position of cotton cellulose was followed according to methods described earlier [6, p. 17–19]. Samples from flasks were withdrawn after 7, 14, and 21 days for determination of residual cellulose. If ammonium phosphate was used as a nitrogen source, the addition of up to 1 % (0.1 *M*) Na ClO_3 had very little effect on the cellulose decomposition. The results obtained with a nitrate medium were different. The values from this experiment are given in Fig. 1. The diagram has been drawn in the same fashion as Goksöyr's [4] Fig. 1 to permit direct comparison.

It is evident that chlorate affects the decomposition of cellulose in *Cytophaga* cultures containing nitrate and that the inhibition by chlorate is dependent on the amount of nitrate present. At a ratio chlorate/nitrate of 1:1 or even 2:1, there is no appreciable inhibition of the cellulose decomposition, but at higher ratios there is a significant effect. This is at variance with the results obtained by Goksöyr [4] with *Aspergillus*.

Admittedly, *Aspergillus* and *Cytophaga* are widely different organisms, and although the evidence brought forward favours the hypothesis that chlorate is able to combine with the nitrate-reducing enzyme, the affinity of this to chlorate may perhaps vary from one organism to another. Further studies on different microorganisms are therefore needed.

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Received November 26, 1951.

The Crystal Structure of the Methanethiosulphonates of Divalent Sulphur, Selenium and Tellurium

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The synthesis and the unit cells and space group of these compounds were described by one of us recently [1]. The crystals are isomorphous, with a four-molecule unit cell based on the space group $C_{2h}^5 - P2_1/n$. The dimensions are:

	a, Å	*b*, Å	*c*, Å	β
$S(S_2O_2CH_3)_2$	11.33	5.21	16.14	91°
$Se(S_2O_2CH_3)_2$	11.38	5.23	16.23	91°
$Te(S_2O_2CH_3)_2$	11.43	5.29	16.32	91°

Weissenberg photographs were taken with CuK radiation on multiple films, and the intensities estimated visually.

A Patterson synthesis based on the *h0l* data for the tellurium compound indicated four possible tellurium positions. A Fourier map for one of the positions, using signs of the reflections calculated from the tellurium contributions alone, gave a clear resolution of the sulphur atoms. Inclusion of the calculated structure factors from these atoms changed the sign of 13 % of the reflections, and a second two-dimensional Fourier analysis was made, with the resulting tellurium and sulphur parameters:

	S_I	S_{II}	Te	S_{IV}	S_V
x	0.133	0.123	0.234	0.422	0.436
z	0.117	−0.017	−0.068	−0.054	−0.163

A Fourier analysis based on the *h0l* data for the sulphur compound was subsequently carried out, using signs of the reflections obtained from the tellurium compound revised by subtracting two thirds of the calculated tellurium structure factors. The five sulphur atoms were clearly resolved, and after three successive

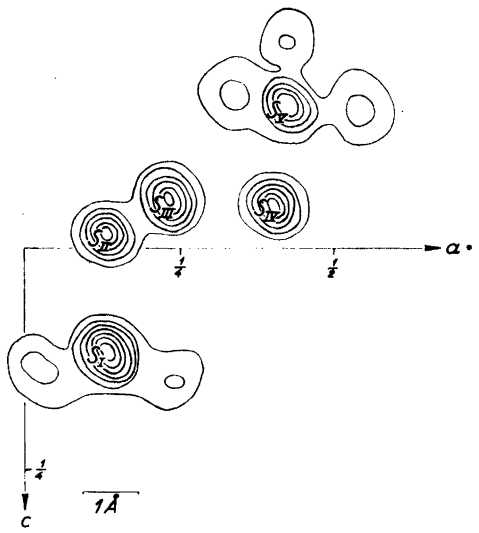

Fig. 1. Projection of $S(S_2O_2CH_3)_2$ along the b axis.

refinements the electron density map shown in Fig. 1 was obtained. The reliability factor $\Sigma||F|_{obs} - |F|_{calc}|/\Sigma|F|_{obs}$ is at this stage 0.22, and the structure is being further refined. The present sulphur parameters are:

	S_I	S_{II}	S_{III}	S_{IV}	S_V
x	0.129	0.133	0.234	0.403	0.428
z	0.119	−0.015	−0.053	−0.047	−0.159

Fig. 1 shows that the compound possesses an unbranched chain structure, the distances $S_I - S_{III}$, $S_{II} - S_{IV}$ and $S_{III} - S_V$ in the projection being 2.91 Å, 3.11 Å and 2.93 Å, respectively, *i.e.*, too large for bonds to exist between those atoms.

This is the first structure determination reported for a pentathionic compound. Details of the complete structure analyses of the sulphur, selenium and tellurium methanethiosulphonates will be published in due course.

The work is carried out by the aid of grants from the *Norges Almenvitenskapelige Forskningsråd.*

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Received November 26, 1951.

The Fluorometric Measurement of 4-Pyridoxic Acid in Normal Urine

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Huff and Perlzweig [1] have isolated and identified the excretion product 4-pyridoxic acid (2-methyl-3-hydroxy-4-carboxy-5-hydroxymethylpyridine), which is supposed to be the main excretion product of vitamin B_6. In the same work they described a fluorometric method for quantitative determination of 4-pyridoxic acid in urine. The fluorometric determination is based on the fact that the lactone form of 4-pyridoxic acid gives a fluorescent intensity 25 times that of the free acid, which in itself is highly fluorescent. In human urine the product occurs in the free acid form. By heating the urine in acid solution this compound is converted into its lactone form. The blank is an untreated urine sample. With this method it has been found that the average 24 hour urinary excretion in man is from 3 to 4 mg [2–4].

In a critical study of the Huff and Perlzweig method Sarrett [5] has shown that the blank is not reliable in measurements of normal urine. Sarrett reports of unsuccesful attempts to separate the 4-pyridoxid acid from interfering substances by means of adsorption or precipitation.

Using the same method we have found that other substances than 4-pyridoxic acid present in the urine increase in fluorescence by treatment with acid. We have therefore used a blank prepared in a different way. Our technique is based on the reconversion of the lactone into the free acid by heating the urine in alkaline solution. The first step is to heat the urine with acid. By this treatment the free acid is converted into its lactone form and the fluorescence of this sample containing the