SCIENCE

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OLD PROBLEMS AND A NEW TECHNIQUE[1]

IT is a truism to say that new instruments and new modes of technique may be as productive of advances in science as generalizations that point the way for many investigations. The telescope, the photographic plate and the spectroscope in astronomy, the chromometer and the thermometer in physics, the balance in chemistry, the microscope and the microtome in biology are trite examples of instruments and related technical processes so commonly used that their importance is forgotten. During the past twenty-five years, the string-galvanometer and methods of determining small amounts of gases in blood and other fluids of the body have been productive of great advances in physiology; while instruments for micro-dissection, and methods of staining, like those with hæmatoxylin, have made possible a flood of investigations.[2] The Greeks failed in

[1] Address of the retiring Vice-president and Chairman of Section F, American Association for the Advancement of Science, read at the Zoologists dinner, Nashville, December 29, 1927.

[2] The advent of such methods is sometimes vividly remembered by those who lived through the period. Recalling that I had once heard my former teacher, Professor S. F. Clarke, of Williams College, speak of the coming of ribbon sections in the early eighties of the last century and knowing that two other veteran American Zoologists, E. B. Wilson and E. L. Mark, were students abroad at this period, I inquired of these individuals. Each has contributed items of interest, but the statement by Professor Wilson is the most comprehensive. He says: "I first became acquainted with the ribbon method of section-cutting at the laboratory in Cambridge just after its discovery by Caldwell in 1882, and as I had very recently completed a research which involved the laborious cutting of great numbers of small eggs, one by one, and mounting the sections singly, you can imagine the surprise and pleasure with which I saw them reeled off wholesale by the ribbon method. As it happened I was, I think, the first person to introduce this method in Germany, having taken it over to Leuckart's laboratory in the early winter of the same year, and I have never forgotten the astonishment with which the operation was viewed by the group working there at the time. It was at first employed simply by the old method of cutting by hand with a razor on a flat-topped glass plate secured to a table, and was only a little later extended to the Thoma sliding microtome. It seemed to me then, and still seems to me, to be one of the most important steps

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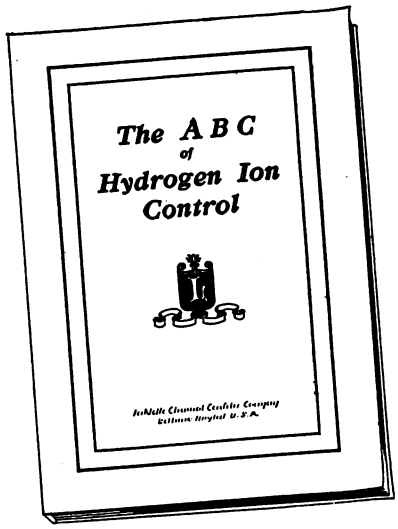

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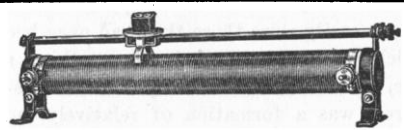

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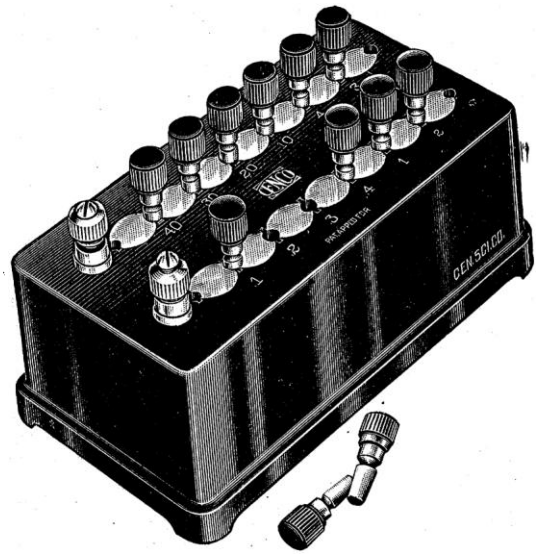

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