For reactions of protein synthesis, the question has not been answered as completely. Broad ranges have been observed over which the rates of incorporation of an amino acid or of the net synthesis of protein *in vitro* do vary with the amino acid level; but such ranges are not yet adequately defined for the various tissues *in situ*. In addition, mutual supplementation experiments among the amino acids have shown how readily one amino acid may fall to levels suboptimal for growth.

Furthermore, the finding should be considered that amino acid levels are rather uniformly high where protein synthesis or growth is accelerated. Before we can imply a causal relationship in this association, we must consider one alternative explanation. Protein synthesis undoubtedly proceeds through activated amino acid intermediates; by spontaneous dissociation, these intermediates (or the proteins themselves) might release amino acids at high levels. At high synthetic rates such intermediates might be more abundant, and the free amino acids could therefore reach higher levels. (Such a hypothesis must also assume that the precursor amino acids are taken from one compartment—for example, the cell exterior—and that the intermediates are dissociated into another—for example, the cell interior). For example, when the immature uterus entered an estrogen-stimulated growth phase, perhaps the high amino acid levels were a secondary expression of the high rate of protein synthesis.

Such an explanation becomes highly improbable, however, for the present observations. α-Aminoisobutyric acid is not incorporated into protein, and it is unlikely that it proceeds even to intermediate stages of that synthesis. For example, no stimulation by it of the exchange of radioactive phosphorus between pyrophosphate and adenosine triphosphate has been detected (*20*). Accordingly, the reaction which was stimulated upon administration of estrogen was most likely the transfer reaction itself.

Note that estradiol intensifies AIB concentration by the uterus and not by the liver, whereas hydrocortisone intensifies mainly the hepatic capture. If we assume that the same amino acid carrier operates in these two tissues, there must be local factors which make the transport more susceptible to an endocrine agent in one tissue than in the other. For example, a particular hormone molecule might gain access to the transport apparatus more readily in one than in the other.

Apparently we have in nitrogen metabolism additional instances of endocrine control operating on transfer reactions. Certain other steroids are already recognized to influence the transfer of Na^+ and K^+ between cells and surrounding fluids, and insulin has been shown to increase the access of sugars to the cell interior (*21*). The fate of the amino acids appears to be collectively modified by changing the extent to which various cells concentrate amino acids from the extracellular environment.

References and Notes

1. D. D. Van Slyke and G. M. Meyer, *J. Biol. Chem.* 16, 197 (1913–14).
2. H. N. Christensen, in *Amino Acid Metabolism*, W. D. McElroy and B. Glass, Eds. (Johns Hopkins Press, Baltimore, Md., 1955), p. 63.
3. H. N. Christensen and T. R. Riggs, *J. Biol. Chem.* 220, 265 (1956).
4. J. Monod, in *Enzymes, Units of Biological Structure and Function*, O. H. Gaebler, Ed. (Academic Press, New York, 1956), pp. 7–28; G. N. Cohen and H. Rickinberg, *Compt. rend.* 240, 466 (1955).
5. H. N. Christensen and J. A. Streicher, *J. Biol. Chem.* 175, 95 (1948).
6. E. F. Gale, *Advances in Protein Chem.* 8, 287 (1953).
7. H. N. Christensen *et al.*, *J. Biol. Chem.* 175, 101 (1948).
8. H. N. Christensen and M. E. Henderson, *Cancer Research* 12, 229 (1952).
9. H. N. Christensen, *Bull. New England Med. Center* 10, 108 (1948).
10. M. W. Noall and H. N. Christensen, *Biochem. Preparations*, in press.
11. H. N. Christensen, A. J. Aspen, E. G. Rice, *J. Biol. Chem.* 220, 287 (1956).
12. T. R. Riggs, L. M. Walker, H. N. Christensen, *Federation Proc.* 16, 238 (1957).
13. H. N. Christensen, J. A. Streicher, R. Elbinger, *J. Biol. Chem.* 172, 515 (1948).
14. F. L. Engel, S. Schiller, E. I. Pentz, *Endocrinology* 44, 458 (1949).
15. I. Clark, *J. Biol. Chem.* 200, 69 (1953).
16. F. L. Engel, *Endocrinology* 45, 170 (1949).
17. N. B. Talbot, O. H. Lowry, E. B. Astwood, *J. Biol. Chem.* 132, 1 (1940).
18. P. D. Bartlett and O. H. Gaebler, *J. Biol. Chem.* 196, 1 (1953).
19. A. Kretschmar, unpublished results from our department and from the Oak Ridge Institute for Nuclear Studies.
20. G. Rendina, unpublished observations from our laboratory.
21. R. Levine *et al.*, *J. Biol. Chem.* 179, 985 (1949).

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Ward Vinton Evans, Physical Chemist

On 2 August 1957, Ward Vinton Evans died in Rawlinsville, Pennsylvania, where he had been born 77 years before.

His professional activities had made him well known within his own scientific group, but his part on the world stage did not come until 1954 when, well into his 70's, he served on the special three-man security board which reviewed charges against J. R. Oppenheimer. Before this, he had served on a number of review boards dealing with security clearances in the Chicago area. His dissent from the majority finding against Oppenheimer attracted world-wide attention. As the *Washington Post* said in an editorial on his death, "his pungent dissent from the majority finding against Dr. Oppenheimer, written in earthy language, stands as a model of clarity and common sense. The failure to clear Dr. Oppenheimer, he noted, will be a 'black mark on the escutcheon of the country.' Conservative in his politics and personal views, Dr. Evans had a refreshing tolerance for disagreement and idiosyncrasy once basic loyalty was established. He knew that a narrow conformity in thought and action produces stereotyped minds. He followed his own philosophy of tolerance, and those who were exposed to it will not soon forget him."

"Doc" (he was so universally known as "Doc" that, even here, it seems inappropriate to refer to him in any other way) entered his chosen profession somewhat late. He received his bachelor's degree from Franklin and Marshall in 1907 (and an honorary D.Sc. in 1932). Following graduation he taught high school for 6 years in Pennsylvania and New York before commencing graduate work at Columbia University. He was 36 when he was awarded the Ph.D., in 1916. He remained at Columbia for a year as Harriman fellow and then joined the faculty of the department of chemistry at Northwestern University, where he remained until he became professor emeritus in 1945. During his last 3 years at Northwestern he was chairman of the department.

Doc was not one who retires easily. The following year he was with the U.S. Army University in France and England. He then became professor of chemistry at Loyola University in Chicago, from which institution he acquired his second title of professor emeritus, in 1956.

Between 1920 and 1942, Doc published about 20 scientific papers. The most important of these dealt with electrochemical studies of the structure of Grignard reagents. These papers are basic to the subject and are frequently referred to. A subject which occupied him in less formal ways was explosions. He became interested in these during a period with the Army during World War I. He was concerned with explosions, either as a member of committees or as a legal expert, until his death.

He was active in the affairs of the American Chemical Society. He was chairman of the Chicago Section for a year and a director and councilor of the section for many years. He also served a term as chairman of the Division of Physical and Inorganic Chemistry.

Small, wiry, and hardy, Doc was of the type who looks older than his age when young and younger when old. He was extremely shrewd in his judgment of facts, of men, and of fish. Shrewdness in the first two items stood him in good stead in the classroom and on the witness stand. His disarming manner and casual appearance (his hats were a Northwestern tradition, and one former student swears that he wore the same necktie every day for an entire year) led a number of opposing lawyers seriously to underestimate him, to their mortification when Doc finally sprang his bear trap. Shrewdness with regard to fish was developed in over 70 years' practice of his favorite sport on the lower stretches of the Susquehanna, where he fished as a boy and later had a summer home.

He was an unusually effective teacher and one whom students never forgot. If he took a particular interest in the brilliant students, he also took an almost desperate interest in the academic salvation of the backward. In teaching freshman chemistry, he held that one must first get the student's interest. To this end, he was a master of the functional use of the anecdote, of the vivid expression, and of the demonstration. He also held that a lecturer should be heard in the back row. In fact, his lectures could be heard in the next building. In teaching physical chemistry he aimed at the inculcation of exact thinking in that subject. He believed in assigning large numbers of difficult problems. With these rather different approaches, he was unusually successful in both courses.

Doc was active and prominent in university councils. He particularly enjoyed, and was very effective in, his dealing with students. For many years he was on the Northwestern University athletic committee and chairman of the committee dealing with the undergraduate publications.

ROBERT L. BURWELL, JR.
Northwestern University

News of Science

Nobel Prizes

The Karolinska Institutet, Stockholm, Sweden, has announced that Daniel Bovet, 50, head of the department of pharmacology at the Istituto Superiore di Sanità in Rome, has been awarded the 1957 Nobel Prize in physiology and medicine for work that has led to the development of sulfa drugs, antihistamines, and muscle relaxants. Bovet was born in Switzerland but became a naturalized Italian citizen in 1947. He is the first Italian to win the Nobel Prize in medicine and physiology since 1906. (Enrico Fermi won the physics prize in 1938).

While Bovet was working at the Pasteur Institute in Paris in 1932, Germany's Gerhard Domagk reported that prontosil, a dye product, could be used to kill bacteria that cause common infections. Bovet and his colleagues immediately set about breaking down prontosil, a complex chemical, and eventually isolated sulfanilamide, first of the modern antibiotic drugs. In the next few years Bovet synthesized many related compounds.

Then in 1937, with a Swiss colleague, Bovet produced the first antihistamine. In the next 4 years he conducted some 3000 experiments to work out the chemical formulas that are the basis for most of the antihistamines now widely prescribed for hay fever, eczema, asthma, and other allergies.

Next he turned his attention to a study of curare and the mechanism by which it paralyzes the muscles. It took him 8 years to isolate the essential ingredients from the impure mixtures used by South American Indians to poison darts. He developed a series of synthetic curare drugs that are now considered landmarks in the history of anesthetics—for example, succinylcholine, which is now in general use as a muscle relaxant during surgery on the chest and abdomen. Bovet, who is not listed in either the International or the Italian *Who's Who,* has never taken out a patent in his own name and has never benefited financially from the commercial exploitation of his findings.

This year's Nobel Prize in physics has been awarded by the Swedish Royal Academy of Sciences to two Chinese-born investigators, Tsung Dao Lee, 31, the youngest full professor at Columbia University, and Chen Ning Yang, 27, of the Institute for Advanced Study at Princeton, N.J. Neither is a United States citizen, but both are permanent residents. The two men were cited "for their penetrating investigation of the so-called parity laws which has led to important discoveries regarding elementary particles" [*Science* **123**, 185 (1 February 1957)]. Lee and Yang destroyed experimentally the long accepted "Principle of the Conservation of Parity."

The 1957 Nobel Prize in chemistry, also awarded by the Swedish Academy, will go to Sir Alexander Todd, 50, professor of organic chemistry at Cambridge University since 1944, and chairman of the British Advisory Council on Scientific Policy. He is being honored for his work on nucleotide coenzymes, which has been in progress for nearly 15 years. In an interview with the press, Sir Alexander explained that the contribution by him and his research team was the determination of the fundamental chemical structure of nucleic acids. He described the acids as the genic material that passes on genetic characteristics from the