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Welcome and Laudatio

Dear friends:

In the name of the organizing committee, I welcome you to this Symposium on "Amphibian Epithelia as Hormone and Drug Receptors." It would be a vain enterprise to speculate on the cause of this 120% response to our invitation: Was it a lucky hand in the choice of the topic, or was it perhaps a magnetic effect exerted by our guest of honor? Trying to get an answer would probably mean trying to separate amphibian epithelia from the name *Hans Ussing*. As to the choice of this place, the Reichenstein castle, the decision was easy. With its impressive facades protecting a friendly and romantic interior, it seems predestinated to infiltrate us with its mixed atmosphere of endurance, straightforwardness, and friendly charm. These things might help us to better tolerate a rather tough scientific program. They also may help us to facilitate personal contacts, to create new friendships, or even, hopefully, to settle scientific disagreements here and there. With this in mind, may I wish you and us all the best of success, and may we all enjoy this meeting. If this goal is reached, the generous support by the Swiss National Science Foundation and the Pharmaceutical Industry will not only remain a help, but a worthwhile help. We wish to express our gratitude to these institutions. We would also like to address our sincere thanks to the members of the editorial board of the *Journal* of *Membrane Biology* who agreed to publish the Proceedings of this Symposium in a special issue of the Journal.

But now let us turn to our guest of honor, Professor Hans Ussing. I know beforehand that he will not mind if I let his friends of the Institute sort of share this *laudatio*. For many of us the name *Ussing* will immediately be associated with names like *Koefoed-Johnsen* or *Zerahn*, and we are proud to greet them personally as our guests today. I do not think it necessary to formally introduce Professor Ussing to this audience, an audience he actually created, directly or indirectly, an audience we have the pleasure of assembling on the occasion of his 65th birth-year. Thus, in spite of the fact that for most of us it may mean carrying sand to the seashore, I will try to turn the spotlight

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backwards and recall some of the highlights in Professor Ussing's scientific career, highlights that are basic to today's topic. Thus we will bypass many important publications, since his first one appeared about 43 years ago followed by the impressive number of 136, so far. Although this number may be impressive by itself, knowing Professor Ussing and his way of writing a paper, one would first be inclined to judge his publications for their scientific relevance and teaching value; then one would have to use other criteria—criteria used rather to estimate a piece of art.

Right after World War II August Krogh initiated an investigation of the permeability of biological membranes to alkali metal ions with the help of isotopes, which became available again in Denmark. Professor Ussing was put in charge of this program, as he seemed to be predestinated for this through his experience with deuterium-labeled compounds. This new task, in the beginning appearing like a side task, became the red line in Professor Ussing's scientific career. He soon realized that the theoretical base for the use of tracers in permeability studies were at that time quite unsatisfactory, and in the years to come he devoted all his energy and experimental skill, paired with a talent for clear and sharp reasoning, to obtain meaningful answers. These answers were published in a long series of papers on active transport and passive diffusion of inorganic ions through living membranes. Professor Ussing was always careful to formulate his statements for just one specific mode used *in vitro,* mostly the epithelium of the frog skin. It soon turned out, however, that his theoretical and experimental approach to the problems in this model was just as valid and useful for most other epithelia concerned with asymmetric transport of alkali metal ions. Thus, for the first time it became reality that even clinicians could and would join discussions between physiologists and biophysicists. I am personally grateful to Professor Ussing for the privilege of spending a wonderful and most exciting year at his Institute over ten years ago. We were trying to start an investigation of bioelectrically controlled morphological changes in the epithelium of frog skin. It is largely to his credit that what for a long time was apparently utopic became reality: the dialogue between physiologists and morphologists. This was possible mostly because under his pen terms like exchange diffusion, shunt current, flux ratio, solvent drag, anomalous transport, and, last but not least, short-circuit current ceased to remain abstract terms. They began to make sense even for people not brought up in pure sciences. Thus, one should not wonder that the largest echo came from basic medical

sciences dealing with problems of epithelial transport, e.g., physiology of the kidney, the gut, and other organs.

Professor Ussing is not only an outstanding investigator and scientist; as teacher, he has been heading the Isotope Division of Zoophysiology and later on the A Department of Biochemistry of the University of Copenhagen. As a visiting professor and invited speaker, he has been to the United States over twenty times, not to speak of his shorter and longer visits to Latin American countries and other places around the world. It is not surprising that the honors he received so far are numerous: In 1955 he was appointed member of the Royal Danish Academy of Sciences, and from 1969 to 1975 he was chairman of the science class of that academy. He is honorary member of the Physiological Society of England, of the American Physiological Society, of the American Academy of Arts and Sciences, and of the Jewish Medical Society of Denmark. In 1964 he received the Anders Jahre Medical Prize at the University of Oslo; in 1966, the Homer Smith Prize of the New York Heart Association; in 1969, the Amory Prize from the American Academy of Arts and Sciences; and in 1971, the Alfred Benzon Prize in Denmark. He has received the honorary degree of Doctor of Medicine from the Universities of Kiel and Louvain and the honorary degree of Doctor of Sciences from the University of Cambridge.

Dear Hans Ussing, we have no honor, no prize, no reward to present to you today. However, let me recall a sentence you once formulated in a letter: "The best – in fact the only – reward a scientist can get is to pass on some of his thoughts to the next generation and thus be of service!"

For this service, dear Professor, and in the name of this next generation, in the name of all present here, let me express to you our wholehearted thanks for all you have done and been in the past, and for all you are doing and will do in the present and for a long time to come Thank you!

Cornelis L. Voûte

List of Donors

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