availability which identifies the quantities and forces that operate.

Further inspection of Fick's law reveals that the change in diffusivity with temperature is only partly (about 0.3% per degree near 20° C) explained by the proportionality with absolute temperature (T). The major influence must be associated with changes in frictional resistance (f) of the medium with temperature.

The above comments will serve to emphasize that the tension concept is not useful when one is concerned with diffusion within the liquid phase. Concentration units should be used in such situations, and if one wishes to account for changes in diffusivity the product Concentration × Diffusivity will provide the desired index.

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Treatment of Mouse-Passaged Dengue Virus (Mochizuki-strain) with Protamine Sulfate

IT has been reported that certain viruses are precipitated by adding protamine sulfate to the crude suspensions (*1–3*), and that many species of virus fall into two groups, with few exceptions, i.e., those protamine-precipitated, of larger size, and those protamine-non-precipitated, of smaller size (*3*). Nakagawa (*4*) reported his results of the application of protamine to the Hawaiian strain dengue virus isolated by Sabin and Schlesinger (*5*). The author also, independently of Nakagawa, conducted experiments on the protamine treatment of the mouse-passaged Mochizuki-strain dengue virus (*6*).

From mice moribund after an intracerebral infection of dengue virus, the brains were removed and ground into a 20% emulsion with distilled water.[1] The emulsion was centrifuged at 3,000 rpm for 15 min, and the supernatant fluid taken out was the original virus suspension. Protamine sulfate (clupeine, powdered)[2] was added to the virus suspension at the ratio of 5 mg/ml. The mixture, containing flocculates formed, was set at 0° C for 24 hr, then centrifuged at 3,000 rpm for 60 min. The supernatant thus obtained was slightly opaque fluid. Virus concentrations of the original suspensions as well as the supernatant were measured by an ordinary ten-fold titration in mouse brain. Additionally, the nitrogen amounts of these materials were determined by the micro-Kjehldahl method.

TABLE 1

VIRAL CONCENTRATIONS AND NITROGEN AMOUNTS OF PROTAMINE-TREATED MATERIALS

Expt. No.	Crude suspensions		Protamine supernatants	
	LD50* (L_{50}g)	Nitrogen (mg/ml)	LD50* (Log)	Nitrogen† (mg/ml)
I	5.7	1.512	5.7	1.028
II	6.0	1.538	5.9	1.176
III	6.0	1.521	6.0	1.085

* By the Reed-Muench method (7).
† Containing the excess of protamine.

[1] Adjusted to be pH 7.0 with sodium bicarbonate.
[2] Prepared by the Kossel method at Kyoto University Department of Biochemistry.

Results obtained are summarized in Table 1, and indicate that (1) dengue virus remains abundantly in the protamine-supernatants, (2) therefore, it can be included in the Warren's "protamine-non-precipitated" group of viruses (*3*).

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[3] The author wishes to express his gratitude to Professor Ren Kimura, director of the Institute, for helpful advice in the experimentation. He is also indebted to Mr. Atsushi Sugii and Miss Miyo Sasaki for their technical assistance.

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Evidence for the Nonexistence of a New Highly Penetrating Component of the Solar Radiation

IN 1941, M. Takata and T. Murasugi (*Bioklim. Beiblätter der Meteorologischen Zeitschrift*, 8, 17–26, [1941]) had described a very surprising discovery. These Japanese authors had found that the amount of $HgCl_2$ solution which has to be added to produce protein flocculation in diluted human blood serum varies approximately 10 to 15% dependent upon whether the blood, from which the serum is prepared, is taken from the vein some minutes before or some minutes after the sunrise. It was particularly interesting that this effect (called by Takata the "cosmoterrestrical effect") is noted only if the person is electrically insulated from ground during the taking of blood. Furthermore, the effect is also present in the same intensity, if the person is in a deep cellar room protected from any solar radiation by thick layers of earth and concrete. So, it seemed that a very penetrating and, before Takata's work, absolutely unknown component of solar radiation was found for which only the biochemical test of Takata, but no known physical experiment, gave evidence. Because of the highly interesting physical aspect of the findings

of Takata, the experiments of Takata were repeated on a very large scale by the author and his co-workers during the period from autumn 1950 to spring 1952. The original Takata technique was considerably improved by the introduction of a new and more sensitive method of detecting the initial flocculation. Conductivity measurements were made instead of visual observation of the appearance of the flocculae, used by Takata. After having eliminated some preliminary sources of error, no "cosmoterrestrical Takata effect" could be found at all in more than 100 sunrise experiments despite the fact that decidedly more sensitive measurements were made than had been made by Takata. Also another effect described by Takata, the influence of electrically charging the person from whom the blood was to be taken on the protein liability, could in no way be verified, although, once again the sensitivity of measurement was higher than in Takata's experiments. Other properties of the human blood were experimentally investigated; namely, the pH value of the streaming blood, the blood cell sedimentation constant, the prothrombin amount of the blood and the albumin/globulin ratio of the blood (by electrophoresis). In no experiment was it possible to detect, in even the slightest degree, an effect of the sunrise. Finally, an experiment was performed to determine whether a slight change in the electrical charge of an insluated human being could be detected, by direct electrical measurements, during the sunrise. No such effect was present. All these experiments, performed with high precision, having produced only negative results so far as the effect of sunrise is concerned, support the conclusion that the "cosmoterrestrical Takata effect" is not present at all. The results of Takata and Murasugi were caused by either systematic errors or psychological illusions involved in the original, rather inaccurate, technique of Takata.

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CORRECTION: In the paper by Evans that appeared on page 718, SCIENCE, June 26, the spelling of "Bromsulfalein" should be corrected to read "Bromosulfalein," which is the chemical name of a dye that can also be obtained commercially under the capitalized trade-mark "Bromsulphalein." Correct identification of the substance is important in all discussions of its use, including the recent one.

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Book Reviews

Crime Investigation: Physical Evidence and the Police Laboratory. Paul L. Kirk. New York–London: Interscience, 1953. 784 pp. Illus. $10.00.

Dr. Kirk's avowed intention that this book should serve the "needs of police investigators, general criminalists in the small police laboratories, and students of criminalistics and police science" appears to be too broad. The needs of these groups are not identical or even nearly so. The police investigator is by far the largest of the three groups and is in itself a "specialty" not closely allied to the worker in the small laboratory or the student.

It is not believed that the book has strong appeal for the investigator whose requirements are best served by acquainting him with the possibilities that scientific evidence has to offer. It may be assumed that a more detailed listing of the scientific possibilities never hurts him, but it should be noted that memory is a fickle matter and people tend to remember "wholes" in reference to parts. Too much emphasis on the "parts" in learning often results in a lack of recognition of the "wholes." This, in my opinion, is the error of this book as applied to the "needs of the investigator."

There are many statements that will meet with disagreement by other workers in the field. Such statements and, in some cases, implications might lead the reader to believe that the uncommon becomes the routine. The author states that

From an examination of a glove found at the scene, the following inferences were drawn: (a) The culprit was a laborer associated with building construction. (b) His main occupation was pushing a wheelbarrow. (c) He lived outside the town proper on a small farm or garden plot. (d) He was a southern European. (e) He raised chickens and kept a cow or horse.

The untrained reader may conclude from the above that such inferential reasoning should persist in all cases, and when the police laboratory fails to provide a full description of the criminal in all instances, regardless of the evidence submitted, confidence in scientific crime investigation falters. In criminal investigation, the identification and examination of blood stains is important but usually difficult because of contamination and other factors. Yet the author suggests that "Examination of blood stains may yield information on the presence or absence of syphilis in the donor." Inclusion of the phrase "in the donor" implies fresh liquid blood. The determination of syphilis in fresh blood specimens is a routine examination, but since the heading is "Blood Stains," we presume the author implies that syphilis can be detected from an examination of the stain. Serologists with whom I have discussed the feasibility of testing blood stains for syphilitic bodies hold no claim for positive accuracy. In this procedure, in fact, they all advise against such examinations.

Such points of controversy can be easily recognized