

# ***Regional Meeting - Moscow***



## *The* **PUGET SOUND CHEMIST**

*Bulletin of the Puget Sound Section of the American Chemical Society*



# Announcing...

## Acid Phosphoric C. P. Meta

### in PELLET FORM

Easy to weigh • Free Flowing  
Dissolves readily  
Economical



Acid Phosphoric, Meta CP Baker's Analyzed  
PELLETS  $HPO_4$  M. W. 79.99

Analysis of Lot No. 32147

Alkali Salts (as $NaPO_3$ )	abt. 25.0
Chloride (Cl)	0.0005
Nitrate ( $NO_3$ )	0.000
Sulfate ( $SO_4$ )	0.000
Subst. Reduc. $KMnO_4$ (as $H_3PO_4$ )	0.02
Arsenic (As)	0.00000%
Heavy Metals (as Pb)	0.002

Made in U. S. A. J. T. Baker Chemical Co., Phillipsburg, New Jersey

**Baker's Analyzed**  
THE HIGHEST TYPE OF  
**Chemical Reagents**

J. T. Baker Chemical Co., Executive Offices and Plant: Phillipsburg, N. J.  
Branch Offices: New York, Philadelphia, Boston and Chicago.

# "Baker's Analyzed"

## C. P. CHEMICALS AND ACIDS



BAKER'S ANALYZED C. P. CHEMICALS ARE SOLD IN YOUR AREA BY:

**SCIENTIFIC SUPPLIES COMPANY**      **Seattle, Washington**



# NORTHWEST REGIONAL MEETING

## AMERICAN CHEMICAL SOCIETY

### MOSCOW-PULLMAN

#### MAY 2 and 3, 1947

**Sponsored by Oregon, Puget Sound, and Washington-Idaho  
Border Sections of American Chemical Society**

All chemists in the Pacific Northwest are cordially invited to attend the regional meeting. Members of the American Chemical Society are invited to submit papers for inclusion in the divisional programs. ACS regulations require that at least one author of any paper shall be a member of the Society, and that all papers presented are the property of the Society, to be published in the journals of the Society or released by the appropriate editor. An abstract of the paper should then be forwarded as soon as possible to one of the following:

S. E. HAZLET, *Department of Chemistry,  
State College of Washington, Pullman.*

V. SIVERTZ, *Department of Chemistry,  
University of Washington, Seattle.*

E. C. GILBERT, *Department of Chemistry,  
Oregon State College, Corvallis.*

Papers will necessarily be limited to 10-20 minutes in length, and the program committee will exercise its best judgment in the arrangement of the papers at the different sessions.

#### GENERAL PROGRAM

##### May 2 [Moscow]

11:00 a.m.-1:00 p.m. . . . Registration

1:30 p.m.-2:30 p.m. . . . General Session

Speaker: Professor John C. Bailar, Jr. Dr. Bailar is Professor of Chemistry and Chairman of the Division of Inorganic Chemistry at the University of Illinois. He is Chairman of the ACS Division of Chemical Education and is noted especially for his researches on the stereochemistry of complex inorganic compounds.

3:00 p.m.-5:00 p.m. . . . .  
. . . . . Divisional Meetings

(It is planned to have sections devoted to organic and biological, inorganic and physical, and industrial and engineering chemistry.)

7:00 p.m. . . . . Dinner

Speaker: Dr. Ralph Manley. Dr. Manley was formerly with Armour Research Foundation, Chicago, and is now Director of Research for General Mills, Inc., Minneapolis.

##### May 3 [Pullman]

9:30 a.m.-12 Noon . . . . .  
. . . . . Divisional Meetings (Cont.)

11:30 a.m. . . . . General Session

Speaker: Dr. Wayne Marshall. Dr. Marshall was formerly at the Metallurgical Laboratory in Chicago and is now Chemist in Charge of the Spectrochemical Laboratory,  
(Continued on page 8)

# *The* **PUGET SOUND CHEMIST**

Published monthly by the Puget Sound Section, American Chemical Society

Volume VIII

April, 1947

Number 4

EDITOR: G. OTTO ORTH, JR., 2919 First Ave. South, Seattle 4, Wash., MA. 4090

ASSISTANT EDITOR: ED. LINGAFELTER, University of Washington, Seattle, ME. 0630

BUSINESS MANAGER: RODNEY WILLIS, Standard Chemical Engineering Co., WE. 4666

ADVERTISING MANAGER: HAROLD RUDOW, Scientific Supplies Co., EL. 1134



## **Directory — Puget Sound Section**

### *Chairman*

HERBERT R. ERICKSON  
Tower Co., Inc.  
5421 First Ave. S., Seattle 8

### *Vice-Chairman*

JOSEPH L. MCCARTHY  
Department of Chemical Engineering  
University of Washington, Seattle 5

### *Secretary*

COLLIS C. BRYAN  
Monsanto Chemical Co., Western Div.  
911 Western Ave., Seattle

### *Treasurer*

Q. P. PENISTON  
Bagley Hall, Univ. of Washington  
Seattle 5, Wash.

### *Program Committee*

D. M. RITTER, Chairman  
Bagley Hall, Univ. of Washington  
Seattle 5, Wash.

### *Finance Committee*

JOHN MEILER, Chairman

### *Public Relations Committee*

LESTER D. BERGER, Chairman  
Carbide and Carbon Chemical Corp.  
2900 First Ave. S., Seattle 4

### *Social Committee*

JOHN SCOTT, Chairman

### *Membership Committee*

R. C. SCOTT, Chairman  
Adhesive Products Co.  
3400 Thirteenth Ave. S.W.  
Seattle 4, Wash.

### *Professional Practice and Legislation*

W. R. MOFFITT, Chairman

### *Library Committee*

H. DAUBEN  
L. H. BROWN

### *Employment Committee*

JOHN STEPHAN, Chairman  
Monsanto Chemical Co., Seattle

### *Councilors*

GEORGE H. CADY  
R. W. HARRISON  
T. S. HODGINS  
A. J. NORTON

### *Representatives to the Puget Sound Engineer Council*

R. P. ERWIN

FRANK WEST

*Regional Activities—VICTORIAN SIVERTZ*

### **EDITORIAL ADVISORY BOARD:**

FRED AMBRUSTER, Chairman  
JOSEPH L. MCCARTHY

LESTER D. BERGER  
D. M. RITTER



# April Speaker . . .



Maurice E. Stansby

## BIOGRAPHICAL SKETCH OF MAURICE E. STANSBY . . .

Maurice E. Stansby received the Bachelor and Master's Degree from the School of Chemistry, University of Minnesota, taking his research work under Mr. I. M. Kolthoff on analysis of small quantities of fluorides. In 1931 he started work in the Gloucester, Massachusetts, Laboratory of the U. S. Bureau of Fisheries (now part of Fish and Wildlife Service) as a research chemist. After six years research on Atlantic Coast fishery technological problems in Gloucester; College Park, Maryland; and Boston, he transferred to the West Coast in 1937. From 1940-42 he was in charge of the Ketchikan, Alaska, Fishery Products Laboratory and is at present Chemist in Charge of the Fish and Wildlife Service's Pacific Coast and Alaska Investigations in Fishery Technology with headquarters at the Seattle Fishery Technological Laboratory.

### "Some Problems In the Analysis of Fishery Products"

Fish differ radically in composition from other foodstuffs, mainly in the highly unsaturated nature of their oils. When this fact is ignored and standard methods of analysis commonly used for

other foodstuffs are applied, highly erroneous results are often obtained. Special analytical methods are required in order to satisfactorily determine the oil content and the degree of rancidity of fishery products.

Many unsolved problems exist in the chemical determination of freshness of fishery products and in the determination of vitamin A in fish livers and fish oils. Often errors caused by inadequate sampling of fishery products are greater than errors in the actual method of analysis.

## P. S. S. QUESTIONNAIRE

To make the local official register of members of the Puget Sound Section of the American Chemical Society as accurate and complete in detail of minimum desired information of our membership as possible, a post card questionnaire has been sent out to all members on the mailing list.

It is hoped that each member will comply with the request to fill it out and mail it back immediately.

Should any member fail to receive a questionnaire he should send his name to Collis C. Bryan, Secretary, Puget Sound Section of the American Chemical Society, Monsanto Chemical Company, 911 Western Avenue, Seattle 4, Washington. A questionnaire will be promptly mailed to him.

As soon as the returned questionnaires are tabulated, our official list of members is to be sent to the National Secretary at Washington, D. C., for checking against the official list there. Thus, errors in each list can be corrected.

So please help by sending in your replies promptly.

**NOTICE:** *To those who wish to obtain the Bulletin of the Puget Sound Technical Society — please contact Richard P. Erwin, 2105 Park Road, Seattle 5, Washington, or Frank West at the University of Washington.*



# *April Meeting*

**PUGET SOUND SECTION OF THE  
AMERICAN CHEMICAL SOCIETY**

*Tuesday • April 22, 1947*

**7:30 P.M.**

**Address • Bagley Hall • Room 140**



**S P E A K E R**

**MAURICE E. STANSBY**

**S U B J E C T**

***"Some Problems In the Analysis  
of Fishery Products"***



**REFRESHMENTS AND SOCIAL HOUR IMMEDIATELY FOLLOWING  
THE MAIN ADDRESS**



# **SOME SCIENTIFIC ASPECTS OF AGRICULTURAL RESEARCH AT THE STATE COLLEGE OF WASHINGTON**

**By AIKMAN ARMSTRONG, Jr.**

*Field Engineer, Division of Industrial Research  
State College of Washington*

One yardstick for measuring progress in the practical or applied sciences is the extent to which they include chemistry, biology, and physics. The agricultural sciences are found to involve all three. Spectacular advances can be claimed by one or another of the sciences such as those in genetics which enabled cattle and sheep growers in some cases to double the average weight of their animals during the eighteenth century.

In modern science, these spectacular advances generally come through a combination approach. Knowledge of nutrition may, for example, come through the feeding of specified diets to experimental animals and form the basis for further study to determine the chemical reasons for the demonstrated results with the animals. With a chemical hypothesis formed, the experimenter may turn to biology to prove his case. In the intensely practical field of agriculture, science serves best through the close cooperation of its different branches.

All the divisions of Washington State College's Institute of Agricultural Sciences depend greatly on chemistry. The variety of problems is great; it ranges from the pursuit of a new vitamin to the development of new crops of specified chemical composition, the study of the chemistry of blood in the processes of metabolism, or the development of new analytical processes for the constantly arising crop of new biochemical problems.

Probably the most generally spectacular phase of chemistry is the pursuit of new substances which we know only by their effect but which we have not been able to isolate. Filterable viruses are one example, vitamins which make themselves known only through nutrition studies are another. A typical search of

this type is being made in the Division of Poultry Husbandry in the course of investigations of soybean oil meal now in progress. It has been found that many day-old chicks hatched from eggs of hens which had been fed diets in which all the supplementary protein was supplied by either raw or commercially-heated soybean oil meal showed a severe diet deficiency and poor rate of survival. The diet fed the chicks was complete and well-balanced in all the known essentials. However, if the hens were allowed small amounts of fish meal, meat scraps, or, curiously enough, cow manure, more and healthier chicks were hatched and no sign of the diet deficiency appeared. This investigation by Carver and McGinnis of the Division of Poultry Husbandry, and by other institutions, appears to indicate the presence of a hitherto unidentified food element which seems to have the nature of a vitamin. It is known that it definitely is not an amino acid and that it can apparently be stored in considerable quantity in the egg if the hen has an adequate diet.

The identification, or at least the discovery, of the existence of this substance has a very practical aspect. Because of the present-day shortage and high prices of meat scrap and fish meal, a very large part of both is most literally "going to the dogs," and today chickens are most likely to find in their diet a larger and larger proportion of soybean oil meal, pea meal, or other vegetable proteins. But the missing substance, if supplied in even small amount, will greatly increase the hatchability of eggs and almost double the rate of growth of the chicks. Use of an inferior feed is obviously a highly mistaken economy if it results in a longer period before maturity is

*(Continued on page 9)*



## OUR COVER PHOTO

SCIENCE HALL  
UNIVERSITY OF IDAHO

### *Houses*

Department of Chemistry  
Department of Physics  
Department of Agriculture  
Chemistry  
*and others*

## MAY MEETING

***Special cards  
will be mailed  
prior to  
meeting***

### **NORTHWEST LABORATORIES**

CONSULTING ENGINEERS—CHEMISTS

Second Avenue and James Street  
Seattle 4, Washington

Phone MAin 0680

***Applied Research and Development  
Physical and Chemical Testing  
Engineering Surveys — Assaying***

## **NORTHWEST REGIONAL MEETINGS . . .**

*(Continued from page 3)*

General Electric Nucleonics Project, Hanford Engineer Works. He will talk on spectrochemical analysis.

1:00 p.m. . . . . Luncheon

2:30 p.m. . . . . General Session

Speaker: Professor I Perlman. Dr. Perlman is Professor in the School of Chemistry of the University of California, Berkeley. He has been closely associated with the work of the Radiation Laboratory, including the recent studies on the transuranium elements.

An informal smoker at the Washington Hotel in Pullman is planned for those remaining Saturday evening.

## **TRANSPORTATION TO NORTHWEST REGIONAL MEETINGS**

### **Automobile**

**FROM SEATTLE:** Follow U. S. No. 10 over Snoqualmie Pass to Ellensburg, continue east on U. S. No. 10, crossing the Columbia at Vantage Bridge, thru Moses Lake to Ritzville, then south on 11E to Washtucna, then east on 11B to Dusty, follow U. S. No. 295 to Colfax, then U. S. No. 195 to Pullman-Moscow. Approximately 325 miles, driving time about 7½ to 8 hours.

**FROM BELLINGHAM:** U. S. No. 99 to Everett, U. S. alt. No. 10 over Stevens Pass to Wenatchee, cross Columbia and follow State Highway No. 10 to Quincy, then south about 10 miles to U. S. No. 10 and east to Moses Lake and proceed as "from Seattle" above. Approximately 410 miles, driving time about 9 to 10 hours.

**FROM GRAYS HARBOR AREA:** To Tacoma via U. S. No. 410, to Renton and U. S. No. 10 over Snoqualmie Pass and proceed as "from Seattle" above. Approximately 435 miles, driving time 10 to 11 hours.

*Note:* Chinook Pass will still be closed in May. Please drive carefully as we want no accidents to mar the meeting. If you want a ride or riders, please contact the transportation committee.

### **Bus**

All figures round trip fares and include 15% tax.

BELLINGHAM to MOSCOW...\$17.54—14.5 hrs.

SEATTLE to MOSCOW.....\$14.78—11.5 hrs.

ABERDEEN to MOSCOW.....\$18.00—15.5 hrs.

*(Continued on page 20)*



# AGRICULTURAL RESEARCH

*(Continued from page 7)*

reached. Work is continuing in the Division of Chemistry and Poultry Husbandry to identify this element and to find new and cheaper sources.

The Divisions which are pursuing this vitamin problem, have also been investigating how the nutritive quality of proteins is affected by heat. The food value of the soybean oil meal so far as chicks are concerned rises at first with heat. The graph then levels off and declines more or less in the usual fashion of proteins. Hens, however, are able to obtain the full nutritive value from this food even without such heat treatment and the College is continuing investigations to isolate this compound which is able to reduce greatly the nutritive value for proteins in the uncooked state for chicks. This study is particularly important at a time when soybean oil meal is also relatively scarce and expensive and must be used to the best advantage.

Linseed meal displays a similar peculiar quirk which is being studied by the same division of the College. Although ordinary diets with linseed meal as the protein supplement leaves chicks with some marked deficiencies, if the same feed is soaked in water overnight and then dried and fed to the chicks, they are much healthier. The reason for this is still being sought.

The problem of the Pacific Northwest has been its long-standing need for an economical and practical oil crop, either edible or non-edible. For years, speakers before chemurgic groups and other persons who have interested themselves in the problem have been making the public partly aware of the importance of this search. Soybean oil meal, to repeat, is expensive and, in times of scarcity, goes largely to other areas of the country, but Washington poultry men use it for a great part of their protein feed requirements and they must import it from the Midwest. Linseed meal is helpful, but it is deficient in quality and inadequate in quantity. Other fats and oils are obtained largely from tropical coun-

tries. Admittedly, the shortage of oils and fats is world-wide, as is shown by attempts of other areas to find new sources—witness the recent efforts toward the development of an okra-seed oil crop in Louisiana. But there is good reason to hope that Washington may within a few years be able to supply a much greater fraction of its needs and, concurrently, a new and valuable protein for feed. Sunflower cultivation has reached the stage where it promises favorable results. But recent experiments in Saskatchewan have culminated in the development of a new hybrid sunflower which stands only about four feet high and yields around 2500 lbs. of seed per acre—an excellent yield.

There are several advantages in favor of sunflowers as an oil crop for Washington. In the first place, Washington farmers already have had some experience in growing certain commoner types in the region of Pasco as a combination feed-and-shade crop for turkeys, and something is known about the conditions under which they grow. Such knowledge is being expanded by growing various types at the Experiment Station at Prosser. In the second place, the crop requires little manual labor, little cultivation, and permits harvesting by a combine. The oil, which constitutes 25 to 27 per cent of the dried seed, is an edible oil of high quality, like peanut and cottonseed oils. The remaining meal is 50 to 55 per cent of high quality protein—a percentage much higher than that of soybean oil meal and of better nutritive value and the much-used pea meal. We may hope for a considerable replacement of much of the soybean oil meal now in use in Washington. Industrial uses may also be anticipated.

The dairy industry is an important part of Washington's economy and the Division of Dairy Husbandry has long been actively engaged in this field. The consumption of milk and milk products is commonly considered to be one measure of the adequacy of our diet and more generally, our standard of living. If the goal of the Institute of Agricultural Sciences is the broad one of finding

*(Continued on page 10)*



## AGRICULTURAL RESEARCH

*(Continued from page 9)*

new ways to make better products, to preserve them, and to get them to a larger proportion of the population, then a good example lies in the considerable advances that was made by the Division of Dairy Husbandry and elsewhere during the war in improving the quality and maintaining the flavor of powdered milk. Among the great new prospects, and still lying quite a way ahead of present advances is the hope that, once the milk can be reduced to a stable powder and the flavor of fresh milk successfully captured, a vast new market will open among groups for whom refrigeration is either too expensive, impractical, or even just inconvenient. Practically speaking, the extent of this new market might be almost limitless.

The Division of Dairy Husbandry is carrying on two projects on powdered milk. The first is an investigation of the chemical factors affecting the baking quality of non-fat dry milk solids (powdered skim milk, if you aren't a dairyman). The division is trying to determine why there are slight variations in the volume of loaves of bread when certain samples of milk powder go into the baking formula. That is, the bread just doesn't rise as it should. This problem has been under study for about eight years and has been the subject of several scientific papers. The results of experiments at the College by Dr. U. S. Ashworth and others indicate that the troublesome factor lies in the whey protein fraction of the milk powder and can be corrected by preheating the milk to 80° C. for 45 minutes or 95° C. for five minutes. They also show that milk does not activate the enzymes that attack the flour gluten, and the trouble does not arise from this cause; nor do they show any correlation between the pH of the offending milk powder samples, which lies within the range of normal milk powders (roughly 6.3-6.7) and their baking quality. The problem is complex

and its fundamentals will continue to require much further effort.

The second problem involves equally complex reactions. It is an inquiry into the effect of variations in the process for manufacturing powdered whole milk on the physical properties and their relation to the keeping quality of this product. For some unknown reason, the quality of this product appears to depend on the extent to which the milk has been evaporated down before it is spray-dried. For this project the division has a new 16-inch vacuum-pan evaporator capable of removing about 5 gallons of water per hour at a temperature of about 130° F., and a stainless steel pilot-plant spray drier capable of producing 3 to 4 pounds of milk powder per hour.

So far it has been found that milk powder which is made by the spray drier from milk that has been evaporated down to 40% total solids has a slightly better flavor and keeping quality than similar milk concentrated to only 20% total solids, and the solubility and wettability of the powder made from the high-concentrate milk was far superior.

Other studies are continuing upon preheating and solubility of milk powder. Particle size and density are shown to be an important factor. Powders from lower concentrate milk tend to develop an electrostatic charge more readily than do those from a high-concentrate milk, resulting in greater difficulty of handling and reconstituting. The division has also investigated the effect of using vitamin C as an anti-oxidant for milk powder, but it has concluded that the high pre-heat treatment before evaporation is at least equally effective.

Milk, like many other foods, is very highly dependent for its keeping qualities on the inhibition of mold growth. Many industries—such as the cheese and fermented beverage industries—must be able to organize and direct the action of molds, then bring it to a halt. One mold will make a cheese and another mold will destroy it. Various molds attack tobacco, meats, leather, and fruits—in fact, almost anything of an organic nature. Such mold growth caused very



serious difficulties in overseas shipments, particularly in tropical climates, where certain types were found to be powerful enough to attack the glass lenses of binoculars and render them useless.

However, to date there has been little in the line of an exhaustive study of the optimum conditions for the growth of specific species of molds—information vital to any sound approach to mold problems. Research workers of the Division of Dairy Husbandry, chiefly through the efforts of Dr. N. S. Golding of the Division, have over a period of several years attempted to study the gas requirements of various strains of mold from blue veined cheese. The first study, published in 1937, reported that 75% CO<sub>2</sub> in an atmosphere was sufficient to considerably deter the growth of the mold at 70° F., more strongly at 85° F., and almost completely halt it at 148° F. Other experiments showed in a preliminary fashion the ability of the mold to extract the oxygen from a greatly diluted atmosphere, and, where the mold was grown at 70° F. in an atmosphere of very

low CO<sub>2</sub> pressure, its power to remove all but a trace of the oxygen was apparent. Subsequent work by Golding on the same strains of mold have been directed toward rounding out the picture of the ability of this type of mold to exist in various environments. One study provided a quantitative measure of the ability of the mold to absorb oxygen from a very dilute atmosphere, as well as the variation of this power with temperature. The next paper described detailed experiments with varied amounts of carbon dioxide, demonstrating that a small amount of CO<sub>2</sub> stimulated the growth but that larger concentrations tended to inhibit it, and showing the variation of growth with temperature and proportions of oxygen and carbon dioxide in graphical form. It also showed that different strains of the blue veined cheese mold had different tolerances for carbon dioxide. In a later article, similar experiments were extended to several other common types of molds and the atmospheres over the growths were

*(Continued on page 18)*



**Organic Solvents • • • Compressed Gases**  
**Industrial Chemicals • Flotation Reagents**

Great Western Division

**THE DOW CHEMICAL COMPANY**

SAN FRANCISCO

CALIFORNIA

Seattle

Los Angeles



# To The Editor . . .

Chemists are not the only ones who develop headaches from professional or vocational problems.

We receive a few letters like the following every year that we thought we would pass along for the entertainment, edification, or bewilderment of the chemists of the region.

F. L. COOPER, *Vice Pres.*  
SCIENTIFIC SUPPLY CO.

March 13, 47

SCientific Supplies CO  
Seattle Wash

Dear Sir.

I am asking you, and all so sending a check her. I have a mechanic men her. Came to me Other day asking for this Kind of Crude Alumina magnesium Silicate. and one as he call it expanded alumina magNesium Silicate. This mineral he state could be got from purchased from Chemical Jobbers or Suppliers Co.

The way he talk he use them some way for. for worn spots and abrasions in engine Cylinder walls In this way, the engine should regain its Compression. The way he talk. I believe if we can get the stuff of Crude Alumina Magnesium Silicate and expanded alumina Magnesium Silicate he buy about 100 lbs a month and more. So If we can get it for him, you and I can make some Profit on it. he state he dent care what it Cost a lb So much Just so it reason rate. and he give us his Business.

I look up your Baker analyzed Price list no 152 and I notice you have all Kind of magnesium list but I Just can figure out Just the one is it in your list-ment, now This one he call Crude alumina magnesium Silicate I believe would be (Krood) adj, in a nature state unripe; raw; immature; uncultured; harsh in color.

Now this other one he call expanded Alumina magnesium Silicate. This Product consists mainly of a Peculiar mineral which expands thirty times its own weight by the heat of the engine. now this could be now only thing I could figure out from him it may be this Kind of magnesium, Is a powder which may be formed from this magnesium expanded alumina went it formed by calcining the carbonate or burning the metal. and it may be Dead-Burned Magnesium.

I let this up to you Mr. SCientific supplies Co. what is expanded alumina magnesium call by right name. and I hope you have it and the Crude Alumina Magnesium of Both silicate.

Please ship me 2 lbs of expanded alumina Magnesium Silicate or \$2.00 worth. and Three dollars worth of Crude alumina magnesium Silicate so please ship by Parcel Post at once

and Please give me a price on it at hundred lbs lot, and by the lb, and if you have not got it. Please get it for us at early date you can. let me know back by return mail. Please find my check for \$5.00 her for Two Kind of this Magnesium.

I remain Sincerely Yours

*We returned the check.*

## AN ASHLESS ANTI-CREEP FLUID

This new item just developed should prove of special interest to Analytical Chemists. When a few drops of this Ashless Anti-Creep Fluid are added to the wash solution it prevents the creep of precipitates on the filter paper and also facilitates the transfer of the insolubles from the precipitation vessel.

The latter feature is particularly useful in the filtration of such precipitates as ammonium phosphomolybdate, tungstic acid and heavy metal sulfides, the films of which cling to the beaker and resist transfer by a stream of water.

The Anti-Creep Fluid can be, for all practical purposes, declared ashless. If 1 ml is added to 500 ml of wash water, on the basis of 100 ml of solution used for analysis, only .05 mg of non-volatile matter is introduced into the filtrate.

This Reagent is packaged in 100 ml amber bottles at \$2.00 each and is available through the laboratory supply dealers.

## ANNOUNCEMENT

The J. T. Baker Chemical Company announces the appointment of Dr. John G. Matthyse as entomologist in their development program of organic agricultural chemicals. He will be located in Phillipsburg, New Jersey. Dr. Matthyse received his Ph.D. degree from Cornell University in 1943 and then became a member of the Entomology Department at Cornell. More recently he has been employed as entomologist for Geigy Company in their research laboratories in Bayonne, N. J.





## For chemical purity plus... Specify B&A REAGENTS

In selecting reagents for your laboratory, specify B&A for *chemical purity PLUS product diversity and availability*:

The PURITY . . . guaranteed by the skill, science and technological developments which General Chemical Company's Baker & Adamson Division has gained in 65 years of "Setting the Pace in Chemical Purity."

The DIVERSITY . . . more than 1,000 purity products bear the B&A "Shield of Quality." From them you can order your every requirement.

The AVAILABILITY . . . extensive

stocks of B&A Reagents are maintained in the Company's *own* regional distributing stations from coast to coast. The one serving your territory can supply your month-to-month needs swiftly, surely, steadily.

Remember this when you buy laboratory reagents. Specify B&A for *chemical purity PLUS product diversity and availability*—advantages that really count in operating any laboratory efficiently. Your B&A Technical Serviceman can start special, personalized service for you today. Phone or write the nearest office below.



**GENERAL CHEMICAL COMPANY**

**BAKER & ADAMSON DIVISION**

40 RECTOR STREET, NEW YORK 6, N. Y.

Seattle 1—1326 Fifth Avenue—Elliot 5287

Los Angeles 21—2461 East 8th Street—Van Dyke 1001

San Francisco 4—235 Montgomery Street—Douglas 0904

SETTING THE PACE IN CHEMICAL PURITY SINCE 1882



- **DEVELOPMENT**
- **RESEARCH**
- **CONTROL**

Strategically located in this, the very heart of the nation's plywood industry, our enlarged facilities offer every means of rendering a prompt service. Chemists, alert to the needs of industry, are always ready to work hand-in-hand with you in the development of special products to your own specifications. Call MAin 3536

•  
**Manufacturers of Kaseno 580**  
**exterior plyform and**  
**moisture resistant**  
**glues**

•  
*Adhesive*  
**PRODUCTS**  
**COMPANY**

Home Office and Plant  
 3400 13th Avenue Southwest  
 Seattle 4, Washington

## **Bellingham Tappi Meeting**

A regular meeting of the Pacific Coast Section of Tappi was held at the Leopold Hotel in Bellingham, Washington, Tuesday, March 11, 1947. The total attendance was about 100. The meeting was called to order at 2 P.M. by G. H. Gallaway of Crown Zellerbach, Camas, Washington. A paper was given by Harland R. Clodfelter from the research department of the Crown Zellerbach Corporation, West Linn, Oregon, on "The Recovery of Fibre by Flotation."

A discussion on mill instrumentation was held during the afternoon under the direction of H. T. Peterson of the Pulp Division of Weyerhaeuser Timber Company, Longview, Washington. The speakers were J. B. Chandler, Bristol Instrument Company, Waterbury, Connecticut, who spoke on "Measurement and Control of pH"; Eugene R. Klotz, Pacific Coast Manager of Fischer and Porter Company, Oakland, California, spoke on the "Flowrator"; Mr. J. G. Ziegler of the Taylor Instrument Company, San Francisco, California, spoke on "Applied Process Control."

The afternoon technical section adjourned at 5 P.M. and reconvened at 6 P.M. for dinner in the Crystal Ballroom of the Leopold Hotel. The after-dinner address was the "Industrialization of India," given by Jadish C. Aggarwala, graduate of Punjab University and at present a graduate student of the University of Washington. Those in attendance from the University of Washington were Donald Granquist, Thomas Seacrest and J. L. McCarthy.

## **Phi Lambda Upsilon**

Phi Lambda Upsilon wishes to thank the Alumni who have taken the time to send in their present address.

The Alumni file is consequently almost up to date although there still remain many that are not confirmed and several for which there is no possible means of contact. It is, therefore, urgently re-



quested that all former members of this chapter, who have not sent in their present place of residence and employment, send this information to Phi Lambda Upsilon, c/o Chemistry Department, University of Washington.

## **Northwest Plastic Association**

The first official meeting of the newly-organized Pacific Northwest Plastics Association was held March 27th at the Chamber of Commerce Building, Seattle, Washington. Meeting was started with dinner at 6:30 P.M.

Over fifty people attended and ten new members were signed up.

Mr. William T. Cruse, executive vice-president of Society of Plastics Industries, and a nationally-known authority in the plastics field spoke on the present economic status of the plastics industry and predicted future market trends in the industry. Mr. Cruse complimented us on our new society and extended cooperation from the Society of Plastics Industries. Steven W. Beaver, manager of Wells & Co., Seattle, manufacturer of plastics printing plates, spoke on his problems in developing printing plates and he displayed his developments.

Northwest Plastics Association meetings will be held every two months and arrangements will be made to include in every meeting a program that will be interesting and profitable. Cooperation of the Northwest industry will be appreciated in providing matter for a continuing series of profitable discussions.

### **EMPLOYMENT COMMITTEE**

Employers of chemical personnel needing temporary help for the summer vacation months may obtain listings of available personnel from the Employment Committee Chairman, J. T. Stephan, c/o Monsanto Chemical Company, 911 Western Avenue, Seattle 4, Washington.

**REGISTERED CHEMICAL ENGINEERS**

•  
Telephone WEst 4666  
•

### **STANDARD CHEMICAL ENGINEERING CO.**

Professional Service to Industry  
•

Laboratories  
R. M. WILLIS      1745 Harbor Ave. S.W.  
General Manager   SEATTLE 6, WASH.

### **PACIFIC TESTING LABORATORIES**

—  
**Chemists & Engineers**  
—

**3215 Western Ave.    Seattle  
GARfield 3610**

## **ARTHUR J. NORTON** **Consulting Chemist**

•  
**RESIN, PLASTIC and  
CHEMICAL RESEARCH  
and DEVELOPMENT**  
•

Associates  
G. OTTO ORTH, JR.  
L. H. BROWN  
•

**2919 First South      Seattle  
MAin 4090**



# MONSANTO CHEMICAL COMPANY



SERVING INDUSTRY WHICH SERVES MANKIND

## WESTERN DIVISION

OFFICES

911 Western Ave.

MAin 4203

Seattle, Washington



## **Tacoma A.I.Ch.E. Meeting**

This was the 13th meeting of the Washington - Oregon Section, A.I.Ch.E. Also, the first field trip ever taken by the A.I.Ch.E. as well as the first meeting held outside of Seattle, naturally being the first meeting in Tacoma.

Sixty-seven members and guests attended the plant visit arranged through the courtesy of the Pennsylvania Salt Company of Washington at 4 P.M. Cocktails were served at The Towers, one of Tacoma's new restaurants, located by the Narrows Bridge. Seventy-eight members and guests attended the dinner, and over one hundred were present for the meeting and evening discussion. The speaker and background was John D. Rue of Hooker.

This meeting was sponsored by the Industrial Technical Council, a spontaneous group of technical men, representative of Tacoma's and allied industries.

The April meeting is scheduled for Tuesday, April 15, starting with a field trip through Northwestern Glass Company at 4 P.M. in the afternoon, thence to Rose's Highway Inn on the Tacoma-Seattle Highway for refreshments and meeting, with the evening speaker Mr. Karl Baur, Associate Soil Chemist at the Western Washington Experimental Station, Puyallup, who will talk on fertilizers and soil chemistry. Naturally, nonmembers of the A.I.Ch.E. are invited to participate.

At the March 11th A.I.Ch.E. meeting, John Rue's talk was illustrated by slides showing graphs of the chlorine and caustic production throughout its history, and also slides of German type caustic cells as brought back by the various technical missions. Dr. Robert Springer, Professor of Chemistry at the College of Puget Sound, an A.C.S. member, operated the projector. Projector and screen were made available through the courtesy of the College of Puget Sound.

# **CHEMICALS**

## **INDUSTRIAL • AGRICULTURAL RAW MATERIALS**

***Largest and Most Complete Stocks in Northwest***

# **VAN WATERS & ROGERS**

INCORPORATED

SEATTLE

PORTLAND

SPOKANE

BOISE



## AGRICULTURAL RESEARCH

*(Continued from page 11)*

varied from about one-half atmosphere to two atmospheres without marked change in the rate of growth. These common types of molds were widely different in their physical characteristics, were types that commonly cause food spoilage, and had widely different optimum temperatures of growth. An unexpected result was the proof that growth of the molds was affected according to the gas laws as they govern the solubility of the gases in the medium or mycelium; the inhibiting effect of the  $\text{CO}_2$ , in other words, depends on the solubility of the  $\text{CO}_2$  in the medium or mycelium, not in the composition of the gas above the medium.

The complexity of this study and the time needed for completing it and expressing the results as functions of the variables of temperature, pressure, and concentrations of oxygen, nitrogen, and carbon dioxides for each type of mold are obvious. There are about as many types of molds as there are of the higher plants. But the importance to the food preserving industries of controlling the conditions of operation which were formerly set by trial and error, discerning the chemical reactions involved and controlling them efficiently is manifest. An incidental discovery was that certain common analytical tests—such as the mycelium test for the undesirable fermentation of cream—are quite inadequate unless the temperature is rigidly controlled. Certain canners will find this work of much value. The knowledge might well be applied to the development of a process for completing a curing reaction in the can by controlling the amount and proportion of the gases within the can, or of preserving certain food products by means of carbon dioxide alone.

During the war years many institutions were vigorously investigating the biochemistry of blood as one of the best possibilities for reducing casualties. These studies demonstrated how important is a thorough understanding of the

functions of each of the blood constituents and their complex interrelationships. Certain of these studies require animals from which samples for analysis may be repeatedly drawn without materially affecting blood volume, hemoglobin levels, etc. Work now under way under Dr. Norman S. Lundquist of the Division of Dairy Husbandry suggests that young dairy calves may be ideal for this purpose. As one phase of its work, the division is exploring the function of certain food elements, including ascorbic acid, in the way they seem to influence recovery of animals from anemia.

The vast yield of the farms of Washington inevitably calls for a tonnage of sprays and economic poisons much larger than is normally imagined; and the development of new sprays, with the concomitant rise of new insect pests which can survive each new set of sprays, has, of course, a radical influence upon the entire agricultural chemical market. In this sort of chemical warfare service the College and its Experiment Stations carry on a steady offensive. In the most trying times farmers turn to new and perhaps desperate expedients, and the College must be ready to give the best possible answer based on whatever information is at hand, though a thorough testing may really require use of a material or technique for two or more reasons. The utmost energy in research and experiment is called for. A glance at the proceedings of the last annual meeting of the Washington State Horticultural Association will show how completely the fruit growers are now preoccupied with insect and disease infestation. DDT, once hailed as almost the whole answer to the pest problem, at least for the present, has been recommended as giving remarkable control of the Codling moth, leafhopper, orchard mites, and certain other bugs. But the woolly aphis put up a relatively sturdy defense against DDT, and as for woolly aphis, it appears that DDT, unfortunately, may prove to be deadly to a parasite which was successfully imported and introduced about 15 years ago for the sole purpose of controlling these mites.





**LAUCKS LABORATORIES INC.**

**... Symbolizing long experience  
in the field of industrial research  
and development.**

***Established 1908***

Particularly with certain types of pears, DDT does almost certainly open the door for a most thorough infestation of mites and seriously complicates a pear psylla program.

For apples, however, where the Codling moth is the principal target and where the mite and aphid can be controlled, phenomenal results have come from the use of DDT—as high as 98 to 99.5% worm-free fruit—and the farmer is going to use DDT this year. In 1944 only about 500 pounds of DDT was used in sprays in all Washington. In 1946 the Yakima and Wenatchee areas each consumed about 5 carloads of 50% wettable DDT, and it has been forecast by Dr. R. L. Webster, chairman of the division of entymology, that in 1947 DDT will replace between 75 and 90% of the lead arsenate and cryolite hitherto used for such fruit sprays. It is also hoped that perhaps one or two applications will accomplish as much as 5 or 6 of lead arsenate, with great savings in material and labor costs.

The problems of new insecticides is involved and interrelated with many other problems. No one chemical can stand by itself. For aphid control, much hope is held for the relatively new insecticide developed by the British, hexachlorcyclohexane, more commonly called benzene hexachloride, which in one year's work has successfully controlled apple aphids. But mite control is more complex. The College has found excellent success in the use of DN-111 (2, 4-dinitro-ortho-cyclohexyl phenol) for Pacific mite, but not for the increasing infestations of various other mites; and, as in the case of many other remedies, DN-111 can occasionally cause serious injury at high temperatures. Certain dinitro compounds may prove to be useful in the dormant period. Another chemical for which some hope is held for mite control is hexaethyl tetraphosphate, a dark liquid with a specific gravity of 1.3 which is being tried as a substitute for nicotine in the present shortage. It was developed in Germany

*(Continued on page 20)*



## AGRICULTURAL RESEARCH

(Continued from page 19)

during the war under the name of Bladan and is produced by several companies in this country. However, it is toxic to warm-blooded animals and the important limiting factor at present is the hazard involved to the spray operator and others. It is a skin irritant and respiratory poison. If used in a fog machine as an aerosol, the vapor may drift for long distances, and the College is cautioning all users on the danger in its use.

Rotenone, which is imported from Malaya and South America, has recently risen to price levels that suggest that this drug will be forced to surrender about 90% of its previous tonnage to DDT in 1947 for fighting the pea weevil. This is the case with dry edible peas and canning peas. Where these are used for forage for beef cattle, the DDT residue has been found to be harmless, but the Pure Food and Drug administration has issued a caution against permitting dairy cattle this feed because DDT can accumulate in the milk. As an example of the economies possible with the use of DDT, one canner estimates that its use this year will save perhaps \$20,000 in insecticide costs.

We shall conclude with a few items of interest at the College. It is not generally known that the center of the peppermint growing industry was formerly Michigan and northern Indiana but is rapidly shifting—or perhaps has already shifted—to southern Washington. Large acreages are being cultivated in the lower Yakima valley and the local county agent is collecting weekly samples during harvest season and forwarding them to Pullman. It is hoped that through measurement of optical rotation and a determination of menthol, more definite knowledge can be gained of the optimum conditions for growth and time of harvest. In the Division of Horticulture, under Dr. T. A. Merrill, Dr. C. L. Bedford is doing some very interesting work on the fundamental chemistry involved in the ripening of peaches. This

information is being prepared for publication.

We cannot, of course, in this space complete an exhaustive description of all the valuable work at the State College. Apologies are offered to those numerous other workers whose important contributions cannot be detailed here.

## NORTHWEST REGIONAL MEETINGS . . .

(Continued from page 8)

The only practical schedules leave Seattle at 11:00 P.M. and 12:52 P.M., requiring 11 and 12 hours respectively, the former allowing 45 and the latter 15 minutes for making connections at Spokane.

We could charter a 29 passenger bus from Seattle direct to Moscow at \$11.56 per passenger with a travel time of 7½ to 8 hours, thus saving time, money, and having a much more enjoyable trip. It would also be to the advantage of persons traveling from outside Seattle to transfer to the above bus at Seattle, if sufficient people indicate an interest.

### Train

The only practical train schedule is by the Northern Pacific, leaving Seattle at 9:15 P.M., arriving Spokane 7:25 A.M., leaving Spokane at 8:40 A.M., arriving Moscow 11:56 A.M. The round trip cost would be \$20.07 or \$21.90 for tourist or first class respectively, plus \$2.70 or \$4.03 for a one-way berth, if desired.

### Air

Commercial airline schedules are difficult to be used to best advantage for a trip of this nature. Here again chartering is faster and cheaper and would require only one night's stay at Pullman. A round trip would cost approximately \$60.00 for one passenger, \$37.50 for two, \$30.00 for three, or as low as \$20.40 if 22 persons were interested. The first three would require about 2 to 2½ hours and the latter 1¾, thus it would be possible to leave Seattle about 10:00 A.M., May 2nd, arriving in ample time for the first general session at 1:30, and return home for dinner May 3rd.

It is hoped that all members of the Puget Sound Section will mail in the card designating their intentions if they have not already done so. We hope to have a good representation from our section. If anyone is interested in the proposed chartering plans or has questions regarding transportation, please get in touch with:

B. L. BUSSARD

Bus. Phone: MA. 4203, Ex. 50  
Monsanto Chemical Co.  
911 Western Avenue  
Seattle 4, Wash.  
Home Phone: KE. 3989



# CHEMICAL PROMOTION

*(Introductory Note: In a recent article in Chemical and Engineering News, by H. M. Corley, appeared the following query: "What would be the effectiveness and techniques of one of the tobacco companies' cigarette promotions if this were changed to some chemical instead of a popular brand of cigarette?" The line of thought generated by this query and catalyzed by two martinis evolved the following:)*

The laboratories of the Hypertension and Solubrious Chemical Company have succeeded in developing an economic large-scale process for the manufacture of 4, 2, 2, 1-bis-ultra offalate-5. How is this momentous news to be brought before the public? In a fever of creative pride and promotional passion, the board of H. & S.C.C. commissioned the famous advertising agency, Dabble, Dribble, Baffle and Spink to arrange a full-scale radio extravaganza, for a nation-wide hook-up broadcast. Herewith are reproduced portions of the script for this historical program.

*First Announcer: (Shouts) "Ladies and Gentlemen—The STEAMBATH SERENADE!"* (Crashing applause from the Studio Audience, including whistles and screams, completely blanking out what might be a fanfare. Elapsed time 3 minutes).

*Second Announcer: (Smoothly) "Good evening, America. Tonight we bring to the air a new program sponsored by the Hypertension and Salubrious Chemical Company, creators of (breathlessly) 4,3,2,1-bis-ultra offalate-5, the miracle chemical of the century. (Louder) Chemists! Do your reactions go backward? Are you troubled with negative yields? Does your reflux column taste different lately? Try 4,3,2,1-bis-ultra offalate-5, the miracle chemical of the century. This product, created by chemists and for chemists, is the sensation of the age. All America is talking about it. Listen!"*

*First Woman's Voice: "Oh dear, I'm just so exhausted. My husband is a chemist, you know—and when he comes home he smells up the house so terribly I just can't sleep."*

*Second Woman's Voice: "I had the same problem, until my husband discovered 4,3,2,1-bis-ultra offalate-5. Since he used that miracle chemical he hasn't been home at all, and my, does it smell better!"*

*First Announcer: (Shouts) "Yes, folks, 4,3,2,1-bis-ultra offalate-5 is the miracle chemical of the century!"*

*Quartet: (Sings up the scale) "4 — 3 — 2 — 1 B — U 0 5."*

*Second Announcer: "The miracle chemical of the century."*

*Quartet: (Sings down the scale) "4 — 3 — 2 — 1 — B — U 0 — 5."*

*First Announcer: "Made only by Hypertension and Salubrious Chemical Company."*

*Quartet: (Sings up and down the scale) "4 — 3 — 2 — 1 — B — U — 0 — 5, 4 — 3 — 2 — 1 — B — U — 0 — 5."*

*Second Announcer: "Yes, friends, 4,3,2,1-bis-ultra offalate-5 IS the miracle chemical of the century. Listen . . . This compound contains Queerex, the special five-bonded carbon atom with the left-hand thread, developed and perfected only after years of research. Only Queerex can claim to emulsify water, make a sash-weight sink and write backward under blue ink. Ten out of five chemists interviewed have agreed that 4,3,2,1-bis-ultra offalate-5, containing Queerex, gave them soft, smooth, romantic beakers in just eighteen months. Why wait? Go out tonight and order this miracle chemical from your favorite dealer. By the truckload or by the pocketful, it's 4,3,2,1-bis-ultra offalate-5, containing Queerex, that special ingredient that no other chemical has. Not a molecule in a carload! And now we bring you —————."*

*Third Announcer: "Ladies and gentlemen, as a public service this station will now leave the air for the balance of the evening."*

SILENCE.

—BUNSEN

---

## APRIL A. I. Ch. E. MEETING

The 14th meeting of the Washington-Oregon Section, A.I.Ch.E. was held April 15. A very interesting trip through the Northwest Glass Company preceded the business meeting and dinner, which was held at Rose's Highway Inn on the Tacoma Highway. Mr. Karl Baur, Associate Soil Chemist at the Western Washington Experimental Station at Puyallup, gave a very interesting talk on commercial fertilizers and soil chemistry.

The May meeting is scheduled to be held in Portland, Oregon, May 20. The topic will be the expansion program at Portland Gas and Coke Co. A June meeting is also planned as the last spring meeting.

About 60 members attended. Cocktails were served!

---

**EMPLOYMENT**—Chemist, 25 years broad industrial experience, seeks Northwest connection. Experience and qualifications listed with J. T. Stephan, Chairman, Employment Committee. James Greek, 21736 Snow, Dearborn, Michigan. Would come West for interview if prospects favorable.



# Announcing the New 1947 CHART OF THE ATOMS

showing the new elements

Neptunium — Plutonium — Americium — Curium

PERIODIC CHART OF THE ATOMS																		Revised Edition 1947	Henry D. Hubbard
The Atoms Grouped According to the Number of Outer (Valence) Electrons																		Planetary electrons in the completed shells	
																		Total Atom No.	2 2 3 4 4 3 2
1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	2	2
1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	2	2
2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	10	2-8
3	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18	2-8-8
4	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	36	2-8-18-8
5	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	54	2-8-18-18-8
6	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	86	2-8-18-32-18-8
7	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	118	2-8-18-32-18-8-8

## LITHOGRAPHED IN SIX COLORS

The aid of the cyclotron and betatron in atomic research during the war, and the confirmation of atomic theory in the development of the atomic bomb, has greatly stimulated research and public interest. This revision of our Atomic Chart, under the direction of Dr. W. F. Meggers, Chief Spectroscopy Section, National Bureau of Standards, in close cooperation with Dr. Glenn T. Seaborg, University of California co-discoverer of the new elements *Neptunium*, *Plutonium*, *Americium* and *Curium*, insure up-to-the-minute coverage of the radio active section of the chart and of the whole field of atomic information.

No. 21420

Price: \$7.50 each

**SCIENTIFIC SUPPLIES COMPANY**

**NORTHWEST DISTRIBUTORS**

**Seattle, Washington**