smaller molecule than that in the deproteinated serum.

To the discussion of the view of Waldschmidt-Leitz that the polarographically active substance in carcinomatic deproteinated serum may be a sulphur-free mucoid[4], I would point out that this assumption is not in accord with my experimental facts; the hydrolysates of the deproteinated serum solutions in question show clearly the presence of cystine and, moreover, in the same relative content as found in the various non-hydrolysed deproteinated pathological or normal sera; the cystine content in the deproteinated serum is of the order of 10^{-4} molar, and is always higher in the carcinomatic case; against the necessity for a mucoid theory is also the fact that an identical polarographic effect is evoked by a deproteinated solution of pure crystalline albumin, if the albumin is first degradated with the alkali or pepsin[5].

The experimental evidence thus shows convincingly that the changes in pathological sera polarographically detected consist in a proteolytic degradation of serum proteins by which cystine containing high molecular products, bearing the character of albumose, are split off. The origin of this proteolysis taking place in the blood must be sought in the increase of some products of the pathological metabolism, of the type of Abderhalden's proteolytic reactions.

R. BRDIČKA.

Physico-chemical Institute,
Charles University,
Prague.
Aug. 15.

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Photo-ammonification of Organic Nitrogenous Compounds in the Soil

IN recent years Gopala Rao and Dhar[1], Gopala Rao[2], Dhar and co-workers[3] and Corbet[4] have shown that nitrification in soils occurs partly as a photochemical reaction under the influence of sunlight. Dhar and co-workers[5] have also brought forward considerable evidence to show that fixation of atmospheric nitrogen is favoured by sunlight.

We have now found that the decomposition of various nitrogenous compounds, the so-called ammonification, occurs as a purely photochemical reaction in the presence of photocatalysts like heated soil or ignited ferric oxide. Aqueous solutions of various nitrogenous compounds were exposed to sunlight (for 30 hours) in 'Pyrex' glass flasks under sterile conditions. The amount of ammonia liberated in the decomposition process is estimated by Folin's method. The results are as given below.

	Milligrams of ammoniacal nitrogen per litre	
	Ferric oxide as photocatalyst	Heated red soil as photocatalyst
M/20 glycine ..	43·75	13·85
,, alanine ..	61·25	14·00
,, aspartic acid	65·65	17·30
,, glutamic acid	8·75	7·00
,, urea ..	28·00	12·72

It thus appears that many important chemical reactions in the soil can be brought about by the photochemical action of sunlight, independently of bacteria.

Further work is in progress.

G. GOPALA RAO.
CH. I. VARADANAM.

Andhra University,
Waltair.

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Effect of Pyridine Compounds on the Nutrition of *Staphylococcus aureus*

RECENT investigations have established the necessity of nicotinic acid (or amide) for the growth of *Staphylococcus aureus*[1]. In a previous report, it was shown that the ability of this organism to utilize compounds related to nicotinic acid is limited. We have since prepared several compounds of interest in this connexion, and the determination of their biological activity is herewith reported.

The synthetic amino acid - glucose medium of Fildes *et al.*[2] was employed in testing the activity of the series of compounds. The compounds were tested in the presence of an excess of thiamine (0·05 gamma per 10 c.c. of medium) using an 18-hour culture of *S. aureus*.

Nicotinyl glycine exhibited growth-promoting activity in the same order of concentration as nicotinic acid. Trigonelline, pyridine betaine β-carboxylic acid, α-amino pyridine, and α-amino pyridine β-carboxylic acid, were completely inactive as growth factors for *S. aureus*. It may be of interest to recall that Ackermann[3] isolated nicotinyl glycine and trigonelline from urine following the administration of nicotinic acid.

MAURICE LANDY.

Research Division,
S.M.A. Corporation,
Cleveland, Ohio.
Aug. 25.

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A *Saccharum* - *Zea* Cross

BOTH *Saccharum* and *Zea* are distinguished by the readiness with which they cross with related genera. For example, while Mangelsdorf and Reeves[1] have crossed *Zea Mays* with *Euchlæna* and *Tripsacum*, Venkatraman and Thomas[2] have crossed *S. officinarum* with a species of *Sorghum* and even the remotely related *Bambusa*[3]. I have also crossed *S. officinarum* with *Imperata Cylindrica* Beaew. and *S. spontaneum* L. with *Sorghum Durra* and *Sorghum halepense*. In spite of *Zea* and *Saccharum* being in two different sections of the Gramineæ—Andropogoneae and Maydeae (Bews)—I thought it worth while to cross them, and after several attempts using many thousands of flowers of a male sterile variety (Vellai) of *S. officinarum* $2n = 80 = 8x$ as the female parent, and variety

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