Photosynth Res (2014) 122:113–119
DOI 10.1007/s11120-014-9972-0

NEWS REPORT

Govindjee, an institution, at his 80th (really 81st) birthday in Třeboň in October, 2013: a pictorial essay

Ondřej Prášil

Received: 1 January 2014 / Accepted: 5 January 2014 / Published online: 29 January 2014

Abstract Govindjee (one name only), who himself is an institution, has been recognized and honored by many in the past for he is a true ambassador of "Photosynthesis Research" to the World. He has been called "Mr. Photosynthesis", and compared to the Great Wall of China. To us in Třeboň, he has been a great research collaborator in our understanding of chlorophyll a fluorescence in algae and in cyanobacteria, and more than that a friend of the Czech "Photosynthesis" group, from the time of Ivan Šetlík (1928–2009) and of Zdeněk Šesták (1932–2008). Govindjee's 80th (really 81st) birthday was celebrated by the Institute of Microbiology, Laboratory of Photosynthesis, by toasting him with an appropriate drink of a suspension of green algae grown at the institute itself. After my presentation, on October 23, 2013, of Govindjee's contributions to photosynthesis, and his intimate association with the photosynthetikers (in Jack Myers's words) of the Czech Republic, Govindjee gave us his story of how he began research in photosynthesis in the late 1950s. This was followed by a talk on October 25 by him on "Photosynthesis: Stories of the Past." Everyone enjoyed his animated talk—it was full of life and enjoyment. Here, I present a brief pictorial essay on Govindjee at his 80th (really 81st) birthday in Třeboň during October 23–25, 2013.

Keywords Algae as toast · Mr. Photosynthesis · 80th birthday · Ambassador of Photosynthesis · chlorophyll a

O. Prášil (✉)
Laboratory of Photosynthesis, Center Algatech, The Institute of Microbiology, Academy of Sciences of the Czech Republic, Opatovicky mlyn, 379 81 Trebon, The Czech Republic
e-mail: prasil@alga.cz

Introduction

Govindjee has studied photosynthesis under the greatest giants in the field: Robert Emerson (1903–1959); and Eugene Rabinowitch (1898–1973), both at the University of Illinois at Urbana–Champaign. He told me that brief stints with C. Stacy French (1907–1995), at the Carnegie Institution of Washington, Stanford, California, and with Bessel Kok (1918–1979), at the Research Institute of Advanced Studies in Baltimore, Maryland, were of great significance to his academic life. [See Rabinowitch (1961) for a biography of Emerson; Govindjee (2004) for a tribute to both Emerson and Rabinowitch; Govindjee and Fork (2006) for a biography of French; and Myers (1987) for a biography of Kok.]

Instead of writing anything about Govindjee, who is often listed as "Unknown Govindjee," or "FNU Govindjee," where FNU stands for "First Name Unknown," since he uses only one name, I refer the readers to Eaton-Rye (2007a, b, 2012, 2013), Papageorgiou (2012a, b), Clegg (2012), and to Allakhverdiev et al. (2013) for Govindjee's contributions to photosynthesis and photosynthesis education. I give below a summary of what I said about Govindjee on October 23, 2013.

The birthday party in Třeboň

We began this party on October 23, 2013, by toasting Govindjee with green algae, since we believe that exploitation of algae and cyanobacteria is our future (see Fig. 1(a); other figures show a selection of the audience who came to congratulate and celebrate Govindjee's birthday; Fig. 1(f) shows him with a bocquet presented to him at this great party).


a
b
c
d
e
f

◀**Fig. 1** (**a**) Govindjee (right) and Ondrej Prasil (left) toasting with green algae; (**b**) *Left to right* Govindjee; Ondrej Prasil, and Josef Komenda; (**c**) *Left to right* Judith Noda, Eva Kotabova, Evelyn Lawrenz, Ondrej Prasil, Gabor Bernat, Martin Lukes (*in the rear*), Kristina Felcmanova, Eva Ziskova (*in the rear*), Gabor Steinbach, Anna Martirosyan, Radek Kana, and Hana Medova; (**d**) *Left to right* Michal Koblizek, Eva Kotabova, Zoltan Turoczy, Govindjee, Zuzana Cuperova, Judith Noda, and Evelyn Lawrenz; (**e**) *Left to right* Evelyn Lawrenz; Govindjee, and Judith Noda; (**f**) Govindjee (*with bocquet of flowers*)

Fig. 2 Govindjee and Ivan Setlik in 2007, at the Aquafluo conference organized by Ondrej Prasil and David Suggett in Nové Hrady, The Czech Republic

On Govindjee

Then I gave a short, improvised personal presentation and tribute to Govindjee. I mentioned how the book "Light Emission by Plants and Bacteria" (edited in 1986 by Govindjee, Jan Amesz and David Fork) was my constant companion, and helped me during my very first steps in photosynthesis in the early 1990s under supervision of Ivan Setlik and Itzhak Ohad, when I struggled with thermoluminescence. For some reason, at this time Govindjee's name induced almost mystic connotations in my mind! Later, during Govindjee's several visits to our lab and the Czech Republic (Fig. 2), I was pleasantly surprised to learn that Govindjee is not any exotic yoga master, but is quite a normal human being, with a great appetite for not only good food, but has extremely developed ability to enjoy life. I stressed that Govindjee is not only an extremely productive scientist with almost 600 papers, 15,000 citations, and h-index of 64 achieved during his lifetime, but he also provides an invaluable service to the photosynthetic community by keeping and maintaining the "living memory" of the field of photosynthesis and its pioneers. Not only is he hyperenergetic organizer of the famous book series "Advances in Photosynthesis (and Respiration)" but also he is notorious for passion to take and collect pictures from almost every important meeting on photosynthesis held since, it seems the invention of photography. I concluded by saying to the audience that I wish we all have Govindjee's scientific curiosity, his open mind and ability to ask and pursue questions on photosynthesis.

Govindjee's response

Govindjee talked about how he entered photosynthesis research; paid brief tributes to his former professors Shri Ranjan (who had worked with F.F. Blackman, known for his "law of limiting reactions"), Robert Emerson (who had worked with the 1931 Nobel laureate Otto Warburg), and Eugene Rabinowitch (who had worked with 1926 Nobel laureate James Franck), and then he thanked his Czech hosts, dedicating his brief response to Ivan Setlik.

Govindjee did his M.Sc. in Botany under Shri Ranjan, in 1954. He became interested in photosynthesis research after having (a) organized a mock symposium on photosynthesis, where students acted as Jan Ingenhousz; Joseph Priestley; Otto Warburg; Robert Emerson; and Melvin Calvin, among others. His recollection is that he may have acted as Emerson; and (b) written a term paper on "The role of chlorophyll a in photosynthesis," where he discussed the work of Richard Wilstätter, Theodor Englemann, and Robert Emerson, among others. He was then intrigued by the work of Emerson and Lewis (1943) and his curiosity was the "Red Drop in Photosynthesis." This led him to apply to work with Emerson in 1956. After obtaining a fellowship in "Physico-Chemical Biology" at the University of Illinois at Urbana in September, 1956, he went to study under Emerson, and the rest is history. Due to the untimely death of Emerson on February 4, 1959, in a plane accident, he transferred to do research with Eugene Rabinowitch, obtaining his Ph.D. in Biophysics in 1960. With Rabinowitch, he discovered that chlorophyll a was in both the pigment systems, in contrast to the conclusions of Emerson who had assumed that one photosystem is run by chlorophyll *a* and the other by other pigments (chlorophyll *b* or fucoxanthin, or phycobilins, depending upon the organism) (see Govindjee and Björn 2012). Also see http://www.youtube.com/watch?v=cOzuL0vxEi0 for an interview of Govindjee by Don Ort for Annual Reviews, Inc.

A major point Govindjee made during his talk was that one must question everything and everybody even if the person is a Nobel—laureate!

He thanked everyone he had encountered in Trebon, especially Ondrej Prasil, Radek Kana, Gabor Bernat, and Evelyn Lawrenz, and including those who helped him with directions inside our building (he says, he lacks GPS in his

a

Prezenční listina

Seminář: The talk about research carreer

(on the occasion of the 80th birthday)

Přednášející: **prof. GOVINDJEE**

Podpis přednášejícího: .....

(signature)

Místo konání: **Centrum Algatech,** Mikrobiologický ústav AV ČR, v.v.i., Opatovický mlýn, Novohradská 237, Třeboň

Datum: 23. října 2013, 15:00 hod.

Název projektu: Algaman – Rozvoj lidských zdrojů výzkumu fotosyntézy a řasových biotechnologií v jižních Čechách

Reg. č. projektu: CZ.1.07/2.3.00/20.0203

Jméno	Příjmení	Podpis
TUROCZY ZOLTAN		
Ivan Ivanov		
Gala		
ANA		
Adéla		
TOMÁŠ		
ŽUZANA		
HONZA		
KARTINA		
JAN		

evropský sociální fond v ČR
EVROPSKÁ UNIE
MINISTERSTVO ŠKOLSTVÍ, MLÁDEŽE A TĚLOVÝCHOVY
OP Vzdělávání pro konkurenceschopnost
INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

EVA	KOTHBOVA	
JOSEF	KOMENDA	
ETA		
JIRI	MASOJIDEK	
ANDREAS	LENGYEL	
MARTIN	LIUMR	
EVISKA	TASKOVA	
Lukas	NEUWIRTH	
Andreas	NEUWIRTH	
Radek	KANA	
FELIX	GARLSK	
JUDITH	NODA	
Evelyn	LAWRENZ	
Anna	Mkrtchyan	
Micha	Koblizek	
Jose	Cheel	
TOMASZ		
PETRA	PFEIFEROVA	

b

c

Fig. 3 (**a**) Signatures of some of the participants at the talk about Govindjee's research career; (**b**) Ondrej Prasil; (**c**) *Left to right* Gabor Bernat; Takako Masuda; Radek Kana; and Eva Kotavova; *standing* Evelyn Lawrenz

Fig. 4 (**a**) Govindjee beginning his lecture; (**b**) Govindjee with a slide that he said is based on a slide given to him by Bob Blankenship; (**c**) Govindjee using his camera to demonstrate flashing light experiments of Pierre Joliot that led to the concept of "period 4 oxygen clock" for water oxidation; (**d**) Govindjee answering questions; (**e**) Govindjee describing the day that C-14 was discovered by Martin Kamen and Sam Ruben at Berkeley; (**f**) Govindjee describing how the "future" may be if with the success of "artificial photosynthesis"

head!). Figure 3(a) shows signatures of some of the participants at the party, and Fig. 3(b) and 3(c) show two of the photos that Govindjee showed, while he thanked us.

Photosynthesis: the stories of the past

The day after the birthday party, Govindjee gave a talk on his favorite subject—the history of photosynthesis. Govindjee began his presentation with the following quote from the "Panchatantra:" "*The firefly seems a fire, the sky looks flat; Yet sky and fly are neither this nor that*". The point he made was to have an "open mind" and to continue questioning and challenging yourself to reach a final understanding. I will not discuss further his talk except to point out that from his historical talk we learned the stories of Martin Kamen (the day he and Sam Ruben discovered Carbon-14), of Andy Benson (why and how he did not

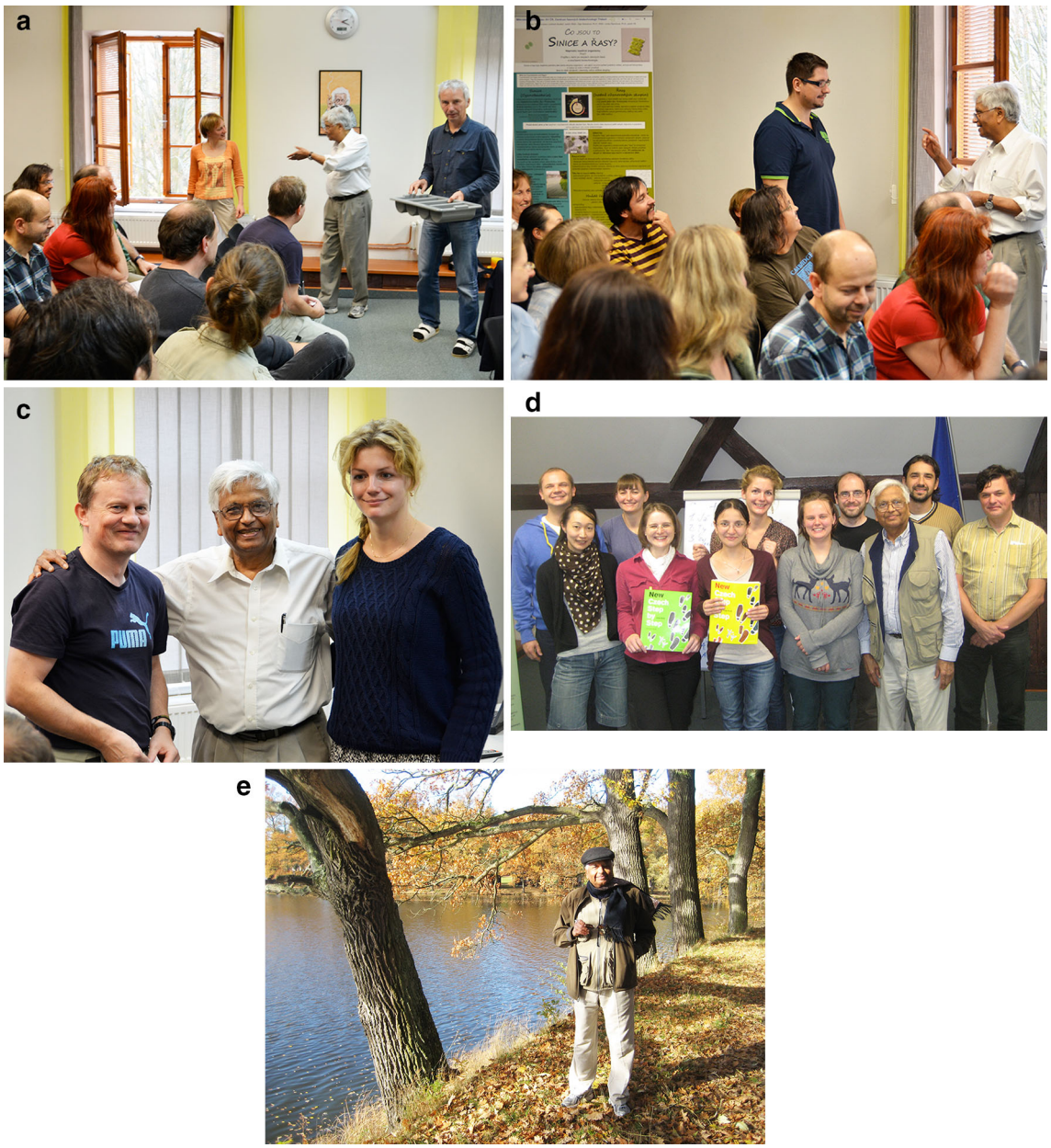

Fig. 5 (**a**) Hana Medova (wearing an orange dress), winner of a book from "Advances in Photosynthesis and Respiration"; (**b**) Jarda Krafl (wearing a dark blue shirt), also a winner of a book from "Advances in Photosynthesis and Respiration"; (**c**) Govindjee (in the middle) with Petra Pfeiferová (who took most of the photographs, on the right) and Josef Komenda (on the left); (**d**) A photograph of the Czech class taught by Petra Pfeiferová; *left to right* Tomasz Tronina, Takako Masuda, Kinga Klodawska, Evelyn Lawrenz, Anna Martirosyan, Petra Pfeiferova, Anna and Gabor Steinbach, Govindjee, Zoltan Turoczy, and Gabor Bernat; and (**e**) Govindjee enjoying the day before leaving Třeboň

share the Nobel Prize with Melvin Calvin in 1961), of Robert Emerson and Otto Warburg (on the controversy of the minimum quantum requirement of oxygen evolution between them, and how it was solved in favor of Emerson—of 8–10 quanta over 2.8–4 quanta; see Nickelsen and Govindjee 2011), of Pierre Joliot and Bessel Kok (on the discovery of the oxygen clock) and many more.

Figure 4 shows some of the photos taken by Petra Pfeiferová of Govindjee and the audience during his talk.

Concluding remarks

I end this brief News Report on Govindjee by wishing him the best in his life, and by encouraging him to come and work with us anytime in the future and intoxicate us with the enthusiasm for research in understanding "*What is really behind it all that we see in our experiments whenever we put our algae and cyanobacteria in our instruments*?"

Figure 5 shows photos of the winners of books from Govindjee; of Petra Pfeiferová (who took most of the photographs); of the Czech class taught by Petra Pfeiferová; and of Govindjee enjoying the day before leaving Trebon.

Acknowledgments I thank all my coworkers and members of my laboratory for their help in making this event a success. I thank the production editor Meertinus Faber for his help in getting this historical Report in print. Govindjee's visit was made possible by project Algaman CZ.1.07/2.3.00/20.0203.

References

Allakhverdiev SI, Shen J-R, Edwards GE (2013) Special issues on photosynthesis education honoring Govindjee. Photosynth Res 116:107–110

Clegg RM (2012) Contributions of Govindjee, 2000–2011. In: Eaton-Rye JJ, Tripathy BC, Sharkey TD (eds) Photosynthesis: plastid biology, energy conversion and carbon assimilation, advances in photosynthesis and respiration, vol 34. Springer, Dordrecht, pp 835–844

Eaton-Rye JJ (2007a) Celebrating Govindjee's 50 years in photosynthesis research and his 75th birthday. Photosynth Res 93:1–5

Eaton-Rye JJ (2007b) Snapshots of the Govindjee lab from the late 1960s to the late 1990s, and beyond. Photosynth Res 94:153–178

Eaton-Rye JJ (2012) Contributions of Govindjee, 2000–2011. In: Eaton-Rye JJ, Tripathy BC, Sharkey TD (eds) Photosynthesis: plastid biology, energy conversion and carbon assimilation, advances in photosynthesis and respiration, vol 34. Springer, Dordrecht, pp 815–834

Eaton-Rye JJ (2013) Govindjee at 80: more than 50 years of free energy for photosynthesis. Photosynth Res 116:111–144

Emerson R, Lewis CM (1943) The dependence of the quantum yield of *Chlorella* photosynthesis on wavelength of light. Am J Bot 30:165–178

Govindjee (2004) Robert Emerson, and Eugene Rabinowitch: understanding photosynthesis. In: Lillian H (ed) No boundaries: University of Illinois Vignettes, Chap 12. University of Illinois Press, Urbana, pp 181–194. ISBN: 0-252-0703-0 (paperback)

Govindjee, Björn LO (2012) Dissecting oxygenic photosynthesis: the evolution of the "Z"-scheme for thylakoid reactions. In: Itoh S, Mohanty P, Guruprasad KN (eds) Photosynthesis: overviews on recent progress and future perspective. I.K. Publishers, New Delhi, pp 1–27

Govindjee, Fork DC (2006) Charles Stacy French (1907–1995). Biogr Mem Natl Acad Sci Wash 88:2–29

Myers J (1987) Bessel Kok (1918–1979). Biogr Mem Natl Acad Sci Wash 57:125–148

Nickelsen K, Govindjee (2011) The maximum quantum yield controversy: Ptto Warburg and the Midwest Gang. Bern studies in the history and philosophy of science. University of Bern, Switzerland, Institute für Philosophie. ISBN: 978-3-9523421-9-0 (paperback)

Papageorgiou GC (2012a) Contributions of Govindjee, 1955–1969. In: Eaton-Rye JJ, Tripathy BC, Sharkey TD (eds) Photosynthesis: plastid biology, energy conversion and carbon assimilation, advances in photosynthesis and respiration, vol 34. Springer, Dordrecht, pp 803–814

Papageorgiou GC (2012b) Foreword. In: Itoh S, Mohanty P, Guruprasad KN (eds) Photosynthesis: overviews on recent progress and future perspectives. IK Publishers, New Delhi, pp vii–x

Rabinowitch E (1961) Robert Emerson (1903–1959). Biogr Mem Natl Acad Sci Wash 25:112–131