More recent work at Johns Hopkins University, 1962 (11) has provided an insight into the electrochemical oxidation of pyrite. Pyrite conducts electricity and exhibits potentials in ageous solutions. It is not surprising then, that the oxidation of pyrite in coal mines in the presence of water be considered electrochemical in nature. Clark, 1965 (12) defines an electrochemical reaction as a chemical oxidation reduction reaction "in which the oxidation reaction (anode reaction) and the reduction reaction (cathode reaction) are in general, occurring at different locations on the conducting material (pyrite)." The oxidation reaction involves the oxidation of pyrite to Fe^{+2}. The reduction reaction involves the reduction of Fe^{+3} and/or dissolved oxygen. The complex system of pyrite oxidation by electrochemical reaction also involves the generation of S gas and soluble sulfur species.(13) The theoretical considerations have been set forth by Clark, however, as far as is known, no practical evaluation of the theory has been made.

3. Bacterial oxidation of pyrite:- The oxidation of pyrite by bacteria has been studied in depth by many workers. Temple and Koehler (14) have made an excellent review of the progress achieved.

The bacterium isolated as the active organism in coal pyrite oxidation is thiobacillus thiooxidans.(15) T. thiooxidans has been found in all acid mine waters tested for its presence. Moreover, it is found in abundance at the site of acid formation in the mine. T. thiooxidan is a member of the group of autotrophic bacteria, distinguished from other living forms by the fact that they utilize the chemical energy from the oxidation of inorganic compounds and obtain all the "element for this growth and metabolism from inorganic sources."(14) This bacterium oxidizes sulfur or sulfur ion in pyrite to sulfate. Significant laboratory data have substantiated the hypothesis that T. thiooxidans is an active pyrite oxidizing agent.(14

4. Overall concept of acidic water formation:- The conclusions reached by most investigators is that the oxidation of pyrite with the subsequent formation of acid