presented in our paper (*2*). What we are uncertain about is the nature of the inhibitors associated with the *mitochondria or microsome fractions of the liver cell.* We have no evidence, as yet, that those inhibitors are the same as the inhibitors present in the plasma or serum (i.e., albumin globulin, calcium, cholesterol, and lecithin).

There are many other discrepancies between what we actually wrote in the paper (*2*) and what Laser interpreted as having been written (*4*). Those interested are referred to the two papers in question.

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References

1. TYLER, D. B. *Proc. Soc. Exptl. Biol. Med.*, **72**, 491 (1949).
2. ———. *Science*, **112**, 456 (1950).
3. LASER, H. *J. Physiol. (London)*, **110**, 338 (1950).
4. ———. *Science*, **113**, 609 (1951).

The Decarboxylation Reaction

SEVERAL specific objections have been raised to the author's proposal (*1, 2*) that transitory carbanions are hypothetical intermediates in the base-catalyzed decarboxylation of alpha amino acids. Three of these objections (the first three discussed) involve emphasis on negative findings as limitations to the generality of the reaction. As such they should be considered with some skepticism. The failure of ethyl isobutyrate to undergo the Claisen condensation was long thought to impose restrictions on the mechanism which experience indicated were nonexistent. Others (the last two) are comments involving interpretations of the transitory existence, method of formation, and structure of the carbanion, and the generalized scope of the carbanion explanation.

1) *The role of the carbonyl function as an acceptor.* The fact (*3, 4*) that aldehydes fail to act as acceptors in the decarboxylation of various acids has been stated as a serious objection to the proposal that addition of a *transitory* carbanion to the carbonyl group of the anhydride plays a role in the decarboxylation. There are, however, decarboxylation reactions in which the aldehyde functions do act as acceptors. These are the spontaneous formation of 1-indanone on decarboxylation of *o*-formylcinnamic acid (*5*) and the base-catalyzed formation of carbinols on decarboxylation of quinaldinic acid in the presence of aldehydes (*6*). Both of these can be visualized as proceeding through a transitory carbanion. These reactions are much stronger evidence than negative findings, particularly in light of our finding that decarboxylation of acetylglycine, although long thought not to take place, does in fact react as other acylamido acids (*2*).

2) *Failure of the reaction in the absence of an alpha hydrogen.* The formation of a carbanion by decarboxylation does not require an alpha hydrogen. It has been reported (*6*), however, that α-phenyl-α-aminopropionic acid does not undergo the reaction, and this has prompted the suggestion that the formation of the carbanion by decarboxylation is unlikely. The decarboxylation of quinaldinic acid in its condensations to form carbinols from aldehydes is an example of a decarboxylation reaction that requires no hydrogen alpha to the carboxylic acid function. Again, this fact indicates that negative evidence to the contrary is likely to be untrustworthy.

3) *The fact that acylamido acids do not lose carbon dioxide in the absence of an anhydride.* This can be interpreted as meaning that the anhydride acts as an acceptor and in doing so provides the driving force for the reaction. One should not lose sight of the fact that the decarboxylation of acylamido acids in the presence of acetic anhydride may be a limited aspect of a general reaction. Many acids lose carbon dioxide in the presence of a base, and possibly it will be demonstrated that additions to carbonyl functions can take place in these reactions also. Hammett (*7*) discusses the relative roles of acceptor and reactant in providing the driving force for acid- and base-catalyzed Claisen condensations.

4) *The transitory role of the carbanion.* The carbanion has a transitory existence in decarboxylation (*1, 2*). This concept may vary from the usually accepted *transitory* carbanion of the aldol type of condensation to the bare possibility of existence even in the absence of resonance stabilization, which is the basis for an explanation of β-elimination reactions (*8*). The usually accepted statement on the transitory nature of ionic intermediates in organic reactions has been given by Hammett (*9*). The extent to which resonance stabilizes the carbanion raises interesting questions, because the only apparent factor involved is the inductive effect of the acyl- or sulfonyl- (12) group. This structure, $RCONHCH_2CO_2H$, is not to be compared, however, to that in which the inductive effect is transmitted through a methylene group. The amino group with its unshared electrons can aid in transmitting the inductive effect of the acyl- or sulfonyl- group to the alpha carbon. Electron-withdrawing effects of the acetamido group are not unknown. The formation of 4′-bromo-4-acetamido diphenyl ether on bromination of 4-acetamido diphenyl ether is an example of the inductive effect produced by the acylamido group (*10*). This group also acts as an electron donor in substitution reactions of acetanilide. It is also recognized that carbanions can be formed as transitory intermediates from compounds where apparently no resonance is involved, such as the bicyclic sulfone of Doering and Levy (*11*) and 3-alkylpyridines (*12*). It would appear from these observations that resonance stabilization of an intermediate carbanion, although of significance in terms of its possible independent existence, is not a reliable criterion for postulating its participation as the sole intermediate in a reaction mechanism. Presumably, increased stabilization would decrease the energy barrier for the formation of an intermediate by an amount equal to the increased energy barrier for the following reaction, with a net result of no obvious gain in lowering the net energy barrier.

5) *Generalized concept of the reaction; oxazolones and oxazolonium intermediates.* The use of oxazolone and oxazolonium structures as a source of carbanions has been considered by some (*4*) as a serious objection to the idea that other types of carbanions can participate in the acylamido reaction. It appears to this author that the oxazolone concept is helpful, although perhaps needlessly elaborate, in interpreting the course of the reaction in this specialized case, so long as it is not made the basis for overemphasis on the need for resonance stabilization of the carbanion. There is, moreover, considerable merit in a more generalized concept of the reaction which will coordinate the data on other decarboxylations, not all of which involve anhydride condensations. Our observations on the formation of disulfides and aldehydes on decarboxylation of sulfonamido acids (*13*) provide an example.

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References

1. WILEY, R. H. *Science,* **111**, 259 (1950).
2. WILEY, R. H., and BORUM, O. H. *J. Am. Chem. Soc.,* **72**, 1626 (1950).
3. ASHWORTH, M. R. F., DAFFERN, R. P., and HAMMICK, D. Ll. *J. Chem. Soc.,* 809 (1939).
4. CORNFORTH, J. W., and ELLIOT, D. F. *Science,* **112**, 534 (1950).
5. WILEY, R. H., and HOBSON, P. H. *J. Am. Chem. Soc.,* **71**, 2429 (1949).
6. DYSON, P. and HAMMICK, D. Ll. *J. Chem. Soc.,* 1724 (1937).
7. HAMMETT, L. P. *Physical Organic Chemistry.* New York: McGraw-Hill, 348 (1940).
8. ALEXANDER, E. R. *Ionic Organic Reactions.* New York: Wiley, 106 (1950).
9. HAMMETT, L. P. *Op. cit.,* 65.
10. SCARBOROUGH, H. A. *J. Chem. Soc.,* 2361 (1929).
11. DOERING, W., and LEVY, L. K. Absts., 112th Am. Chem. Soc. Meeting, New York, 66L (September 1947).
12. BROWN, H. C., and MURPHY, W. A. *J. Am. Chem. Soc.,* **73**, 3308 (1951).
13. WILEY, R. H., and SMITH, N. R.; WILEY, R. H., SMITH, N. R., and GENSHEIMER, D. E. Unpublished observations.

Zoological Nomenclature: Notice of Proposed Suspension of Rules in Certain Cases for Avoidance of Confusion and the Validation of Current Nomenclatorial Practice

(A. (n.s.) 9)

NOTICE is hereby given that the possible use by the International Commission on Zoological Nomenclature of its plenary powers is involved in applications relating to the undermentioned names included in Parts 9/10 of Volume 2 of the *Bulletin of Zoological Nomenclature,* which was published on August 15, 1951:

1) *Entamoeba* Casagrandi & Barbagallo, 1895, *Endamoeba* Leidy, 1879, and *Poneramoeba* Lühe, 1909 (Class Rhizopoda) (action designed to validate existing practice) (pp. 243–81) (File 185).
2) *dentatus* Diesing, 1839 (as published in the binominal combination *Stephanurus dentatus*) (Class Nematoda) (question whether this name should be preserved for the kidney worm of swine) (pp. 282–93) (File 188).
3) *Eysarcoris* Hahn, 1834 (Class Insecta, Order Hemiptera) (proposed validation of existing nomenclatorial practice) (pp. 294–5) (File 212).
4) *acuminata* Ioff & Tiflov, 1946 (as published in the combination *Rhadinopsylla* (*Rectofrontia*) *acuminata*) (Class Insecta, Order Siphonaptera) as applied to species No. 68 (proposed elimination of homonymy caused by printer's error) (pp. 296–7) (File 386).

2. The present notice is given in pursuance of decisions taken, on the recommendation of the International Commission on Zoological Nomenclature, by the Thirteenth International Congress of Zoology, Paris, July 1948 (*Bull. Zool. Nomencl.,* **4**, 51, 57 [1950]; *ibid.* **5**, 5, 131).

3. Any specialist who may desire to comment on any of the foregoing applications is invited to do so in writing to the Secretary to the International Commission (28 Park Village East, Regent's Park, N. W. 1, Eng.) as soon as possible. Every such comment should be clearly marked with the commission's file number as given in the present notice.

4. If received in sufficient time before the commencement by the International Commission of voting on the applications in question, comments received in response to the present notice will be published in the *Bulletin of Zoological Nomenclature*; applications received too late to be so published will be brought to the attention of the International Commission at the time of the commencement of voting on the application in question.

5. Under the decision by the International Congress of Zoology specified in paragraph 2 above, the period within which comments on the applications covered by the present notice are receivable is a period of six calendar months calculated from the date of publication of the relevant part of the *Bulletin of Zoological Nomenclature.* The double part now in question was published on August 15, 1951. In consequence, any comments on the applications published in this double part should reach the secretariat of the International Commission at latest by February 15, 1952.

FRANCIS HEMMING

Secretary to the International Commission
on Zoological Nomenclature

Mathematicians and the California Oath

AT ITS meeting of September 4, 1950, the Council of the American Mathematical Society passed the following motion:

> The Council of the American Mathematical Society deplores the harm done to academic freedom and scientific progress by the recent action of the Regents of the University of California in imposing arbitrary and humiliating conditions of employment on the faculty. The Council notes that this action has already resulted in a great discontent and loss of morale in the California faculty, and in the consequent desire of many distin-