25% above normal (10 to 20%) within 10 days. Nevertheless, the induced sickness had not the characteristics of an epidemic disease, for the death rate in the experiments was rather constant till imaginal moult. A sudden increase of mortality (as was expected after reaching last larval stage) was not observed. Thus one or several additional factors must be of influence.

It is known that mucin increases the pathogenity of *P. aeruginosa*[6]. The rôle of *Aspergillus flavus* in the epidemic of *Schistocerca* was already mentioned. For the disease in *Oncopeltus fasciatus* previously described by BEARD[10], a mycotoxin from *Aspergillus flavus var. columnaris* was made responsible[11,12]. Fungi frequently grow on the normal food (sunflower seeds), but normally the bugs do not seem to mind it. Nevertheless the influence of *Aspergillus flavus* (D2)[5] was tested. Sunflower seeds on an agar culture of D2, and seeds on which D2 was actually cultivated, were given as nutrition to 3rd, 4th and 5th larval instars. The results showed that in no case had D2 a significant impact on larvae. Also when the food was additionally contaminated with Pl 1/12, no synergistic effect of D2 was observed. This, of course, does not exclude that a different strain or another fungus may facilitate the manifestation of the epidemic.

The illness occurred most frequently when humidity and breeding temperature were high (30 °C). Larvae of 4th and 5th stage and imagines reared under these conditions received with Pl 1/12 contaminated food. In all cases 90% of the test animals died within 2 weeks, the majority between day 5 and 10. The sick and dead bugs showed the symptoms of spontaneously diseased populations. The incubation period seems to be about 1 week. This is also supported by the observation that culture jars with healthy larvae which are brought into an incubator with experimentally diseased populations, are invaded by the bacterium after about 10 days. Imagines are obviously susceptible to the bacterium but have probably built up some immunity (see above), which may protect them under normal conditions, where they would hardly come in contact with as much bacteria as in the experiment.

Thus at least three factors are responsible for the manifestation of the epidemic disease: The presence of *P. aeruginosa*, high temperature (optimal temperature for development of *P. aeruginosa* is 37 °C[6]), and high humidity (probably necessary for the bacterium to survive[6]). It is assumed that the disease spreads by peroral infection, while feeding on contaminated seeds. Since cannibalism is not seldom, especially when starving, this could also be of importance for transmission. The bacterium apparently does not damage the gut epithel while passing through the hemocoel. Death is obviously caused by destruction of the fat body.

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Influence of Cyclic Nucleotides on Protein Synthesis in Vascular Smooth Muscle

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Summary. The incorporation of leucine-^{14}C into protein in bovine mesenteric arteries was augmented by cyclic GMP (10^{-3} *M*) and decreased by cyclic AMP (10^{-3} *M*). There was no effect of 5'AMP (10^{-3} *M*). The phosphodiesterase inhibiting drugs theophylline (10^{-3} *M*) and papaverine (5×10^{-5} g/ml) both decreased the leucine-^{14}C incorporation.

In atherosclerotic aortas of pigs, the synthesis of proteins has been reported to be increased[2,3]. There was a reduction of the cyclic AMP and an elevation of the cyclic GMP level in atherosclerotic pieces of the muscle in comparison with normal parts of the vessel[3]. There are reports that cyclic AMP inhibited the proliferation of myogenic cells in tissue culture[4], whereas cyclic GMP was found to stimulate the in vitro synthesis of thyroidal proteins[5]. Considering these observations, we thought it of interest

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Table I. Influence of some drugs on ^{14}C-leucine incorporation in bovine mesenteric arteries

	Control	Drug	Difference
Cyclic AMP (1×10^{-3} *M*) ($n = 6$)	0.257 ± 0.015	0.123 ± 0.015	− 0.135 ± 0.019[c]
Cyclic AMP (5×10^{-4} *M*) ($n = 6$)	0.174 ± 0.020	0.131 ± 0.010	− 0.042 ± 0.010[b]
Cyclic AMP (1×10^{-4} *M*) ($n = 4$)	0.202 ± 0.029	0.227 ± 0.048	0.025 ± 0.019
5'AMP (1×10^{-3} *M*) ($n = 6$)	0.239 ± 0.035	0.235 ± 0.019	0.004 ± 0.015
Theophylline (1×10^{-3} *M*) ($n = 10$)	0.212 ± 0.014	0.168 ± 0.014	− 0.044 ± 0.012[b]
Cyclic AMP (5×10^{-4} *M*) ($n = 6$) + theophylline (1×10^{-3} *M*)	0.218 ± 0.015	0.189 ± 0.018	− 0.029 ± 0.017
Papaverine (5×10^{-5} g/ml) ($n = 7$)	0.174 ± 0.020	0.074 ± 0.012	− 0.100 ± 0.016[c]
Cyclic AMP (5×10^{-4} *M*) + papaverine (5×10^{-5} g/ml) ($n = 7$)	0.174 ± 0.020	0.053 ± 0.012	− 0.121 ± 0.012[c]
Cyclic GMP (1×10^{-3} *M*) ($n = 6$)	0.204 ± 0.027	0.244 ± 0.028	0.040 ± 0.010[b]
Cyclic GMP (1×10^{-5} *M*) ($n = 6$)	0.197 ± 0.022	0.210 ± 0.033	0.013 ± 0.023

Incorporation in μmole/g protein/180 min. Significance of the effects is denoted [a] $p < 0.05$; [b] $p < 0.01$; [c] $p < 0.001$.

Table II. Effects of cyclic nucleotides on distribution of AIB-^{14}C in bovine mesenteric arteries

Nucleotide	Control	Drug	Difference
Cyclic AMP (10^{-3} M) ($n = 9$)	106.0 ± 6.0	105.6 ± 5.5	− 0.4 ± 1.7
Cyclic GMP (10^{-3} M) ($n = 12$)	113.4 ± 5.1	117.8 ± 5.3	4.3 ± 1.6[a]

The distribution in percent was calculated from the quotient $=$ $\frac{\text{content in wet tissue (cpm/mg)}}{\text{medium concentration (cpm/}\mu\text{l)}} \times 100$. Significance as in Table I.

to study the influence of cyclic AMP and cyclic GMP on the incorporation of ^{14}C-leucine in the proteins of vascular smooth muscle – bovine mesenteric artery.

The method has been described in detail by ARNQVIST[6] as the method to investigate accumulation of α-aminoisobutyric acid-^{14}C (AIB-^{14}C). In short, about 20 cm of the mesenteric artery was removed 15–20 min after the slaughter of the animal, rinsed and put in a thermosflask with oxygenated Krebs-Henseleit bicarbonate buffer solution at 37 °C and then transported to the laboratory. The preparation was cleaned from adventitial tissue, cut open along its length and divided into pieces with a length of about 15 mm and breadth of 10–12 mm. The weight of the pieces was about 200 mg. Adjacent tissue samples were used as test and control preparations. The preparations were incubated in 4 ml oxygenated (95% O_2 + 5% CO_2) Krebs bicarbonate buffer for 180 min with 1×10^{-5} M L-leucine containing 0.4 μCi-leucine and 5.6 mM glucose. After incubation for 180 min, the tissue was homogenized in 10% TCA and the protein was purified, dried, weighed and dissolved in 1 ml Soluene. The radioactivity incorporated into protein was measured in a Packard Tri Carb scintillator detector.

Cyclic AMP in a concentration of 1×10^{-3} M reduced significantly the ^{14}C-leucine incorporation, whereas 1×10^{-4} cyclic AMP was ineffective (Table I). In a concentration of 5×10^{-4} the nucleotide was still effective, indicating that the threshold concentration for the cyclic AMP effect may be about between 1 and 5×10^{-4} M. 5′AMP (1×10^{-3} M) had no effect (Table I).

Both theophylline (1×10^{-3} M) and papaverine (5×10^{-5} g/ml), drugs which increase the cyclic AMP level of the muscle by inhibiting the phosphodiesterase activity[7], reduced significantly the leucine incorporation; the effect of papaverine being most marked (Table I). In combination cyclic AMP (5×10^{-4} M) and papaverine had an additive effect but theophylline (1×10^{-3} M) did not increase the action of cyclic AMP (Table I). Cyclic GMP (1×10^{-3} M) in contrast to cyclic AMP stimulated the ^{14}C-leucine incorporation; a concentration of 1×10^{-5} M being ineffective (Table I).

Regarding the mechanism by which the cyclic nucleotides influence ^{14}C-leucine incorporation, both an influence on the transport of the aminoacid through the cell membrane and its incorporation into the proteins may be considered. To study the first of these reactions, the effects of the nucleotides on the AIB-^{14}C transport was investigated. From Table II it is evident that cyclic GMP very moderately stimulated the AIB-accumulation, whereas cyclic AMP had no effect.

The physiological or pathophysiological role of the cyclic nucleotides in protein synthesis is unclear, but the nucleotides may have a role both in metabolic changes observed in atherosclerotic and hypertensive vessels. In aortas from hypertensive rats, the proteins of the vascular wall was found to be increased[8] and the level of cyclic AMP to be decreased[9].

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The Short-Term Effects of Ingested Chrysotile Asbestos on DNA Synthesis in the Pancreas and Other Organs of a Primate[1]

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Summary. Single oral administration of chrysotile asbestos to monkeys resulted 9 days later in the stimulation of DNA synthesis in the pancreas as evidenced by increased incorporation of tritiated thymidine.

Asbestos is now a ubiquitous environmental contaminant, particularly in industrialized communities[2]. There is growing recognition of the exposure of general populations to low levels of asbestos in drugs, food, and drinking water, besides in air[3–8]. Nevertheless, there are no valid toxicological or epidemiological data on the carcinogenic effects of orally administered asbestos. The possibility that asbestos, alone or in some interactive combination with other chemical carcinogens, may be a causal factor in the induction of gastrointestinal (GI) tract cancer, besides possibly cancers at other sites, is attracting increasing interest. It should be noted that GI cancers are one of the commonest internal human cancers, the etiology of which is still largely unknown; approximately 100,000 cases are diagnosed annually in the USA.

There are abundant epidemiologic data relating occupational respiratory exposure to asbestos with asbestosis, pleural and peritoneal mesotheliomas, and bronchial carcinoma, besides carcinomas at other sites, particularly the GI tract[9–13]. Additionally, there is evidence of a synergistic interaction between asbestos and tobacco smoking in the pathogenesis of both bronchial and esophageal carcinomas[14]. Although asbestos is known to be widely disseminated in the body of experimental animals following its initial primary site of absorption or deposition[15–17], there is still uncertainty as to whether the enhanced incidence of GI cancers in workers exposed to asbestos by inhalation[12] is due to hematogenous or