General Discussion

The tabulated results in figures and descriptions thereof in respect of our relative findings have already been presented in table Nos: I to V.
Regarding the basal excretions and their ranges, averages, similarity and conformity with the findings of others have been shown and discussed along with the Table No.I.

In Tables II to IV the increased excretions of different members of B Vitamins after supplementation of the three Vitamins separately have been shown as regards their ranges, averages and majority of excretions in samples of A, B and C. A short description of each table has been embodied along with each table.

In Table No.V, the sum-total excretions of samples A, B, and C (24 hours) of each Vitamin and metabolite: have been shown and also the ranges, averages, majority of excretions, their percentages of excretions above basal values and their 't' values have been calculated. From table No.V, it is evident that oral supplementation of 50 mgs. of B₁ causes increased excretion of B₁ by 67.8% of the basal value. The excess excretion of B₁ is obvious. It is also evident that excess B₁ is excreted at the earliest opportunity with highest rate of excretion during three hours after B₁ administration.
After the administration of B1, excretions of B1 and B2 increased within three to six hours, whereas the excretions of NA and N\textsuperscript{+}MN, took place after six hours, indicating that the latter two had a slower rate of excretion unlike B1 and B2. The excretions of above vitamins approximated the normal level after 48 hours.

From the results it is observed that administration of B2 or N.A. like that of B1 causes increased excretions of all the three vitamins or metabolites pari passu.

Further it was observed that the excretion rate of supplemented vitamins in individual experiment has been proportionately more than the other excreted Vitamins.

The increased excretion of the supplemented Vitamin is normally expected through the renal threshold service. But the reason for the increased pari passu excretions of other vitamins may be explained apparently by

(i) the disturbance in Vitamin equilibrium in the system,

(ii) the release of stored Vitamins,
(iii) increased biosynthesis, 
(iv) sparing action and lastly, 
(v) the change in renal threshold of vitamins.

The phenomenon may tentatively be ascribed to release of stored Vitamins (loc.cit.ii) meaning, of necessity, from the 'pool' of the prosthetic moieties in nucleosides, nucleotides or independent phosphorylated entities etc., or conjugated proteins etc, consequent on an impact on the optimum condition of dynamic equilibrium of physiological constants (loc.cit.i) otherwise maintained by the systemic cell metabolic processes in vivo carried through enzymatic activities - phosphorylation, methylation, co-enzyme formation etc.

The specific sparing action (loc.cit.iv) of one component of vit.B complex on the other component, as of Ellis et al. (1937), can not get explained per se from our results, since the excretion rate of all the three components increases pari passu irrespective of supplementation by any one of the Vitamins separately rather exposing thereby every one of the Vitamins as having on the others severally the so called 'sparing action' which basically can explain nothing per se
without the above context of an in-vivo upset in the dynamic balance of reactions in the cell metabolic processes. Biosynthesis (loc.cit.iii) particularly of B₂ or B₁ of Dey H.N. et al. (1949) can be ruled out in our work in view of the rapid excretion rates, though a suggestion for such a synthesis may be ventured in case of NA and N₂MN to account for the much pronounced delayed excretions vis a vis the findings of Perlzweig (1943) regarding methylation of NA to N₂MN in Liver(Methionine).

Renal 'threshold' (loc.cit.V) activities having necessarily the physiological importance in all cases of biological excretions or retentions must not escape the recognition in our work in as much as the effect of disturbance of the metabolic balance is brought to bear upon the function of Kidney in respect of its selective monitoring control by lowering or raising the excretion or retention limits of Vitamins as well or its metabolites of our study, keeping up with the emergent condition in the organism by its regulatory physiological regimen.
Similarly the causative factor of the phenomena of the increased excretions of B1 after oral administration of B2 and Nicotinamide can be eventually equated to the phase of disturbed metabolic equilibrium as indicated in the above context.

Increased excretion of NA and NADPH after supplementation of B1 and B2 can also be explained in the above line.

The abrupt or graded administration of massive doses of vitamins always tending to take part in enzymatic reactions independently or forming prosthetic parts of enzyme system in the cell activities according to maximal or minimal specific requirements for the time being, would a priori set up an abrupt graded imbalance that would only be regulated or compensated by actions and/or reactions whatever be the mechanism, of course governed by the principles of biophysico-chemical processes in vivo involved in the intracellular surface activities within the milieu interieur of body fluids, of course not precluding the possibility of mass action, effect of velocity of electrolytic
or osmotic dissociation exchanges or exchanges due to molecular - structural - moiety similarity, simulating and stimulating or synergising characteristic reactions even transitorily (Elles et al., 1937) - all to meet the emergency call for readjustment of upset dynamic equilibrium - all meaning to recover the balance in vitamin or premetabolite phases just necessary for their part to play in the metabolic balance, of course by alerting the kidney at the same time to take a leading part in the check posts with threshold importance whatever it means for each of the metabolites.

It is noted that excess excretion of above mentioned vitamins during our work produces no deficiency symptoms for any of the vitamins in our normal subjects, though in general vitamin B Complex deficiency cases, specific deficiency, had been precipitated by administering particular vitamin-say B₁, clinically (Syndestricker 1941) confirming further that metabolic interrelationship amongst the components of vitamin B Complex namely Thiamin (B₁) Riboflavin (B₂) and Nicotinamide as we have conclusively postulated from our findings in respect of subjects
Summary:

i) The excretions of Thiamin, Riboflavin, Nicotinic Acid and n-Methyl Nicotinamide have been estimated in 24 hrs. urine in 20 male College Students on a normal standard diet.

ii) The daily excretion of B1, B2, NA and N'MN have been estimated after oral administration of 50 mgs. each of B1, B2 and Nicotinamide separately and respectively.

iii) After oral administration of B1, the total excretion of B1, B2, NA and N'MN have been increased from the basal. The administration of B2 and Nicotinamide also cause increased excretion of all the above Vitamins from the basal.

iv) The excretion rate of B2 is most rapid of all the other Vitamins.

v) The possible reason for increased excretion of administered Vitamins and others and their inter-relationship have been discussed.