that solid hydrogen was probably a metal. We know now that hydrogen is colorless both as solid and as liquid. Consequently the steel blue color was either due to an impurity or was a structural color.

In a paper on "The Coming of Age of the Vacuum Flask" in 1914, Dewar points out that as far back as 1873 a highly exhausted annular metallic vessel was used by him in calorimetric experiments. It was not until 1893, however, that he described the use of glass vessels. During the war the all-metal thermos bottle was developed, thus harking back to the original type.

While one can not fail to be impressed by the brilliancy and versatility of Dewar's work, it is surprising that there is so little in the way of theory. The truth of the matter seems to be that Dewar was what the reviewer has called an accumulator rather than a guesser. He was intensely interested in experimentation and he did not care at all for the theoretical bearing of the experiments. He did a good deal of work on adsorption of gases but he never cared about the laws of adsorption. This appears even more strongly in his work on soap films. The results are fascinating and are veritable triumphs of experimental ingenuity. Bubbles were blown four feet in diameter which lasted several hours; one bubble, 46 cm. in diameter, lasted sixty-three days; and a horizontal black film, 20 cm. in diameter, lasted for a year. Dewar gives all details; but he draws no theoretical conclusions from them and makes no effort to do so.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE GINS METHOD OF DEMONSTRATING CAPSULES OF BACTERIA

WHILE using the Burri India ink method of studying bacteria, especially for demonstrating the various forms of the diphtheria bacillus, the idea occurred of attempting the demonstration of capsules of bacteria through staining of the India ink films. The method was tried with excellent success. Subsequent search of the literature has shown that the method in all its essential details has been described previously by Gins.[1] Since the method has worked out very well in class use and does not appear to be generally known in this country, I am giving the technic for the information of others.

The ordinary India ink sold in this country for drafting purposes can be used for this purpose providing it is free of bacteria. This, however, was not the case in several samples recently purchased, there being large numbers of organisms present. An ink which is prepared especially for the purpose is that of Grübler, known as Pelikan tusche No. 541. This ink probably contains a preservative since bacteria have been absent in the samples examined.

The ink usually works better when it is diluted with an equal amount of sterile distilled water. A drop of the diluted ink is placed near one end of a very clean slide and a loopful of the bacterial suspension is carefully mixed with it. The mixture is then spread across the slide with the edge of a second as when making a blood smear. A properly made preparation should be uniformly spread and of a grayish color rather than black. After drying in the air, the film should be fixed by heating or preferably by dipping in methyl alcohol. The slide may now be stained with any of the ordinary bacteriological stains including the Gram method. If the film is too thick it sometimes loosens after fixation, but properly spread films seldom give any trouble in this respect. A cover-glass may be used to protect the film but such protection is not needed if the slide is carefully handled.

Under the microscope well-stained organisms can be seen lying in lacunae in the film of ink. The margin of the capsule is sharply delineated by the ink, and the margin of the bacterial cell is sharply delineated by the stain. Between the two is a clear space which represents the capsular substance. If the film of ink is too thick, shrinkage of the film may produce separation of the ink from the cell wall, thus giving rise to an artifact which resembles a capsule. When the ink is properly diluted this difficulty has not been met with.

This method has been used successfully in class work using the Friedlander bacillus, the anthrax bacillus and the pneumococcus as test organisms. The anthrax organism shows a thin capsule even in cultures which have been continuously in artificial media for many generations. A similar capsular substance has also been evident in the streptococcus cultures which have been examined by this method. These organisms do not show any evidence of capsular substance when examined by other capsule demonstrating methods and are not capsulated in the ordinary sense of the word. Apparently some sort of intercellular substance exists in all chain-forming organisms and it is this material which is demonstrated by this method.

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[1] Centralbl. f. Bakteriol., Parasitenk. u. Infektionskrankh. Abt. I Orig. 1911, Bd. 57, 477.