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PERMANENT ELEMENTS IN THE FLUX OF PRESENT-DAY PHYSICS¹

By Professor P. W. BRIDGMAN

JEFFERSON PHYSICAL LABORATORY, HARVARD UNIVERSITY

MANY of us could, I believe, confess to a feeling of breathlessness at the rapid changes of our present physical progress, and some of us might even, in a moment of candor, admit a little resentment at our shortness of breath. Let us discuss together what we may perhaps best do to recover our poise.

The changing situation which is responsible for our discomfort is complex. First and foremost there is our changing experimental knowledge, reaching over the entire range from the infinitely small to the infinitely large. The upsetting feature here is not so much that we have discovered an enormous array of new facts, which in themselves are difficult enough to

keep pace with, as that these facts have proved in many cases to be irreconcilable with our previous expectations of what was possible, so that we have been forced to change our entire conceptual attitude. These conceptual changes have in many cases been associated with mathematical theories, which are being continually formulated at an ever-accelerating tempo and in a complexity and abstractness increasingly formidable. Some of the more important landmarks in this progression are: The electromagnetic theory of light, the special theory of relativity, the general theory of relativity, the quantum theory of Bohr, the matrix calculus of Heisenberg, the wave mechanics of Schrödinger, the transformation theory of Dirac and Jordan, the group theory of Weyl and now the double quantization theory of Jordan and others.

¹ Address of the retiring vice-president and chairman of Section B—Physics, American Association for the Advancement of Science, Des Moines, Iowa, December, 1929.

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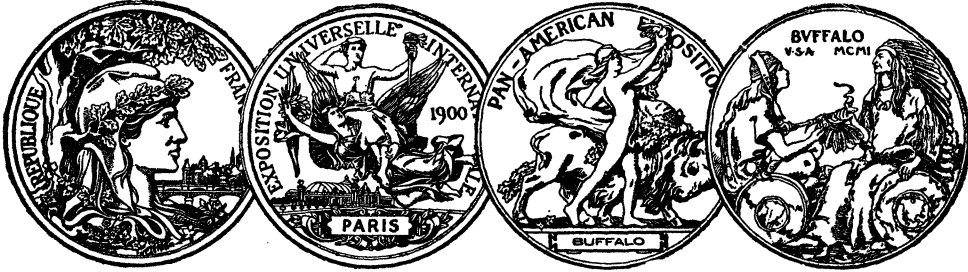
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