It is suggested that the minimal EEG response can therefore be used as a method for studying convulsive threshold in human beings, thereby avoiding drastic aspects of the seizures themselves.

Utility of Sulfa Drugs for the Inhibition of Mold Respiration in Grain [1]

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Recent studies (*3*) have indicated that the carbon dioxide evolved from normal grain, held over time intervals of several days at moisture levels in hygroscopic equilibrium with air relative humidities in excess of 75 per cent, is due principally to the respiration of an indigenous mold population growing on the seeds. Under such conditions, the respiration of the seeds themselves is completely obscured. The respiratory activity of a freshly dampened seed sample increases continuously over time periods of several days and then tends to level off, the respiration-time curve thus assuming the form of a microbiological population-growth curve. On the other hand, at moisture levels in equilibrium with relative humidities below 75 per cent, where mold growth is not involved, seed respiration shows an extremely low and virtually constant rate with time.

With the object of obtaining data on the characteristics of true seed respiration at humidity values where it is normally obscured by mold respiration, a large number of organic compounds have been tested on wheat for fungistatic activity. The criterion of a suitable compound is that it must be fungistatic or fungicidal, but it must not adversely affect seed respiration or viability. Among the compounds which have been proposed for the suppression of mold respiration in grain are carbon tetrachloride (*2*) and trichloroethylene, quinosol, diacetyl, and phenothiazine (*1*). In the present studies search is being made for fungistatic compounds which are dry, relatively insoluble powders of low toxicity to animals and humans, and which would be odorless and tasteless. Among those investigated were 11 common sulfa drugs. Snow and Watts (*4*) have recently observed fungistatic activity by certain sulfa drugs when these were incorporated into nutrient agar media on which were cultured several mold species isolated from feeding stuffs.

TABLE 1

EFFECT OF SULFA DRUGS ON THE INCREASE OF ACIDITY DUE TO MOLD GROWTH ON REGENT WHEAT

Compound	Acidity*
Control	67.8
Sulfanilamide	22.6
Sulfapyridine	34.5
Sulfapyrazine	50.6
Sulfathiazole	33.3
Sulfaguanidine	52.2
Sulfadiazine	52.2
Sulfamerazine	53.8
Sulfaquinoxaline	50.1
Sulfasuxidine	29.6
Phthalyl sulfathiazole	56.3
Sulfamethazine	57.1

* Milligrams KOH required to neutralize benzene extract of 100 grams ground sample, air dry basis.

In the present studies the sulfonamides were finely ground and dusted onto the damp grain. Relative fungistatic activity was estimated from the increases in the acidity of benzene extracts of Regent wheat dampened with water to 20 per cent moisture (equilibrium relative humidity, 90 per cent) and stored for one month at room temperature. The results of this experiment are shown in Table 1. The effect of dry, powdered sulfanilamide in concentrations of from 1/2,000 to 1/250 (ratio of weight of sulfanilamide to weight of damp seed) on the respiration of Regent wheat containing 20 per cent moisture is shown in Fig. 1. Germination data for these wheat samples after the 11-day respiration trial are given in Table 2.

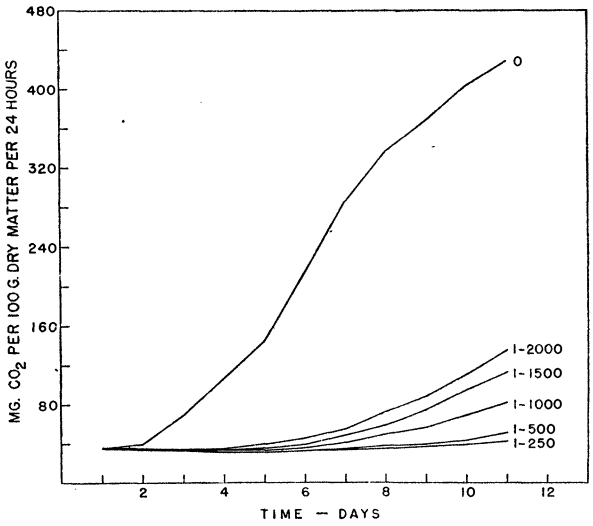

FIG. 1. Influence of various concentrations of powdered sulfanilamide on the respiratory behavior of wheat at 20 per cent moisture (relative humidity, 90 per cent).

Sulfanilamide showed the greatest fungistatic activity of the 11 sulfa drugs tested. It would appear that substitution in the amino group attached to the sulfonyl radical reduces the inhibitory effect of sulfa drugs toward the particular mold types which proliferate on wheat at this humidity level.

In the respiration trial the control sample showed respiratory increases analogous to the form of a

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microbiological growth curve, which is indicative of mold proliferation. Increasing concentrations of sulfanilamide increased the latent period of mold spore germination in proportion to the concentration of inhibitor used. It is significant that the respiratory rate of the control sample on the first day, before mold proliferation commenced, was the same as that of samples treated with sulfanilamide. This respiratory rate (about 33 mg. CO_2/100 grams dry matter/day) remained virtually constant for 8 days at the highest concentration of sulfanilamide and is probably representative of the true seed respiration under the conditions of moisture and temperature applied. Germination data (Table 2) indicate that suppression of mold growth by sulfanilamide yielded a larger percentage of viable seeds at the end of the trial.

TABLE 2

EFFECT OF SULFANILAMIDE ON WHEAT RESPIRATION AND ON THE MAINTENANCE OF WHEAT VIABILITY AT A MOISTURE VALUE FAVORABLE TO MOLD GROWTH*

Sulfanilamide concentration	Respiratory rate†	Germination (%)
0	428	10
1–2,000	136	57
1–1,500	114	62
1–1,000	83	69
1–500	52	82
1–250	43	84

* Wheat samples were tested for germination after 11 days in respirometers at 30° C., at a moisture value of 20 per cent. Initial germination was 94 per cent.

† Milligrams CO_2/100 grams dry matter/24 hours, on 11th day of trial.

Use of these findings is being made to determine the true respiration of wheat seeds with moisture contents as high as that required for germination. Investigation of the fungistatic effect of other organic compounds containing the sulfonamide radical is in progress. The utility of such compounds as a practical means to prevent the deterioration and heating of grain in storage is also under consideration. Results of these experiments will be published later.

References

1. CAMERON, MARGARET P. Unpublished Master's thesis, Univ. Saskatchewan, 1945.
2. LARMOUR, R. K., CLAYTON, J. S., and WRENSHALL, C. L. *Canad. J. Res.*, 1935, **12**, 627.
3. MILNER, M., and GEDDES, W. F. *Cereal Chem.*, 1946, **23**, 225.
4. SNOW, D., and WATTS, P. S. *Ann. appl. Biol.*, 1945, **32**, 102.

News and Notes

AAAS Meeting Notes

The Cambridge Entomological Club will hold a special meeting in conjunction with the AAAS meetings in Room B-455, Biological Laboratories, Harvard University, at 8:00 P.M. on Thursday, 26 December. The meeting will be addressed by Clarence H. Kennedy, of The Ohio State University, whose subject will be: "The Child Labor of the Termites Versus the Adult Labor of the Ant Society." An informal social gathering will follow. Visitors will be welcome.

The American Society of Parasitologists will meet in Boston in affiliation with the AAAS for a three-day program session, 26–28 December. The Statler Hotel will be the Society's official headquarters. The opening session on 26 December (2:00 P.M.) and the two sessions on 28 December (9:00 A.M., 2:00 P.M.) will be held there. Those for 27 December (9:00 A.M., 3:00 P.M.) are scheduled for Building EII, Harvard Medical School. The address of the retiring president, N. R. Stoll, on "This Wormy World," will be delivered at 11:00 A.M., 27 December. The annual luncheon and business meeting are scheduled at the Longwood Towers, Brookline, at 12:30 P.M., 27 December. The local representative of the Society is D. L. Augustine, Department of Comparative Pathology and Tropical Medicine, Harvard Medical School.

About People

Gregory Breit, professor of physics, University of Wisconsin, will become professor of physics at Yale University on 1 February 1947. Dr. Breit, a native of Russia, was National Research Council Fellow at Leiden in 1921–22 and at Harvard in 1922–23. He has served on the faculties of the University of Minnesota and New York University, and has been at the University of Wisconsin since 1934. He was resident of the Technische Hochschule in Zürich in 1928 and visiting member at the Institute for Advanced Study at Princeton in 1935–36.

Elaine Friedberg, a senior in The Ohio State University College of Pharmacy, received the Kilmer prize award, top honor for U. S. seniors in pharmacy, at the recent annual meeting of the American Pharmaceutical Association in Pittsburgh.

Victor Moritz Goldschmidt, professor of mineralogy and geology, University of Oslo, and head of the research laboratory on Mineral Raw Materials, Norwegian Ministry of Commerce, has returned to his work in Norway. He had been abroad since his arrest by the Nazis in 1942. Following his temporary release to continue his research on utilization of low-grade phosphate rocks he was again seized by the Nazis but