ALFRED L. COLEY, THE TEACHER AND FOUNDER

By Siegfried Witte

The science of medicine has always involved and still involves the phenomenon of the development of “schools.” Up until approximately 25 years ago, they were formed by the fruitful ties between teacher and pupil. Today, they are often based on the phenomena of trends, tendencies, and indeed “fashions.” A. L. Copley cannot be categorized as founder of a school along these two lines, although he has become a teacher to many physicians. He has developed a variety of research specialties, founded several successful journals, and created the basic framework for a world-wide extending science by founding the International Society of Hemorheology, which later on was renamed International Society of Biorheology. He is a unique and great personality who in reality comprises two different personalities, as has been revealed in a recently published book, One Man, Two Visions—A. L. Copley, A. L. Copley; Artist and Scientist; published by Pergamon Press, from which the following article quotes.

What has been my own experience with him? The study of blood clotting formed the beginning of his work as well as that of mine. While still a student, in the clinical semester at the Institute of Physiology, University of Würzburg, he had assisted Professor Wöhlisch in isolating the clotting enzyme, thrombin. About 15 years later, in the Medical Polyclinic of the same University, I too worked with clotting methods. The in vitro tests then in use did not satisfy me as a clinician. I wanted to investigate blood clotting in vivo. As a disciple of Paul Morawitz of Leipzig, my chief, Professor Norbert Henning, was interested in hematological microscopy besides clotting; I, therefore, endeavored to investigate the phenomenon of blood clotting in vivo using microscopic methods. The permeability of blood vessels of the microcirculation could be investigated in animal experiments. Fluorescent labelling of components of blood plasma proved to be especially suitable in this context. Pursuing this approach, I found in 1956 that vascular permeability was always increased when blood clotting was disturbed in terms of reduced coagulability (Witte, S., Über Beziehungen zwischen Blutgerinnung und Capillarpermeabilität. Habil. schr. Erlangen 1958; Fol. haemat. N. F. 1, 320-338, 1957; Z. ges. exp. Med. 129, 181-192; 358-367, 1957; Thromb. Diath. haem. 2, 146-169, 1958).

In the discussion of these findings I have quoted Al’s lecture, “Thrombosis and Thrombo-Embolism in Blood Capillaries,” which I heard during the International Conference on Thrombosis and Embolism in Basel in 1954. There, he suggested that the “so-called endocapillary layer of the endothelium may be identical with non-gelated fibrin” ((1953). Thrombosis and Embolism. Th. Koller, W. R. Merz, Eds., Benno Schwabe, Basel, 452-457). His idea that “fibrin is a constituent of the interendothelial cement or of an endothelial coating contributing to the integrity of the wall of blood vessels” ((1953). XIXth Internat. Physiol. Congr., Montreal, Abstr. of Commun., p. 280) was based on the results that capillary petechiae can be induced by a local application of plasmin, carried out with the method of the nictitating membrane of the rabbit’s eye, developed by him, together with R. Chambers.

In this way, a research direction was built up which led to many new fields of research and has become of far-reaching importance for clinical medicine. I can only give a very subjective and incomplete view of these developments.


The Fourth International Congress of Rheology held at Brown University, Providence, Rhode Island in 1963 was a highlight in the life of Al. Here, he organized a Symposium on Biorheology. With the assistance of the U.S. Navy he gathered together participants who to this day constitute the research elite in biorheology. The proceedings of the Congress were printed in four parts by John Wiley in 1965. Part 4, edited by Al, is


The pathophysiological aspects of blood clotting clearly have impacts on the field of thrombogenesis and it was typical for Al to conclude in 1972 that he should found a new journal, Thrombosis Research. It was the same year that the First International Congress of Biorheology took place in Lyon. These three Pergamon Press journals initiated by Al, as well as the international congresses in hematology, biorheology, and microcirculation became fertile fora for the presentation and discussion of his ideas and findings in the years that followed.

At the World Conference of the European Society of Microcirculation in Antwerp in 1976, I demonstrated vital experimental microscopy findings with fluorescent-labeled fibrinogen that showed an affinity of fibrinogen for the capillary wall in situ and thus supported Al’s hypothesis of the existence of an endothelial fibrinogen lining (EEFL) in vivo ((1977). Witte, S., Zenzes-Geprags, S. The affinity of fibrinogen to the vessel wall as proved in situ. Bibl. anat. 16, 279-281). Al compiled further findings and arguments on the EEFL, on fibrinogen clotting and on the interface between the two portions of the “vessel-blood organ” and printed these in the first number of Clinical Hemorheology in 1981 (1981). Copley, A. L. Hemorheological aspects of the endothelial fibrin lining and of fibrinogen gel clotting. Their importance in
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The history of clinical hemorheology was outlined by Al in a plenary lecture at the Fourth European Conference on Clinical Hemorheology in Siena in 1985 (((1985). Copley, A. L. The history of clinical hemorheology. Clin. Hemorheol. 5, 765-811). At this meeting he also presented a look into the future. In particular, he drew attention to the field of perihemorheology which is linked to the “vessel-blood organ” by the processes of transcapillary transport.

A. L. Copley is and will remain a teacher of medicine. His pupils are and will be working on the most diverse aspects of theoretical and practical medicine. They will themselves become teachers; perhaps they will found schools. Al’s message is and will be spreading.