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Bulletin of the Puget Sound Section of the American Chemical Society

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The PUGET SOUND CHEMIST

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THE EDITOR'S RETORT

With this issue, The PUGET SOUND CHEMIST completes its Spring activities. The next regular issue of the magazine to reach our readers will be that for the month of October. As has already been announced, however, we plan on publishing a special bulletin issue for the Western Division of the national meeting to be held in Portland in September. It can hence be safely said that the staff will enjoy no summer vacation from its duties, as the problems already arising in connection with this project are legion. To those of the membership who have so kindly offered assistance, we extend our thanks, and our assurance that there will be more than one occasion when we will call for help in the coming months.

Let no one underestimate the potential importance to the Pacific Northwest of the forthcoming Portland meeting. Here is an opportunity for chemists from all over the country to visit an area famous for its natural beauty, but too little appreciated as a source of great industrial power. It is also an opportunity to awaken in the Pacific Northwest a new realization of the importance chemistry will play in the development of this area. Consider that in the fields of agriculture, forest products, pulp and paper and mineral refining the chemical approach is becoming daily more important. The advances which are possible in these basic fields of area industry alone, if the full force of technical research were applied to them to advantage, would considerably strengthen the Northwest economy. When one considers further the broadening and integration of these industries which can be achieved by sound technical development, it becomes clear that scientific study and research is one of the essential keys to economic and industrial progress in the Northwest. It is events such as the Portland meeting which will accelerate the interaction of the vast potential in this area with the advanced scientific know-how of technical industry to produce eventually a great industrial area.

June Meeting

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

Tuesday, June 8, 1948

8:00 P.M.

Bagley Hall • Room 140



SPEAKER

DR. EUGENE D. FARLEY,
Attorney at Law
Portland, Oregon

SUBJECT

"CHEMICAL PATENTS"



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

Our May Speaker . . .

Dr. F. H. Lee was born in Nanking, China, in 1902. He received his B.S. degree from the University of Nanking in 1925 and his M.S. and Ph.D. degrees in 1929 and 1931, respectively, both from Northwestern University in Evanston, Illinois. Dr. Lee has been a professor of chemistry in the University of Nanking for sixteen years and in recent years he has also served as Dean of the College of Science at that institution. By invitation of the British Consul, Dr. Lee spent the academic year 1947-48 in England.

His principal researches have been in the field of electrolysis of Grignard compounds in ether solutions, ionic radii and hydration of ions, apparent ionic volume in infinitely dilute solutions, molar polarization and radius ratio of ions, and interionic attraction between ions and dipolar ions. He was given a high prize by the Ministry of Education of China in 1943 for his scientific contributions.

Dean Lee is a member of Sigma Xi and Phi Lambda Upsilon Societies. He is a charter member and a member of the standing committee of the council of the Chinese Chemical Society for which he also served as the deputation editor of the journal during the war period. He is on the council of both the Natural Science Society of China and the Association for the Advancement of Science in China. He represented China at the centenary meeting of the Chemical Society and International Congress of Chemistry held in London in 1947.

The Endeavors of Chemists In China

by F. H. LEE

[Summary]

During the Japanese Invasion, Chinese Universities moved a thousand miles into the interior of China. The speaker told his memories of different aspects of life during this period. He also read excerpts

from poems composed by him at various times during the war period, in order that the emotional reactions of the Chinese people to the problems which confronted them might be more fully understood by his listeners.

A series of pictures was shown, indicating the type of country through which the members of the Chinese Universities traveled during their move inland. Pictures of the war-time university were presented, as well as scenes showing some of the efforts made to develop the production of chemicals on an industrial scale in the face of almost impossible war-time conditions.

WESTERN DIVISIONAL MEETING

American Chemical Society
Portland, Oregon

September 12-16, 1948

The following Divisions are
scheduled to meet:

PHYSICAL AND INORGANIC

COLLOID

CELLULOSE

SUGAR

AGRICULTURAL AND FOOD

CHEMICAL EDUCATION



GET THAT PAPER READY



For other news of Plans for
this Meeting, see Page 7.

Meetings Planned . . .

CHEMICAL SYMPOSIUM AT BERKELEY

The following program of the American Chemical Society Section of the Pacific Division of the American Association for the Advancement of Science has been announced to be held June 22 and 23, at Berkeley, California. Submission of papers for presentation at this meeting will be welcomed.

Tuesday Morning, June 22

SYMPOSIUM IN ORGANIC AND BIOLOGICAL CHEMISTRY

Allylic Rearrangements—W. G. Young,
University of Calif. (Los Angeles).

The Blood Group Specific Substances—
Carl Niemann, Calif. Inst. of Tech.
Biochemical Studies with Bacteria—H. A.
Barker, Univ. of Calif. (Berkeley).

Tuesday Afternoon, June 22 SUBMITTED PAPERS

Wednesday Morning, June 23 SUBMITTED PAPERS

Wednesday Afternoon, June 23 SYMPOSIUM IN PHYSICAL AND IN- ORGANIC CHEMISTRY

Fluorocarbons—George Cady, Univ. of
Wash.

Nuclear Transformations at High Ener-
gies—I. Perlman, Univ. of California,
(Berkeley).

Kinetics of the Plastic Deformation of
Solids—Henry Eyring, Univ. of Utah.

CEREAL CHEMISTS TO MEET IN PORTLAND

Plans for the fifteenth annual Convention of the Pacific Northwest Section of the American Association of Cereal Chemists were announced recently by Francis P. Owens of Laucks Laboratories, Inc., Program Chairman for the Convention.

The Convention, to be held June 17 to 19, at the Benson Hotel in Portland, Ore-

gon, will be attended by over fifty delegates from Washington, Oregon, Idaho, Montana, California and the Western Provinces of Canada.

Highlights of the program will include an opening address by William L. Haley of Fisher Flouring Mills Co., President of the National Association, and a lecture by Dr. W. W. Moyer, Director of Research for Crown Zellerbach Corporation.

In addition to the various discussions and lectures delegates will participate in tours of local industries, a golf tournament at Colwood Course and a dinner dance in honor of the delegates' wives. The Convention will adjourn Saturday noon.

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UNIVERSITY OF WASHINGTON NEWS

ADDITIONS AND CHANGES ON STAFF

Dr. Norman L. Matthews recently joined the staff as an Associate Professor of Pharmacology in the Department of Pharmacology at the University of Washington Medical School. He received his B.S. degree in chemistry from the University of Chicago and his M.S. and Ph.D. degrees in chemistry from Ohio State University in 1937 and 1940, respectively. He received his M.D. degree from the University of Rochester in 1946. While he was at Ohio State he was Research Assistant in the Department of Medical and Surgical Research. He was instructor in Biochemistry at Emory University School of Medicine from 1940-1943. He served his internship in medicine from 1946-47 at the Strong Memorial Hospital, University of Rochester. He will assist in lectures and laboratory supervision in Pharmacology. Dr. Matthews' research interests lie in the field of Biochemistry and Pharmacology, and his most recent studies have been on the glyceryl ethers of shark liver oils. He has been a member of ACS since 1940.

Dr. Donald J. Hanahan recently joined the staff of the Department of Biochemistry as an instructor. He received his B.S. degree from the University of Illinois in 1941 and Ph.D. from the same institution in 1944. He was on the Manhattan Project from 1944-45. In 1945 he was appointed Research Fellow at the University of California where he remained until coming to the University of Washington. He will assist in lectures and laboratory supervision in Biochemistry. His research interests lie in the studies of metabolism of phospholipids and steroids and the application of radioactive isotopes to biological studies.

Dr. Derrol E. Pennington, who has been with the Pulp Analysis Research Project at the University of Washington since 1945, has been appointed Instructor

in Microbiology in that department at the University. Dr. Pennington received his Ph.D. from the University of Texas in 1942 and was with the NDRC during the war.

NEW ELECTRON MICROSCOPE

The arrival and installation of a new electron microscope at the Engineering Experiment Station at the University of Washington was recently announced by F. Burt Farquarson, director of the Station. The microscope is a universal model which can be used for all types of studies. It uses an electron beam instead of a light beam and has magnetic fields for lenses. It has a magnification of 25-5-thousand and with the photographic enlarger it is believed that this can be increased to more than 100 thousand.

It will be of particular value in studying colloidal sized particles as well as pigments, particle sizes, bacteria, wood, etc. It is also equipped for diffraction work for studies of crystalline structure. Oliver Rowe, who is in charge of the microscope, was sent to the University of Texas by the experiment station to train on the use of such microscopes. It is expected that in the near future the microscope will be available to all departments interested in making use of it.

MEETINGS PAST AND FUTURE

Representatives from the University at the 113th National meeting of the American Chemical Society in Chicago on April 19-23 were: Drs. Hyp J. Dauben, Jr., David M. Ritter, Herman V. Tartar, and Rex J. Robinson. Dr. Dauben presented a paper before the Division of Organic Chemistry on Sulfa Blue, a blue oxidation product of sulfanilamide, with H. J. Ringold and F. H. Skewis as co-authors.

Drs. R. W. Moulton and H. K. Benson attended the meeting of the American Society for Engineering Education on April 23rd in Corvallis, Oregon.

NEW GROUTING MIXTURE

A series of grouting experiments are being conducted by the Seattle District Corps of Engineers to gather information on technique and materials that will be of assistance in designing the right bank cut-off and controlling the inflow of water during construction of the Foster Creek Dam, near Bridgeport, Washington, Colonel L. H. Hewitt, District Engineer, reports.

Under the direction of Mr. G. B. Hunt, Chief of the Foundations and Materials Branch, a laboratory investigation was planned to develop a grouting mixture which would: (1) have high penetrating qualities in well-graded and open work gravels with normal low pressure grouting methods, (2) have fairly high resistance to water erosion, (3) have setting time controlled by suitable admixture, and (4) develop sufficient strength properties to provide stability in the gravels. A number of combinations of various cementing and inert materials considered to be the best suited to produce these characteristics were selected to be used in the testing program.

The following materials believed to be best suited for this experiment were chosen for testing and study: portland cement, lumnite cement, colloidal clay, emulsified asphalt, calcined gypsum, a cement dispersion product, silt (rock flour), and fine sand (pass No. 16 sieve).

Small trial batches of the above materials in combinations were mixed to conform to the approximate consistency of normal rock grout. Approximate setting time, shrinkage, tendency to hold solids in suspension, resistance to water erosion, and strength characteristics were observed.

The penetrating qualities of selected grouts were determined by pumping the grout into the interstices of medium to high permeability porous concrete stones. The stones were made from lightly cement-coated sand particles ranging in size from the No. 16 to No. 30 sieve with approximately 30% voids and were moulded to fit a 1/10 cubic foot con-

tainer. The stone, after being placed in the container was sealed around its edges and inundated in water. Grout was introduced into the bottom of the container and applied under pressure to the stone. Pressure grouting of each stone was continued until 20 pounds-per-square-inch pressure was attained. The grout in the stones was cured for a period of 7 days, after which the stones were cut in half and the depth of grout penetration observed.

In addition to the laboratory work, experiments are being conducted in the field. Test holes are drilled and grout mixtures introduced. The results of these laboratory and field experiments will aid the Corps of Engineers in determining the best and most economical method of making any necessary cut-off on the right bank of the Foster Creek Dam.

J. A. MACE, *Chief*,
Technical Information Branch
Department of the Army
Corps of Engineers
Seattle District

SPRINGFIELD ALCOHOL PLANT CLOSED

The three million dollar experimental alcohol plant for the production of ethanol by the fermentation of sugars made by the hydrolysis of cellulose from wood waste, closed down some time ago after running long enough to prove that the production of alcohol by this process is practical. In the present state of the market for grain alcohol the plant could not compete with other fermentation processes. In March the Willamette Valley Wood Chemical Company filed a petition in bankruptcy. The Company was certified to have \$164,739.00 liabilities and only \$12,868 assets. The plant, one of the best fermentation and distillation plants constructed in the West, was built by and is owned by the Federal Government and has been put up for lease or sale by the War Assets Administration.

J. M. MCGEE
Eugene, Ore.

OREGON SECTION OFFICERS PLANNING WESTERN DIVISIONAL ACS MEETING FOR PORTLAND



Hard at work on plans for the forthcoming Fall meeting in Portland are (left to right): Leo Friedman, Councilor; Joseph Schulein, Chairman, Oregon Section; Vernon H. Cheldelin, Chairman of the Fall Meeting; and Mr. M. T. Hood, Philanthropist, and owner of twelve million acres of Oregon timber land, including world famous Mount Hood. The above typical view of Oregon Section activities shows Mr. Hood losing his monopoly on viewing rights to the mountain bearing his name to Chairman Schulein's royal flush, as a result of which transaction all visitors to Portland may now see Mount Hood absolutely free—tax included.

NEW WOOD WASTE AND PAPER FACTORY

The Weyerhaeuser Timber Company has started construction of a new sulphate paper pulp plant at Springfield, Oregon, estimated to cost \$6,000,000. The plant is part of the Company's long range plan for integrated plant processing and is another step in the whole crop utilization of their timber resources. The raw materials will be obtained from logging and milling waste, thus utilizing leftover slab and edgings from their saw-

mills. The Weyerhaeuser Company owns sufficient timber in the Eugene-Springfield vicinity to insure a long-time operation of the plant and will produce 150 tons of paper board per day.

W. J. Park and Sons, Yakima, Wash., have the contract for the building construction and the paper board machine to be used in the plant will be constructed by the Rice Barton Corporation of Worcester, Mass.

J. M. McGEE
Eugene, Ore.

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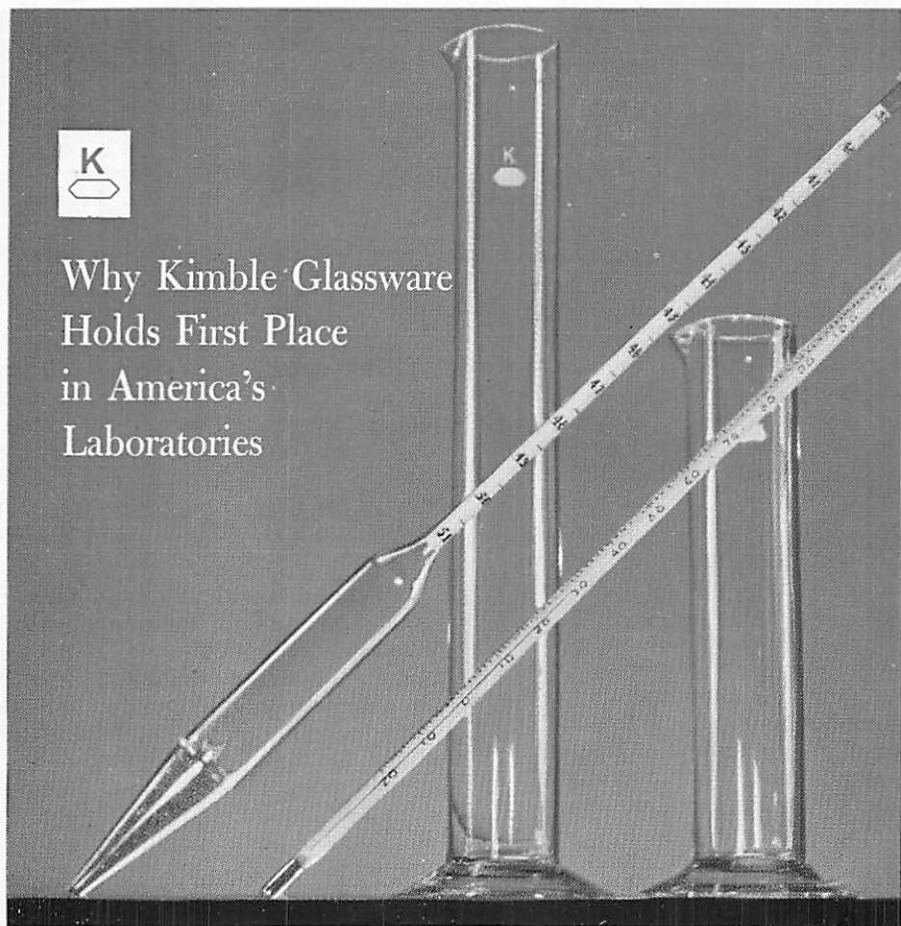
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CHEMICALS IN THE FOOD INDUSTRY

Taken from a Report by

DR. T. L. SWENSON

FOOD, CHEMICALS & RESEARCH
LABORATORIES, INC.

To the consuming public, food is food. From the industrial viewpoint, however, it means a great deal more than that. It connotes engineering development; chemical, bacteriological and quality evaluation research. The following estimated figures on chemicals today used in the Food Processing Industries indicates the interdependency of the Chemist, Bacteriologist and Industrial Processor of foods.

Discounting the use of fertilizers, fungicides, and insecticides, utilized in farm production of the raw materials used in commercial food packs, a great variety of chemical substances are employed in connection with the production, processing, preservation, and distribution of foods. These include edible acidulants and colors; flavoring and sweetening agents; disinfectants for stables, grains, seeds, soils, and dairy implements; preservatives for food stuffs; food sanitation and refrigeration chemicals and herbicides; and special miscellaneous chemicals and indicators for quality control. The following tabulation indicates chemicals used by the individual food-packing industries:

<i>Food Industry</i>	<i>Chemicals Used</i>
FISH	Carbon dioxide.
CANDY	Edible acidulants, food colors and chem. flavoring agents.
MEAT	Carbon dioxide, sod. nitrate, agar & benzoic acid.
CARBONATED BEVERAGES	Carbon dioxide, edible acidulants, food colors, caffeine.
FLOUR (wheat for baking)	Bleaching and aging chemicals, vitamins, iron salts, phosphate.
BAKERY PRODUCTS (inc. yeast)	Nitrogen compounds, phosphates, edible acidulants, food color.
DAIRY INDUSTRY (ice cream, fluid milk)	Carbon dioxide, alginates, gelatin, food colors, sanitation chemicals,

sulfuric acid, phosphates, citrates, methyl cellulose.

JAMS, JELLIES	Edible acidulants, pectin, food dyes, flavoring agents, benzoic acid.
POULTRY (chickens, broilers, turkeys, eggs)	Formaldehyde, potassium permanganate, phenothiazin, vitamins, magnesium sulphate, medicinals.

Edible acidulants, as the name implies, are acids derived from different sources, the use of which is permitted in foods. Acids most commonly employed in this category are the organic acids: Citric, Tartaric, Lactic, Acetic (vinegar) and Malic. The inorganic acid most commonly used is Phosphoric acid.

Of the chemical flavoring materials used, only a few will be mentioned here. Mono-sodium glutamate, one of the more important such compounds, imparts a meat-like flavor to foods, and is used extensively in canned and dehydrated soups. Synthetic fruit flavoring agents include ethyl butyrate, propyl acetate, amyl acetate, isoamyl isovalerate (apple), benzaldehyde, cinnamic aldehyde, and methyl anthranilate.

Most important aging and bleaching chemicals are hydrogen peroxide, benzoyl peroxide and sulphur dioxide. Potassium bromate is used extensively in maturing bread dough. Sweetening agents such as sucrose, dextrose, and corn sirup are important ingredients to the food and beverage industry. Pectin, lecithin, and agar are high on the list of emulsifiers and stabilizers used in the industry.

Food supplements include many phosphorus compounds. Certain iron salts as well as elemental iron are used for flour enrichment. Also included in this category are the vitamins so familiar to all.

Broken down to functional groups, estimated values of these materials are shown in the following tabulation:

(Continued on page 16)

NEW CONSULTING FOOD LABORATORY

Recently announced was the founding and organization of the Food, Chemical and Research Laboratories, Inc., located at 1201 East 38th St., Seattle.

Dr. T. L. Swenson, President and Executive Director of the Laboratory, although born in Michigan, was raised and educated in Washington schools. He received his B.S. degree in Bacteriology and Pharmacy as well as Ph.C. in Pharmacy at Washington State College in 1923. M.S. degree in Advanced Food Bacteriology, and Ph.D. in Biochemistry were received at the American University in Washington, D. C.

Dr. Swenson comes to Seattle from the Stanford Research Institute where he has been the Director of Food Technology from 1939-47. Prior to his work at Stanford he was Head Chemist and Director of the Western Regional Research Laboratory, Albany, California; Fruit and Vegetable Laboratory, Pullman, Washington; and Fruit Products Laboratory at Los Angeles.

With the level of food discrimination continually rising, Dr. Swenson feels that eventually, most, if not all, of the food packers and processors will be required to furnish evidence of continuous "quality-control" to the brokers and food buyers. Toward that end the Food, Chemical and Research Laboratories, Inc., stands ready to give service to packer, processor and buyer.

Horse sense is a thing that horses have that keeps them from betting on people.

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CHEMICALS INDISPENSABLE
TO INDUSTRY AND AGRICULTURE

THE TURBO ENCABULATOR

(Although this article, a reprint from the Industrial Bulletin of the Arthur D. Little Co., was printed in the May, 1946, issue of the Puget Sound Chemist, it is as timely and significant today as it was then. The staff feels that those who read it before will gain new inspiration from this precise technical presentation. It is, however, primarily reprinted for those who did not have a chance to familiarize themselves with this fascinating subject when first printed.—Ed.)

For a number of years work has been proceeding in order to bring perfection to the crudely conceived idea of a machine that would not only supply inverse reactive current for use in unilateral phase detractors, but would also be capable of automatically synchronizing cardinal grammeters. Such a machine is the "Turbo-Encabulator." Basically, the only new principle involved is that instead of power being generated by the relative motion of conductors and fluxes, it is produced by the modal interaction of magneto-reluctance and capacitive directance.

The original machine had a baseplate of prefabulated amulite, surmounted by a malleable logarithmic casing in such a way that the two spurving bearings were in a direct line with the pentametric fan. The latter consisted simply of six hydrocoptic marzelvanes, so fitted to the ambifacient lunar wan shaft that side fumbling was effectively prevented. The main winding was of the normal lotus-o-delta type placed in panendermic semi-boloid slots in the stator, every seventh conductor being connected by a non-reversible tremie pipe to the differential girdle spring on the "up" end of the grammeters.

Forty-one manestically spaced grouting brushes were arranged to feed into the rotor slip-stream a mixture of high S-value phenylhydrobenzamine and five per cent reminative tetryliodohexamine. Both of these liquids have specific pericocities given by $P 2.5C^{6.7}$ where n is the diathetical evolute of retrograde tem-

perature phase disposition and C is Cholmondeley's annular grillage coefficient. Initially, n was measured with the aid of a metapolar refractive pilfrometer (for a description of this ingenious instrument, see L. E. Rumpelverstein in "Zeischrift fur Elektrotechnistatichs-Donnerblitze," vol. vii), but up to the present date nothing has been found to equal the transcendental hopper dadoscope. (See "Proceedings of the Peruvian Academy of Skatological Sciences," June, 1914.)

Electrical engineers will appreciate the difficulty of nubing together a regurgitive purwell and a supramitive wenel-sprocket. Indeed, this proved to be a stumbling block to further development until, in 1942, it was found that the use of anhydrous nagling pins enabled a kryptonastic bolling shim to the tankered.

The early attempt to construct a sufficiently robust spiral decommutator failed largely because of a lack of appreciation of the large quasi-piestic stresses in the gremlin studs; the latter were specially designed to hold the roffit bars to the spamshaft. When, however, it was discovered that wending could be prevented by a simple addition to the living sockets, almost perfect running was secured.

The operating point is maintained as near as possible to the h.f. rem peak by constantly fromaging the bitumogenous spandrels. This is a distinct advance on the standard nivel-sheave in that no dram-cock oil is required after the phase detractors have remissed.

Undoubtedly, the turboencabulator has now reached a very high level of technical development. It has been successfully used for operating noffer trunnions. In addition, whenever a barescent skor motion is required, it may be employed in conjunction with a drawn reciprocating dingle arm to reduce sinusoidal depeneration.

Low Hit
M A 3536

LETTERS TO THE EDITOR

Dear Sir:

The article appearing in the April issue was a fine idea and I agree that the Puget Sound Section can be proud of the fine record of the CHEMIST. However, I feel that an apology is due to Dr. V. Sivertz, who originated the mimeographed PUGET SOUND CHEMIST back in 1939 and put it out single-handed for quite a few years thereafter. Certainly some recognition of his years of good work is due.

E. C. LINGAFELTER

Our thanks to Dr. Lingafelter for pointing out our error of omission with regard to the early days of the CHEMIST. The Section certainly owes an unlimited debt of gratitude to Dr. Sivertz for the many contributions he has made to its success.—Ed.

ARTHUR J. NORTON

Consulting Chemist

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Chemicals In the Food Industry

(Continued from page 12)

General Classes	Annual Dollar Value
Acidulants	\$16,590,000
Bleaching & Aging Agents	12,000,000
Certified Food Colors	2,000,000
Chem. in Sugar Industry	15,000,000
Emulsifiers & Stabilizers	3,500,000
Flavoring Agents	80,500,000
Food Supplements	6,500,000
Food Enrichment Agents (vitamins)	98,000,000
Food Preservatives	390,000
Food Packaging Materials	18,000,000
Sanitation & Cleaning Compounds	15,000,000
Total.....	\$267,480,000

The above figure, as compared to an estimated Annual Food Pack (1943) of \$14,405,000,000, is indeed a reasonable price to pay to guarantee food preservation and ensure consumer acceptance; and further shows the manifold value of the chemist and bacteriologist to the Food Processing Industry.

POSITION WANTED

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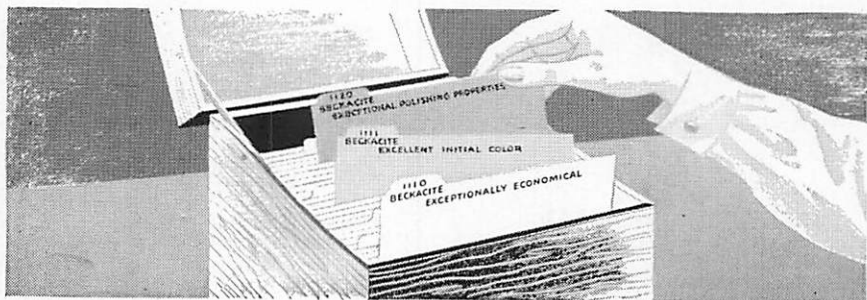
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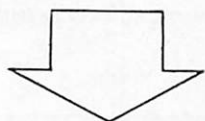


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