The PUGET SOUND CHEMIST

Bulletin of the Puget Sound Section of the American Chemical Society

VOLUME IX MARCH, 1948 NUMBER 3

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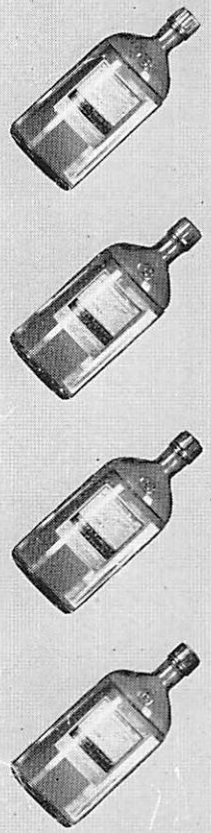

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The PUGET SOUND CHEMIST

Volume IX March, 1948 Number 3

EDITORIAL ADDRESS: 2901 1st Avenue South, Seattle 4, Washington

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THE EDITOR'S RETORT

For the benefit of those who were not present at the March meeting, we wish again to mention that the PSC is in need of a few additional staff assistants. A group of interested members willing to give a very short ration of their time each month to this publication will assure us of a continually improving magazine, springing from the ideas of a broad segment of the membership. It will also assist in the not inconsiderable task of publication, in order that a few will not be overburdened. If you feel you can help in a small way, or perhaps a large way, get in touch with the editor.

We had the great pleasure, a few weeks ago, of attending a meeting of the Inland Empire Chemists' Association in Spokane. This group, organized within the past year by chemists in the Spokane area, hopes to supplement the program of the Washington-Idaho Border Section with meetings more easily accessible to the group centered about Spokane. Chairman of the organization is Mr. Bonde Tuveson of Northwest Magnesite Company, Chewelah, and their Secretary is Mr. Walter Broom of Centennial Flouring Mills Co., Spokane. Although there are not as yet a sufficient number of ACS members in the group to constitute a new Section, they hope to grow to the point where a charter may be granted them in the near future. Already an active program of plant visits and dinner meetings with speakers of significance in the world of chemistry is underway, under the able supervision of Father Arthur McNiel of Gonzaga University, who is program chairman. The IECA will welcome any of the members of the Puget Sound Section who journey to Spokane as their guests at regular meetings, the dates of which we hope to have available for publication in the near future. The formation of this group gives further evidence of the march of progress of chemistry in the Northwest, and the interest of chemists in furthering such progress through organized activities.

April Meeting

PUGET SOUND SECTION OF THE AMERICAN CHEMICAL SOCIETY

Friday, April 9, 1948

7:30 P.M.

UNIVERSITY OF WASHINGTON

BAGLEY HALL

ROOM 140

★

There will be an informal Dinner at 6:00 P.M.
For Reservations
Call ME. 0630, Ext. 439, before April 5th

★

SPEAKER

DR. E. G. ROCHOW

Associate Professor of Chemistry, Harvard University
[Formerly of General Electric Company, Schenectady, N. Y.]

SUBJECT

SILICONES

A Social Period will follow the Meeting and Address

Our March Speaker . . .

BIOGRAPHY

EARL THURSTON McBEE

Earl Thurston McBee was born at Braymer, Missouri, July 6, 1906. In 1929 he received the A.B. degree at William Jewell College. Graduate work was undertaken at Purdue University where he received his M.S. in 1931 and his Ph.D. in 1936. For two years at William Jewell College, he was an assistant in chemistry. From the time he went to Purdue in 1929, he has held varied positions in the Department of Chemistry — Assistant, 1929-30, Research Fellow, 1930-35; Instructor, 1935-37; Assistant Professor, 1937-40; Associate Professor, 1940-43; Professor 1943 to date. Mr. McBee also is Coordinator of the Purdue Research Foundation projects in Chemistry.

During the war, Dr. McBee was actively engaged in war research with the Office of Scientific Research and Development, the Manhattan District, U.S. Army Engineer Corps, Naval Research Laboratory, and the Army Air Forces. He was an Official Investigator of, a member of, and a consultant to, the National Defense Research Committee; member of the Research Advisory Committee, U.S. Engineer Office, Madison Square Area; and Research Consultant for U.S. Engineer Office, Madison Square Area. At the present time, he has a personal contract with the Atomic Energy Commission.

Dr. McBee is a consultant to several chemical companies, and has directed research fellowships at Purdue University for more than forty different organizations. From his research on derivatives from petroleum, oxidations, chlorinations, pharmaceutics, and fluorinations, he has fifty publications, nine patents, and one hundred eighteen patent applications. In addition, numerous papers have been submitted to the Atomic Energy Commission for publication.

Dr. McBee is a member of the American Chemical Society, Sigma Xi, Phi Lambda Upsilon, American Association for the Advancement of Science, Indiana Chemical Society, and American Association of Scientific Workers. Prized honors include Sigma Xi Award for outstanding research at Purdue and the Modern Pioneer Award sponsored by the National Association of Manufacturers.

CHLORINATION

By EARL THURSTON McBEE

Research in the field of chlorination has been extensive since the advent of the Kekule theory. However, until recently, the commercial utilization of chlorinated organic compounds has been determined largely by the physical properties which they possess. Modern research has not only extended the uses of chlorinated organic compounds as based upon physical properties, but in addition has created entirely new fields of investigation based on chemical and physiological properties. Foremost among these is the discovery of the value of D.D.T., hexachlorocyclohexane, chlordane and toxaphene as insecticides, chloranil as a fungicide, 2,4 D as a herbicide, and the dichloropropanes and pentanes as soil fumigants.

The increasing value of chlorinated organic compounds as chemical intermediates is illustrated by the use of 1,4-dichlorobutane and 1,4-dichlorobutene for the manufacture of Nylon, chloroacetic acid for the manufacture of carboxymethyl-cellulose, allyl chloride for glycerol, hexachlorocyclopentadiene for chlordane, chlorinated fatty acids for plasticizers, and chloral for D.D.T.

These commercial applications have resulted in modern development procedures exemplified by continuous chlorinations, jet chlorinations, thermal chlorinations, and methods for substitutive and additive chlorination in alkaline and acidic media.

Radical departures from conventional methods for preparing commercial products have unfolded new fields for chemical exploitation. Thus, chloranil is being prepared by passing chlorine into a solution of phenol or aniline in sulfuric acid, hexachlorobutadiene and hexachlorocyclopentadiene are prepared by the thermal chlorination of polychlorinated butanes

(Continued on page 15)

NEW CHEMICALS IN THE NEWS

New hope for heart disease sufferers is offered by a new drug called dicumarol. This compound was originally isolated from spoiled sweet clover, as a result of an investigation into the reasons why spoiled hay caused cattle to become "bleeders," bleeding to death from a small scratch. Dicumarol was first synthesized in 1939, and its application to the treatment of heart disease is now being developed. The drug is helpful in treatment or coronary thrombosis, since this disease results from the formation of blood clots which block the supply of blood to the heart. Even if the blood clot is dissolved and the patient survives, other clots remain clinging to the walls of the heart chamber. Here they are a constant menace, since they grow and may break loose and dam the blood stream. Although dicumarol does not dissolve these blood clots, it prevents their growth, and also prevents the formation of new clots. The hazard of the use of dicumarol lies in the fact that an overdose might reduce the clotting power of the blood to the point where serious hemorrhages result. This tendency can be overcome, however, by the use of vitamin K. One of the outstanding advantages of dicumarol is that it may be administered by mouth. It also has a lasting effect, and so must be administered only every day or two. This drug is now under thorough investigation in fourteen hospitals in all parts of the country, and the results of these tests will be known in two to three years. Heart disease experts are already predicting, however, that dicumarol can save the lives of many thousands of victims of coronary thrombosis.

Hexachloroethane recently made news as a potential new tool for the increase of our national meat supply. Each year over a million pounds of beef liver must be condemned because cattle are infected with a parasite called liver fluke. Animals so infected also tend to gain weight slowly, and thus are very expensive to fatten. A single treatment of hexachloroethane, administered by being dissolved in the cattle's drinking water, will eliminate adult liver flukes in the animals, thus putting more beef on their bones, and, presumably, on the tables of those who are eating beef these days.

As a result of the advance of chemistry, the need for slipping a fork under that shaky restaurant table may soon be eliminated. The "bouncing putty" developed a few years ago is to be used in a gadget consisting of an expanding cylinder and piston arrangement incorporated into table legs. The cylinder contains a lump of the "bouncing putty" which acts as a spring enabling the table legs to adapt themselves to unevenness in the floor. The post-war era of easy living is most certainly with us.

Here is an item for those who like onions. Have you been socially ostracized as a result of your passion for the strong fruit? Now you can start feeling altruistic, because you have actually been reducing the germ concentration in the air around you, at least in theory. The Russians have discovered that onion and garlic vapors heal wounds, and more recently, thioaldehyde has been determined as the active constituent of onions. Chewing a raw onion might therefore help a cold. It almost certainly would help prevent the spreading of a cold by isolating the carrier who ate the onion.

—Bunsen.

APRIL MEETING

CANADIAN INSTITUTE OF CHEMISTRY

Vancouver, B.C.

Speaker

DR. E. C. LINGAFELTER

Subject

"Colloidal Electrolytes"

Monday, April 12, 1948

Call Dr. V. Sivertz, University of Washington, for Transportation Arrangements

The consumption of *natural rubber* exceeded that of the synthetic product during 1947 for the first time since 1943.

On the second day of this year the *earth* was at its closest point to the sun; it was some 4,000,000 miles nearer then than the 94,451,000 miles that separated the two on July 5, 1947.

They say young Henry Ford is known around the plant as H_2F—Who makes it?

OUR COVER PHOTO

Courtesy of

NORTHWESTERN MUTUAL FIRE ASSOCIATION

APPLE BLOSSOM TIME
CENTRAL WASHINGTON

Cosmetics A GROWING FIELD FOR CHEMISTS

By F. L. RUNNELS, W. P. C. Laboratories

The year 1946 saw the Cosmetic Industry reach $850,000,000[1] in sales. Such a figure should convince skeptics of its impact on the American economic scene. A breakdown that makes this figure seem even more impressive is the per-capita consumption figured from the above of approximately $6.00.

Undeniably wartime prosperity gave the industry a big boost to its present commanding height, for sales and production followed closely the nation's war activities.

Just how solid the gains made in recent years are may be illuminated by scanning post war performance. The uncertainties, cancellation of war contracts, and rush for demobilization after the cessation of hostilities, gave the nation eighteen months of uneasiness with strikes and shortages plaguing all. Consumer purchasing capacity dropped 3%. Toilet goods sales on the other hand rose 5.6% with per-capita consumption rising 32 cents. Thus the industry was able to consolidate gains and has a broad foundation for future building.

Growth of the toilet goods industry in the United States has been impressive. Such expansion could only be possible in a society where all levels are reached. True to the spirit of American progress, cosmetics, once used by the few, are now enjoyed by the greater majority of our population. Not only that, but American preparations are in heavy demand throughout the world. Such is the desire of mankind to enhance one's appearance.

Webster defines cosmetics as "imparting or improving beauty." The desire for improving his beauty was probably born in the first man aware of himself. Thus the origin of cosmetics is lost in antiquity. For certainly every civilization that set down a record is known to have practiced a cosmetic art.

Archaeologists upon opening tombs of the Pharaohs of Ancient Egypt[2] have found receptacles for ointments and perfumes. Moreover, the fragrance of the material enclosed with the deceased king thirty centuries before could still be detected.

Egypt produced in the first century B.C. probably the most famous exponent of cosmetic use in history—Cleopatra. She made up for lack of natural beauty by extensive use of all the developments in cosmetic art of her day.

The histories of Greece, the Roman Empire, China and India are likewise rich in cosmetic lore. It is easy to see that desire for improved appearance and personal enhancement is universal, confined to no class of people, and to no civilization. We cannot but expect it to be further developed today.

Modern cosmetics, although to a certain extent empirically evolved by mankind through the centuries, finds its present form deeply rooted in the science of pharmacy and applied dermatology.

The ointment and medicinal emulsion are on common ground with cosmetics in mode of preparation and raw materials. Also the industry is quick to recognize that many of its present leaders and its most likely source of new recruits as cosmetic chemists come from the Schools of Pharmacy.

The pharmacist is constantly reminded in trade journals that his background makes his retail outlet a natural for cosmetic distribution because he has scientific knowledge of cosmetics and their application.

The medical doctor today has replaced his indifference with recognition that cosmetics are an important part of our standard of living. Such acceptance has given rise to "Ethical" lines which are detailed to the doctor, and sold on prescription. These companies maintain laboratories that work with the doctor in determining just what type of preparations are best suited for allergenic patients.

A brief examination of basic formulae in any of the standard works will disclose

that a preparation prescribed for a medicinal ointment base with modification may become a hand cream. The difference being that the chemical properties of the raw materials are used with an eye to cosmetic effect in the hand cream and for therapeutic effect in the ointment. A man experienced in one field easily qualifies in the other.

For many years the connotation of frivolity dogged every move of the Cosmetic Industry. This attitude was fostered by its advertising copy writers and those manufacturers that persisted in back room operations. However, such maneuvers were doomed to failure and it was recognized by its leaders that for sound and healthy growth a substantial policy had to supplant the rule of thumb. Deep in the depression various firms examined their operations with critical eyes and adopted policies of controls on raw materials as stringent as pharmaceutical houses. Emphasis was placed on research, not copy, as the source of new items.

It is only natural that these events began to attract high caliber personnel in various scientific fields to man the laboratories of the now wide awake manufacturers.

The suppliers of raw materials with their eyes on the profitable expanding market turned their facilities to the needs of the industry. The result of this combined effort has produced several notable advancements in the past ten years.

In investigating the wherefore behind the turn to the scientific attitude so much in evidence, the role played by the Food, Drug and Cosmetics Act cannot be overlooked. The original act of 1906 left much to be desired both on the side of the manufacturer and the enforcing agency. The Federal Food, Drug and Cosmetic Act of 1938[3] now controls the manufacture and sales of cosmetics in interstate commerce.

Since it went into effect interpretation of its various sections have and will continue to be made. The aims as pertaining to the Cosmetic Industry are fair and can only be helpful. In general they are as follows: To control preparations to exclude deleterious ingredients; plant inspection to assure that manufacturing conditions are properly controlled and conducted in clean and sanitary surroundings; to prevent fraudulent representation through deceptive packaging, to control labeling for the elimination of false and misleading claims. Ignorance is no excuse. Scientific background is the only defense. The impetus of this legislation has been the hiring of technical people—chemists to handle the technical side of the business, and as many other industries have found that this has paid, not only in satisfaction but in dollars and cents.

It must be remembered, however, that the law alone has not been responsible for present high standards. The best example of industry initiative is in the forming of the Scientific Section of the Toilet Goods Association Inc., in the Fall of 1943. Meetings are held twice yearly, and the papers presented are published in the Section's "Proceedings," available shortly after each meeting. The caliber and scope of this activity has surged forward. Each year sees more and more members of the T.G.A. participating. Needless to say, to keep pace with fellow members of the Association the individual must have the same background. Competition relentlessly forces those who hesitate.

In 1945 the Society of Cosmetic Chemists was formed. The basic idea was an organization that would provide means of maintaining professional standards, by mutual association and the exchange of general information. The society meets twice yearly and publishes a journal, the first issue of which appeared in July, 1947.

The organization set high standards to insure that it remain a professional society. It has enjoyed a vigorous growth which attests to its need in the scheme of things.

It is also well to point out that recognition in educational circles of the need of trained personnel for the industry is evident by courses in Cosmetic Chemistry included in curricula of various colleges and universities throughout the nation. Among these is our own University of Washington.

(Continued on page 15)

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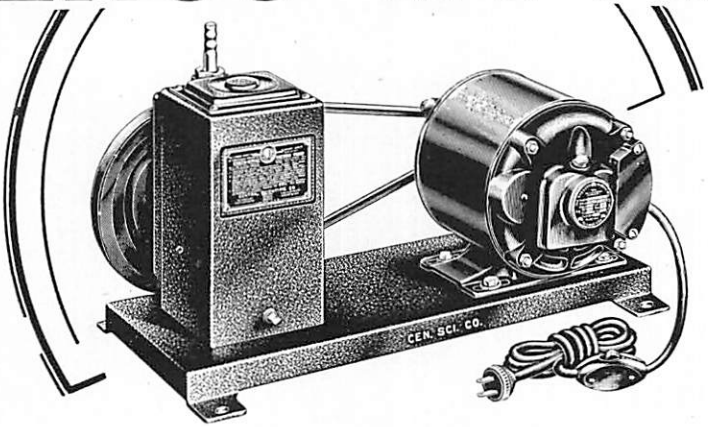

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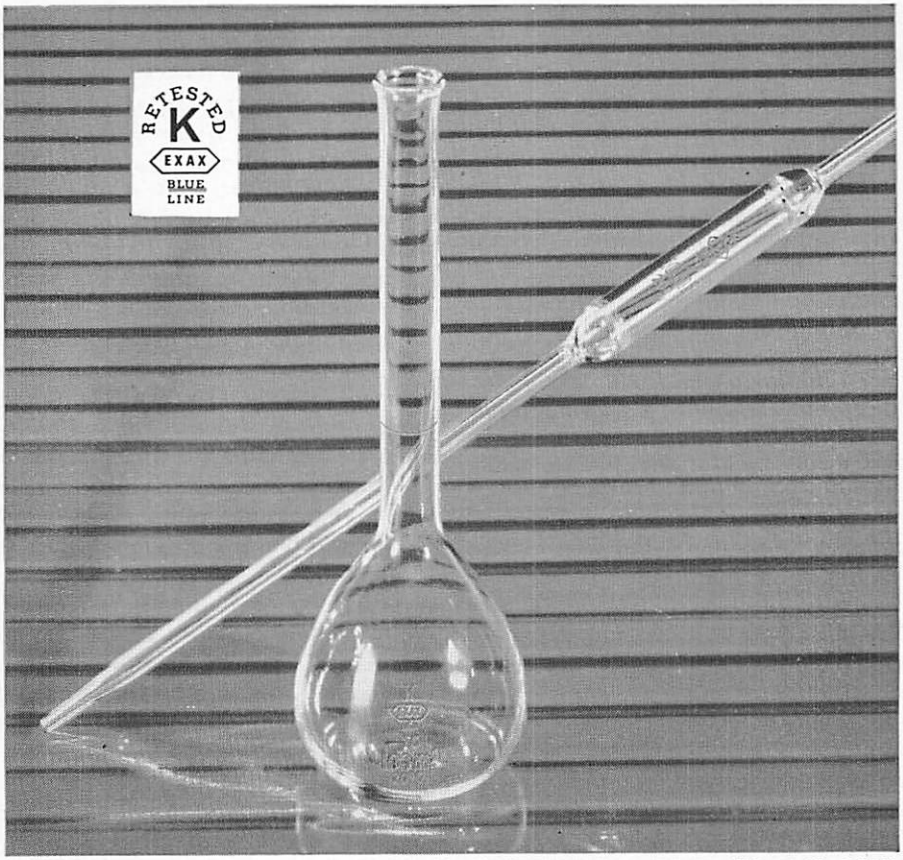

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REPORT ON FEBRUARY MEETING . . .

By **L. W. LANG**

The Tacoma joint meeting of the American Chemical Society and the American Institute of Chemical Engineers was an unqualified success and enjoyed by over two hundred thirty-five members and guests.

The success of the meeting was due in large part to fine organization and planning by many people. The meeting was planned and arranged for by the Industrial Technical Council, a group representative of Tacoma process industries, whose members are also professionally affiliated with the American Chemical Society, American Institute of Chemical Engineers, and others. Capably serving as Chairman of this group was Dr. R. D. Sprenger, a member and officer of both the ACS and the AIChE, and associated with the College of Puget Sound at Tacoma. Arrangements for the speaker were made jointly by John Stephan of the AIChE and Dave Ritter of the ACS, head of their respective program committees.

Prior to the social hour and dinner, plant visits were arranged with the help of Marshall Ramstad who was in charge of same. The opportunity to see the inner workings of representative Tacoma industry was availed by a total of one hundred ninety. Twenty-three were guests of the Hooker Electrochemical Company in the visit to their Chlorine and Caustic Plant. Al Rosengarth, Plant Superintendent, was in charge of the tour. Thirty-seven men were conducted through the Permanente Metals Aluminum Plant in charge of C. P. Love, Plant Manager. Eighteen men toured the Pennslyvania Salt Company, Harry S. Fisher being in charge.

Largest attendance of any of the plants was the eighty-five who toured the St. Regis Paper Company's Sulfate Pulp Mill. This trip was arranged by Mr. Lindley, Assistant Plant Superintendent. The West Tacoma Newsprint Company's Groundwood Pulping Operation was host to twenty-seven men in charge of Neil Robertson, Mill Manager.

These visits were through the courtesy of John D. Rue, Works Manager at the Hooker Electrochemical Co.; Fred Shaneman, Plant Superintendent at the Pennsylvania Salt Co.; Ross McCory, Superintendent at St. Regis Paper Co.; and George Russell at The West Tacoma Newsprint Co.

The various plant groups and those who could not make the industrial tours gathered at The Towers for a Social Hour prior to dinner. The refreshment table was handled by Glenn Welde and Lou Schatz. Four of the plants visited, as an additional gesture of hospitality, contributed much of the refreshments.

Social Hour was continued into and through the dinner, and The Towers' staff are to be complimented on the way they handled this capacity banquet. Dinner arrangements were made by Arnold Johanson.

Introductions and acknowledgments were made by Dr. Sprenger. Dr. H. K. Benson introduced Mr. C. L. Thompson, the speaker of the evening who talked on the subject, "The Chemical Utilization of Waste Wood Products." Mr. Thompson, technical director of the Pacific Lumber Company of San Francisco, has been actively engaged in developments in the chemical utilization of waste wood products and has been associated with several new developments which have occurred in this field during the past ten years.

The fine manner in which this meeting was handled all the way through, certainly calls for a repeat performance. Possibly an annual meeting along these lines would be very much in order. We understand that the Tacoma delegation would be glad to play host should such a policy be adopted.

It seems to us that the Tacoma representation is certainly on the ball. There were Seattle men attending, too.

A Hydrogen Peroxide Industry for Puget Sound?

By G. L. PUTNAM, University of Washington

Produced by our electrolytic caustic-chlorine industry, large amounts of pure hydrogen are burned as fuel under steam boilers. With 14-gravity oil at $2.70 per bbl., the value of hydrogen as fuel is about 2.2 cents per lb.

Hydrogen combines with oxygen to form hydrogen peroxide under activation by heat, by the silent electric discharge, and by radiation with light of 2537 A° wave length. In the form of hydrogen peroxide, hydrogen is worth $8.78 per lb. (4).

Pease in 1930 (1) first obtained appreciable amounts of peroxide by reaction of hydrogen and oxygen at temperatures a few degrees below the ignition temperature. Pease concluded that hydrogen peroxide is an important intermediate in the combustion of hydrogen. A most important point is the method of cleaning the Pyrex vessels used for the reaction, since extremely minute traces of heavy metals rapidly catalyze hydrogen peroxide decomposition at the temperatures involved.

More recently, Cook (2) improved the synthesis by coating his vessels with boric oxide. Cook postulated a mechanism as follows (3):

(a) $H + O_2 + M \longrightarrow HO_2 + M$

(b) $HO_2 + H_2 \longrightarrow H_2O_2 + H$

"M" is any third molecule in the gas phase, or the surface of the reaction vessel.

From 4 to 20 percent of the oxygen used up is converted to hydrogen peroxide (1, 2). At pressures of 1 to 35 atmospheres, space time yields are 2 to more than 20 grams of hydrogen peroxide per liter of reaction space per hour. Good yields may be obtained with air as the source of oxygen (5).

The silent electric discharge synthesis, now being studied at the University of Washington (7), was investigated in Germany between 1931 and 1945 (6). The following quotation from letter of Jan. 10, 1945, A. Pietzsch to the *Oberkommando der Kriegsmarine* is of interest:

"Pease in his experiments used Pyrex glass of which we could not get an adequate supply here and so we have been unable to repeat Pease's tests . . . Heil Hitler, A. Pietzsch."

Under German conditions, a yield of 25 grams of hydrogen peroxide per kw-hr. was obtained at a conversion of hydrogen to peroxide of 70 percent. The capacity of the apparatus increased in direct proportion to the frequency of the silent electric discharge. When the hydrogen was produced from sodium chloride cells, it was necessary to remove all traces of sodium chloride spray. To avoid danger of explosion, the gas mixture contained 95 percent hydrogen and 5 percent oxygen. The best yields were obtained by saturating the gases with water at 60° C and operating the ionization chamber at 150° C.

Analysis of the data developed in Germany indicates that a most important factor limiting yields was decomposition of the hydrogen peroxide on the walls of the apparatus. The literature does not indicate any very extensive work on the silent electric discharge process.

Literature Cited

(1) Pease, J. Am. Chem. Soc. 52, 5106 (1930).

(2) Cook, U. S. 2,368,640, Feb. 6, 1945. (Assigned to Carbide and Carbon Chemicals Corp.)

(3) Cook and Bates, J. Am. Chem. Soc. 57, 1775 (1935).

(4) Chemical and Engineering News 26, 720, March 8, 1948.

(5) Putnam, Unpublished work.

(6) Office of the Publication Board, PB Report 33491.

(7) Dobo, Moulton and Putnam, Unpublished work.

Hardwoods Will Yield Pulp With New Process Method

Paper Pulp from Southern New England and New York hardwoods is possible with a new process developed at the Polytechnic Institute of Technology, the Technical Association of Pulp and Paper Industries was told at a New York meeting by Dr. Robert S. Aries of the Institute staff.

The process consists of treating the oak, hickory and other hardwoods with soda ash and sulfur dioxide, followed by a method of mechanical grinding. Besides making hardwoods available for pulping, this method, since it involves only mild chemical treatment, results in a much higher yield of pulp than conventional methods of pulping. These conventional methods rid the woods of the greater part of the lignin. Normal pulp yields are about 50%; with the new process 75% becomes pulp.

The pulps obtained from hardwoods are particularly suited for making high quality rayons, cellophane and plastics products. There is an extensive oak-hickory area within a few hundred miles of New York.

Science News Letter, March 6, 1948

LETTERS TO THE EDITOR

Sir:

I was very much interested in your article under "The Editor's Retort" in the February issue of *THE PUGET SOUND CHEMIST*. Possibly the businessman you mention should not be blamed too much when the Editor did not know that the forthcoming meeting in Portland is not a Western regional meeting but is a full session of the national A.C.S. meeting.

JOSEPH SCHULEIN, *Chairman*
Oregon Section, A.C.S.

Thanks to Chairman Schulein for correcting the Editor's inept choice of terms. For the information of our readers, the Portland meeting should be referred to as the Western Division of the 1948 National Meeting. Ed.

COSMETICS

(Continued from page 9)

The essential oil industry which is closely allied to the Toilet Goods Industry has provided its share of influence on technical progress. Since the synthesis of Coumarin in the early 19th century by William Henry Perkins, intense research in the field of aromatic chemicals has unlocked many of the secrets of nature's perfume store and made even a step further—namely, the synthesis of odoriferous materials found nowhere but in the laboratory. Perfume chemistry is a lucrative field for those who are able to combine art and science.

It is self-evident that no matter how lofty the ideals behind a program, if it doesn't pay off in progress, it cannot long endure. Another axiomatic fact is that research pays. This easily demonstrated in the Cosmetic Industry's efforts.

The use of sulphides in depilatories has been a trial. Their evil penetrating odor is well known, even to the elementary chemist. In 1939 a new, almost odorless preparation[4] was offered to the public. Immediately sales soared three times greater than any previous year. Here we have a paradox. The new, almost odorless agent is a mercaptan. Noted for their foul odors that can be detected even in extreme dilutions, the use of mercaptans seems like jumping from the frying pan into the fire. However, it was found that by using substituted mercaptans, preferably with ionizing groups such as COOH in alkaline solution, they were more effective, less irritating, and practically odorless in comparison with the sulphides. This depilating action takes place in a critical range around pH 12. It was further found that a permanent waving lotion, that was better in every respect to the sulphide lotion was had at the critical pH range of 9.2 to 9.5. The reception by the market of the mercaptan cold wave[4] has been even greater than the depilatory. Research indeed pays handsomely.

Other notable achievements have been the development of sunscreening preparations that allow tanning without burning, providing full protection for periods up to four hours. Also, the development of buffer salts to protect clothes against acid disintegration in connection with the use antiperspirants.

The Toilet Goods Industry is big business. It has grown phenomenally in the past and shows every promise of continued future gain. Witness the entrance of such firms as Lever Brothers into the field.

The demand for cosmetics is universal in our economy. It has its foundation in human desire for improved appearance.

There has been a rapid change from empiricism in the last fifteen years to progress through research. The chemist has been responsible for the greater portion of the success of this program. He has several factors aiding him in making the change complete, both from inside and outside the industry. There is a challenge for him at every turn, for surely the surface has only just been scratched. Here indeed is a fast growing field for the Chemist.

(1) *Drug and Cosmetic Industry*, April '47:60, 4.

(2) *The Science and Art of Perfumery*, by EDWARD SAGARIN. (McGraw Hill Book Co., New York, 1945)

(3) *The Chemistry and Manufacture of Cosmetics*, by DE NAVARRE. (D. Van Nostrand Co., Inc., New York, 1945)

(4) MCDONOUGH, J., Soc. Cosmetic Chem., 1:27, July, '47.

CHLORINATION

(Continued from page 5)

and pentanes, and 1,4-dichlorobutane from furfural.

Some of the more promising developments in pioneering investigations include the peroxide-catalyzed condensations of chlorinated aliphatic compounds with olefins, diene syntheses with chlorinated derivatives of cyclopentadiene, the production of chlorocarbons by the chlorinolysis of polychlorinated hydrocarbons, and the fluorine-catalyzed chlorination of hydrocarbons.

KINETICS

Dr. Delahey of Brussels, Belgium joins the staff on Corrosion Research in the U. S. Navy, under the direction of Professor Pierre Van Rysselberghe. Dr. Delahey was born in the Netherlands, of Belgian parents. He attended preparatory school in Brussels and took the degrees of electrical engineer (University of Liege) and "Licencie" in chemistry (University of Brussels) in 1946.

In the summer of 1946 Dr. Delahey followed Dr. Van Rysselberghe to the States after hearing a series of his lectures in Belgium. He earned his Ph.D. Degree in the Department of Chemistry at Oregon in October, 1947, and then returned to Belgium.

In January of 1948 he returned to the United States and was made a research associate in the Department of Chemistry, University of Oregon, and joined the group engaged on the polarographic study of the corrosion of metals. Dr. Delahey has developed a portable polarograph, a most valuable instrument for both laboratory and field work. He is also applying his technique to the confirmation of the corrosion diagrams of Dr. M. Pourbaix of the University of Brussels, which give zones of passivity and of corrosion where the potential of the metal and the pH of the solution in contact with the metal are the coordinates.

J. M. McGee

BOOK REVIEWS

MILK AND DAIRY PRODUCTS

By LINCOLN M. LAMPERT *(Senior Dairy Chemist, California Department of Agriculture).*

Price: $7.00. 291 Pages. 1947 Ed.

An up-to-the-minute treatise on the food value, composition, chemistry, bacteriology and processing of milk and dairy products.

In clear, non-technical language and without assuming previous knowledge of dairy science, the reader is introduced to the fundamental principles of bacteriology, testing operations, the chemistry of milk and its products and the part these products play in nutrition.

The results of recent research are summarized and interrelated for the first time to give readers a volume of reliable data formerly widely scattered in technical publications.

MODERN COSMETICOLOGY

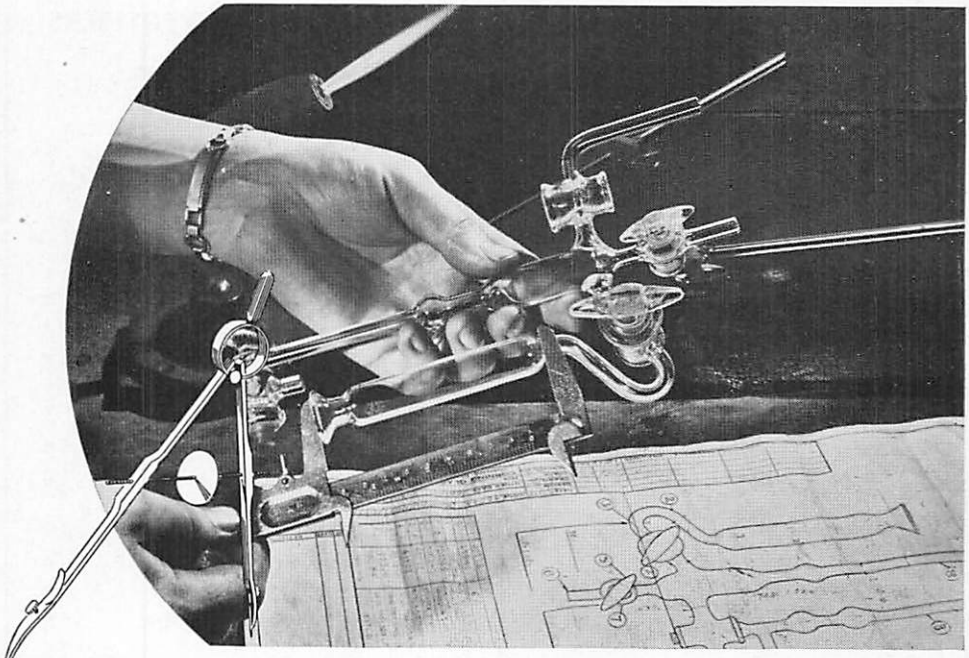
By RALPH G. HARRY, *Head of the Cosmetic Department, Beecham Research Laboratories, Ltd.*

515 Pages. 1947 Ed. (Third Revised Edition)

This is the third revised edition of this book which has apparently been well expressed. The author appears to show a decided interest in the further studies and research in dermatology and genetics and appears to stress the value of the chemist in the Cosmetic field.

Additional chapters added in this edition include preparations for babies, feet, insect bites and acne.

The book is well written nad the references are well selected. The subject matter is well chosen and is not highly technical but assumes a general knowledge of chemistry.



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