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Introduction

The last few decades have seen considerable development and intensification of experimental research in the physiological sciences. The many partial problems of physiology and pathophysiology led to their being studied in such detail, and so complexly, that it in turn proved necessary to integrate them and to interpret the combined results systematically in special monographs. A striking example of this is the present publication, in which the authors have summed up the present level of knowledge on the physiology and pathophysiology of cough and other protective and defensive reflexes of the airways.
Both the authors – the one a pathophysiologist, the other a physiologist – have long devoted themselves to the resolution of these problems and during a period of almost 30 years they have carried out a tremendous number of experimental analyses. The course of their work has followed existing modern methods on the one hand and the development of new methodological approaches of their own on the other.

It was precisely this rich arsenal of techniques which enabled the authors not only to make detailed analyses of single respiratory reflexes with reference to their control mechanisms, but also to investigate their dynamics and mechanics and to modify their course by various treatments, as well as their effects on haemodynamics, the oxygenation of the blood and its pressure changes in the body cavities. They did not confine their research to acute experiments on adult animals of only one species in these analyses, but extended them to phylogenetic and ontogenetic analyses and to long-term experiments on unanaesthetized and nonimmobilized animals. In this association they elaborated experimental models of respiratory tract diseases which have a very frequent incidence in man.

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It is now more than 150 years since the bulbar centre which regulates respiration was discovered, but since then there have been many thousand experiments investigating the motor activity of breathing. It is a remarkable achievement that the authors of this monograph should have succeeded in discovering two previously unknown respiratory reflexes – the aspiration reflex and the expiration reflex. The newly discovered reflexes are analysed in detail in the monograph and are compared with other reflex respiratory movements.

Today, research on respiratory functions and analyses of protective and defensive reflexes of the respiratory system, together with experimental modelling of airway diseases, are highly topical subjects, in view of the progressive increase in air pollution problems. In this respect the present publication is of basic importance both for physiologists and for pathophysiologists and medical practitioners, from the aspect of prevention, diagnostics and treatment.

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XI

Authors' Introduction
Almost 30 years have gone by since Bucher and Jacot's "Zum Mechanismus des Hustens" first came into our hands. We found the mechanisms of cough so interesting that our orientation in these problems has persisted every since.

We began our own investigations together with Prof. I. Ivano at the Department of Experimental Pathology of the Faculty of Medicine, Šafárik University, Kosice, without any previous experience in this field. Initially, of course, we encountered various difficulties, but in time we acquired both good collaborators and proper technical equipment. We found particularly good conditions at the Faculty of Medicine in Martin, where we were appointed head of the Department of Physiology and head of the Department of Pathological Physiology and Pharmacology, respectively and were able, in our further research, to call on the aid of other laboratories as well as our own.

We were thus able to study cough complexly, from both the theoretical and the clinical aspect.

In the present study we inevitably came up against other defensive reflexes of the airways which attracted our attention. In addition, we discovered two more reflexes, which we termed the aspiration and the expiration reflex, according to their respective functions.

The findings made in the course of these investigations piled up so alarmingly that we were obliged to work up them in a survey. Another factor which prompted this step was the absence of any comprehensive publication on the physiology and pathology of cough in the world literature. One of the reasons why we felt it our duty to remedy this deficiency is that diseases of the respiratory system are a serious public health care problem throughout the world.

Cough is a frequent – and often the only – sign of these diseases. Other defensive reflexes likewise unquestionably play role in their origination and development. These were the factors that gave rise to the Slovak edition of our monograph, published in 1975. Since it was written a great deal has been added to our knowledge, both here and in other countries, with the result that the present English edition is almost twice the size of the original.

We also considered it necessary to sum up the most important studies in the world literature which deal with these questions and this is reflected in very many quotations of the various studies in question.

We hope that our book will prove useful to theoreticians for the further development of this field of science, and to clinicians for the identification and treatment of diseases of the respiratory organs.

In conclusion, we should like to thank all those who took part in our...
experiments or helped us in other ways. We are especially grateful to the many workers, in Czechoslovakia and other countries, whose advice and encouragement during courses of study, mutual visits and congresses, etc. contributed to the analysis of the various questions involved. We are also deeply indebted to Prof. J. G. Widdicombe and his University Laboratory of Physiology, Oxford, now to the Department of Physiology, St. George’s Hospital Medical School, London, to Academician V. V. Parin, Academician A. M. Chernukh, Prof. A. M. Kulik and their Institute of Normal and Pathological Physiology, now the Institute of General Pathology and Pathological Physiology of the Academy of Medical Sciences of the USSR, Moscow, and to Prof. W. A. Karczewski and his Institute of Neurophysiology of the Polish Academy of Sciences, Medical Research Centre, Warsaw.

We extend our thanks to our families, colleagues and friends for their loyal support and last, but not least, to the staffs of the VEDA, Publishing House of the Slovak Academy of Sciences in Bratislava and the SNP Printing Works in Martin, who made the publication of this book possible.

Martin, May 1979 The authors