One would think that the intent of the law was obvious and reasonable. The Coast Guard, however, has interpreted these words as granting it power to deny licenses to applicants on political grounds. The Commandant of the Coast Guard has stated that

> The Attorney General of the United States publicly listed certain organizations, etc., which are believed to be subversive or disloyal to the interests of the United States, and in cases where I am possessed of information to justify the belief that an applicant is a member of, affiliated with or sympathetic to the principles of such organizations, I do not consider such applicants to be safe and suitable persons to be licensed under the provisions of Public Law 525.

The Coast Guard has recently denied licenses to scores of radio operators, most of whom served with distinction during the last war and most of whom have been active in the radio operators' trade unions. This assumed, broad power to deny licenses to persons who are alleged to be "sympathetic to the principles" of any organization on the Attorney General's "subversive list" has been applied without granting to the applicants any hearing or even any report as to the source of the Coast Guard's information.

It will be noted that in the past, the government has contended that the Attorney General's "subversive list" was intended merely to govern the qualifications of government employees; it was urged in defense of the promulgation of the list that the government had the right to apply any kind of test to its own employees. The position now taken by the Coast Guard is, of course, a vast extension of that doctrine. It would permit the application of political tests by any public authority granting licenses in many spheres of private employment. The governmental licensing system necessary for the public health and welfare could (on arbitrary grounds chosen by the authorities) now be misused to disqualify doctors, dentists, lawyers, engineers, barbers, veterinarians, nurses, midwives, insurance and real estate agents, or taxi drivers. The list is much wider and could cover any work that is regularly licensed, including many technical and scientific professions.

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The Toxicity of Ammonia

Recently F. C. Schmidt and D. Vallencourt (*Science*, 1948, **108**, 555) reported that when human subjects inhaled air containing ammonia gas their blood ammonia reached a level of 36.4 mg N/100 ml of blood. This appears impossible. H. Tauber and I. S. Kleiner (*J. biol. Chem.*, 1931, **92**, 177) reported that the ammonia nitrogen level of rabbit's blood shortly before death from ammonium carbonate poisoning was 2–3.5 mg/100 ml of blood. In their investigation of antiurease formation, J. S. Kirk and J. B. Sumner (*J. biol. Chem.*, 1931, **94**, 21) found that, in rabbits injected with urease, death is caused by the formation of ammonia. They believed that the poisoning was due to the ammonia itself rather than to an alteration in the pH of the blood.

I have carried out numerous experiments with white rats and find that when ammonium citrate is injected intraperitoneally the animals die at an ammonia nitrogen level of 8–11 mg N/100 ml of blood. When crystalline urease is injected, death occurs at the same level.

I wish to thank the Rockefeller Foundation for financial assistance and Prof. J. B. Sumner for his interest in this study.

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Hydrostatic Pressure Reversal of Narcosis in Tadpoles[1]

Under physiological conditions the narcosis of bacterial luminescence by alcohol, urethane, and certain other drugs may be virtually abolished by an increase in hydrostatic pressure (Johnson, F. H., Brown, Dugald, and Marsland, Douglas. *Science*, 1942, **95**, 200). Experiments reported herein show that a similar relationship occurs in higher animals, viz., tadpoles of *Rana sylvatica*.

Young larvae, measuring 15–18 mm in total length, were placed in 3%–6% alcohol in tap water at room temperture, 22°–26° C. Both spontaneous activity and response to gentle mechanical stimuli ceased in a few minutes. The narcotized animals were transferred to a steel pressure chamber with Herculite plate glass windows which afforded an adequate view of the interior. The chamber was filled with the same narcotic solution, and pressure was applied from a connecting hydraulic pump. Pressures up to 1,000 psi had no apparent effect, but higher pressures, between 2,000 and 5,000 psi, varying somewhat in repeated experiments with different groups of individuals, caused reappearance of spontaneous activity almost immediately with rise in pressure, and the animals swam about in apparently normal manner. In luminous bacteria at optimum temperature, 3% alcohol causes about 50% inhibition of luminescence intensity, which is largely reversed under 5,000 psi.

Similar results were obtained with tadpoles narcotized in 0.08 M urethane; this inhibition of luminescence is likewise reversed by pressures of the same magnitude.

In contrast, pressure did not reverse the narcosis of tadpoles in 0.001 M *n*-amyl carbamate. This result again corresponds to those obtained in current studies with luminous bacteria which indicate that the inhibition of luminescence by *n*-amyl carbamate, in approximately the same concentration, is scarcely affected by pressure.

Unnarcotized tadpoles became more active under 2,000 psi, but less active with further rise in pressure, and motionless at 5,000 psi. Other aquatic animals have been observed to behave similarly, and pressure itself has been

[1] This report is based on studies aided in part by a grant from the American Cancer Society, through the Committee on Growth of the National Research Council, and in part by an institutional grant to the Department of Biology, from the New Jersey Section of the American Cancer Society, for fundamental biological research.

viewed as a narcotic (Ebbecke, *Pflüg. Arch. ges. Physiol.*, 1935, **236**, 648). In our experiments the reversal of drug narcosis was always manifested before harmful effects of pressure became apparent. Following compression at 5,000 psi, gradual recovery in tap water at normal pressure often occurred, but some of the individuals died. Narcotized animals that were not subjected to pressure always recovered after transfer to tap water.

The basic mechanism through which temperature, pressure, and various drugs act on luminescence has been considered at some length (reviewed by Johnson, *Adv. Enzymol.*, 1947, **7**, 215). Heretofore, there has been no direct evidence that the same theory, specifically with reference to the influence of hydrostatic pressure on narcosis, applies in higher organisms, although other parallels have been found with reference to the influence of temperature. These relations support the general implications of the fundamental theory, and invite further study with various aquatic animals and narcotic agents.

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Erratum

In my recent paper "Concerning the Theory of Photoconductivity in Infrared-sensitive Semiconducting Films" (*Science*, 1950, **111**) page 685, line 7, column 2, should read ". . . to essentially pictures (1) or (2). . . ." rather than ". . . pictures (*10*) or (*5*). . . ." On page 687, line 5, column, 1, the words "fixed," "positive," and "electrons" should be deleted.

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Pancreatic Changes after Injection of Intermediary Fat Metabolites

It has already been reported (Nath, M. C., and Brahmachari, H. D. *Nature*, Lond., 1944, **154**, 487; and Nath, M. C., and Brahmachari, H. D. *Nature*, Lond., 1946, **157**, 335) that intermediary fat metabolites are responsible to a great extent for the onset of diabetic symptoms. Recently it has been found (Nath, M. C., and Brahmachari, H. D. *Nature*, Lond., 1948, **161**, 18; and Nath, M. C., and Brahmachari, H. D. *Indian J. med. Res.*, 1949, **37**, 71) that the guinea pigs injected with these substances show hypersecretion of insulin in the first stage. The animals begin to lose the activity of their pancreatic insulin after treatment with intermediary fat metabolites for about two months. A stage is reached in 70 days when the potency of the pancreatic insulin comes down to half the normal value.

This hypothesis has found support from A. Lazarow, who believes the effect of injected ketone bodies might account for the increased fasting blood sugar levels observed when men are placed on a high fat diet (*Physiol. Rev.*, 1949, **29**, 48); and the increasing demand for more and more insulin which results might increase the sensitivity of beta-cells to degeneration.

This prompted us to undertake histological examination, at different stages, of pancreatic cells from animals injected with β-hydroxy butyric acid (Na salt) in gradually increasing doses as mentioned hereafter.[1] The results of preliminary observations are indicated here:

First stage—The animals (rabbits) were killed on the 27th day.

1. The area of the islets of Langerhans increases; there are relatively fewer islets in a particular microscopic field in comparison with the normal pancreas.
2. There seems to be an increase in the number of cells in the islets as shown by their being very tightly packed.
3. The nuclei of these cells are large and appear to be active, as shown by staining with hemotoxylin.
4. However, the cells of pancreatic acini do not show any deviation from the normal.

Second stage—The animals were killed on the 53rd day of the experiment.

1. Islet cells do not show the close packing present in the first stage. There is a great amount of intercellular space.
2. The nuclei of these islet cells show distinct signs of degeneration. They take less stain and are therefore less clearly defined. The islet as a whole appears dull in contrast to the deep-staining cells of the pancreatic acini.
3. In at least one islet there is an invasion of the pancreatic blood capillary.
4. A curious feature is that the acinar cells do not seem to be affected at all and are normal.

These findings confirm the hypothesis, started by two of the authors in 1944 (Nath, M. C., and Brahmachari, H. D. *Nature*, Lond., 1944, **154**, 487) that keto acids might first stimulate the pancreatic islet cells and later cause lesions after fatigue through excessive work.

Further studies on detailed investigations are in progress.

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[1] The total number of animals used in the experiment was 12, of which 2 were killed after the 1st stage and an equal number after the 2nd stage. The remaining animals were used for glucose tolerance tests and other observations. The weight range of the animals selected was between 1.8 and 2.1 kg each, and the injections were given intramuscularly in the leg muscle every day after giving food. The initial daily dose of injection was about 50 mg per kg, which was increased by 7.5 mg per kg per week.

[2] The authors are grateful to Drs. K. Krishnamurti and M. A. Moghe for their kind interest and for the facilities they offered.

The Donora Episode—A Reply to Clarence A. Mills

There are many misleading statements in Dr. Mills' note regarding the U. S. Public Health Service's Bulletin 306 on the Donora episode (*Science*, 1950, **111**, 67). Neither of us has any connection whatever with the steel mill and zinc plant in the Donora area, or with the Public Health Service, but we wish to reply to Dr. Mills.