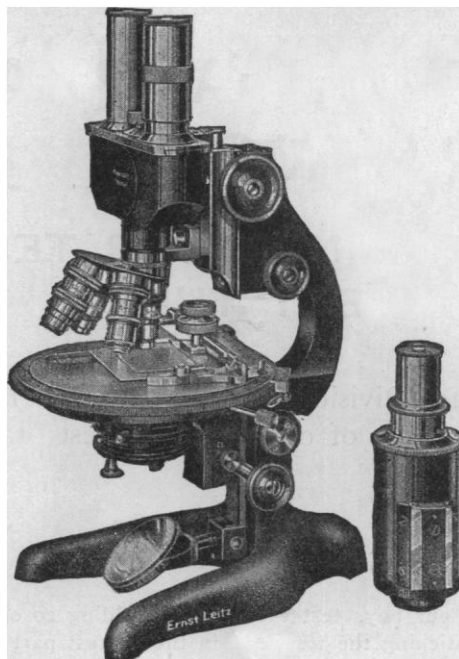


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The chief of the Division of Agricultural Biochemistry, of the Department of Agriculture of one of our largest State Universities writes as follows:

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"I have your letter of the 21st, together with a package of strain-tested test tubes.

"I had one of our boys test these out by adding 20 cc of ice water and then immediately sticking the test tube in the hottest part of a Meker flame. Under less drastic conditions, we have in the past been able to save about one test tube out of three. Using your tubes, one tube broke on the first trial; the other eleven came through the first trial successfully and, on repeating the experiment, all eleven came through a second time. This is somewhat more drastic treatment than a test tube is usually put up against, and I would say from this experiment that the tubes are highly satisfactory."

In reply to our request for permission to publish the above report, this Professor writes:

June 15th, 1927.

"I will be perfectly willing for you to send out that information because, as I told you, I have been thoroughly disgusted in the past with . . . test tubes and have wasted a great deal of valuable material by the breaking of test tubes just at the time that I did not want them to break."

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# SCIENCE

VOL. LXVI      AUGUST 5, 1927      No. 1701

RESEARCH<sup>1</sup>

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MAN's search for information about his surroundings and about himself is as old as the race. He has been conscious of it since thought began. Only in degree, in precision, has our search changed in all the ages; now, in designating a very careful, very logical, extremely critical phase of this feature of our intellectual life we have come to use the word research.

A dog searches for a bone led by his senses and experience, influenced little, if at all, by what he has of reasoning ability. The morphologist searches for the reasons underlying the shape of the bone; the physiologist examines into its functions—both search with the aid of their highly developed reasoning powers, and their work we call research.

Whatever the details of the special case, research is a mental process superimposed upon the observation of facts. It is mechanical as well as rational, the two functions being equally important. Because it is a human activity it may be judged in terms of its usefulness as against its cost, cost being interpreted as human effort rather than as mere money expended. However, being wide enough to embrace the infinite multitude of observable facts, whether these are found under natural conditions or as the result of the artificial conditions we call experiment, and also being a product of the trained imagination whose every guess is legitimate if in harmony with the facts, research is not easily reduced to analysis. How is it possible to place a value on a product as intangible as a work of art? How can we say whether the effort that went to the making of it is justified or wasted? It is no easier to judge the value of the products of the play of the imagination on the facts of existence. It is perhaps still harder to judge the value of the effort that goes to the collection of a mass of minute facts, each trivial as the hammering of a nail into a plank, yet each contributing to knowledge. It is much easier to judge of visible products, thus, when the architect and the artisan are finished, the result of the interplay of imagination and detail stands before us and we can judge it according to our likes and dislikes, of our feeling of its fitness to fulfill its purpose as measured against its cost.

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<sup>1</sup> Presented at a joint meeting of the Rhode Island Sections of the American Chemical Society and the American Association of Textile Chemists and Colorists.

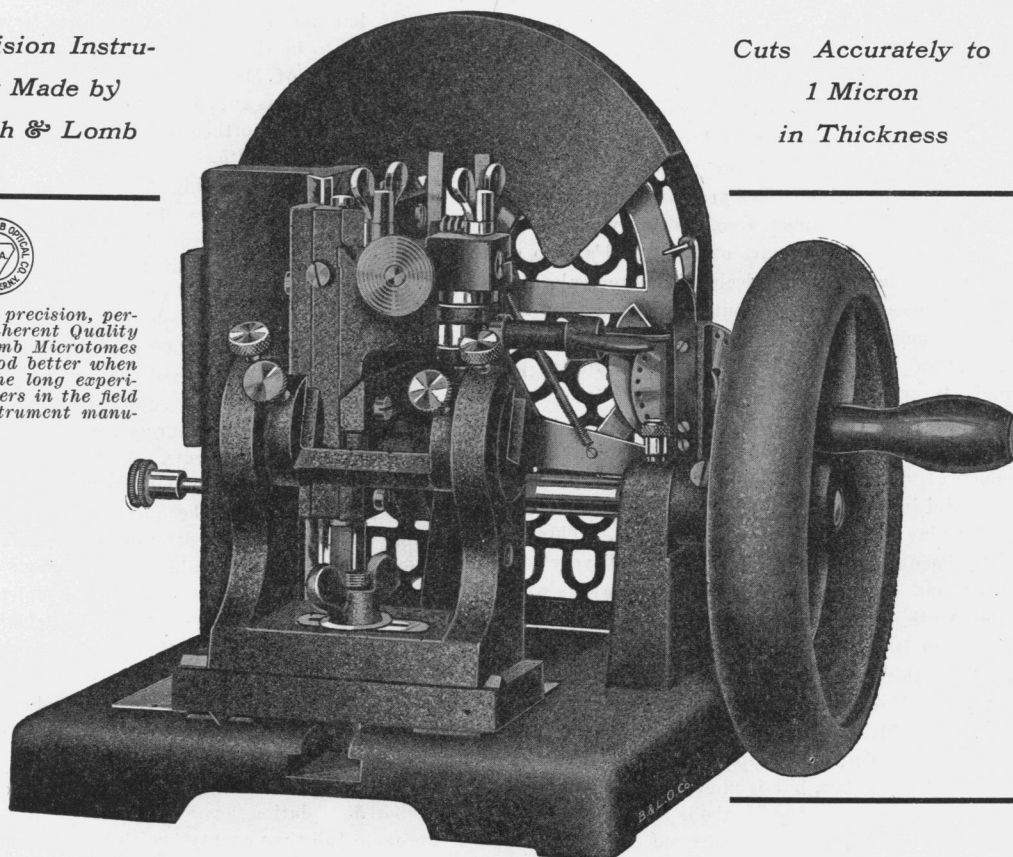
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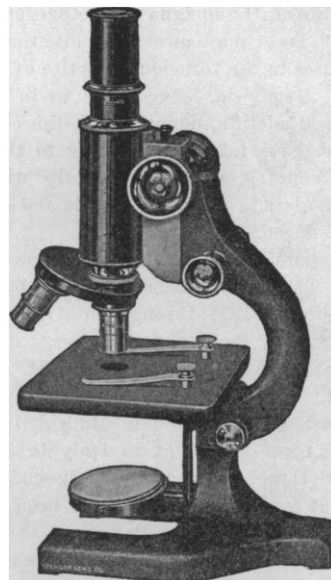
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