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CONTENTS

<i>Operative versus Abstract Philosophy in Physics:</i>	
PROFESSOR W. S. FRANKLIN	623
<i>Julius Robert Mayer and the Blood's Circulation</i>	
Rate: DR. EDWARD F. ADOLPH	626
<i>John J. Flather:</i> DEAN O. M. LELAND	629
<i>Scientific Events:</i>	
<i>The Commonwealth Institute of Science and Industry; Federal Legislation; The Control of Cancer in Massachusetts and New York; Presentation in honor of Dr. B. F. Kingsbury; The Grabau Medal</i>	
	630
<i>Scientific Notes and News</i>	632
<i>University and Educational Notes</i>	635
<i>Discussion:</i>	
<i>A Program for Biologists:</i> PROFESSOR T. D. A. COCKERELL. <i>The de Revolutionibus Orbium Coelestium:</i> DREW BOND. <i>A Plant New to the United States:</i> FRANK C. PELLETT. <i>Milling and Baking Qualities of Old Wheat:</i> DR. C. O. SWANSON	
	635
<i>Scientific Books:</i>	
<i>Howe on Chemistry in Industry:</i> DR. H. W. WILEY	637
<i>Scientific Apparatus and Laboratory Methods:</i>	
<i>The Use of Arcs and Other Fluctuating Sources in Photo-electric Photometry:</i> B. KURRELMAYER	
	640
<i>Special Articles:</i>	
<i>Quartet and Doublet Terms in the Copper Spectrum:</i> DR. A. G. SHENSTONE. <i>Blood Studies in General Anesthesia:</i> DRS. H. J. STANDER and A. H. RADELET	
	641
<i>Science News</i>	x

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OPERATIVE VERSUS ABSTRACT PHILOSOPHY IN PHYSICS

THE limited usefulness in science of what we may, perhaps, call verbal philosophy has long been recognized, especially in the mathematical sciences. Unfortunately the term verbal philosophy conveys a suggestion of contempt, whereas no contempt whatever is here intended. By verbal philosophy we mean the marvelously effective method of thinking which all men use in their dealings with the complex problems of daily life, a method of which the most striking characteristic is the transformation of the essential phases of a problem into verbal forms, not solely for purposes of articulate speech, by any means, but to facilitate thought.

My own opinion is that the training of the mathematical physicist is vastly inferior to the training of a good lawyer as a preparation for dealing with complex human problems, and the lawyer's training is in verbal philosophy. I must not, however, let this statement stand unqualified, for it needs to be qualified in two ways. In the first place scientific men would like to see the training of a lawyer arranged so as to lead to mental honesty as certainly as the training of the scientist, and in the second place scientific men would like to see a wider recognition among men of affairs (meaning the men who use what we have called verbal philosophy with great success in dealing with the almost infinitely complicated problems of practical life) of the fact that in every problem we face in this world the philosophy of precise ideas has come to have a place and that in most purely physical problems the philosophy of precise ideas is supreme.

Every person with whom I have ever talked, theorist or practitioner, student-in-general or specialist in whatever line, has exhibited more or less distinctly an attitude of impatience towards this or that phase of the precise modes of thought of the mathematical sciences.

Da wird der Geist euch wohl dressirt
In spanische Stiefeln eingeschnürt
(There, alas, the spirit is constrained
And laced in a Spanish corselet)

Nothing, however, is so essential in the mathematical sciences as the possession of precise ideas. One must think so and so, there is no other way. And yet there is always a conflict in the mind even of the most willing student because of the narrowing

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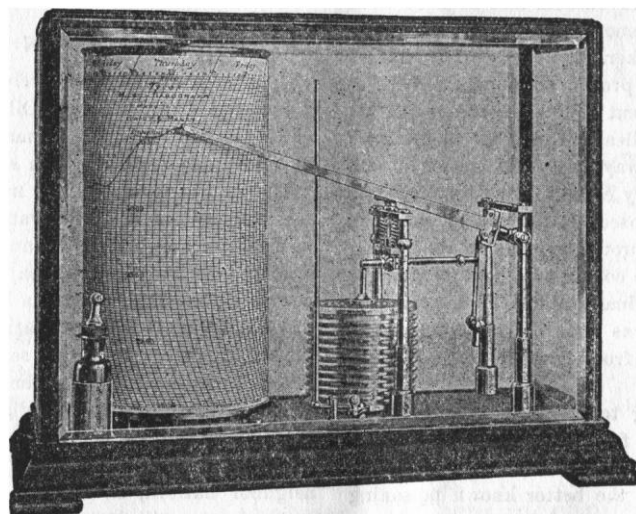
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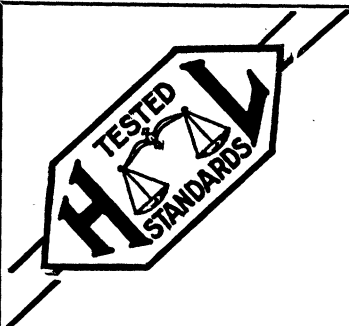
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