chlorbenzol–air, and calculations for h/k given in Table 1 show that this ratio is in all cases substantially equal to the humid heat of the entering gas, which in this case was identical with the specific heat because the gas which was used was vapor free.

Table 1. *Values of h/k for various vapor–gas mixtures*

	h/k calculated from experimental results	Specific heat of gas
Water–air	0·236	0·238
Water–carbon dioxide	0·217	0·220
Toluol–air	0·238	0·238
Chlorbenzol–air	0·248	0·238

We have therefore demonstrated that, granting substantial constancy of s and r_w, and assuming H to be small, the ratio of the coefficient of diffusion of heat to that of any vapor through the gas film on the surface of the liquid is equal to the "humid" heat of the gas. Furthermore, during "adiabatic"[1] evaporation of a liquid into a gas, the liquid being in dynamic equilibrium with the gas the temperature of the liquid remains unchanged throughout the process and the end-point of the process is reached when the gas has cooled itself to saturation at a temperature identical with that of an ordinary wet-bulb thermometer.[2]

IMPORTANCE OF THE RELATIONSHIP $h/k = s$

The importance of the relationship $h/k = s$ is very great. The term s, the humid heat, may be readily calculated for any case regardless of whether the problem is primarily one of heat transfer or of diffusion. Hence if the heat-transfer coefficient h has been experimentally determined for a certain type of apparatus operating under definite conditions, the coefficient of diffusion equals h/s, and the capacity of this same apparatus may be predicted when functioning in diffusion processes, e.g. as a gas scrubber. Conversely, if k and s are known for definite conditions, h equals ks; in other words, one can predict the performance of a given apparatus for heat transfer from data upon the same equipment functioning as a scrubber.

These processes of diffusion of heat and of vapor are at the basis of the performance of all such equipment as humidifiers, dehumidifiers, water coolers, gas scrubbers, air driers, light oil stripping columns, and the like. The above relationships make it possible to study the performance of such equipment on a more rational basis than hitherto and to compare the effectiveness of different types of equipment even when the data on the individual types are obtained under widely varying conditions. The Department of Chemical Engineering, Massachusetts Institute of Technology, expects to publish in the near future a series of articles showing various applications of these relations.*

1. W. H. Carrier, Journal Am.Soc.M.E., 1912, p. 1321.
2. *Ibid.*

* *Editor's footnote:* It was in one these, namely *Mech. Engng* vol. 55 (1933), p. 567, that Lewis himself pointed out the fallacy in the argument of his 1922 paper. Before turning to the later paper for confirmation, readers might like to make up their own minds about where the fallacy lies.

ERRATA

H. L. Evans: Mass transfer through laminar boundary layers—6. Methods of evaluating the wall gradient (b_0'/B) for similar solutions; some new values for zero main-stream pressure gradient, *Int. J. Heat Mass Transfer*, **3**, No. 4, 321–339 (1961).

The following corrections should be made to formulae—

(a) Equation (25) should read:

$$e = \frac{\beta}{f_0^4} \tag{25}$$

(b) The penultimate term of equation (33) should read:

$$-5775e^3$$

(c) Equation (54) should read:

$$\frac{v_0 \Delta_2}{K} = \frac{1}{(1/\sigma f_0^2) - (1 + \sigma)} \tag{54}$$