(1) The specific radioactivity of IV and VII is equal to that of II and V.

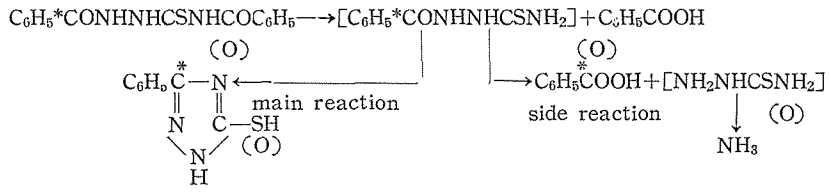
(2) When treated with alkali in the same manner as mentioned above, non-labeled specimens of A and A.' gave the triazole derivative, benzoic acid and ammonia.

(3) The amount of ammonia (2.3 % : 36%) was roughly proportional to the magnitude of specific radioactivity of benzoic acid (III) (0.08 μc/m.mole) and (VI) (1.76 μc/m. mole).

These results would lead to the following conclusion : In the action of alkali on 1,4-dibenzoylthiosemicarbazid [1-carbonyl-C^{14}] or 1,4-dibenzoylsemicarbazide [1-carbonyl-C^{14}], inactive benzoic acid and 1-benzoylthiosemicarbazide [carbonyl-C^{14}] or 1-benzoylsemicarbazide [carbonyl-C^{14}] and formed in the first step as a result of hydrolysis and the latter further cyclizes mainly to give 3-phenyl-5-mercapto-1, 2, 4-triazole [3-C^{14}] or 3-phenyl-5-hydroxy-1, 2, 4-triazole [3-C^{14}] with loss of water. Meanwhile, a part of the intermediate is hydrolysed to radioactive benzoic acid and thiosemicarbazide or semicarbazide, which affords ammonia by alkali with ease. Thus, specific radioactivity of the isolated benzoic acid, which is composed of inactive and active one, shows the magnitude of a side reaction.

The essential reaction routes of 1,4-dibenzoylthiosemicarbazide [1-carbonyl-C^{14}] and 1,4-dibenzoylsemicarbazide [1-carbonyl-C^{14}] with alkali are shown in Chart 2.

Chart 2.



Microbiological Studies of *Coli-aerogenes* Bacteria. (I)

Convertion of the Lactic Acid Fermentation to α-Ketoglutaric Acid Fermentation

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During investigations of the metabolisms of glucose by *coli-aerogenes* bacteria, it was found that the bacteria accumulated a large amount of α-ketoglutaric acid under aerobic conditions such as shaking culture, while lactic acid was ascertained to be produced anaerobically by the bacteria as was already known.

Table 1. Fermentation products of *E. Coli* under static conditions.

	Glucose consumed	Lactid acid formed	Acetic acid formed	Pyruvic acid formed	Ethanol formed
mg/dl	2000.0	900.0	205.7	20.0	128.0
% on consumed glucose		45.0	10.3	1.0	6.4

Table 2. Fermentation products by shaking culture.

Glucose used (%)	2.0	4.8
$(NH_4)_2HPO_4$ used (%)	0.05	0.1
$(NH_4)_2SO_4$ used (%)	0	0.1
Glucose consumed (%)	100.0	100.0
Lactic acid formed (%)	0	0
Acetic acid formed (%)	0	0
α-Ketoglutaric acid formed (%)	40.0	45.0
Pyruvic acid formed (%)	0	0

Microbiological Studies of *Coli-aerogenes* Bacteria. (II)

Oxidative Fermentation of Glucose

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In the previous paper, it has already been found by us that the various species of the genus *Esherichia* and the genus *Aerobacter* reveal their ability of producing a large amount of α-ketoglutaric acid from glucose, when they are cultivated under aerobic conditions such as shaking culture. From the results of experiments, it is observed that some strains of the bacteria of *coli-aergenes* types accumulated none of the metabolic intermediates except α-ketoglutaric acid, while so many products such as acetic, pyruvic and α-ketoglutaric acids were obtaind with other strains of the same types of the bacteria. In other words, so many forms of oxidative fermentation of glucose exist in the metabolisms of the bateria of *coli-aerogenes* types, as given below:

1) α-Ketoglutaric acid fermentation,
2) Acetic, pyruvic and α-ketoglutaric acids fermentation,
3) Acetic and α-ketoglutaric acids fermentation,
4) Pyruvic acid fermentation,
5) complete oxidation to CO_2 and H_2O.

It is worth to note that a lower yield of α-ketoglutaric acid was generally observed, when the production of acetic acid was inereasing. Lockwood *et al.* found 2-ketogluconic acid, which in the early stage of fermentation was produced from glucose and that 2-ketogluconic acid was then changed into α-