

SCIENCE

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THE REGULATION OF NEUTRALITY IN
THE ANIMAL BODY¹

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It was a favorite figure of Cuvier's, recurring again and again in his works,² to compare life with a vortex into which molecules continually enter, from which they continually depart; meantime the vortex remains, and thus the form of a living thing appears to be more important than the substance. Cuvier's analogy, though almost forgotten, is quite as valid to-day as a century ago, but I suspect that the modern physiologist will be disposed to see in such a view a justification of the study of *conditions* rather than a claim for morphology. What, indeed, is the importance of the anatomy of a whirlpool in comparison with the dynamics thereof?

Now it is the study of conditions within the organism which physical chemistry has contributed to physiology—solution, surface tension, the colloidal state, osmotic pressure, ionization, alkalinity or neutrality—and these are dynamical equilibria rather than in any sense morphological elements. To such conditions Cuvier's figure exactly applies, and provides, moreover, the very best means for their systematic investigation; while the conditions, in turn, most fully reveal that which was partly made clear to Cuvier by the imagination of genius, and, in spite of it, quite certainly in part unknown to him.

The right working of physiological proc-

¹ Read in the joint meeting of Section K of the American Association, the American Physiological Society and the American Society of Biological Chemists at Cleveland.

² See Merz, "A History of European Thought in the Nineteenth Century," Vol. I., p. 129.