When the mirror is standing across a given curve, and is normal to it, there will be no break between the curve and its image at the foot of the mirror; any deviation from the normal will cause a noticeable break. Obviously, then, the line ab will be parallel to the tangent at that point, and the numerical value of the tangent can be obtained from its intersection with the abscissas and ordinates of the paper on which the graph is plotted. This calculation is much simplified if ab is made of such length that ten or one hundred units can be used as one of the ordinates in calculating the tangent.

It is well to caution the novice that the curve must be drawn *very* smoothly or false tangents will result. With a little practise, considerable accuracy can be attained in the use of this instrument.

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The Influence of Intensive Drying on Inner Equilibria.—In relation to the publication of G. N. Lewis[1] concerning Baker's drying experiments, I will state here to prevent confusion that I had already discussed the problem in detail and published in the early part of 1922 an explanation corresponding exactly to that later published by Professor Lewis.

This explanation in its original form,[2] stated that by intensive drying the inner transformations in a unary phase are stopped and consequently the inner equilibrium is fixed and a mixture is obtained which, on distillation, generally gives a distillate with a lower boiling point and a residue with a higher boiling point than that of the original liquid. Further, it was concluded that the boiling points observed by Baker were abnormally high because the liquid mixture, before reaching the boiling point, had already partly evaporated.

After the publication of Baker's later investigations on the properties of extremely dry liquids[3] the author discussed these results in a chapter of his book "Theory of Allotropy" and considered, in view of these new experiments, whether the original explanation set forth above might be regarded as adequate, or should be supplemented by the assumption that the inner equilibrium is first displaced and then fixed. The conclusion arrived at was that for the purpose of providing a general explanation the original form should be supplemented by the assumption that, by the drying process, the inner equilibrium can be displaced—an assumption which is not in contradiction with thermodynamic considerations.

Moreover, the best way of answering the question as to what actually

[1] Lewis, THIS JOURNAL, 45, 2836 (1923).

[2] Z. physik. Chem., 100, 477 (1922).

[3] Baker, J. Chem. Soc., 121, 568 (1922).

occurs during intensive drying was indicated, namely, by the determination of the vapor pressure, at the drying temperature, since a difference between the drying temperature and the temperature at which the vapor tension is measured, might have significance.

After this explanation of the behavior of an intensively dried liquid as a mixture had actually been verified,[4] Lewis' paper appeared, in which an explanation of Baker's observations is offered corresponding exactly with that which I had originally given. Lewis, however, makes no reference in his paper to my previously published explanation, either in the earlier or later form.

Although I have just published[5] a more detailed article on this point, it appears advisable to give here also a short statement of the results obtained. A year ago I and my assistants began experiments to determine whether the drying process is a fixation of the inner equilibrium or a displacement of the inner equilibrium, followed by a fixation, and probably these experiments will soon yield a solution to the problem. Furthermore, we have begun an extensive investigation of the influence of intensive drying on other properties of a large number of substances. Of these substances sulfur trioxide has already given most interesting results, behaving completely as a mixture, so that it has been possible to determine an important part of the pseudo-system.

Again, it had seemed to me that pure, freshly distilled phosphorus pentoxide, perhaps the dryest of all substances, would therefore be expected to be an extremely interesting material to study more closely. Accordingly, it was investigated, with the result that it confirmed completely my expectations of it, behaving very distinctly as a mixture over a wide range of temperature.

The first parts of the detailed reports of our work on these two substances, sulfur trioxide and phosphorus pentoxide, will appear shortly in the *Journal of the Chemical Society.*

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Moving Boundaries and the Phase Rule.—In a recent article[1] J. A. Beattie derived the phase rule as it applies to the equilibrium state of a system containing N components, P phases and S surfaces at which electric potentials exist. The equation is

$$F = N - P + S + 2 \tag{1}$$

[4] *Ann. Rep.*, **19**, 36 (1922).

[5] Smits, *J. Chem. Soc.*, **125**, 1068 (1924).

[1] Beattie, THIS JOURNAL, **46**, 2211 (1924).