Letters to the Editor

Life Insurance Medical Research Fund Grants

On page 392 of *Science* for 25 October 1946, in an announcement of grants made by the Life Insurance Medical Research Fund, it was incorrectly stated that grants recently made in support of medical research at the Carnegie Institution of Washington, McGill University, and New York University had a total value of $633,591. This amount, $633,591, in fact represents the total value of all grants-in-aid made by the Life Insurance Medical Research Fund since its inception a year ago. In addition to this sum, fellowships with a total value of $55,800 have been awarded by this Fund in 1946.

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Myosin and Adenosinetriphosphatase in Muscular Activity

It is now generally assumed that the hydrolytic splitting of ATP furnishes the energy for muscular contraction or relaxation, and that this splitting is catalyzed by the contractile protein, myosin, itself, or by an enzyme closely associated with it.

Evidence obtained from recent experiments in this laboratory does not support this view.

It is found that the enzymatic activity of myosin or actomyosin, even under optimal conditions, is strongly inhibited by Mg-ions, and it can be shown that in muscle this inhibition is probably fully developed. Calculations show that the liberation of inorganic phosphate from ATP by myosin in dog muscle can take place with a speed of, at most, 0.003 mg. P/minute/mg. myosin.

From data in the literature (E. Lundsgaard. *Biochem. Z.*, 1930, 227, 51), on the other hand, it is calculated that the liberation of inorganic phosphate in contracting frog muscle takes place at a rate of at least 0.200 mg. P/minute/mg. myosin. Therefore, it is concluded that hydrolysis of ATP by myosin—ATPase— cannot be the source of the liberated inorganic P and of the energy for muscular activity.

On the other hand, it is found that ATP induces striking physical changes in myosin even under conditions which exclude hydrolysis of the ATP. It is not denied, therefore, that interactions between ATP and myosin (and ions) form the basic phenomena of muscular activity.

Detailed publications will be submitted to the *Journal of General Physiology.*

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The Possible Role of the Guppy, *Lebistes reticulatus*, on the Biological Control of *Schistosomiasis mansoni*

It has been observed that, in certain regions in Puerto Rico endemic for schistosomiasis and where numerous snails (*Australorbis glabratus*) could be recovered previously, these can no longer be found. Instead, numerous guppies of the species, *Lebistes reticulatus* (Peters), are seen in the water. Some of these were collected and brought to the laboratory. When placed in aquariums and other artificial containers, the guppies fed actively on the egg masses laid by the snails on rocks inside the aquariums, along the sides of the glass containers, on the vegetation, and on the snails' own shells. The fish preferred to attack those egg masses containing young snails just about ready to come out. On another experiment it was also observed that the guppies fed readily on cercariae shed by the snails.

According to S. D. Erdman in "Aquarium fishes in Puerto Rico" (*Rev. Agric. P.R.*, in press), *A. glabratus* is common where guppies are found. This investigator suggests that the absence of guppies in certain aquatic regions in Puerto Rico may be due to the fact that the *A. glabratus* is also absent. The egg masses of the snail may constitute essential food for the guppy for which the fish might have predilection.

Further investigations on this problem are being carried on. Guppies have been introduced in bodies of water containing snails, and the effect on the snail population is being constantly observed.

The author wishes to express his gratitude to B. Quiñonez Chacón and Felix Iñigo, from the Division of Fisheries, Department of Agriculture and Commerce, for the identification of the guppy and for their cooperation in this work.

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Reduction of Excess Acetylcholine in the Serum of Pernicious Anemia Patients by Treatment With Pteroyl Glutamic Acid, Liver Extract, or Ventriculin

Continued, twice-daily injections of acetylcholine into dogs was shown by us (*Science*, 1946, **104**, 37) to produce a hyperchromic anemia which responds to treatment with pteroyl glutamic acid or liver extract. Evidence was also presented which indicated that the therapeutic agents employed for producing remission of certain macrocytic anemias acted by increasing the cholinesterase activity of the organism. This letter is written to report some recently obtained observations on human patients with well-established diagnoses of pernicious anemia.

Serum acetylcholine concentrations were estimated on three patients in relapse and two patients in therapeutic remission. Our method of determining serum acetylcholine is being published elsewhere. It involves a biological assay utilizing the eserinized rectus abdominis muscle of the frog. In one case, the identification of the active substance in the serum as acetylcholine was made more certain by an experiment in which it was observed to cause a contraction of an isolated segment of rabbit intestine which was subsequently antagonized by atropine.

It was found that three pernicious anemia patients

in relapse had serum acetylcholine concentrations varying from 15 to 18 γ/100 cc. of serum. On the seventh or eighth day of treatment, when reticulocyte responses were near their peaks, each of the three patients was found to have about 6.5 γ of acetylcholine/100 cc. of serum. Two normal human subjects also had about 6.5 γ per cent in their sera, while two patients with pernicious anemia in remission, upon returning for maintenance treatment with liver, were found to have 8 and 10 γ per cent of acetylcholine.

Each of the three cases of pernicious anemia in relapse was treated with a different therapeutic agent or preparation. One patient, severely ill, received 60 mg. of pteroyl glutamic acid intramuscularly per day; one received 40 grams of ventriculin daily; and one received 1 unit of liver extract, intramuscularly, per day. As a chemical result of these varied treatments, all three patients showed a reduction of approximately 60 per cent from their high serum acetylcholine levels.

A study of the serum cholinesterase will be reported later, but to date we have found that this activity *is* present in the serum of pernicious anemia patients during relapse, and is, in general, proportional to the erythrocyte count.

These experiments were performed in Detroit, Michigan. Grateful appreciation is expressed to the Anemia Laboratory of Parke, Davis and Company, and its director, Dr. E. A. Sharp, who made these cases available; to Drs. E. C. Vonder Heide, L. Berman, and Axelrod, who diagnosed and treated these cases; and to Dr. W. H. Seegers and the Department of Physiology, Wayne University, for the use of laboratory space and facilities.

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On Virus Nomenclature

The chaotic state of virus nomenclature needs little elaboration. It is apparent that, with no rules to follow, a whim may result in the designation of a new agent after a variety of entities—a host, a geographical location, a disease condition, a season of the year, or the discoverer thus forming a simple nomial or very involved polynomials. Unwieldy names like *Eastern-Russian-spring-summer encephalitis virus* now burden the worker, but even worse is the wealth of synonyms, often only the result of variation in word order, that are used for some virus agents.

This confusion is more likely to increase than decrease with time, since taxonomic classification may be a long way off, while newly discovered viruses continue to be reported in current publications.

A suggestion is offered here that might alleviate some of the confusion in the naming of new viruses by adapting systematically certain current practices, namely, the use of a trinomial such as *Equine encephalomyelitis (Eastern)* or *Mouse pneumonitis (Nigg)*—a system which has several points to recommend it. The first name indicates the apparent primary host; the second, the type of disease; and the third, the immunological strain, after the isolator or the region where it was recovered. If a number of virus agents were named in this manner, it would not be necessary to affix the word *virus* to the name, as that connotation would be carried by the form itself. At any rate, the agent would have a somewhat descriptive and rather precise name considerably easier to handle in writing and in speaking than one like *submaxillary gland virus of guinea pigs,* which may be written *guinea pig submaxillary gland disease* and another time *virus disease of the submaxillary gland of guinea pigs*—a variability that causes some difficulty when searching the literature and which might have been avoided by a trinomial like *Cavian submaxillitis (C. & K.)*.

However, this suggestion is offered not with the intention of altering well-established names but as a basis for reconsidering the current practices of coining names for virus agents.

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Book Reviews

Scientists against time. **James Phinney Baxter, 3rd. Boston: Little, Brown, 1946. Pp. xv + 473. (Illustrated.) $5.00.**

This is a book for which American scientists have been waiting. It tells the official story of the Office of Scientific Research and Development. Within the limits of one volume it presents a clear, detailed, and yet stylistically most attractive account of the victory made possible by the civilian scientific research effort of our Nation during World War II.

The author, James Phinney Baxter, 3rd, is president of Williams College and a former professor of history at Harvard. His special field of distinction in historical scholarship has included the consideration of the effect of the introduction of new weapons, such as the ironclad warship, in previous wars. His selection as official historian of OSRD was therefore most fortunate. The present book is not to be mentioned in the same breath with the drab and desiccated bureaucratic documents that are sometimes issued by Federal agencies as the story of the past.

Dr. Vannevar Bush, the director of OSRD, says in his foreword that the book is "the history of a rapid transition, from warfare as it has been waged for thousands of years by the direct clash of hordes of armed men, to a new type of warfare in which science becomes applied to