For any liquid, the absolute temperature T of the boiling under a pressure of p atmospheres is determined by the same general law slightly specialized as follows:—

$$T = Y_1 + Y_2 \quad . \quad . \quad . \quad . \quad (4)$$

where

$$Y_1 = K_1[1 \cdot 4 + \log p] \quad . \quad . \quad . \quad . \quad (5)$$

and

$$Y_2 = K_2[\log \pi - \log p]^2 \quad . \quad . \quad . \quad . \quad (6)$$

The logarithmic limits of all liquids intersect in the same absolute zero point determined by $T = 0 = -273°$ C. and $\log p = -1 \cdot 4$. For each individual liquid this limit extends upwards to the critical point of the liquid, $p = \pi$ and $T = \theta$. For many liquids the critical point can be theoretically calculated, as well as the value of the parameter. It is understood

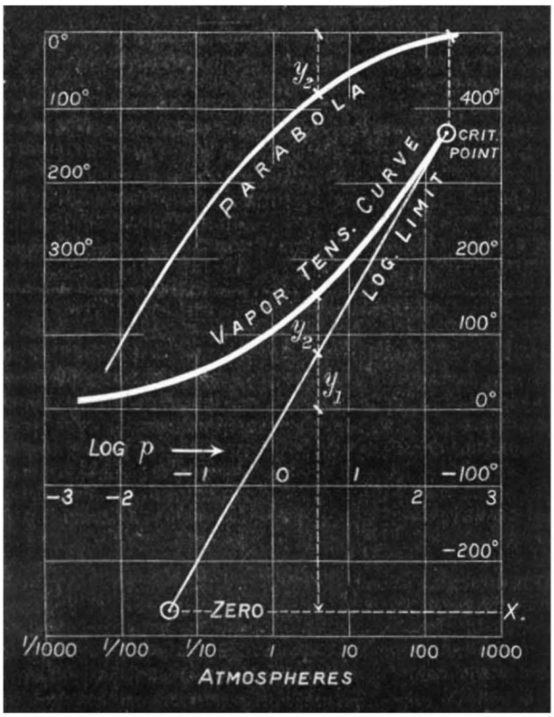

FIG. 2.

that the parabolic curve is tangent to the logarithmic limit at the critical point.

It hardly needs to be said that the tension of dissociation, and even the solubility of solids, are subject to the same general law.

The fusing points are obtained by simply changing the sign in (1) to

$$t = y_1 - y_2 \quad . \quad . \quad . \quad . \quad (7)$$

so that the parabolic curve will be placed below the logarithmic limit.

One of the most remarkable results of this research is the mechanical determination of the true position of the carbon atoms in organic serials, and the complete explanation of the difference in fusing point between compounds containing an even and odd number of carbon atoms.

It should also be understood that the change in fusing point produced by change in pressure is expressed by the same general law.

Putting $\log a = x$, $\log p = z$, and $\log \alpha = \xi$, $\log \pi = \zeta$, the formulæ (1) to (7) will become

$$t = y_1 \pm y_2, \quad y_1 = k_1(x - \xi), \quad y_2 = k_2(\xi_2 - x)^2 \; . \; (8)$$
$$T = Y_1 + Y_2, \quad Y_1 = K_1(z - \zeta), \quad Y_2 = K_2(\zeta_2 - z)^2 \; . \; (9)$$

These formulæ strikingly show the simplicity of the laws stated, and also determine the surfaces formed by the co-ordinates x, t, and y in general.

In subsequent notes special topics covered by this general law will be taken up, and the complete concordance of the law with the results of observations will be shown.

Porpoises in African Rivers.

IN reference to Mr. Sclater's letter in NATURE of June 11 (p. 124), the following may be interesting to your readers:—

The skull of a Delphinoid Cetacean from Cameroon has lately come into my hands, through the kindness of Prof. Pechnel-Loesche. The sender, Mr. Edward Tëusz, gave the following information concerning it. The animal to which it belonged was caught in Kriegschiff Bay, after very heavy rains, and was being devoured by sharks. The contents of the stomach consisted of grass, weeds, and mangrove fruits. None of the natives had ever seen the animal before. In preparing the skull, Mr. Edward Tëusz noticed that the nostrils projected above the surface of the forehead.

I am preparing for publication a detailed description of the skull, and must here confine myself to remarking that, though the animal belongs to the genus Sotalia, it differs in several essential points from all the species of that genus hitherto described. I have no doubt that it is a new species. There are twenty-seven teeth on each side in each jaw. Their form, in that they are not pointed, but worn down, indicates, as also do the contents of the stomach, that the animal is herbivorous. It therefore seems certain that it is a fresh-water animal. It is well known that other Sotalia live in rivers.

Jena, June 20. WILLY KÜKENTHAL.

PHYSICAL SCIENCE FOR ARTISTS.[1]

I.

I THINK it right that I should begin by explaining how it is that I am here to-day, to lecture to you on a subject which touches art as well as science. It happens in this wise. Some years ago, while studying a certain branch of optics, it became important for me to try to learn something of the exact sequence of colours at sunrise and sunset; and being, like you, busy all day in a large city, I thought it would not be a bad idea, and that it would save a little time, if I studied pictures representing these phenomena *en attendant* the happy holiday time that I should spend in the country. So I went to the Academy and other picture galleries, and endeavoured to get up the information from pictures which I could not at that time get from Nature herself. I then had, as I have still, such an extreme respect for art and artists that I was perfectly prepared to take the pictures as representing truthfully what I wanted to see. The result, however, brought me face to face with a difficulty that I was not long in finding out. I was driven to the conclusion that artists could be divided into two distinct classes—those who studied Nature and Nature's laws, and gave us most exquisite renderings of this or that, and those who apparently considered themselves far superior to any such confining conditions as would be imposed by any law; and that, unfortunately, made me a little doubtful as to the results.

My friend, and your friend, Dr. Russell, happens to know this little bit of my experience, and hence it doubtless is that he requested me to come down to-day to say a few words to you, his plea being that this College is one of the very few institutions of its kind in the world where there is a studio and a physical laboratory side by side.

That, then, is the reason I am here, and what I want to impress upon you to-day is that the highest art can only be produced by those who associate the study of physical science with the study of art, and that therefore the possible producers of the highest art can only be looked for in such an institution as this if training of any kind has anything to do with it.

[1] A Lecture delivered at Bedford College, by J. Norman Lockyer, F.R.S., on June 10, 1891.