dioxide to sulphuric acid. By exposing paper, usually under damp conditions, to atmospheres containing about 0·5 per cent sulphur dioxide, that is, 10,000 times that in an industrial atmosphere, Langwell measured the increase in sulphate in the paper by extraction with water and precipitation as barium sulphate. The uptake of sulphur was correlated with catalysts present in, or added to, the paper, and iron was found to be an important catalyst for the conversion of sulphur dioxide to sulphate under these conditions.

His work was limited by the sensitivity of the precipitation method. One of us had found, in another connexion[7], that sulphur-35 could be used very effectively in paper for studying migration by autoradiographs or counting. We therefore decided to repeat some of Langwell's experiments using sulphur labelled with sulphur-35. W. H. Langwell, himself, kindly supplied us with the same papers that he had used in studying the effect of catalyst inhibitors[4].

Detailed results will be published elsewhere, when they are complete, but some new information has been found already. Using a wet atmosphere and 0·5 per cent sulphur dioxide the uptake of sulphur dioxide could be detected with a Geiger–Müller counter after 2-hr. exposure only, and after 24-hr. exposure the papers tested could be shown to fall in general into the order already found by Langwell using a seven-day exposure.

Some labelled sulphur was burned in a desiccator to give a concentration of 1 per cent sulphur dioxide under normal dry conditions (about 50 per cent relative humidity). When papers were exposed to this the uptake of sulphur dioxide could be detected in 3 hr., and after 24 hr. the papers again fell into the order obtained by Langwell.

It was necessary to expose all papers to atmosphere before counting to allow gaseous sulphur dioxide to diffuse out; but a steady counting-rate was obtained after 4 hr.

The labelled paper samples after exposure to sulphur dioxide under both wet and dry conditions were placed between X-ray film for three weeks and then developed. The autoradiographs showed some general take-up of sulphur; but they also showed a random distribution of intense black spots with dark areas spreading from them. The paper itself was now developed with acid potassium ferrocyanide and it was found that the dark areas corresponded to iron, and in some cases, bronze spots in the paper. The take-up of sulphur dioxide is, therefore, partly general and partly localized.

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Detonation Phenomena in Homogeneous Explosives

In their discussion of certain detonation phenomena in homogeneous explosives, Campbell *et al.*[1] describe a curious effect obtained by lining the container of an explosive with metal foil. They state that very thin metal foils, of the order of 0·001 in. thickness, can reduce quite considerably the diameter at which failure of detonation of nitromethane occurs.

In considering the effect of the container on the detonation of an explosive charge, the natural impulse is to look for an interpretation of the phenomenon in terms of confinement, by which is usually meant the resistance offered by the envelope to the lateral expansion of the detonation products. It is known, however, that the initial mass movement of the products, or 'streaming velocity', is forward, from which it may be deduced that the early stages of detonation are more likely to be influenced by resistance to forward, rather than to lateral, movement. This suggests that frictional resistance at the surface may be a more potent factor initially.

That this effect exists is indicated by the fact that detonation in a gaseous explosive is established sooner in a tube with a rough interior than in one which is smooth. Also, detonation sets in earlier in a narrow tube than in a wide one[2]. These facts show that the onset of detonation is governed by conditions at the surface and that the roughness of the surface is involved. The inference is that frictional resistance at the surface, which is a tangential force and so does not oppose lateral movement, is a significant factor in the development of detonation.

In detonation, very high pressures and velocities are involved and, as violent friction causes abrasion and erosion, the surface material is reduced and is able to mix, and possibly react chemically, with the products of detonation, much as coal dust is raised and consumed in a mine explosion. The violent explosions which have occurred in oil-contaminated compressed-air lines[3], the independent propagation of detonation in tubular cavities in high-explosive cartridges[4], and the low-velocity detonation regime in cartridges of granular explosive[5], are probably further instances of surface films taking part in high-velocity explosive reactions. Thus the action of the surface layer can be chemical as well as physical.

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Activation of Phospholipid Thromboplastin by Lecithin

This communication is prompted by the recent report of Newlands and Wild[1] that a preparation of soybean phospholipid can serve as a useful source of platelet factor for the thromboplastin generation test. We have been trying in this laboratory for several years to define the phospholipid structures responsible for thromboplastic activity. Reports