Letters to the Editor

Pectin Intravenously

In his communication under the above title Hueper (*Science*, 1945, 102, 233) commented on our note, "Uronic acids in animal bodies" (*Science*, 1945, 101, 670). We believe he may have overlooked our intent, which was to emphasize the importance, wherever practicable in future biological studies, of differentiating between glucuronic and galacturonic acids rather than masking probably galacturonic values under the designation glucuronic acid.

We suggest that those interested in the use of intravenous pectin should read carefully the complete articles referred to by Hueper as well as others which have appeared in medical literature. Because of space limitations neither our note nor Hueper's could treat this subject adequately.

W. E. Baier, E. F. Bryant, G. H. Joseph, and G. H. Palmer

Research Department
California Fruit Growers Exchange, Ontario, California

Genetical Studies of the Sesame Flower

A preliminary study of the flower of sesame (*Sesamum indicum* L.) has revealed 33 morphological and 30 color differences among the many varieties and hybrids in the collection of this department. The mode of inheritance of 24 of these basic flower types has been determined, showing simple segregations, modifying factors, complementary factors, multiple alleles, duplicate factors, and five cases of linkage (the first to be described in sesame).

Of particular interest is a type with all five lobes of the corolla completely separated, in contrast to the usual tubular form. Some of the other characters include the colors yellow, red, and purple in different intensities and distributions fused anthers, tuft of hair, double flower, double lip, elongated cells in the foveola, and glabrous.

These flower differences, in addition to supplying a wealth of material for determining the linkages of numerous other characters previously reported (D. G. Langham and Maximo Rodriguez. *Boletin No. 2, Instituto Exp. Agric.*, Caracas, Venezuela, June, 1945) and in study, may be extremely useful in a study of the geographic distribution of sesame with special reference to its place of origin.

D. G. Langham

Instituto Experimental de Agricultura
Caracas, Venezuela

A Possible Source of Atmospheric N_2O

The existence of nitrous oxide (N_2O) in the earth's atmosphere has been established by the discovery and analysis of an absorption band at 7.77 μ in the solar spectrum (A. Adel. *Astrophys. J.*, 1939, 90, 627; 1941, 93, 509). The origin of this gas in the atmosphere is still in doubt, for its presence is not readily explained by the photochemistry of the air. It is the intention, in what follows, to call attention to an apparently plausible and interesting means of accounting for the phenomenon.

In recent examinations of soil air for hydrocarbon content, M. W. Kriegel, of the Carter Oil Company, Tulsa, Oklahoma, has found a hitherto unreported component; and on the basis of careful investigation of its properties, he suggests that the gas is very probably nitrous oxide (*Geophys.*, 1944, 9, 447–462). Kriegel points out that "nitrous oxide in the soil is not surprising when it is remembered that the element nitrogen in the form of ammonium salts, nitrites or nitrates is present in fertile soils; and that one method of preparation of pure Nitrous Oxide is according to the equation:

$$NH_4NO_3 = N_2O + 2\,H_2O$$

It is also probable that the slow decomposition of commercial fertilizers might account for some of the Nitrous Oxide in farming areas. In connection with the studies of decomposition of vegetation under aerobic conditions, it has been shown by this laboratory that a gas having properties similar to Nitrous Oxide forms a large portion of the condensed fraction."

If, as appears to be the case, it is indeed true that soil air contains N_2O, is it not reasonable to assume escaping soil air to be one source—perhaps the principal one—of the atmospheric nitrous oxide layer?

Arthur Adel

Randall Laboratory of Physics, University of Michigan

The Function of Psychology

These remarks are suggested by reading the article by Captain Jenkins (*Science*, 1946, 103, 33–38), which seems to me too diffuse.

In a certain sense, it may be claimed that psychology is the most important of all sciences, since the future of the human race, and even its existence, depends on the actions of people, and those actions depend on their knowledge and beliefs.

I find myself with certain opinions, including opinions about psychologists. How did I come by them? Partly as the result of teaching, partly from direct experience. Owing to various inventions, such as those of the telescope and microscope, I find myself able to be directly aware of many phenomena which would be imperceptible to my unaided senses. This extension of the senses has been so remarkable in recent years that the range of direct observation or experience has been enormously extended. But a single mind cannot compass all these things, and for the most part I have to depend upon others to see what I might have seen, to hear what I might have heard.

Thus, at the beginning of the century the age of the various geological strata was carefully estimated by com-

petent geologists, but the physicists were presently able to give convincing reasons for increasing these estimates about tenfold, and these results have been meekly accepted by the geologists and biologists. Superimposed, or perhaps I should say underlying, all these observations, direct and indirect—the material of science—is the body of overbeliefs, resulting from tradition, and fed by the emotions. We cannot escape from these, or abandon our sense of human values. A great dilemma of modern life results from the fact that some or many of the ancient beliefs do not accord with the findings of science, and people live, as it were, in two worlds, one of practical realities, and one of the emotions. The reconciliation of these discrepancies is one of the great tasks for the future. What have the psychologists to say about this? What has science to say about it? What is the verdict of religion?

The great tasks of education are twofold: to educate the mind, or the senses, so that the findings of science may be available to all, not as rigid dogma but as reasonable approximation to truth, certain to be largely extended and modified in the future; to educate the feelings, the social senses, so that the welfare of all mankind becomes in a measure that of every individual, the happiness of all the happiness of each.

T. D. A. COCKERELL

Box 411, Palm Springs, California

Water Loss From the Respiratory Tract in the Subtropics

The interpretation of Dr. Burch's valuable data (*Science*, 1945, 102, 619–620) on water loss from lungs, in so far as this is a function of the temperature and humidity of the inspired air, would be facilitated, I believe, had he used values of humidity in terms of physiological saturation deficit rather than of relative humidity. Physiological saturation deficit, a term I am now inventing or reinventing, is the difference between the absolute humidity of the air and what the absolute humidity would be at saturation at body temperature. Since it would be impossible for the lungs to evaporate any moisture into air already saturated at body temperature, the PSD represents the opportunity for evaporation from the lungs.

I have derived the PSD's for the temperature and humidity conditions presented by Dr. Burch, with the following results. It is convenient to work in terms of the deficit of the vapor pressure of the air relative to that at saturation at body temperature, 6.2 mb. The PSD's for the conditions under which most of the measurements were made (20.0 to 21.1° C. and rel. hum. 55 to 60 per cent) were 4.7 to 4.9 mb. The PSD for the cool, foggy air (15° C., 97 per cent rel. hum.) was 4.6 mb, and of cool, dry room air (15° C., 60 per cent rel. hum.) 5.2 mb. Since these humidity conditions differ by only 4 to 8 per cent from the standard test conditions it is natural that they influenced the rate of water loss relatively little.

The hot dry air (50° C., 18 per cent rel. hum.), though its PSD was, at 4.0, less than under the standard conditions, increased the rate of water loss. Perhaps this was owing to increased heart action and respiration to be expected in such a high temperature, for the expired air had a PSD of 1.0 mb, or 3.0 mb lower than the inhaled air, which was the same as the reduction in PSD from the 4.7 to 4.9 of inspired air to the 1.7 mean of exhaled air in the general test. The hot moist air (50° C., 49 per cent rel. hum.), with a PSD of only 0.2, naturally, reduced the rate of water loss considerably. Indeed, it appears, from the fact that the expired air (at 39.4° C. and 74 per cent rel. hum.) had a PSD of 1.0 mb, that there was condensation of vapor in the body!

CHARLES F. BROOKS

Blue Hill Meteorological Observatory
Harvard University

Rediscovery in the Vitamin A Field

It is becoming increasingly troublesome to verify whether or not one has made a discovery, or merely a rediscovery. However, if the matter seems worth publishing, courtesy surely demands the admission that no thorough literature search has been made when this is so.

According to recent communications to this journal (*Science*, 1945, **101**, 585; **102**, 158) the blue colour developed on treating vitamin A with various acid earths has been independently discovered three times, by Lowman, by Meunier, and by Emmerie and Engels. [For references, see *Science*, 1946, **103**, 175.] It is possible to add a fourth and probably the original discoverer to the list, namely Takahashi (K. Takahashi and K. Kawakami. *J. chem. Soc. Japan*, 1923, **44**, 590), who published the observation no less than 16 years before the earliest reference previously quoted.

Similarly, the fact that the greater part of the vitamin A of fish-liver oils is present as fatty acid esters has been independently discovered at least three times. K. Hickman (*Ind. eng. Chem.*, 1937, **29**, 1107) confirmed the observation by analytical molecular distillation but referred to no earlier work. In a recent paper from the same laboratories (H. Koscher and J. Barter. *Ind. eng. Chem.* (Anal. ed.), 1945, **17**, 499), priority is accorded to L. Reti (*C.R. soc. Biol.*, 1935, **120**, 577), who used partition methods. The original observation, also using partition, was published by A. L. Bacharach and myself seven years earlier (*Quart. J. Pharm.*, 1928, **1**, 539).

E. LESTER SMITH

Glaxo Laboratories, Ltd.
Greenford, Middlesex, England

Freedom of Science in Soviet Union

We followed with great interest the exchange of views between Dr. Karl Sax, of Harvard University (*Science*, 1944, **99**, 298–299; 1945, **102**, 649) and Dr. Anton R. Zhebrak of Timiriazev Agricultural Academy, USSR (*Science*, 1945, **102**, 357–358).

K. Sax wisely leaves unchallenged some purely political questions raised by A. Zhebrak. If a one-party state with a system of election when the population has