blue shift of the Soret band and a loss of the 695 nm. band, and the Soret band of the ferro form increased in extinction by 15% without shift. Product III probably had a much looser crevice structure than product I, as product III was autoxidizable and not reduced by NADH-cytochrome *c* reductase. The *pK* values for the high-spin transition for native cytochrome, product I, and product III were 2.5, 2.7 and 4.3 respectively. The ferro form of product III, unlike product I, was partly in the high-spin state at a neutral pH and was converted into a low-spin state by imidazole. A ligand change from sulphur to an oxygen atom after methionine oxidation, unlike carboxymethylation, may result in only a small disruption of the haem environment.

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Biochemical Changes in Skin and Muscle after Thermal Injury

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The concentrations of various enzyme systems have been examined in homogenates of skin and muscle taken from the hind limbs of cats after thermal injury, to compare changes in the enzymic activities of the tissues with those previously found in the lymph draining the tissues (Lewis, 1967). A mean decrease of 14% was found in the lysosomal enzyme acid phosphatase in muscle and skin, and a second lysosomal enzyme, β -glucuronidase, was decreased by 15% in muscle and 50% in skin. However, no increase in either of these enzymes was found in the lymph draining the injured limb. Mean increases were observed in the skin cytoplasmic enzymes lactate dehydrogenase and creatine phosphokinase of 100% and 35% respectively, in spite of the facts that up to 30% of the total skin lactate dehydrogenase appeared in the lymph during 4 hr. after injury, and that overall protein-synthetic activity measured by the incorporation of labelled precursors *in vivo* and by the activity of skin ribosomes *in vitro* (White & Worthington, 1968) was decreased by about 50%. Further, administration of the inhibitors cycloheximide and actinomycin failed to affect the increased concentrations of cytoplasmic enzymes in skin and

lymph. Therefore the changes in these enzymes cannot be due to increases in their respective rates of synthesis but might be attributed to some form of activation. Examination of the isoenzyme patterns of lactate dehydrogenase by isoelectric focusing in polyacrylamide gels (Dale & Latner, 1968) indicated that formation of isoenzyme LDH-1 (H_4) was stimulated after thermal injury both in skin and in lymph even after the administration of cycloheximide.

As early as 30 min. after thermal injury, there was a decrease in skin and muscle glycogen of approx. 50% and, after 4 hr., an average increase in skin DNA of 43%. These changes, taken together with formation of isoenzyme LDH-1, which favours pyruvate oxidation, may well constitute a part of the mechanism leading to tissue repair.

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Changes in the Cell-Wall Composition of a Strain of *Bacillus subtilis* grown in a Chemostat

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The cell-wall composition of strains of *Bacillus subtilis* has been shown to change qualitatively and quantitatively when the organisms are grown under different growth-limiting conditions in a chemostat. Thus, strains that contain a teichoic acid (a phosphorus-containing polymer) in their walls lose this polymer when grown under phosphorus-limiting conditions (Ellwood & Tempest, 1967, 1968).

A laboratory strain of *B. subtilis* was found not to contain any teichoic acid in its wall, and to have a wall composition similar to that of *Bacillus polymyxa* (Goundry, Davison, Archibald & Baddiley, 1967; Nermut & Murray, 1967), suggesting the presence of an outer coat of lipoprotein.

It was of interest to discover what changes occurred in the composition of the cell wall of this organism with respect to the lipoprotein coat, when it was grown with different limiting substrates in a chemostat.

Cell walls from this *B. subtilis* grown in several different limiting media were prepared by disintegration of heavy suspensions of washed organisms in a Braun M.S.K. disintegrator. Chromatographic analyses of the cell walls after acid hydrolysis showed the presence of ten amino acids and