Bain has shown that in gelatin and in soaps, and therefore probably in many other if not all lyophilic colloids, *there is no reversal of phases in the formation of a gel*, but merely an aggregation of the colloidal particles—the dispersion medium in the sol is still the dispersion medium in the gel. The conception of a reversal of phases in the process of gelation owes its origin to the earlier supposition that the lyophilic colloids are liquid-liquid, "emulsoid" systems, an idea which is not now held by such chemists as Donnan, Freundlich, McBain and Zsigmondy. One wonders, therefore, how far we dare go in our phase reversal speculations on the mechanism of permeability changes and similar vital phenomena.

The full account of the experimental data here briefly reported will include a discussion of the remarkable behavior of the emulsion with a gelatose emulsifier. This is an emulsion of the oil-in-water type and is reversible, in the *same* direction with the hydroxide of either the bivalent cation Ba or the monovalent cation Na, but not with the salt of either cation. There will also be published data on the possible influence of acidity on phase reversal. That pH value is a factor in phase reversal is apparently true in certain cases, but that it is the determining factor in other cases is certainly not true. H-ion concentration must affect the ability of an emulsion to reverse through acting on the emulsifier—possibly the hydration power of the emulsifier—consequently, the effect of pH will differ in emulsions with different emulsifiers, and this the experiments show to be true.

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ACTIVE HYDROGEN BY THE ACTION OF AN ACID ON A METAL

Evidence for the formation of active hydrogen from its positive ion in an acid has been negative. The reports of the latest workers in this field, Wendt and Landauer[1], show that there are certain difficulties to be met. The main one is to eliminate the moisture that accompanies a rapid evolution of hydrogen and at the same time not destroy the active hydrogen if any were formed. If the gas stream were too low a velocity the active component would decay before reaching the sulfur. Then if the velocity were too high the moisture carried over would form a protecting film on the powdered sulfur and prevent the reaction between the two to form hydrogen sulfide.

During the work on the activation of hydrogen by corona discharge it was found by Wendt and Grubb[2] that active hydrogen combines with pure nitrogen to give ammonia. This method of testing for active hydrogen can be used to good advantage where moisture is carried along with the evolved hydrogen, since the spray does not prevent the contact of active hydrogen and the nitrogen.

If hydrochloric acid or sulfuric acid is dropped upon metallic magnesium suspended in such a way that the metal is at no time immersed or partly covered with any large portion of liquid, the drop of acid can react with the metal in the shortest possible time. This gives off hydrogen very rapidly, in fact, almost explosively, and with a minimum quantity of spray. If this evolved hydrogen is brought in contact with pure nitrogen it is found that ammonia is formed readily. The active hydrogen was then passed through a plug of glass wool before coming in contact with the pure nitrogen. The activity of the hydrogen still persisted as shown by the formation of ammonia. Therefore, the activity of the hydrogen cannot be due to ions or atomic gas. But Langmuir[3] has shown that monatomic hydrogen does not react with nitrogen to form ammonia. In view of this fact, if we allow pure nitrogen to escape at the surface of the magnesium where the hydrogen is evolved we find a maximum quantity of ammonia formed. The amount of ammonia formed increases with an increase in the rate at which the acid is dropped upon the metal. This of course means that the amount of the active component varies with the velocity of the gas stream.

If the acid is dropped on the metal very slowly and the evolved hydrogen passed through glass wool before coming in contact with nitrogen, no ammonia is formed. This indicates that

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[1] Wendt and Landauer, *Jour. Am. Chem. Soc.*, xlii, 930, 1920; *Ibid*, xliv, 510, 1922.

[2] Wendt and Grubb, *Ibid*, xlii, 937, 1920.

[3] Langmuir, *Ibid*, xxxiv, 1324, 1912.

the active hydrogen has reverted to the ordinary before meeting the stream of nitrogen. The life of the active gas seems to be not longer than two minutes. This checks very closely with the life of triatomic hydrogen formed by other methods.

These results seem to substantiate the theory of Wendt and Landauer, namely, that triatomic hydrogen ought to be produced wherever atomic hydrogen is evolved. It is reasonable then to expect that a higher per cent. of active hydrogen would be found in the gas evolved from the surface of the metal than in the molecular hydrogen subject to electronic bombardment in a discharge tube. In the former all the hydrogen evolved goes through the atomic state while in the latter case only a very small amount of atomic gas may exist at one time. The discharge would also destroy some of the active variety.

The preliminary results to determine the per cent. of activation are in harmony with this theory. Further work is in progress to determine the quantitative relations of some of the factors involved.

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SLIDE HOLDERS FOR OVERCOMING A DEFECT IN ATTACHABLE MECHANICAL STAGES[1]

THOSE employing attachable mechanical stages no doubt have encountered, the same as the writer, an unsatisfactory feature in their construction leading to frequent annoyance and delay in examining slides. This relates to the portions of the stage between which the slide is clamped. Instead of resting all but in contact with the stage of the microscope, they frequently lie in a plane sufficiently above the same to permit slides, especially the thinner ones, to become wedged beneath, thus interfering with a free movement of the stage. Stages undoubtedly present a range of variations in this respect. The writer has found the defect present to a certain degree in all stages used by him thus far, belonging to two makes.

The devices or slide holders here described are designed to obviate the difficulty. They are designed for a Spencer stage, but there is no reason why they should not be readily adapted to other makes.

The one shown in Figure 1 was made from No. 20 brass wire. It is a little shorter and somewhat broader than the slide to be carried. The upward projecting loops at *a, b,* and *d* should be tilted inward a little. They serve as supports for the back and right edge of the slide and also prevent the holder from becoming wedged beneath the stage in the same manner as slides. The end of *c* should be bent up very slightly to avoid wedging. The portions of the back of the holder having contact with the mechanical stage should be flattened with a file to give good contact and prevent the holder from slipping up. This holder is very readily made with no more tools than a round and a flat-nosed pair of pliers. The ends of the wire should be joined by being clamped in a thin metal sleeve. The holder should be straightened and made to lie perfectly flat by testing it out on a table or some other plane surface.

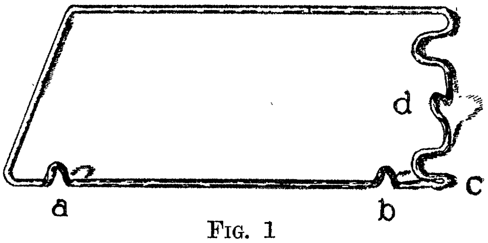

FIG. 1

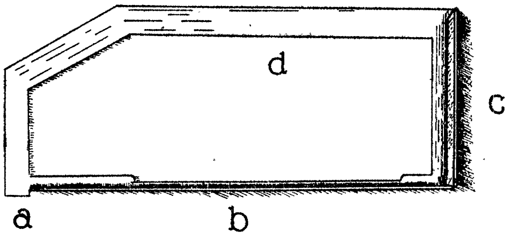

FIG. 2

The design shown in Figure 2 was cut from sheet brass of about the thickness of the above No. 20 wire. Its size is such that the end of the slide is flush with that of the holder and the front edge reaches to *d*. The edges *b* and *c* are first turned up to provide support for the

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[1] From the Department of Animal Pathology of the Rockefeller Institute for Medical Research, Princeton, New Jersey.