of insufficient air, putrefaction will take place, which is most likely caused from outside agents, like bacteria, instead of heating, which is due to the enzymes within the seeds. Under some conditions, when very little air is admitted, heating and putrefaction can take place together.

To determine the chemical changes in seeds during putrefaction, I filled a glass jar with very wet seeds and closed the jar with a tight cork stopper. The jar was kept at room temperature, protected against direct light for about a month. When the stopper was removed the odor became very offensive. As the seeds were very high in moisture it was necessary to let them dry at room temperature, before passing the seeds through the huller. The results are reported under sample "A" in the table giving analyses of Putrefied Seed. Sample "B" represents the results on seeds which were wetted and placed into a tight barrel. Heating and putrefaction took place simultaneously. The maximum temperature reached was 97° F. But as not sufficient air could gain admission the seeds became putrefied as easily noticed by their odor.

Chemical Analysis of Putrefied Seeds (Meats only analyzed)

	"A"	"B"
Moisture in seeds	5.00	14.52
Damaged seeds	65, slightly off	24.
Oil in meats	34.28	28.94
Total nitrogen	5.40	5.40
Magnesia	0.31	0.06
HCl. MgO. N	1.37	0.89
Stutzer's Reagent N	5.44	5.12
NaCl sol. N	4.59	3.57
Alcohol ppt. N	3.14	2.71
Phos. Tung. Acid not ppt. N	0.48	0.42
Water sol. N	1.21	1.12
Alcohol, sol. N	0.18	0.09
Reducing Sugars	0.00	0.00
Total Sugars	0.00	1.19
Pentosans	3.87	3.76
F. F. A. in meats	6.60	4.79
F. F. A. in extr. oil	8.64	17.01

The analysis of putrefied seeds does not show a large chemical change. It is remarkable that the seeds do not become black in appearance, but only slightly off in color, while heated seeds soon become dark. The solubility of the proteins in the salt solution has not been changed much. The above analyses do not show a large increase in loosely bound ammonia or amines, most likely because some of the volatile nitrogen compounds were lost in drying or were extremely badly putrefied seeds the protein compounds tracted by the petroleic ether. Judging by the odor of break down to amines and even free ammonia like any other protein. A test was run with another sample of seed treated like sample "A." Some of the putrefied seeds were placed in a Kjeldahl flask after mashing in an iron mortar and, without drying or extracting, distilled with water and magnesia. By titration of the distillate 0.37% nitrogen was found which figured back to air-dry meats, would amount to about 0.90% nitrogen as ammonia. The petroleic ether extract of the putrefied meats has a very offensive odor, which indicates that some of the decomposition products are soluble in petroleic ether. The sugars are even more quickly destroyed than in heating seeds. Two samples of cottonseed cake were analyzed, principally to find out the action of the heat on the proteins. The results show that the heat during cooking does not coagulate the proteins completely. The high acidity of the oil left in the cake is no proof that the cake was made from damaged seeds. The

oil left in the cake is invariably of higher acidity, than the oil expressed. This observation has been described on olive press cake by Lewkowitsch and found by me to be also the case with cotton seed cake.

Chemical Analysis of Cotton Seed Cake

Moisture	9.48	9.42
Oil	6.00	6.04
Total Nitrogen	6.97	7.11
Magnesia N	0.35	0.10
HCl, MgO N	1.76	1.30
Stutzer's Reagent N	6.93	7.10
NaCl Sol. N	4.33	4.44
Alcohol ppt. N	3.99	4.29
Phos. Tung. Acid not ppt. N	0.45	0.44
Water sol. N	0.81	0.94
Alcohol sol. N	0.15	0.12
Reducing Sugars	0.00	0.00
Total Sugars	5.25	5.35
Pentosans	7.78	6.55
F. F. A. in cake	1.16	1.13
F. F. A. in extr. oil	5.14	5.84

Quite different chemical changes are taking place when seeds germinate, than when they putrefy or heat. For the following experiments a wooden box was used filled with wet sea sand. The seeds were placed on the surface of the sand and covered with a wet cloth. Additional water was added daily to keep the sand moist. When the germs had reached the desired length, the seeds were removed and the meats separated from the hulls by hand. The meats or germs were dried on a warm place and ground. Not sufficiently large samples were obtained to make complete analyses. The seeds taken for the three germinating tests were not portions of the same sample of seeds.

Chemical changes in sprouting seeds.

	% lost on drying	Oil	air dried germs used. Nitrogen	Total Pen-Sugar tosans	
Germs up to 1 inch		19.80	6.44	3.50	5.32
Germs up to 3 inches	87.5	12.66	6.02	2.81	6.02
Germs up to 5 inches, leaf fully developed	92.68	6.00	6.19	1.91	7.03

The great difference between germinating seeds and heating seeds is, that in sprouting seeds the oils rapidly decrease and that the pentosans increase. A subsequent article dealing with the chemical changes of the oil will follow in a later issue of THE COTTON OIL PRESS.

A. O. C. S. NEW MEMBERS

Thos. B. Caldwell, Sec. and Treas., Wilmington, N. C.

The following 22 active members, 2 honorary members and 4 corporation members have been added to our Society since May 10th, 1921.

Charles A. Brown, Care Wm. J. Moxley, Inc., 541 W. Randolph, Chicago; Arthur C. Eaton, care Genesee Co., Inc., Rochester, N. Y.; Clarence Estes, care Aunt Jemima Mills Co., St. Joseph, Mo.; Bernard N. Glick, care Industrial Chemical Co., New York; John C. Ingram, care Morris & Co., Chicago; William H. Irwin, care Swift & Co., Chicago; John Alexander Kyle, 14 Chambres Road, Southport, England; Millard Langfeld, care Cudahy Packing Co., Omaha, Neb.; Frank Rabak, Bureau of Plant Industry, Washington, D. C.; Samuel H. Ross, care Cudahy Packing Co., East Chicago, Ind.; A. F. Sievers, Bureau of Plant Industry, Washington, D. C.; Proctor Thomas, care Proctor & Gamble Co., Ivorydale, Ohio; Charles E. Long, 1120 W. Edwards St., Springfield, Ill.; Jas. C. McMillan, Milton Ave., and A. & W. P. R. R., Atlanta; Raymond Wells, Homer, N. Y.; Geo. S. Morgan, Box 370 C. S., Toledo; Ernest J. Brennsen, 406-408 W. Court St., Cincinnati; Irving C. Bull, 50 West

St., New York; L. Y. Dyrenforth, 415 Realty Bldg., Jacksonville, Fla.; Herbert Austin, care Ernest Scott & Co., Fall River, Mass.; J. S. Boulden, care Wm. Walthe & Co., St. Louis; and Chas. B. Grimes, care Pomeroy & Fisher, New York.

HONORARY: Dr. Carl L. Alsberg, Chief Bureau of Chemistry, Washington, D. C., and Dr. W. W. Stockberger, Office Drug, Poisonous & Oil Plant Investigation, Washington, D. C.

CORPORATION: Capitol Refining Co., Washington, D. C.; Glidden Nut Butter Co., 2670 Elston Ave., Chicago; Chemical and Metallurgical Engineering, New York, and Globe Soap Co., Cincinnati.

REPORT OF RESOLUTION COMMITTEE ADOPTED AT CHICAGO CONVENTION

By C. P. Long, Chairman

Be it resolved, that the American Oil Chemists' Society in convention assembled, extend to its retiring president, Mr. F. B. Porter, our most hearty thanks for his untiring efforts toward the welfare of the Society during the year filled with trying obstacles and for the inspiration he has given us by his "Pithy Paragraphs."

And to our Secretary, Mr. T. B. Caldwell, our heartiest thanks for the efficient manner in which he has handled the duties of his office during his tenure.

Be it also resolved that we wish again to record our most hearty thanks to Mr. Herbert Bailey, Editor of our Chemists' Section of the COTTON OIL PRESS, to Dr. J. H. Shrader, assistant editor and to Mr. Louis N. Geldert, editor of the COTTON OIL PRESS, for their untiring efforts in bringing the Chemists' Section to its present high standard and for their vision of a still better Section.

Be it also resolved, that our heartiest thanks be extended to the entire local committee for the efficient manner in which they have arranged for the details of our meeting and our entertainment.

Also to those non-members who have contributed through papers or otherwise to the good of the meeting.

Be it also resolved, that the American Oil Chemists' Society in convention assembled, extend to the management of the Congress Hotel our thanks for the provision they have made for our comfort and for the courtesies shown to us during our convention.

C. P. Long, Chairman; L. B. Forbes, H. C. Timney,

CERTIFICATION OF REFEREE CHEMISTS

By David Wesson, S. C. O. Co., New York City.

The Referee Examining Board is ready to receive applications for certification for the coming year.

Chemists who have already been certified should write at once to the chairman of the board requesting a new certification.

Members who have not already been certified should write requesting application blanks and rules.

Certificates will be issued to laboratories in good standing as well as to individuals. Certificates will only cover such products as are dealt in under the rules of the Interstate Cottonseed Crushers Association.

No certificates will be issued to any one who is not a member of the Association.

Firms or Laboratories taking out certificates must take out company membership in the Society.

The Code of Ethics must be signed and all dues paid before any application can be considered.

A fee will be charged "to cover cost of engrossing certification" as decided at the annual meeting of the Society.

THE CODE OF ETHICS.

By Dr. David Wesson, S. C. O. Co., New York City.

Our Secretary reports that signed copies of the Code are reaching him promptly from many of the members, which is a good indication that it is pretty generally approved.

Opinion on the Code may vary, but if the members of the Society will all take the stand of Dr. A. H. Gill, as indicated in the following correspondence there will be no question regarding the future prestige of our Society.

MASSACHUSETTS
INSTITUTE OF TECHNOLOGY
CHEMICAL DEPARTMENT.

CAMBRIDGE, JULY 5, 1921.

Mr. Thomas B. Caldwell,
Secretary and Treasurer
The American Oil Chemists Society,
Wilmington, N. C.

Dear Sir:—I have your circular including the copy of the Code of Ethics, which I herewith enclose signed and will ask you to send me a duplicate. I am heartily in accord with the spirit of the circular, as you will see by the enclosed copy of a paragraph from an address by a former colleague of mine, Mrs. Ellen Richards.

"The best business men are quick to value an honest opinion and an incorruptible servant. There is for the scientific man a great safeguard in that the name of the institution must be protected at all hazards. Nothing must go out from its precincts less than the best. No taint of work done for advertising purposes, of help given to a process which is to defraud the public or endanger men's lives, no careless, inaccurate work, must bear the stamp of the Institution."

ELLEN H. RICHARDS.

This I have had framed and posted in my office for many years.

Yours very truly,

A. H. GILL.

W. H. LOW IN POTASH BUSINESS

Wilson H. Low and John H. Shaw, formerly chief and assistant chief chemist, Cudahy Packing Co., Omaha, Neb., now of Los Angeles, Calif., have acquired the plant of the California Chemical Products Co., near Owens Lake, Calif., and will recover alkali salts from the lake water. (*Chem. Age, June, 1921.*)

AMERICAN FERTILIZER CHEMISTS MEET

At the annual meeting of the American Institute of Fertilizer Chemists held recently at the Battery Park Hotel, Asheville, N. C., matters pertaining to the various phases of chemical work, of benefit to the fertilizer trade, were discussed. The following were elected as officers for the ensuing year: President, Dr. Frank L. Parker, Charleston, S. C.; vice-president, A. G. Stillwell, New York City; treasurer, W. J. Gascoyne, Jr., Baltimore; secretary, S. W. Wiley, Baltimore.

HE TRIED IT ONCE

"Why don't you advertise?"

Country Storekeeper: "No, siree. I did once and it pretty near ruined me."

"How was that?"

"Why people came in and bought darn near all the stuff I had."