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Gerontological Aspects of Eye Research

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Preface
Most of clinical medicine, including ophthalmology, is applied to the very young and the elderly, especially the very old. The increasing proportion and absolute numbers of the elderly in so-called advanced countries will tend to increase the large amount of time the ophthalmologist already devotes to their diseases, especially `senile cataract' - which is one of the commonest causes of disability they suffer. Should we just shrug our shoulders and say that cataract is due to old age and think no further, as some used to do in atherosclerosis, coronary thrombosis, hypertension, hemiplegia and arthritis? Most of us would say `no', and ask why so many old people have clear lenses and why `senile cataract' is not a single disease. Even if there is an important hereditary basis in many cases of senile cataract, as I suspect, environmental influences on this relatively insulated organ probably affect it or may alone determine the development of a cataract.

Chemical and other analyses of cataractous human lenses removed at operation may be expected to provide some insight into the disease - just as postmortem examinations have contributed much to our understanding of systemic disease. Correlation of these findings with morphology observed in vivo, and with the general health of the patient, may tell us more. Some of the papers in this volume relate such observations.

But the human animal has a long life span, a highly variable environment and diet, and can hardly be subject to long-term experimental manipulation. Many of the papers in this volume describe observations on rats and their lenses which constitute a very useful animal model for human cataracts.

Clinical research is becoming increasingly dependent on basic scientists to collaborate in defining questions, constructing hypotheses and planning investigations. Lens research is a subject in which there is already evidence of important results from such collaboration. And the lens, avascular and with a limited range of chemical constituents and accessible to observation in vivo, seems an ideal organ for investigations into ageing.

I would commend this volume to a wide audience of clinicians, not only ophthalmologists, and basic scientists for two reasons: the intrinsic interest and importance of the papers and the indication of some advances in an increasingly important field of research - ageing.

Colbert I. Phillips, Edinburgh

Introduction

On behalf of the local organizing committee, it is a great honour to welcome you most cordially as participants of the 18th Meeting of the Association for Eye Research in Bonn. I feel a special welcome is due to our colleagues from the United States and Japan who have taken the trouble of a long voyage.
to be with us to discuss the special problems of the age changes of the eye. Tackling this issue is not novel and the Association for Eye Research had already considered the matter as a key program at a former congress. However, the manner of dealing with age research in ophthalmology has been subject to certain changes. From the clinical observations of age signs a special form of experimental gerontology of the eye resulted and all over the world research teams are more and more involved with the mechanisms leading to age changes on the cellular, molecular or organ level. Naturally, the clinical ophthalmologist is keen to learn the progress of such research.

Today, the ophthalmologist has to deal with more geriatric problems than any other specialist. This is due to the following facts: through general prophylactic measures the number of inflammatory diseases of the eye, such as scrofulism, tuberculosis, lues, pox, trachoma, gonoblenorrhea and ulcus serpens could, at least in Europe, be reduced to a minimum, and further, the life expectancy of the individual is greatly increased.

To outward view, it seems that ophthalmology lags somewhat behind where results in gerontological problems are concerned, although ophthalmologists have already at a very early date tried to elucidate age changes of the eye and have taken great pains to determine and document these changes by visual and technical means, but the impression is not true. The higher life expectancy is mainly due to the fact that acute mortal conditions can often be eliminated, not, however, to a postponement or abandonment of processes of aging of unknown mechanisms and origin.

We all know the most common geriatric diseases in our aged patients: cataracta senilis and senile macula degeneration.

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In the first case we are well able to help. In the last 20 years techniques of cataract surgery have been greatly improved and there is hardly any risk involved. However, the ultimate goal is the elucidation of the causes and mechanisms leading to opacification and their prevention. With respect to the senile macula degeneration, there is still no definite possibility to influence the incident, and we can but hope that new methods in angiology will one day enable to cope with flow disturbances in the complicated region of the uveal and the retinal circulation.

However, geriatric problems of the eye extend to other diseases besides the two mentioned above. More important than the investigations on our special ophthalmo-geriatric problems is the possibility to use the eye as a model for studies on the processes of ageing in general, which may enable us to test theories on age processes by our means of investigation. This is also the aim of the 1977 Congress of the Association for Eye Research in Bonn, which I want to
open with my best wishes for a successful and productive scientific meeting.

Erich Weigelin, Bonn