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9. **Benefits from Agricultural Limestone.** J.N. Payne, University of Arkansas.
10. **Scientific Research in Southern Universities and Colleges.** W. Paul Brann, University of Arkansas.
11. **Tetramerism in Narcissus.** D.M. Moore, University of Arkansas.
12. **A New Fern Record for Arkansas.** D.M. Moore, University of Arkansas.

**32nd Annual Meeting May 7-8, 1948.
University of Arkansas
Fayetteville**

Physical Section - Friday, May 7, 2 P.M.

1. **Mechanism of Magnesium Corrosion.** D.S. Burgess, ORDARK Research Project, University.
2. **Surface Area of Powdered Materials.** J.E. Shoemaker, ORDARK Research Project, University of Arkansas.
3. **The Slow Oxidation of Lactose (Milk Sugar).** E.A. Provine, Ouachita College.
4. **Application of Chemical Engineering to the Production of Paints and Paint Products.** D.E. Dick, Stebbins and Roberts, Inc., Little Rock.
5. **Notes on the Velocity Amplification of Acoustical Resonators.** R.L. Morse, Novelty Clock Co. and University of Arkansas.
6. **Acoustical Impedance and Absorption Coefficients of Heerwagen Tile.** W.A. Hilton, William Jewell College and L.B. Ham, University of Arkansas.
7. **A General Theory of Physical Structure.** C.W. Bock, Polytechnic Institute, Russellville.

Biological Section - Friday, May 7, 2 P.M.

1. **Blood Supply of Nerves.** Dean J.T. Roberts, M.D., PH.D., University of Arkansas School of Medicine, Little Rock.
2. **Biochemical Analysis of Cotton Leaves and their Chemical Deflection as Affected by Environment.** Vernon L. Hall, University of Arkansas.
3. **Effect of Sodium Azide on Water Transfer in Root Tissue.** Sister M. Germaine Rachaner, St. Scholastica Academy, Fort Smith.
4. **Ecology and Surface Geology of the Carizozzo Lava Flow.** Preliminary Report. Harold M. Hefley, University of Arkansas.
5. **A Preliminary Report on Arkansas Bryophytes.** Display of specimens. E.B. Wittlake, University of Arkansas.
6. **Some Endemic Flowering Plants of Arkansas and the Ozark Region.** D.M. Moore, University of Arkansas.

Evening Session

Lecture: "Microseisms and the Weather". Dr. J.B. Macelwane, S.J.,
Dean of the Institute of Geophysical Technology,
St. Louis University.

Saturday, 9 A.M.

Symposium. Rice and the Rice Industry

1. **The Rice Industry.** L.C. Carter, Gen. Mgr. Arkansas Rice Growers Cooperative Association, Stuttgart, Arkansas.
2. **Problems of Rice Milling.** C.R. Walton, President Walton Rice Mill, Stuttgart, Arkansas.
3. **Pilot Plant Rice Milling.** W.L. Belvin, Professor of Chemical Engineering, Bureau of Research, University of Arkansas.
4. **Recent Research in Rice.** M.C. Kik, Asst. Professor of Agricultural Chemistry, University of Arkansas.
5. **Medicinal Value of Rice.** Dean J.T. Roberts, University of Arkansas Medical School, Little Rock, Arkansas.

Saturday Afternoon

Field Trip - Savoy and Lake Wedington, conducted by Dr. Dwight M. Moore.

ABSTRACTS OF PAPERS PRESENTED AT THE

32ND ANNUAL MEETING. PHYSICAL

SCIENCE SECTION: May 7, 1948.

3. **Oxidation of Lactose by Copper Acetate.** E.A. Provine, Ouachita College, Arkadelphia. 20 minutes. Oxidation of lactose by copper acetate at constant temperature 60°C has been carried on for varying lengths of time up to 2400 hours. Cupric oxide was added to the reaction mixture in order to maintain a constant pH. The reaction mixtures were analysed and quantitative determinations made for carbon dioxide, formic acid, oxalic acid, glyoxalic acid, osone, unchanged sugar, the quantity of oxygen used, and the hydrogen ion concentration. Tests for hydrolysis of lactose in a nonoxidizing medium at 60°C and pH 4.10 showed no hydrolysis up to 2400 hours. Corresponding mixtures of glucose and galactose were also oxidized and reaction products determined quantitatively. Results have been plotted to show the moles of each product per mole of sugar used against time. The enediol theory is used in the interpretation of the results.
4. **Application of Chemical Engineering to the Production of Paints and Paint Products.** D.E. Dick, Stebbins and Roberts, Inc., Little Rock. In the production of paint and paint products six basic principles of applied science evolved by Dr. Rassweiler, Vice-President for Research and Development of the Johns-Manville Corporation, are not only especially applicable but are also some of the main tenets of a chemical engineer.

The successful paint formulator should have a chemical educational background to enable him to understand the basic chemical reactions involved in the compounding of the raw materials used in his formulae. In choosing the raw materials with which he works he must be able to "sift the wheat from the chaff" so that he may formulate economically. Likewise,

he must compute his costs, which is no more than common-sense inclusion of all cost factors involved.

Paint plant superintendents are hired to manage the integral operations of paint factories as efficiently as possible. Likewise these men establish accurate laboratory control over plant production to ensure product uniformity of viscosity, net weight per gallon, fineness of grind, applicability, drying, color, gloss and film. Quite often one man fills both positions described above which after all are but applications of chemical engineering.

5. **Notes on the Velocity Amplification of Acoustical Resonators.** R.L. Morse. Novelty Clock Co. and University of Arkansas. 15 minutes. A summary of work done in measuring the velocity amplification of single and double resonators is presented. Discrepancies between theory and experiment are found to be serious, particularly with respect to the variation in amplification with chamber volume. An unexplained critical volume is found which permits greatly increased amplifications.

The more or less accepted superiority of double resonators as amplification devices is challenged.

6. **Acoustical Impedance and Absorption Coefficients of Heerwagen Tile.** W.A. Hilton, William Jewell College and L.B. Ham, University of Arkansas. 20 minutes. Acoustical impedance and absorption coefficient are probably the two most significant measurements that can be made upon any sound absorbing material. The method of setting up standing waves in a tube has been used in this study to determine the acoustical impedance and absorption coefficients of Heerwagen Acoustical Tile at the following frequencies: 130, 260, 390, and 520 cps.

The tube was constructed of heavy oak lumber weighing 9 1/2 pounds per square foot. It is 9 feet in length and one foot square (inside) cross section. The sound source consists of a beat-frequency oscillator connected through an amplifier to a high quality speaker attached to one end of the tube. The sample of acoustical material is attached to the other end of the tube. The intensity of the standing waves set up in the tube is then measured by a sound level meter which is connected to a pressure microphone which can be moved up and down the tube. The readings of the microphone at successive minima in accordance with theory give the necessary data for the calculation of absorption coefficients and acoustical impedance.

7. **A General Theory of Physical Structure.** C.W. Bock, Polytechnic Institute, Russellville. (1) The aim or object of a general theory of structure is to explain or describe by one perceptually realizable concept the structure (static and dynamic) as well as the behavior (genetic, absorptive, emissive and interactive) of such physical entities as the solar system, the sun, earth and moon, the electron, proton and neutron, the atom and molecule as well as the generality of physical entities of whatever degree or state of aggregation. (2) Such a theory may properly be termed an "electromagnetic" theory, based as it is, on the simple facts of electro-magnetism. It may be most conveniently described as an association of orbitally directed energies--here termed the electric component (field)--about which revolves a similar system of energies at right angles to the first by the right-hand thumb rule. The latter being termed the magnetic component, while the association as a whole becomes an electro-magnetic field. (3) The primary burden of a similar theory must define the association in its particulars,

especially in its genetic, evolutionary, involuntary and structural aspects. And secondarily, how the same may be made to do duty for the generality of physical structures. (4) Its application to the structure of the earth (dynamic and static) will be illustrative of the general intent of the proper theory.

**33rd Annual Meeting - May 6-7, 1949.
University of Arkansas School of Medicine
Little Rock**

Biological Science Section - Friday, May 6, 2 P.M.

1. **Sanitary Survey of Shallow Wells and Springs.** A.L. Ludy and I.A. Wills, John Brown University, Siloam Springs.
2. **Grassy Lake: A Biologist's Paradise.** D.M. Moore, University of Arkansas, Fayetteville.
3. **The Action of Ions on Reproduction.** O.K. Cosla, The College of the Ozarks, Clarksville.
4. **The Influence of Injectable Liver Extract Upon *Ascaridia galli* infections in Chicks.** Cecilia K. Keith, J.R. Totter and E.Sadun, University of Arkansas, School of Medicine, Little Rock.
5. **Experimental Contributions to the Cellulary Synthesis of Cellulose.** O.K. Cosla, The College of the Ozarks, Clarksville.
6. **Scientific Soilless Plant Cultivation.** T.L. Smith and O.K. Cosla, The College of the Ozarks, Clarksville.
7. **The Bryophytes of Spy Rock Hollow.** E.B. Wittlake, University of Arkansas, Fayetteville.

Medical Science Section - Friday, May 6, 2 P.M.

1. **Blood Sugar Levels and Cataract in Alloxan-treated Galactose-fed and Xylose-fed Weanling Rats.** R. Sterling and P.L. Day, University of Arkansas School of Medicine.
2. **Clinical Evidences of Nutritional Deficiencies in Alaskan Eskimos.** C.F. Shukers, J.R. Totter, University of Arkansas School of Medicine, and Christine A. Heller, Territorial Department of Health, Juneau, Alaska.
3. **Biochemical Findings in a Nutritional Survey of Alaskan Eskimos.** J.R. Totter, Christine A. Heller, and C.F. Shukers, University of Arkansas School of Medicine.
4. **A Method of Measuring Iodine - 131 in Urine and other Liquids.** W.A. Reilly, M.D., R.R. Edwards, and R.G. Holmes, University of Arkansas School of Medicine.
5. **Medical Applications of Nuclear Physics.** P.J. Rosenbaum, University of Arkansas School of Medicine.