The mean values of the five controls are statistically very constant and obviously less than the theoretical diploid value (mean deoxyribonucleic acid content of spermatocyte I /2 = 980·1 ± 7·98). The mean values of the nephrectomized rats show a clear tendency to increase, without reaching the theoretical diploid value. In order to demonstrate objectively this impression we pooled the measurements in each group.

Pooled results	n	$\bar{x} \pm S\bar{x}$	S
Nephrectomized	500	900·5 ± 5·0	111·9
Controls	500	842·5 ± 4·4	98·5

T-test	t	p
Controls/nephrectomized	8·78	< 0·001

By Student's test it is demonstrated that the increase of deoxyribonucleic acid after nephrectomy is highly significant. We therefore conclude that the increase of the mitotic activity produced in the tubuli contorti of the kidney by compensatory hypertrophy after contralateral nephrectomy is correlated with an increase of the deoxyribonucleic acid content of the interphasic nuclei.

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J. Fautrez
G. Cavalli
E. Pisi

Department of Human Anatomy,
and
Belgian Centre of Normal and
Pathological Growth,
University of Ghent.
Dec. 14.

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Synthesis of Peptides by Aminolysis of Nitrophenyl Esters

The aminolysis of esters has already played a part in early attempts at peptide synthesis, as in the works of E. Fischer[1]. Fischer recognized that methyl esters react more readily than ethyl esters. Recently, H. Brockmann and H. Musso[2] applied methyl esters of amino-acids to the preparation of peptides. The more reactive esters were not used, though the work of M. Gordon, J. G. Miller and A. R. Day[3] shows that the speed of aminolysis of vinyl, and especially phenyl, esters of fatty acids is several magnitudes greater than that of the ethyl or methyl esters.

We have investigated the action of the phenyl ester of a protected amino-acid (the phenyl ester of phthalylglycine) on the ethyl ester of glycine, and found that in benzene solution at room temperature, after some days, the ethyl ester of phthalyldiglycine could be isolated in good yield. Th. Wieland and co-workers[4] used the thiophenyl esters for the same purpose, their view being that the thio-acids, which readily form amides, should be employed in this case. They used thiophenyl esters only, because they were not able to synthesize the amino-thio-acids at that time. In his more recent work, Th. Wieland reports results obtained with thio-acids since prepared by him.

We believe that Wieland in this work with thiophenyl esters is perhaps not quite correct in emphasizing their character as thio-acid derivatives. We think rather that their reactivity is due to the fact that they are phenyl esters. In recent experiments, we have examined the esters of nitrophenols, which contain a phenolic hydroxyl group with a hydrogen of greater degree of dissociation, and it was found that the speed of aminolysis of the nitrophenyl esters is much greater than that of the phenyl ester and even than that of the thiophenyl ester. Table 1 shows the relative reactivities of the phthalylglycine esters at the boiling point of benzene.

Table 1

Phthalylglycine ester	Per cent transformation in 20 min.	Phthalyldiglycine isolated (per cent of theoretical)
Phenyl ester m.p. 123–124° C.	26·5	2·6
Thiophenyl ester m.p. 103–104° C.	47·5	30·8
o-Nitrophenyl ester m.p. 169–171° C.	90·0	76·0
m-Nitrophenyl ester m.p. 160–161° C.	97·5	82·7
p-Nitrophenyl ester m.p. 180–181° C.	95·0	75·2

The dinitrophenyl ester of phthalylglycine (m.p. 217° C.) in dioxane solution and ethylglycinate react rapidly with evolution of heat.

In our opinion the phenyl esters, especially the nitrophenyl esters, deserve further attention. They are less reactive than the acid chlorides, the acid azides or the mixed anhydrides; but that is often an advantage. For example, if there are free hydroxyl and amino groups simultaneously present (tyrosine, serine), it seems desirable to prepare first the well-defined nitrophenyl esters and then proceed to the selective acylation of the NH_2 group. Harington and Pitt Rivers[5], in their synthesis of S-benzyl-N-carbobenzyloxy-cysteinyl tyrosine, first protect the hydroxyl group of tyrosine and then add to it the protected cysteine by Curtius's method. Thus the synthesis required ten steps, in place of which the same protected peptide could be obtained more simply and in good yield through the reaction of S-benzyl-N-carbobenzyloxy-cysteine-*p*-nitrophenyl ester (m.p. 84° C.) with ethyl tyrosinate, followed by saponification of the ethyl ester group.

M. Bodánszky

Research Institute of the
Pharmaceutical Industry,
Budapest.
Nov. 29.

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Identification of the Protein Fraction of Human Serum containing the Thyrotropic Hormone

After paper electrophoresis at *p*H 8·6 in a veronal-sodium buffer of a purified bovine hypophysial thyrotropic hormone preparation, the hormonal activity was found to move with the same speed as the β-globulins of human serum under similar conditions. The thyrotropic hormone assay was carried out by the iodine-131 accumulation test in mice treated with iodocasein[1].