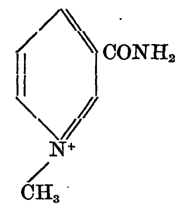
which we had identified as N^1-methylnicotinamide.[2,3] Najjar and collaborators,[4,5] who, in fact, had discovered the fluorescent derivative of this metabolite obtained upon extraction into butanol from an alkaline aqueous phase, designated the fluorescent derivative as F$_2$[5]. However, in the same article[5] Najjar and Holt speak of "the failure of the dog to excrete F$_2$" and the article itself and a subsequent one[6] contain in their titles the wording "the excretion of specific fluorescent substances in the urine," and in both of these articles the authors speak of "the excretion of F$_2$ in the urine." It is obvious, therefore, that Najjar and collaborators employed the terms "fluorescent substance" and "F$_2$" to designate both the fluorescent compound observed in the butanol extracts from alkaline solutions and its precursor present in the urine.

In our publications[2,3] we presented proof of the identity of N^1-methylnicotinamide with the nicotinic acid metabolite and referred to it as F$_2$, following the precedent of the originators of this term. Neither of our articles dealt with the chemical structure of the compound produced from the metabolite (N^1-methylnicotinamide) by the action of alkali and butanol. Therefore, we consider the recent statement of Najjar and White calling our findings "an obvious error" on these grounds as entirely unjustifiable.

Until conclusive proof is adduced to the contrary, we feel convinced that the metabolite of nicotinic acid found in the urine is the cation of N^1-methylnicotinamide



which exists in the urine in equilibrium with the various anions according to the law of electroneutrality. There is no reason to suspect that the nature of the particular anion which may be associated with the cation is of any physiological significance. We utilized the well-established, classical[7] technic of isolating the base as a picrate, in the same manner in which it is used to isolate creatine and other bases from urine. There is little likelihood of any significant changes being produced in the structure of the metabolite in the formation of the picrate as implied by Najjar and White.

To avoid further confusion in this problem we wish to propose that only the fluorescent derivative in butanol obtained by extraction from strongly alkaline aqueous solutions be called F$_2$, and that its precursor, the physiological metabolite of nicotinic acid, be designated as the cation N^1-methylnicotinamide.

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RECENT RESEARCHES ON HEAVY WATER

THERE have been carried out some experiments on heavy water in Free China, since the war began in 1937. The temperature of the density maximum of heavy water[1] is measured with a 16 ml pycnometer made of quartz glass with a stem of 0.5 mm diameter. It is found to be 11.21 0.50°, in close agreement with the latest result of Stokland, Ronaess and Tronstad (1939). The measurement on the density of heavy water is further extended to the temperature range between its freezing point and 50°.[2] The differences between the densities of ordinary and heavy water show a maximum at 40°, which amounts to 0.10770 g/ml.

The molal freezing point lowering of D$_2$O with acetone as solute is observed as 2.00°, agreeing well with the calculated value 2.004°.[3] These values are lower than that calculated by Bartholome and Clusius (1935).

The solubilities of sodium chloride in 8 different mixtures of H$_2$O and D$_2$O are measured at 25°.[4] With an accuracy of 0.1 per cent. the relation $s_n = 6.145-0.334\,n$ holds, where s_n is the number of mols of NaCl dissolving in 55.51 mols of the aqueous mixture containing n mol fraction of D$_2$O. The solubility of NaCl in D$_2$O thus found is higher than that observed by Taylor, Caley and Eyring (1933). Furthermore, it is suggested that if such a linear relation holds for all soluble compounds, their solubilities can

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[2] J. W. Huff and W. A. Perlzweig, SCIENCE, 97: 538, 1943.

[3] J. W. Huff and W. A. Perlzweig, *Jour. Biol. Chem.*, 150: 395, 1943.

[4] V. A. Najjar and R. W. Wood, *Proc. Soc. Exp. Biol. and Med.*, 44: 386, 1940.

[5] V. A. Najjar and L. E. Holt, SCIENCE, 93: 20, 1941.

[6] V. A. Najjar and H. J. Stein, L. E. Holt and C. V. Kahler, *Jour. Clin. Invest.*, 21: 263, 1942.

[7] G. Barger, "The Simpler Natural Bases." Chapter VIII. London, 1914.

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[1] Tsing-Lien Chang and Jen-Yuan Chien, *Jour. Chinese Chem. Soc.*, 8: 74, 1941.

[2] Tsing-Lien Chang and Jen-Yuan Chien, *Jour. Am. Chem. Soc.*, 63: 1709, 1941.

[3] Tsing-Lien Chang and Tsin-Chang Chu, *Sci. Rep. Nat. Tsing Hua Univ.*, A4, No. 4–6, 30th anniv. Commemoration Issue, delayed in press. A pamphlet entitled "Abstracts of Papers" thereof appeared in April, 1941, p. 7.

[4] Tsing-Lien Chang and Tsin-Chang Chu, *J. physik. Chem.*, A184: 411, 1939.

be determined by linearly extrapolating the results for low D_2O concentrations.

One of the experiments on the chemical kinetics in D_2O is the velocity change of the reaction between hydrogen peroxide and hydriodic acid through the displacement of protium by deuterium atoms.[5] The time of the first 10 per cent. conversion of a solution of 0.01 n HI by H_2O_2 is measured in mixed aqueous media containing 0, 19, 50 and 73.7 ml D_2O at 20°. The reaction volume is 1 ml. The end point is indicated by the blue coloration of iodostarch after the iodine corresponding to the 10 per cent. conversion has been removed by 0.001 m $Na_2S_2O_3$ previously added. The results are extrapolated to 100 per cent. D_2O. It is concluded that the reaction $D_2O_2 + I^- — D_2O + IO^-$ in D_2O proceeds 0.60 times as fast as the corresponding reaction $H_2O_2 + I^- — H_2O + IO^-$ in H_2O.

Another similar experiment is the reduction of the permanganate ion by hydrogen peroxide in heavy water.[6] A solution of 0.001 *n* $KMnO_4$ in 0.05 *n* H_2SO_4 is reduced by H_2O_2 of various concentrations at 20°. Mixed aqueous media containing 0, 28.7, 47.8 and 79.6 mol per cent. D_2O are employed. Extrapolation of the results 100 per cent. D_2O leads to the conclusion that the autocatalysis of Mn^{++} ion proceeds more quickly in the presence of D_3O^+ in D_2O than in the presence of H_3O^+ in H_2O, the maximum increase of velocity being 50 per cent. Further, D_2O_2 reacts directly with MnO_4^- in D_2O with a rate equal to only 15 per cent. of that of H_2O_2 in H_2O. In the transitional region the velocity ratio drops down to a minimum of only 2.5 per cent., the reaction involving deuterium being slower.

Besides, heavy water is used to hydrolyze sodium and aluminum ethylate respectively.[7] The obtained ethyl alcohol-d, C_2H_5OD, purified by distillation in vacuum, boils at 78.8° and weighs 0.801 g/ml at 25°.

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"THE PERMEABILITY OF LIVING CELLS"

WE have received a number of letters from interested people inquiring about the fate of the monograph which we wrote for the Protoplasma series, entitled "The Permeability of Living Cells." Since there seems to be some interest in the subject, we would appreciate this notation concerning the book.

In 1929 I was invited by the editors of the Protoplasma series, in collaboration with Mrs. Brooks, to write a volume on the "Permeability of Living Cells." This was finished in 1939, before we entered the war. Through various censorship delays at Bermuda and on ships, we were not able to get the final book out of Germany before we entered the war. We tried to get some copies imported through Stechert in New York for the various libraries and for others, but the Treasury Department refused a license. Dr. Joseph Needham, of Cambridge, England, interested himself in this, and through his efforts and those of Sir Henry Dale, the president of the Royal Society, and of Dr. A. V. Hill, the secretary of the Royal Society, the Ministry of Economic Warfare of Britain gave permission to have the book brought in through England. However, in spite of this, the U. S. Treasury still refused to grant us a license. Following this, various members of the National Research Council, the National Academy of Science, the American Physiological Society and the Office of Scientific Research and Development of this country have tried to get the book passed by the Treasury Department without success.

We made a personal visit to the Treasury Department in Washington and were given a "conference" by a Mr. Wechsler, formerly of New York. We were given a "dressing down" and told in a none too pleasant tone that we could be accused of "trading with the enemy."

After returning to the west coast again, we took the matter up with the Foreign Funds Division of the Federal Reserve Bank in San Francisco and asked permission to get a few free copies out through Switzerland. They gave us a license expiring in a month, and our letter to Switzerland was returned "Service discontinued" after a considerable time.

The American Library Association became interested, but since the book was not on the original list of foreign books to be imported, they said that nothing could be done by them.

Finally, through the efforts of various libraries and scientists who wanted the book, the matter was brought to the attention of the Alien Property Custodian of this country who asked us for a copy so that it could be reprinted!

The book is a critical analysis of various problems relating to the intake of salts, water, drugs, dyes in such things as cells, blood, serum, the various tissues and organs. It is without doubt a book which would facilitate the research being done in these various fields, being a critique and having over 3,000 references.

The present status is that we have the page proof with corrections, but this is evidently not satisfactory for filming, such as is the work of the Alien Property Custodian.

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[5] Tsing-Lien Chang and Yu-Chih Wei, *Jour. Chinese Chem. Soc.,* 8: 138, 1940.

[6] Tsing-Lien Chang and Yu-Chih Wei, *Science Record,* L: 132, 1942.

[7] Tsing-Lien Chang and Yu-Chih Wei, *Sci. Rep. Nat. Tsing Hua Univ., loc. cit.,* p. 10.