized in conjunction with the AAAP Annual Meeting, thus there was a possibility to pursue. John, Maricarmen and I met with Nathan Bevans-Kerr of the AAAP during the 2022 Annual Meeting of the AAAP to develop a budget outline for the Symposium to be held in 2024. The AAAP Board of Directors (BOD) provided a tentative approval during the BOD meeting in the winter of 2023 and final approval during the 2023 AAAP Annual Meeting. In the meantime, we had alerted the International Advisory Committee of the MDAH symposia that we were planning to organize the 14th Symposium directly after the 2024 AAAP Annual meeting. The national organizing committee, consisting of John, Maricarmen, Mark Parcells, Nathan and later Bob-Bevans-Kerr assisted by Lily Peterson and myself as chair, started the development of the meeting. Maricarmen took charge of the fundraising committee and John chaired the scientific committee. The excellent fundraising results certainly helped to get the final approval by the BOD.

Fig. 37. Bob Bevans-Kerr and Lily Peterson of the AAAP office during the banquet. Photo credit: K.A. Schat

On July 12, Dr. John Dunn welcomed the participants to the 14th International Symposium. It was great to meet old friends again after the 2018 Symposium and make new friends. John also introduced the first keynote speaker Dr. Clinton Jones from the Oklahoma State University. His lecture was entitled "The intimate relationship between stress and neurotropic herpesvirus." The second keynote lecturer, Dr. Gisela Erf, from the University of Arkansas was introduced by Caroline Denesvre. The topic of her keynote lecture was "Lessons earned from autoimmune vitiligo in the Smyth chicken: insights into multifactorial disease and avian immune responses."

Fig. 38. Dr. John Dunn welcoming the participants and introducing the keynote speaker Dr. Clinton Jones. Photo credit: K.A. Schat

The special event of the Symposium happened during the banquet. The National Organizing Committee wanted to honor Dr. Dick Witter for his lifelong research on avian tumor viruses. The idea was to ask Dick to give a short presentation about the origin of the HVT vaccine strain FC126. John Dunn asked Dick, but his invitation was declined. I called Dick for some other reason and Dick mentioned that John had invited him to give the lecture. To make a long story short I was able to convince Dick to give the short presentation, which he did (Fig. 39) and was, of course, very well received (see Appendix 2 for the presentation). After a standing ovation, Dick returned to his seat. After a short review of some of the highlights of his career by John Dunn and Ton Schat, he was asked to come back to the podium. There he was presented with the award (Fig. 40 A, B). After another standing ovation, the surprised but very pleased Dr. Witter returned once more to his seat. Afterwards "everyone" wanted a photo (Fig. 41) or selfie with Dick. Dick told me later that he had wondered about the invitation but never gave it a second thought. It was indeed a complete surprise.

Fig. 39. Dr. Dick Witter presenting his lecture on the history HVT FC126. Photo credit: Bob Bevans-Kerr.

Fig. 40. A. Dr. Dick Witter receives the award for his lifelong achievements in research of avian tumor viruses from Ton Schat. B. The plaque. Photo credit: Bob Bevans-Kerr.

Fig. 41. Dr. Dick Witter with friends. From left to right: Deb Velez-Irizarry, Taejoong Kim, Sanjay Reddy, Dick Witter, Isabel Gimeno, Susan Williams, Blanca Lupiani, John Dunn, Ton Schat, and Huanmin Zhang. Photo credit: Bob Bevans-Kerr.

Fig. 42. The Sponsors for the 14th Symposium. Many of these Sponsors have sponsored previous Symposia and Workshops. **THANK YOU!**

The fifteenth Symposium in Namur, Belgium (2026)

Will be organized by Benoît Muylkens and associates from June 29-Juy 2.

The sixteenth Symposium in Sapporo, Japan (2028)

Will be organized by Prof. Murata.

The first workshop in St. Petersburg, Florida (1995).

The first molecular workshop was hosted by the Tampa Bay Research Institute (TBRI) (http://www.tampabayresearch.org/), which was founded in 1981 as the first 501 (c)(3) not-for-profit biomedical research organization of its kind in Florida. The original research performed at TBRI was headed by two world-renowned virologists, Drs. Meehan Nonoyama and Akiko Tanaka. Dr. Tanaka, currently President of TBRI, opened the workshop welcoming the participants. The workshop clearly filled a need, because subsequently four more workshops were held until Marek's disease symposia were organized at two-year intervals.

The second workshop at the Smolen ice Castle near Bratislava, Slovak Republic (1998). The second workshop was organized by Dr. Vladimir Zelnik of the Institute of Virology in Bratislava. The setting for the workshop, Smolen ice Castle, was unique with perfect weather conditions allowing some sessions to be held outdoors and a lovely farewell party (Fig. 43A, B). Another and very appropriate highlight for a workshop on Marek's disease was the visit to Horna Strada, before

Fig 43. A. Outdoor scientific session on the terrace of the Castle. B. Farewell party in the meadows on the edge of the forest close to the Castle. Photo credit: Dr. Vladimir Zelnik.

1920 known as Vagszerdahely, Nyitra County in Slovakia, where Dr. Marek was born in 1868. Dr. Zelnik had arranged a meeting with the mayor of the town including a small reception. Fig. 44 shows participants in front of the house where he was born and in front of a memorial plaque (Fig. 45).

Fig. 44. Participants in front of the birthplace of Dr. Marek. Photo credit: Dr. Vladimir Zelnik.

Fig. 45. A few of the participants in front of the Memorial plaque of Dr. Marek in Horna Streda. Photo credit: Dr. Vladimir Zelnik.

The third workshop in Limassol, Cyprus (2002).

Originally, the Organizing Committee consisting of Drs. Irit Davidson, Dan Heller and Bob Silva had planned to have the meeting in a resort center at the Dead Sea in Israel. However, the political situation at the time prevented the USA government researchers to travel to Israel. Fortunately, the organizers were able to change the location to Cyprus. The third workshop was combined with the 7th Avian Immunology Research Group meeting. The combination of the two groups was logical based on the many overlaps between the pathogenesis, immunology, and vaccinology of Marek's disease on the one hand and general avian immunology on the other hand. Although the 114 participants judged the combined meeting a success it has not been repeated afterwards.

The fourth workshop at the University of Delaware (2006).

Dr. Mark Parcells, with assistance from his colleagues at the University of Delaware organized the fourth workshop on the molecular pathogenesis of Marek's disease. In addition to the regular Marek's disease presentations, three invited speakers presented keynote lectures. Dr. Lynn Enquist provided an overview of the infection and spread of Pseudorabies virus in neurons. Dr. Pamela Green discussed the importance of small RNAs, and Dr. Erie Robertson analyzed the function of the essential EBV nuclear antigen EBNA3C. The banquet was at Longwood Gardens (*https://longwoodgardens.org*), which has beautiful gardens to wander around.

The fifth, and last, workshop at the University of Georgia (2010).

Thie fifth workshop, including the 1st Symposium on Avian Herpesviruses was organized by Drs Maricarmen Garcia and Stephen Spatz assisted by a national organizing committee. I had not planned to attend the workshop because the dates conflicted with my teaching duties at Cornell University. However, after intensive pressure from the organizers I relented to give a keynote

lecture entitled “Thirty years of Marek’s disease research in 30 minutes”. I later learned that the organizers were ready to call the Dean at Cornell to tell me to come to the meeting! Rather being naif, I did not wonder why Robin Morgan emphasized the evening before the lecture, that it was really important to keep my lecture to the allotted time. After my lecture and answering one or two questions I wanted to go back to my chair in the audience. Robin had other ideas and told me to take a chair in front of the audience and started to present my career and present me with an award (Fig. 46). The text of her hilarious presentation is attached as Appendix 3.
In addition to the plaque, I received a check which was the start of the K.A. Schat award for the best graduate student presentation. My reasoning for giving the award was to stimulate young researchers by presenting their work at the next MD symposium and experience the stimulation of meeting established researchers like I had when I participated in the first Marek’s disease symposium in 1978 soon after receiving my PhD degree. Fortunately, industry support has been obtained over the years to continue the award.

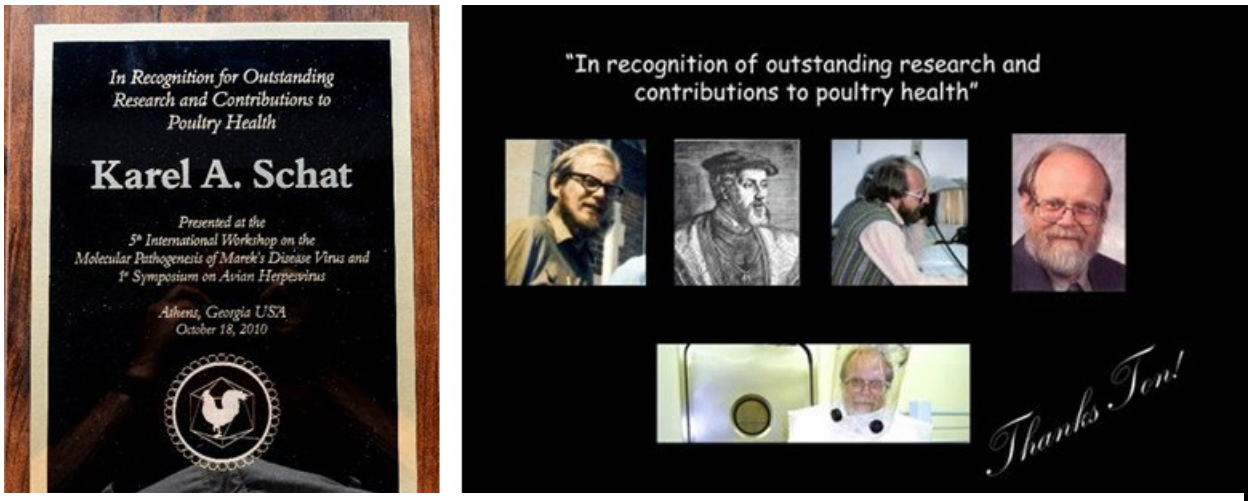

Fig. 46. A. The plaque presented to me during the 5th workshop. B. The slide Dr. Morgan used to describe my adventures (see Appendix 3 for the actual text she used).

The K.A Schat Award for best graduate students and postdocs presentations

9th International Symposium on Marek's disease and Avian Herpesviruses (Berlin, 2012).

During the 9th International Symposium, the awards, sponsored by Lohman Animal Health, were presented for the first time (Fig. 47). The first prize was awarded to Julia Schermuly from the Institute for Animal Physiology of the Ludwig-Maximilians University, Munich, for the development of a new method to infect B cell cultures with MDV to previously unattained percentages allowing examining in detail molecular events. The second prize went to Annachiara Greco from the Institute of Virology of the FU Berlin. Ms. Greco was working on the mode of operation of telomeric repeats in the genome of MDV, which plays a role in tumor development. Viruses with modified telomeric repeats have reduced tumor formation in chickens. In addition, a travel award was given to Nicole Bance of the Simon Fraser University in Canada who succeeded in inserting genes for fluorescent proteins into the MDV genome allowing not only to visualize the path of the virus through the cell but also to differentiate the state of the virus as lytic or latent.

Fig. 47. Left to right: Dr. Rahaus representing Lohman, Nicole Bance, Annachiara Greco, Julia Schermuly.

10th International Symposium on Marek's disease and Avian Herpesviruses (East Lansing, Michigan, USA, 2014).

The 2014 Awards were again sponsored by Lohman Animal Health (Fig. 48). The first prize went to Evin Hildebrandt (ADOL) for her presentation on the importance of a single point mutation in the UL5 helicase-primase subunit gene. The mutation significantly reduced *in vivo* replication and virulence. Mauricio Coppo from the University of Melbourne received the second prize for his presentation describing the development of an *in vitro* model using chicken tracheal organ cultures to study early innate immune responses after infection with wild-type and mutant ILTV isolates. The third-place award went to Cynthia Boettger from the University of Delaware. She used five CAM-purified isolates from a single commercial ILTV CEO vaccine. Two of the isolates were significantly less pathogenic than the CEO vaccine. SNP analysis indicated that the commercial vaccine consisted of a mixed viral population.

Fig. 48. Left to right: Noel Janney representing Elanco, Mauricio Coppo, Evin Hildebrandt, Cynthia Boettger, and Ton Schat.

11th International Symposium on Marek's disease and Avian Herpesviruses (Tours, France, 2016).

Christa Drexler on behalf of Elanco presented the 2016 Elanco-K.A. Schat Scientific Awards during the 11th International Symposium (Fig. 49). The first prize went to Jakob Trimpert from the Freie Universität Berlin for his presentation describing the importance of point mutations in the exonuclease domain of viral DNA polymerase for the fidelity of viral replication. Tereza Faflikova, also from the Freie Universität Berlin, received the second prize. She described a system to demonstrate MDV lytic and latent infection in living cells using the well-established tetracycline operator/ repressor system. Vishwanatha Reddy from the Ghent University, Belgium was recognized with the third prize for this work using chicken tracheal and conjunctival explants to study the replication of ILTV. Viability analysis of infected explants indicated that ILTV blocks apoptosis of infected cells but activates apoptosis of bystander cells.

Fig. 49. Left to right: Christa Drexler, Jakob Trimpert, Tereza Faflikova, Vishwanatha Reddy and Ton Schat

12th International Symposium on Marek's disease and Avian Herpesviruses (Yangzhou, China, 2018).

Mr. Lei Wang of presented the Elanco & K.A. Schat Scientific awards on behalf of Elanco (Fig. 50). The first-place award was presented to Ahmed Kheimar from the Freie Universität Berlin for his study showing that MDV telomerase RNA has tumor promoting functions. In addition, he showed that Epstein-Barr virus encoded RNAs (EBER-1 and -2) can replace MDV telomerase to promote MDV tumors. Nick Egan of the University of Delaware received the second-place award for his presentation describing the interactions between latently expressed Meq splice variants and host polycomb repressive complex protein Bmi-1. Na Tang received the award for her poster

Fig. 50. Left to right: Lei Wang, Nick Egan, Ahmed Kheimar, and Na Tang. Photo credit: Dr. Aijian Qin.

describing the use of CRISPR/cas9 as an efficient method to generate HVT recombinants expressing VP2 of IBDV.

13th International Symposium on Marek's disease and Avian Herpesviruses (Zoom meeting Guelph, Canada, 2021).

Because of the virtual meeting, a composite photo of the winners has been made (Fig. 51).

Andelé Conradie from the Freie Universität Berlin received the first-place graduate student long presentation award. She examined if changes in the meq gene are important for the increased virulence of MDV. She replaced the meq gene in the very virulent RB-1B MDV strain with meq isoforms from different pathotypes and evaluated them *in vitro* and *in vivo*. Replacement of meq isoforms only had a minor effect on virus replication. Insertion of meq isoforms from lower virulent pathotypes completely abrogated or dramatically reduced tumorigenesis. Insertion of vv+ meq isoforms did not increase virulence, indicating that other changes in the viral genome are required to achieve the virulence of vv+ strains. Importantly, the vv and vv+ meq isoforms allowed the virus to efficiently overcome vaccine protection and enhanced shedding of the virus into the environment.

The first-place graduate student short presentation award went to Parisa Armat from the University of Melbourne, Australia. She manipulated the genome of ILTV by replacing the UL12 gene with codon deoptimized versions of the gene to reduce the translation efficiency while conserving the amino acid sequence. As the UL12 gene in ILTV is likely to play a role in viral recombination, mutants developed in this project may have a reduced capacity to recombine.

Yifei Liao, Texas A&M University, College Station, USA received the second-place award for the presentation on the role of MDV US3 protein kinase in the replication of MDV. MDV-1 US3-null virus and chimeric viruses by replacing MDV-1 US3 with MDV-2 or HVT US3. Using MD as a natural virus-host model, we showed that both MDV-2 and HVT US3 partially rescued the growth deficiency of MDV-1 US3-null virus *in vitro*. Daniel Maekawa, University of Georgia, Athens, USA received the third-place graduate student award for his study on the importance of cytotoxic T lymphocytes, natural killer cells and regulatory T cells in the larynx-trachea of chickens vaccinated with CEO, TCO and rHVT-LT ILTV vaccines after challenge with ILTV. The CEO vaccinated chickens blocked challenge virus replication, prevent trachea lesions and clinical signs with an early increase and activation of CTLs. A significant correlation was found between increase of activated CTLs and decrease of clinical signs. The TCO and rHVT-LT vaccines induced partial protection a moderate increase of resting and activated CTLs and NK cells. Regulatory T and NK cells were significantly increased in the non-vaccinated challenged group.

Fig. 51. From left to right: Andelé Conradie, Parisa Armat, Yifei Liao, and Daniel Maekawa

14th International Symposium on Marek's disease and Avian Herpesviruses (St Louis, MO, USA, 2024).

The K.A. Schat awards were sponsored in 2024 by Boehringer Ingelheim. The winner of the graduate student awards was Emma Armstrong from the Roslin Institute for her presentation on the tissue distribution and immune responses after in ovo vaccination with HVT. After ingestion from the amniotic fluid, HVT spreads by systemic circulation mostly to the thymus. mRNA expression of ninety-six anti-viral innate immune related genes showed that large changes occurred in control embryos between ED18 -ED 21. Vaccination resulted in only a small fold change in innate immune gene expression. Joseph Patria (University of Delaware) received the 2nd prize for his description how the Meq oncoprotein of vv+MDV mediates the nucleolar recruitment of a cellular ATP-dependent chromatin remodeler, BRG1. This specific binding of BRG1 increases the transcriptional activity of the thirty-three amino acid C-terminal of Meq. Matthew Smallridge (University of Melbourne) was recognized with the third-place award for his studies on the location of ILTV in chicken embryos inoculated at ED14. The virus concentrates in the embryonic annexes. The winners are depicted in Fig. 52.

Fig. 52. The winners of the Graduate Student Award. A. Emma Armstrong (1st place), B. Joseph Patria (2nd place), and C. Matthew Smallbridge (3rd place) with Ton Schat, Marke Parcells (Chair of the Award Selection Committee) and Francesco Pradini representing Boehringer Ingelheim, sponsor of the 2024 Awards. Photo credit: Bob Bevans-Kerr.

Ayumi Matsuyama (University of Saskatchewan) was the winner of the postdoc award for her work on the importance of γδ T cells in immune responses against avian herpesviruses with an emphasis on MDV infection. Sonsiray Alvarez-Narvaez (USDA-ARS US National Poultry Research Center) received the second-place award for her studies on identifying MDV genes that may inhibit IFNα. This cytokine delays the onset of Marek's disease. The purpose of this study is to develop better vaccines using attenuated MDV strains lacking genes interfering with the expression of IFNα. Unfortunately, Sonsiray had to leave before the awards were announced. Yaoyao Zhang (Pirbright Institute) received the third- place award for her work showing the use of CRISPR/Cas9-based genome editing to generate recombinant HVT-vectored vaccines.

First, second and third place Poster Awards were presented to Deborah Velez-Irizarry (USDA-ARS Avian Disease and Oncology Laboratory), Sareeta Bagri (University of Warwick), and Lei He (USDA/ARS US National Poultry Research Center), respectively (Fig. 53). Unfortunately, Deborah and Lei had to leave prior to the Award Ceremony. Deborah Velez-Irizarry dissected cell-type allele-specific expression (ASE) in spleen cells after MDV infection from L6, L7 and L6 x L7 chickens for scRNA-seq analysis. Genes associated with ASE SNPs showed differential expression

Photo credit: Bob Bevans-Kerr.

Fig. 53. The winners of the Postdoctoral Award (A, B) and Poster Award (C). A. Ayumi Matsuyama (1st place), B. Yaoyao Zhang (3rd place) and Sareeti Bagri (2nd place) with Ton Schat, Mark Parcells (Chair of the Award Selection Committee) and Francesco Prandini representing Boehringer Ingelheim, sponsor of the 2024 Awards, Sonsiray Alvarez-Narvaez (2nd place Postdoctoral Award), Deborah Velez-Irazarry (1st and 3rd place Poster Awards) had left prior to the announcement of the awards. Photo credit: Bob Bevans-Kerr.

with most of the differences observed in T-cell subpopulations. Sareeta Bagri addressed the important question of how MDV is transported from cell to cell. She showed that MDV hijacks the cellular microtubule cytoskeletal network. She identified several MDV proteins with binding motives to kinesin-1, one of the moto proteins involved in shuttling cargo along microtubules. Lei He used the TS09 paramyxovirus type 1 vaccine to generate recombinant vaccines expressing MDV-gBpf and MD-gBpf+ GM-CSF (chicken granulocyte-macrophage colony stimulating factor). The recombinant viruses expressed gB in DF1 cells.

A personal note from Dr. Schat:

I want to thank the sponsors of the K.A. Schat Scientific Awards: Lohmann Animal Health (2012, 2014), Elanco (2016, 2018), and Boehringer Ingelheim (2024, 2026, and 2028). Without their sponsorship the awards would not have continued after the first one. **THANK YOU!!!**
I also want to thank the colleagues serving on the Awards Committees for selecting the winners of the awards. This is an incredible difficult job with the high quality of the presentations. **THANK YOU!!!**
I also want to thank Drs. John Dunn and Dick Witter for reviewing the manuscript, their comments were much appreciated.

Published Proceedings of International Symposia on Marek's Disease and Avian Herpesviruses

Biggs, P.M. (Editor). Resistance and immunity to Marek's disease. ES-SC-EEC-EAEC, Brussels-Luxembourg. Pp 1-617, 1980.

Calnek, B.W., J.L. Spencer, (Eds). Proceedings International Symposium on Marek's disease. AAAP, Kennet Square, PA. Pp 1-603, 1985.

Kato, S., T. Horiuchi, T. Mikami, K. Hirai, (Eds). Advances in Marek's disease research. Japanese Association on Marek's Disease. Pp 1-483, 1988.

Marek's disease in Proceedings XIX World's Poultry Congress, Amsterdam, The Netherlands, September 20-24, 1992. Ponsen & Looijen, Wageningen, The Netherlands. Volume 1, pp 31-335, 1996. (There were no editors mentioned).

Silva, R.F., H.H. Cheng, P.M. Coussens, L.F. Lee, L.F. Velicer, Eds. Current research on Marek's disease. AAAP, Kennet Square, PA. Pp 1-516, 1996.

Schat, K.A., R.M. Morgan, M.S. Parcells, J.L. Spencer, Eds. Current progress on Marek's disease research. AAAP, Kennet Square, PA. Pp 1-366, 2001.

Schat, K.A. (Guest editor). Avian Diseases 57:329-571, 2013. (Special issue 2S1 with most of the papers presented during the 9th International Symposium on Marek's Disease and Avian Herpesviruses, Berlin, Germany, 2012).

Published Proceedings of the Workshop on the Molecular Pathogenesis of Marek's disease.

Acta Virologica 43:75-204. 1999. Proceedings of the 2nd Workshop on the molecular pathogenesis of Marek's disease, Slovakia 1998.

Published abstract books International Symposia of Marek's disease and Avian Herpesviruses

7th International Marek's Disease Symposium. Abstract Book. St. Catherine's College, Oxford, UK. July 10 – 14. pp 1 – 88. 2000. In addition, a CD was provided after the meeting containing the program, abstracts, >170 photos, and other information (Proceedings of the 7th International Marek's disease Symposium, St Catherine's College, Oxford, England, 10-14 July, 2004).

8th International Marek's Disease Symposium. Rydges Hotel Southbank, Townsville, North Queensland, Australia. July 6-10. Pp 1-79. 2008.

9th International Symposium on Marek's Disease and Avian Herpesviruses, Freie Universität, Berlin, Germany. June 24-28. Pp 1-69. 2012.

10th International Symposium on Marek's Disease and Avian Herpesviruses, Kellogg Hotel and Conference Center at Michigan State University, East Lansing, MI, USA. July 20-23. Pp 1-118. 2014.

11th International Symposium on Marek's Disease and Avian Herpesviruses, Vinci Congress Center, Tours, France. July 6-9. Pp 1-106. 2016

12th International Symposium on Marek's Disease and Avian Herpesviruses, Shangri-La Hotel, Yangzhou, China. July 29-August 2. Pp 1-97. 2018.

13th International Symposium on Marek's Disease and Avian Herpesviruses, Virtual from Guelph, ON, Canada. June 1-3. PDFs of Proceedings + participants combined in one document Pp 1-97. 2021.

14th International Symposium on Marek's Disease and Avian Herpesviruses, St Louis Union Station Hotel, St. Louis. MO, USA. July 12-14. Pp 1-23 (printed program and list participants), USB drive. Pp 1-96. 2024.

Published abstract books of the Workshops on the molecular pathogenesis of Marek's disease.

Current Developments in the Molecular Biology of Marek's Disease Virus Workshop. St. Petersburg Beach Hilton Resort. St. Petersburg, Florida. January 6 - 8, pp 1-38. 1995.

Workshop on Molecular Pathogenesis of Marek's disease and Avian Immunology. Limassol, Cyprus. October 6 - 11, pp 1-118. 2002. (BARD Award No. W-62-02). A CD with the same title was provided to all participants. The CD included some extended abstracts.

Parcells, M.S., R.W. Morgan, J. Burnside, C.J. Schmidt, E. L. Bernberg, C. Kinney, E. Eppler, Eds. 4th International Workshop on the Molecular Pathogenesis of Marek's Disease Virus. University of Delaware. August 5 – 8, pp 1-60. 2006.

Spatz, S., A. Moody, Eds. The fifth International Workshop on the Molecular Pathogenesis of Marek's disease Virus and 1st Symposium on Avian Herpesviruses. Georgia Center for Continuing Education Conference & Hotel. Athens, GA, USA. October 17-20, pp 1-167. 2010.

Appendix 1

Tribute to Lucy Fang Lee
9th International Symposium on Marek's Disease and Avian Herpesviruses

Contributed by R.L. Witter

Lucy F. Lee, research chemist at the USDA-ARS-Avian Disease and Oncology Laboratory, East Lansing, Michigan, was honored by the 9th International Symposium on Marek's Disease and Avian Herpesviruses for her many contributions to knowledge on Marek's disease. Following a biographical review of her life and career by Dr. Richard Witter, Dr. Klaus Osterrieder presented Dr. Lee with a plaque of distinction.

Lucy was born in China but immigrated to the United States as a teen-ager where she attended Ohio Dominican College, the University of Maryland and, finally, Michigan State University where she earned a Ph.D. in biochemistry. She accepted a position with the USDA-ARS-Regional Poultry Research Laboratory (now Avian Disease and Oncology Laboratory (ADOL) in 1968. Over the ensuing 43 years at ADOL, she built a distinguished career conducting research on avian tumor viruses. Much of her work focused on Marek's disease virus (MDV) where she began with chemical characterization, moved to immunology with special emphasis on monoclonal antibodies, moved again to molecular biology to focus first on the identification of viral genes and later to sequence the entire genome, and finally to the development and evaluation of recombinant vaccines. She also contributed to knowledge on avian leukosis virus and reticuloendotheliosis virus. Many of her monoclonal antibodies continue to be in widespread use in research and commercial laboratories. She was the first to obtain a complete genetic sequence of MDV. She mentored many Chinese students and scholars, beginning in the early 1980s, several of whom developed their own distinguished careers in science, both in China and the United States. She earned the respect of her colleagues, co-workers, and students with her high standards of professional achievement, her substantial research contributions, her strong collaborations, her skill as a mentor and teacher, and her warm and engaging personality. She retired from ADOL in May 2011 but continues her professional work as a collaborator at ADOL.

Appendix 2

Award to Richard L. (Dick) Witter

"In Recognition of Outstanding Research and Contributions to Poultry Health and Avian Virology"
14th International Symposium on Marek's Disease and Avian Herpesviruses.
St. Louis, Missouri. July 13, 2024.

The HVT Story
A personal reflection by Richard L Witter

History … is important… and at times can be a lot of fun. However, history is a poor substitute for the excitement of actually being there, as I hope you will learn from my story. This is a story of two laboratories, one at the University of Wisconsin and the other at our laboratory in East Lansing, MI. The Wisconsin lab was led by Dave Anderson. Dave was a relatively new faculty member in the Veterinary Science Department. Hitoshi Kawamura, from Japan, was his graduate student.

The main timeframe of our story is a brief 13 months, from the summer of 1968 to the summer of 1969. How many of you were not yet born in 1969? But let me start chronologically with the summer of 1967 when the herpesvirus etiology of MD was first announced by the Houghton and East Lansing labs. This was really big for a lot of reasons. Importantly for our story, we now had tools to detect MD virus and antibodies in chicken flocks. Although I focused on MD in chickens as my first research priority, I was also aware that tumors were occasionally seen in quail and turkeys, and it seemed important to see whether MD virus was involved. Thus, in the summer of 1968, I conceived and launched a small side project focusing on ducks, quail, and turkeys. Meanwhile, in Wisconsin, Kawamura was busy trying to isolate reovirus from cultured kidney cells of adult turkeys. But he kept getting a strange round cell CPE that appeared to be a contaminant. The round cells contained particles that were diagnosed as herpesvirus by EM studies.

On September 24th, I received a group of live 23-week-old turkeys from a flock in Indiana experiencing tumors. I inoculated several types of cell cultures with fresh blood or kidney cells, using the same technique as for MDV isolation. On October 3rd, my technician (Harvey Burgoyne) called my attention to some unusual plaques. The CPE sort-of resembled MDV but there were clear differences. I initially thought this must be a new strain of MDV.

Since this isolate was catalogued as entry 126 in our field case book, I settled on the designation of FC126 for this isolate. I soon had two more turkey isolates, one from Georgia and the other from Indiana. By the end of October, my colleague, Kev Nazerian, established by EM that the infected cultures contained herpesvirus particles.

It probably was early November when I first inoculated day-old chickens with the FC126 isolate (still thinking it was a virulent MDV). But surprisingly, all birds remained normal through 2 and 4 weeks and beyond whereas birds in my control groups inoculated with virulent MDV were sick and dying. The turkey virus could be reisolated from the inoculated chickens, proving the birds were infected. Also, antibodies were detected using MDV antigen.

Late in November, I had the opportunity to attend the Cyanamid Poultry Pathology Conference held in Princeton, NJ. A chance meeting with Dave Anderson at this conference allowed us to share observations. Dave told me about Kawamura's work. I told him about my recent studies and asked whether he would share his isolate with me – to see if they were indeed the same. He agreed. Kawamura sent his isolate, WTHV-1, which I received on December 10th. It proved, ultimately, virtually identical to my isolates.

It probably was about this time when I suggested to Bill Okazaki that he might like to include FC126 in his vaccine trials since the virus was apparently nonpathogenic but antigenically related based on very preliminary data. Bill was not an enthusiastic guy, but he quickly agreed. Perhaps I could have taken the next steps by myself, but Okazaki and Purchase were already doing vaccine evaluation trials, and it just seemed logical. It still does.

By January, Bill had grown stocks of my HVT isolate and started the first trial to see whether it would protect chickens vs MD challenge.

During the first 3 months of 1969 I was busy expanding our knowledge on HVT. With the help of Graham Purchase, we confirmed a strong antigenic relationship between the turkey virus and MDV using AGP, FA and VN tests. Moreover, the virus appeared totally apathogenic.

At about this same time, I was invited to present a paper at the NECAD meeting to be held in June in Orono, ME (my hometown). I submitted an abstract on the turkey herpesvirus work.

By April, I started to draft our paper and prepare my NECAD talk. Also in April, the first vaccine trial with HVT was complete and showed 100% protection. Amazing! This is probably when I began to realize, for the first time, that our group may be in the middle of something really important.

April was also the month when Kawamura submitted his paper for publication in Avian Diseases. But of course, I knew nothing about this. My paper on HVT was submitted to AJVR in June. To say that my NECAD presentation in Orono attracted considerable interest would be an understatement. There may have been several questions asked but I only remember two.

Bruce Calnek commented that my acronym, THV, had been pre-empted by Snoeyenbos for turkey hepatitis virus. Also, someone asked the question whether we had tried this virus as a vaccine against MD. For some reason, I was mentally unprepared for this rather obvious question. I think I may have smiled a bit as I answered that such trials are in progress…. and appear promising. That's all that I said, but it was enough.

Dr. Witter's ppt presentation

The HVT Story

a personal reflection

Richard L. Witter
Retired from USDA, ARS, Avian Disease and Oncology Laboratory, East Lansing, MI

1

The Beginnings

- Summer 1967 – viral etiology of MD
- Summer 1968 – quail, pheasant, turkey project
- Summer 1968 – Kawamura tries to isolate reovirus
- Sep 1968 – live turkeys from Indiana, FC126 isolate
- Oct 1968 – two more isolates, herpesvirus by EM
- Nov 1968 – inoculated chickens with turkey virus
- Nov 1968 – discuss work with Anderson, will send virus

2

The Real Work

- Dec 1968 – I receive WTHV-1 isolate
- Dec 1968 – offer virus for Okazaki vaccine trials
- Jan 1969 – Okazaki starts trials
- Jan-Mar 1969 – characterize virus, relation to MDV
- Mar 1969 – first vaccine trial looks good so far
- April 1969 – prepare NECAD talk and publication
- April 1969 – Kawamura submits paper to Avian Dis.
- April 1969 – First vaccination trial complete

3

The Final Actions

- Jun 1969 – Submit paper to AJVR
- Jun 1969 – NECAD meeting
- Jul 1969 – Okazaki vaccine paper at AAAP
- Jul 1969 – Anderson leaves Wisconsin
- Jul 1969 – HVT acronym agreed

4

November 1969

157 Citations to date

March 1970

Citation Classic 1980
643 Citations to date

5

Wisconsin Team

Hitoshi Kawamura

Dave Anderson

6

ADOL HVT Team

Harvey Burgoyne

Keyvan Nazerian

Bill Okazaki, Ben Burmester, Graham Purchase, Dick Witter

7

Special thanks to

John Dunn

8

Appendix 3

Award to Karel A. (Ton) Schat

"In Recognition of Outstanding Research and Contributions to Poultry Health"
5th Avian Herpesvirus Workshop, Athens, GA. October 18, 2010

Contributed by Robin Morgan

Ton, the organizers of this conference – as well as many of your colleagues and friends – have realized that you are serious about retiring. They know that seeing you in the future might necessitate a trip to the Great Barrier Reef. So, a decision has been made to spend a few more minutes with you today, and I have been given the honor and privilege of overseeing this activity. What will transpire over the next few minutes is a combination of serious and silly.

Ton…the professor. Ton Schat is a dual degree professor who spent his career at Cornell. He earned his DVM from the State University in Utrecht, The Netherlands in 1970 and his PhD from Cornell in 1978. In 1978, Ton joined the faculty at the College of Veterinary Medicine at Cornell. He is Cornell through and through. Ton became a critical component of life at Cornell. In fact, I am told that no one there needed a calendar to know when winter arrived. They knew because Ton showed up on crutches. He had been skiing again. He is now a professor in microbiology and immunology. He has managed a superb research program throughout his career studying avian virology with emphasis on Marek's disease, chicken anemia virus, reticuloendotheliosis virus, avian influenza virus and much more. Ton is well known for the discovery of SB1, which is the widely used serotype 2 Marek's disease vaccine, but his research accomplishments and impact extend way beyond SB1.

Ton…the Explorer. As a scientist, Ton was truly an explorer. He understood the whole organism and disease/pathology aspects of avian virology, but he also taught himself and became excellent at molecular biology. Some thought that Ton had gone over to the dark side when he became molecularly oriented. Julius Fabricant once said that Ton did not know anything except things that had to do with DNA. Ton responded by saying, "That's not true, I also know about RNA." Truth be told, Ton bridged the disciplinary continents – and never shied away from taking on a new challenge or teaching himself what needed to be learned. Even more impressive, Ton became an immunologist. He understood the surface markers and the intracellular pathways … layering this knowledge on all that he did.

Ton…the Voice. Over the course of his childhood and career, Ton has learned to speak many languages…Dutch, English, avian pathology, molecular speak, and even immunolese. Ton was never shy about sharing his opinions. No one, no one loves a good back-and-forth more than Ton Schat. Quick to approach a microphone at the end of your presentation, when you see that forehead wrinkle up, and the eyes begin to glow, you are in for some good and engaging

conversation. One can only imagine what the walls of the Cornell coffee rooms have heard – particularly between Julius Fabricant and Ton over the years – because both like to argue about anything. In fact, Julius now says he thinks they both have symptoms of senile dementia because they actually AGREE on some things!

Ton…the Traveler. Ton Schat is truly a world scholar. He had a global perspective even before this was fashionable. He has always known the value of meshing different cultures and people. He is diversity as much as he is Cornell. He travelled widely and opened the doors and refrigerators of his lab to others from around the world. Class after class of students at Cornell have benefited from his global perspective and dedication to teaching them. My favorite travel story about Ton is one from my own collection of memories. The setting was the Montreal Marek's meeting. Ton was organizing the Marek's meeting and was involved in the World Poultry Congress, so he had gotten two adjacent hotel rooms to keep himself organized. Early one morning with much on his mind, he tried to travel from one room to the other, forgot to pick up his keys, and landed himself out in the hallway locked out of both rooms. He was freshly showered but wrapped only in a towel! But seriously, the point is not about Ton's apparel or dress code. It is about his worldliness. Truly across generations, across continents, races, nationalities, and doctrines, Ton has been a friend to all.

Now for two questions…
Ton, I want you to answer a couple of questions. These have not been rehearsed. Just like your dissertation defense umpteen years ago, I will ask you a question, and you will answer. In 2 minutes or less.

1. You are not allowed to answer with "the discovery of SB1." In fact, you have to answer this question without using the term "SB1" or you will be disqualified. Okay? Of all that you have accomplished – the various projects and discoveries, looking back from today's perspective, what do you think is most important? What has had the most impact? In other words, ten years from now when you are receiving the Nobel Prize, for what will you be recognized?
2. Second question We all know that we learn as much from the missteps as from the triumphs. What was the biggest mistake you made – lab blunder, misinterpretation of data, poor choice of research strategy, etc., etc., and how did you noodle your way out of it? Was there anything that happened along the way that seemed like disaster at the time, but turned out to be anything but? Ton, what was your big mistake?

So … Ton the organizers – together with your friends at this conference have decided to give you an award. I know that you have won many before – including the Pfizer Award for Excellence in Poultry Research and the Merck Award for Achievement in Poultry Science plus many others. But I am wagering that this one will be one of the most special that you hang on your wall. This award has never been given before and it may never be given again. Like you, it is "One of a Kind." The award is simply a plaque from those you have influenced and inspired over the years. It reads, "In recognition of outstanding research and contributions to poultry health" and it commemorates all that you have done and all that you have been to us. Congratulations, good luck in your retirement, and most of all thank you.