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THE EDITOR'S RETORT

A member of the Puget Sound Section was recently engaged in conversation with a Seattle business man who may without question be classed in the group regarded as leaders of the community. During the discussion, reference was made to the American Chemical Society, and the forthcoming Western Regional meeting in Portland. It may come as a shocking revelation to many of us that this individual expressed complete ignorance concerning the Society and all its works. Far from realizing that the ACS is a national organization with an active membership of over 50,000 he was little less than astonished to learn that in his own city there was a Section of the Society numbering over 300 chemists in its membership.

Do not cast the blame for such a situation on the individual concerned. This was a successful man, well-informed, active in civic affairs and with a strong interest in the development of the future of Seattle and the Pacific Northwest.

It is important that the significance of this incident be brought home to each of us, for the delinquency here is not of the individual but of the Puget Sound Section. How, one may ask, are we to further the interests of chemists and the chemical profession in this area if the civic and business leaders of our communities are uninformed concerning the aims, the plans, the basic principles, even the very existence of our Section? Nor should the palliative thought that this is an isolated instance be accepted as valid. Correspondence with Chambers of Commerce throughout the State of Washington has brought inquiries saying, in effect, "What is the American Chemical Society, who are its members, and what does it do?"

There is a strong tendency on the part of professional groups to shun the mundane affairs of local politics and the inevitable atmosphere of incompetent do-goodism that shadows the efforts of those who attempt to serve the community. To mock is effortless, and to follow the path of professional introversion is both secure and acceptable. The benefits to the

(Continued on page 20)

March Meeting

PUGET SOUND SECTION OF THE
AMERICAN CHEMICAL SOCIETY

Tuesday, March 16, 1948

7:30 P.M.

UNIVERSITY OF WASHINGTON

BAGLEY HALL

ROOM 140

★

SPEAKER

DR. E. T. McBEE

Professor of Chemistry, Purdue University

SUBJECT

CHLORINATION

A Social Period will follow the Meeting and Address

Our February Speaker . . .

C. L. THOMPSON

C. L. THOMPSON is the director of research of the Pacific Lumber Company, having headed that company's research activities over a period of 15 years. Prior to his association with Pacific Lumber Company, Mr. Thompson was engaged in forest products research and development for various interests in the lumber and plywood fields in the Pacific Northwest.

"THE WASTE UTILIZATION PROGRAM OF THE PACIFIC LUMBER COMPANY"

The Pacific Lumber Company over the past ten years has carried out a very broad program on fundamental and applied research, based on the utilization of the wastes which are inherent in this, as well as all West Coast lumbering operations.

We, as successful lumbermen over the years, have acquired through practical experience a broad knowledge of the physical characteristics of redwood, as lumber, in the end uses to which it has been applied as a specialty lumber product.

To equip ourselves, however, with a knowledge as to the chemical characteristics of this species necessitated a background of fundamental research on both the wood, as such, together with the unusual type of bark which is found only with this species.

In the milling of redwood it becomes necessary to peel the bark from the logs before they are sawed.

We have pioneered the operating procedure of peeling these logs at the plant, instead of in the woods, and, having taken this step, have thereby created a daily production of bark slabs representing a serious liability, as to disposal, unless ways and means could be found to make use of such a slab as a raw material for product recovery.

Early in our research program we had to attack this problem as a primary step in waste utilization. Our progress has been substantial in finding uses for the fibrous end products produced by the equipment we have installed in our bark processing plants.

The yield of such fibrous products is low in percentage, leaving as a residue a very heavy tonnage of material which has unusual physical and chemical properties.

Over the years we have acquired a very broad fundamental knowledge of the chemistry of this residue which has led us into applied research in several directions.

The major percentage of weight of this residue is made up of a granular dust which constitutes the amorphous binder that holds the fagot of fibers together in nature's process of growing the virgin bark slab.

This amorphous material, like in many natural substances, represents an involved structure containing a low methoxyl phenolic acid, a fraction resembling lignin but containing a definite percentage of carboxyl groups, small amounts of catechol type tannins, and phlob-

aphenes, as well as a carbohydrate gum.

Of the above group of isolated materials the methoxyl phenolic acids represent 70 to 80% of the overall dust.

Through applied research we have developed a product produced from this residue dust which we have termed Sodium Palconate, which in substance represents an alkaline extract from a mild cooking operation with caustic soda.

The characteristics of this product have presented some extremely interesting applications as a drilling fluid reagent in controlling viscosity and filter loss with normal rotary oil-well drilling operations, with results that are comparable to the imported quebracho tannin now used for such purposes.

In the field of wood substance research we have in redwood sizable percentages of a tannin which is definitely a phlobatannin of the catechol type, as well as the redwood phlobaphene, a water insoluble fraction, which our fundamental work leads us to believe is a direct condensation product of the tannin itself, having one or more less water molecules.

The subject of vegetable tannin is fast becoming quite a serious one in this country, especially as it bears upon our large tanning industry.

In our fundamental work we have found that redwood tannin, as a catechol type, can be used directly as a blending material in the satisfactory tanning of leather.

The heartwood of a redwood tree will contain from four to five per cent of such a water soluble tannin, a yield which is somewhat too low to justify an extraction operation on a sound basis of economics. It is possible, however, in place of a straight aqueous extract, to produce an alkaline tannin with the use of caustic and a small amount of sulphite. Such an extraction will solubilize the major portion of the phlobaphene, thereby producing an overall yield of alkaline extract in excess of 10% on the O.D. weight of the wood.

The problem with such an end product, however, is one of stability. If this sodium tannate extract can be permanently stabilized the volume production of it should make a sizable contribution to our national need for vegetable tanning materials.

Our current research focuses upon methods for such an extraction and the end use of the extracted chip, when defiberized.

Over the years we have been prone to look upon the huge volume of waste wood substance of all West Coast lumbering operations as a wastage of our basic natural resources for which the lumbermen have been condemned many times. The utilization of such wastes in fabricated end products definitely focuses on the one word "economics" as applied to the costs of fabrication, and more important, an assurance of sound market outlets.

Most of us look upon these wastes as representing zero costs. Unfortunately, this is not the case. They must stand all of the handling and harvesting costs, as applied to wood wastes, inherent with such materials. Therefore, any fabrication operation faces a definite raw material input cost to begin with.

The overall economics of forest products industry over the last few years has shown, and will undoubtedly continue to show, an increasing value for sound wood substance in its relation to supply and demand. With such an increasing value for such materials, obviously, wastes that contain such sound wood substances cease to be known as a waste if their costs are competitive with previously used wood substance.

It is this picture of overall economics of waste value vs. utilization value, in the era that is ahead of us, which should put to work in diversified utilization, selected material from the residue which is left in orthodox logging and lumbering operations from many of our West Coast operations.

We in Pacific's organization look to the future with confidence that through diversified utilization of the chemical and physical values of redwood we can ultimately reach the point of substantially a complete recovery from the cubic measurement of our natural resources—THE REDWOOD TREE.

A Message from Our Chairman

DR. JOSEPH L. McCARTHY

Members of the Puget Sound Section of the American Chemical Society:

First let us record thanks to our retiring chairman, Herbert R. Erickson, and to the other officers and committeemen of the past year who freely expended their time and efforts in carrying forward the affairs of this Section of the American Chemical Society. Particularly extensive has been the work of Dr. David M. Ritter, Program Committee chairman, and of Otto Orth, editor of the PUGET SOUND CHEMIST.

For 1948, we have already enjoyed the interesting meeting in Tacoma on February 18th which was arranged by our colleagues in Tacoma and was held jointly with members of the Washington-Oregon Section of the American Institute of Chemical Engineers. We may now look toward the usual monthly meetings with outstanding speakers who will come both from the Puget Sound Section and from other parts of the country. Your suggestion as to programs will be welcomed by Dr. Fred Schubert, the Program Committee chairman for 1948.

As you know, a National Meeting of the American Chemical Society will be held in Portland, Oregon, during September of 1948. It is understood that six of the Divisions will participate, including the Division of Physical and Inorganic Chemistry and the Division of Cellulose Chemistry. Symposia on "Fluorine Compounds," "Diffusion" and "Lignin" and perhaps other subjects are being developed. Thus, now is the time for you to complete that research on which you have been working so that you will be in a position to present it at the Portland meeting.

Since members of the Puget Sound Section as well as of the Oregon Section will aid in preparing for this National meeting, it seems desirable for this year only not to try to hold the Annual Pacific Northwest Regional Meeting in May or June.

At least two special matters may require consideration this year. Firstly, the Section will need to rewrite its Constitution and Bylaws to bring these into accord with the new Constitution of the national organization. Secondly, the Section may wish to consider the desirability of making an annual award, perhaps to one or more outstanding high school senior interested in chemistry or chemical engineering, or perhaps to one of the Puget Sound Section members of the Chemical Society for his professional contributions.

It may also be desirable to give some attention to national legislation such as the National Science Foundation Bill and to the way in which the State Professional Engineers Registration Act is working out.

Your new officers and committeemen will need your interest and support in carrying through another busy year the affairs of your Society, the Puget Sound Section of the American Chemical Society.

J. L. McCarthy, *Chairman*

Meet Your Officers . . .

Dr. Joseph L. McCarthy, our newly-elected Chairman, was born in Spokane, Washington, October 19, 1913. He attended the University of Washington to secure his B.S. in Chemical Engineering in 1934. M.S. degree was taken at the University of Idaho in 1936, and Ph.D. at McGill University in 1938, where he was Sessional Lecturer and Research Fellow from 1938-41.

Outside of one year spent with Fraser Companies, Ltd., during 1940-41, Dr. McCarthy has been with the University of Washington, distinguishing himself with his work in cellulose, lignin, and wood chemistry. He served as a Research Associate Chemist from 1941-42, an Instructor during 1942-43, Assistant Professor, 1943-47, and is now an Associate Professor at the University.

Dr. McCarthy's activities are legion. He is a member of the Society of Chemical Industries, Technical Association of Pulp and Paper Industries, Canadian Pulp and Paper Association, American Institute of Chemical Engineers, as well as the American Chemical Society, in which he has served as Vice-Chairman and Secretary of the Puget Sound Section. One of his closest associates is a rugged pipe, and "Joe" with all his responsibilities is never too busy to give a cheerful greeting to friends or advice to students. He has an eleven-month-old boy, and admits to an occasional hobby of securing sleep.

The Puget Sound Section of the American Chemical Society is proud to have Dr. Joseph L. McCarthy as its Chairman.

Dr. John G. Meiler, the new Vice-Chairman, was born January 8, 1904, in Chicago, Illinois. He attended the University of Chicago to receive his Bachelor's Degree in 1925, and Ph.D. in 1929. He taught for two years at the University of Nebraska, and spent 1930-33 with the A. O. Smith Corporation of Milwaukee as a Research Chemist. The following nine years were spent with the Marathon Corporation of Wisconsin on plastics development; followed by one year with the Diamond Alkali Company of Ohio on the same type of work. For the past three years Dr. Meiler has been the Director of the Plywood Research Foundation of Tacoma.

Mr. Collis C. Bryan, *Secretary*, received his B.S. at the University of Washington in 1927, and secured his M.S. degree in 1935. He has spent six years teaching, and is now with Monsanto Chemical Company, Western Division, in Seattle. Mr. Bryan carries on with his duties from last year. He is doing a grand job for the Society as Secretary.

Dr. Q. P. Peniston, Treasurer, is a native Seattleite. He attended the University of Washington to secure his B.S. degree in 1931. M.S. was attained at Massachusetts Institute of Technology in 1933. His Ph.D. degree was taken at McGill in 1939. Dr. Peniston worked as a Research Chemist for Corn Products Refining Company before coming to the University of Washington to work on the Pulp Mills Research Project. As Mr. Bryan, he continues his office from 1947.

Mr. Herbert R. Erickson, *Councilor*, was born in Denver, Colorado. At the University of Denver he received his B.S. in Chemical Engineering, and his M.S. in Chemistry in 1937. He has been with the Tower Company, Inc., of Seattle since 1941, having had diversified experience in the Mid-West, and later with the Northwest Testing Laboratories, prior to his Tower Company affiliation. Mr. Erickson has just finished a very successful term as Chairman. The Puget Sound Section greatly appreciates the fine work put in by "Herb," and is happy to have him as a new Councilor.

Dr. P. R. Fehlandt, *Councilor*, was born in Illinois in 1900. He received his M.S. degree in Physical Chemistry, and Ph.D. in Organic at Wisconsin. He taught five years at Wisconsin University and three years at Wittenberg College. The last ten years have been spent at the

(Continued on page 16)

ECONOMIC ASPECTS OF SYNTHETIC RESINS IN THE WEST COAST PLYWOOD INDUSTRY PRESENT AND FUTURE

by D. V. REDFERN, *Technical Director*
American-Marietta Company; Adhesives, Resins and Chemicals Division

Synthetic resins for West Coast Plywood Manufacture can be divided into classes according to the use requirements by the industry.

It is obvious that by far the largest volume goes into the bonding of the plywood itself. However, other uses are important enough to warrant interest. The industry uses synthetic resins for edge gluing its veneer, for patching defects and for scarfing panels into larger sizes. It is also used in ever-increasing amounts in papers for overlaying plywood veneers.

Before 1941, resin companies and some of the plywood mills were engaged in research and production on plywood using phenolic resins as the bonding agents, but that year actually marks the beginning of high-volume production of resin bonded plywood. The following figures show the trend toward increased consumption of resin:

Pounds of Phenolic Resin Used in West Coast Plywood Industry [U.S.] 1941-1947

	Liquid pounds
1941	6,250,000
1942	17,250,000
**1943	19,500,000
**1944	23,500,000
**1945	19,393,000
1946	24,000,000
*1947	33,000,000

*Estimated at 45% solids
*Estimated for the last three months
**War years total production of plywood decreased

A little over six million pounds of phenolic resin were used in that year (1941) to produce, roughly, 120,000,000 square feet of 3/8" Douglas Fir plywood. This can be contrasted with the year 1947 when the estimated usage will be 33,000,000 pounds of resin to produce 650,000,000 square feet of plywood on the same basis.

In 1941 there were two resin companies in the Northwest manufacturing phenolic resins for plywood along with two of the plywood mills; the year 1947 will end with five major resin producers operating eight separate plants in the Northwest (including British Columbia) plus the same two plywood mills. These producers are located from Springfield, Oregon, on the south, to Vancouver, B.C., in the north, with Seattle the major producing center, having four large plants.

In addition to the capacity mentioned above, there are four eastern producers actively engaged in selling in this market. Major interest by the resin industry has centered in this market because of its rapid strides in conversion to exterior plywood and because of the very high potential entailed in its future.

As you know, the quality of logs for the manufacture of plywood is not improving; this means that more patching, edge gluing and defect covering has to be and is being considered by the industry.

In 1941 the plywood industry used, roughly, 1,500,000 pounds of urea resin for correcting defects and edge gluing. In 1947 the industry will use an estimated 300,000 pounds of urea melamine and resorcinol resin for the same purposes.

The dollar volume of the resin industry has grown from $1,000,000 in 1941 to well over $4,000,000 in 1947.

In addition to the synthetic resins that are used, there is a sizable tonnage of extenders such as wood flour, fir bark flour, walnut shell flour and inert materials. Estimating the use requirements of these materials on the basis of 20% of the resin used, their volume will reach 3,600 tons, and $300,000 this year. There

are two major producers in this field, both located on the West Coast.

The reasons for this rapid growth are varied; one being an increase in plywood production from one billion square feet on a 3/8", 3-ply basis in 1941 to approximately two billion square feet in 1947.

The other reasons go back to the changing use requirements of plywood and research done to improve it.

Douglas Fir plywood has always had an ever expanding acceptance, but the market trends have changed. It was obvious to the industry many years ago that if the glue bond could be made waterproof, plywood would enter fields less competitive than wall board, and could be considered suitable for more structural uses, where its true value lies.

The first phenolic resins for this purpose were expensive; they required high temperatures and long times in the hot press to complete their cure. However, rapid strides were made in overcoming the defects and as the plywood mills started to convert from the cold press to the hot press technique, the initial deterrent of high cost per thousand to produce exterior plywood was rapidly overcome. The cost per thousand to produce exterior plywood on a 3/8" basis has gone roughly from $10-$12 in 1941 to $5-$6 in 1947—a 100 per cent change.

We end up with four main considerations for this rapid growth:

1. *Increase in plywood production.*
2. *The conversion of the industry to the hot press technique. This conversion is still going on—it was delayed by the war.*
3. *Decrease in cost of exterior plywood per M board feet by research. Decreased usage of resin per M board feet.*
4. *Change in market trends and exterior plywood's acceptance in new markets.*

It must be remembered that in the past as well as the present, the plywood industry has depended on high production technique to allow it successfully to compete in the economic market. This has meant that research to produce adhesives for this industry is centered on filling the bill. The criterion for a good plywood adhesive is based on stringent use requirements. Phenolic resins at the present time seem destined to maintain their present success due to their inherent characteristics.

Due to the rigid requirements and standards set up by the Douglas Fir Plywood Association, the prerequisite for an adhesive in the industry is that it pass the tests for the particular grade it is to be used for. These are detailed in Department of Commerce bulletin CS45-47. In the case of exterior plywood the well-known "boil test" is an example. The glue line must show no less than 60% wood failure after boiling in water for four hours and drying at 145°F. for twenty hours, reboiling for four more hours and shearing in a conventional shear machine while wet.

Assuming that the adhesive will pass the rigid test requirements, its first asset must be ease in handling. Due to the large-volume demand by the industry it must be easy to handle and have a favorable storage life. Handling requirements start with the receipt of the material at the mill. A trend at the present time is away from drum shipment to tank-car shipment and storage. This means that the material must be capable of pumping and that its storage life be at least one month and longer if possible. Ease of mixing for use is very important. The least number of steps and the least complication in carrying these directions out is essential to be sure of the quality required in its use.

Second on the list is a wide latitude in application. This means that the adhesive is easily spread with the conventional spreaders now in use by the industry. It must be able to stand large variations in moisture content of veneer—these variations being from 0-15%, with the average being 5%. Due to fluctuations in the temperature of the veneer stock the adhesive must be capable of standing variations up to 110°F. and sometimes over with assembly times up to 20 minutes before hot pressing.

Because of the volume requirements of the industry it is not always possible to maintain the spreader in perfect condi-

tion or eliminate variables in the veneer. This causes a fairly large variation in the spread which the adhesive must be capable of withstanding without failures occurring. Of paramount interest to the user is the cost per M square feet in the use of the adhesive. Since the inception of the phenolic resins for gluing Douglas Fir Plywood, the cost per M in their use has been ever downward. At the present time the gross cost per M cannot be over $6.00. The prime reason for this is because of the competitive picture with other materials. One trend is to get the cost of the exterior type of glue line low enough to make it advisable to manufacture all grades of plywood with a single quality glue line. This means that the cost per M must be lower yet.

The quantity of plywood manufactured is the determining factor in the industry. This means that the adhesive must thermoset fast enough to cause no bottleneck in production. The temperature of setting is controlled by the ability to maintain platen temperature no higher than a maximum of 300°F. This means that the resin must set within a range of 200-250°F. The present schedules are almost low enough to cause no great loss in production, but could be scaled down. As an example it requires 7.5-8.0 minutes to cure a 13/16" panel, one per opening at 285°F. The plate pressures cannot be over 200 pounds per square inch, due to the crushing effect on the veneers with pressures over this.

In order to get the most from the adhesive spread, and to provide a quality glue line with no staining through, the adhesive must remain on the glue line. The major role of specific adhesion is recognized in this industry and has been substantiated. There is more than one way to accomplish this adherence to the glue line. One is to provide a large molecule, one that will not penetrate the veneer. A second method is to extend with an extender that will decrease the tendency for migration. Walnut shell flour is an example of a good inert extender for this job.

Another but less satisfactory method is the precuring and predrying of the adhesive after spreading and before pressing. The advantage to this method is the versatility in lay-up time requirements, as panels can be made up far ahead of actual pressing time. Due to the nature of the phenolic resins, this method requires adhesives that have long pressing times.

Another, but not essential requirement, is the versatility in extension. Some thinking in the industry is along the lines of a resin that can be used with varying amounts of extension to furnish all qualities and prices of glue lines for the industries' requirements. This has merit and will probably continue to be an aim of the industry for some time.

A controversial requirement, but one we feel is important, is that the glue lines must be either neutral or on the alkaline side. Data collected on the use of acid setting, or resins that produce a low pH glue line, show that the wood is definitely attacked. So far, no conclusive data have been presented on effect of alkaline glue lines on wood, but the feeling is that the wood is not harmed even with a moderately high pH resin. One school of thought feels that the acid glue lines, even though the wood is affected, are just as good for ordinary exposures.

The belief is that the foregoing are the major requirements for an adhesive in the plywood industry with particular reference to Douglas Fir Plywood.

As the industry increases its production of plywood for exterior uses the trend for patching and scarfing glues is toward the phenolic and resorcin adhesives for these purposes, the big factor for their slow acceptance being the inherent dark color not shared by the water white, but less durable urea and melamine resins. However, customer acceptance and more stringent use requirements are forcing the issue.

As stated earlier, the industry is faced with the problem of using poorer quality logs now and in the future, compared to a few years back. This trend, coupled with the inherent disadvantage of Douglas Fir Plywood as a surfacing material, have implemented a program for surface improvement of both plywood and ve-

(Continued on page 14)

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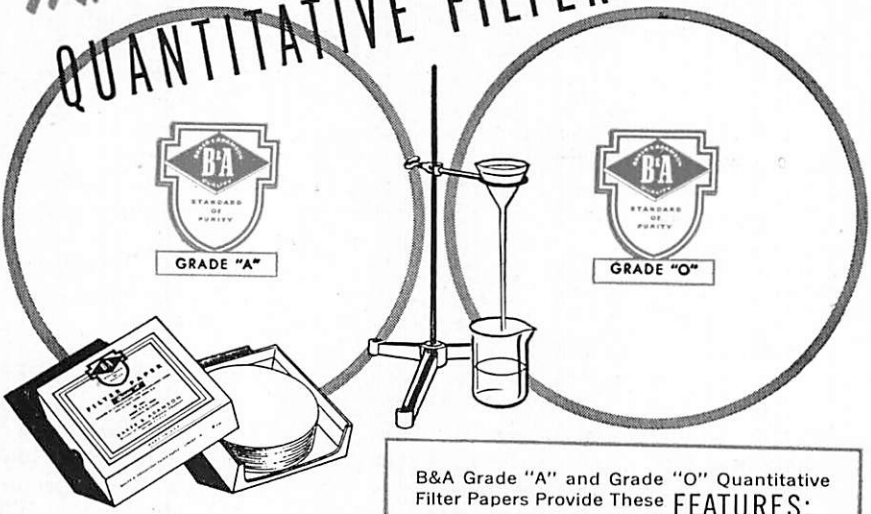

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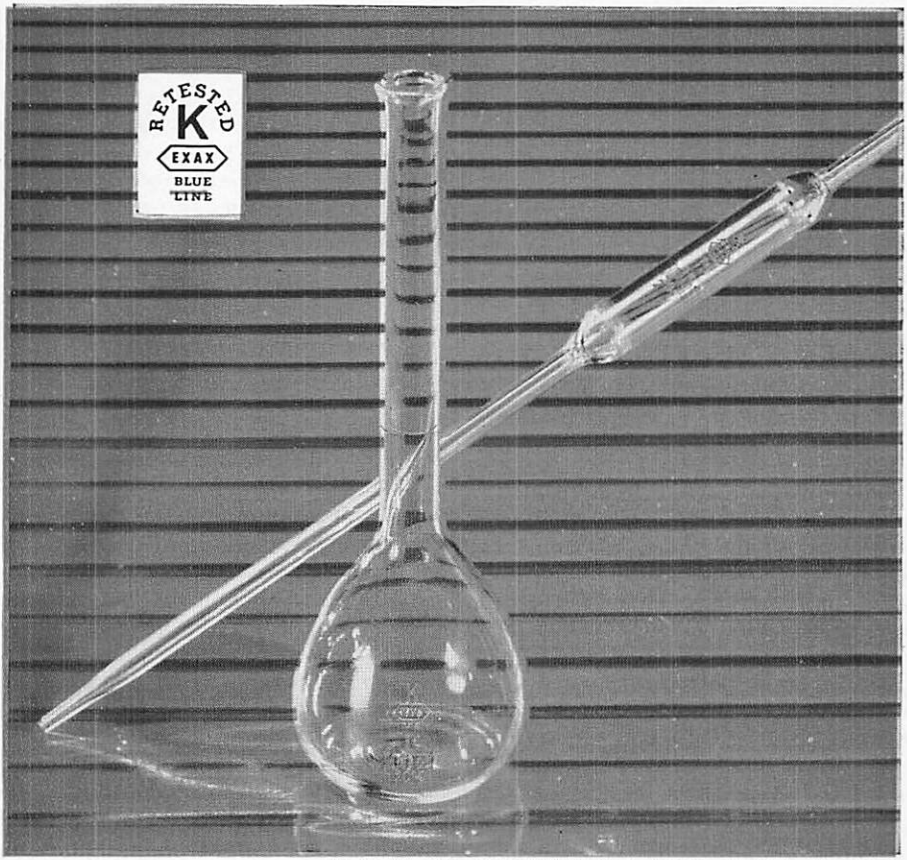

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SYNTHETIC RESINS

(Continued from page 11)

neer. Douglas Fir Plywood when exposed to the weather has a tendency for surface checking and grain raising that even proper priming and painting will not eliminate. Coupled with the need to use defective veneer for face material, the incentive has led to some very interesting results.

At the present time, quite a sizeable volume of Douglas Fir Plywood is being produced with a low phenolic resin content kraft sheet on both surfaces as an overlay to improve surface characteristics, such as grain raise and poor paintability.

Some mills are using high resin content phenolic sheets to give a hard abrasive-resistant surface to plywood for counter tops and items of this nature. These improvements in surface are in the right direction, but the big single factor in producing plywood with lower grade veneers on the surface successfully hidden by an overlay is not being commercially practiced. Present thinking lies in the direction of a low phenolic resin content pulp-type sheet for this purpose. It is a conservative estimate that when this research has culminated it will result in the use of 45 million pounds of phenolic resin per year on a 40% solids basis, making the total potential two-and-one-half times its present volume. Coupled with this is the use of 30,000 tons of pulp which obviously will be produced in this area to meet these demands. It is anyone's guess to to when the overlay program, as envisioned here, will become a reality, but by 1950 it should be well toward realization.

The future holds in store improvements in the present phenolic adhesive, and new synthetic resins, in some cases to supplant and in others to augment them. It has been said that phenolic resins now being produced for the industry can be improved in quality. This has to be approached from the realistic angle of price versus the improvement made. At present prices there is an economic block to the production of phenolic type resins for the plywood industry with attributes thought more suitable for the high production technique involved. It is the aim of the industry to lower press times so the production can be increased, decrease the temperature at which the adhesive has to be set, and to increase the efficiency of its use. In order to accomplish the first two points with phenolic-type resins, we may assume that the trend will be toward the combination of phenol and its homolog such as resorcinol with formaldehyde to do this job.

With the cooperative attitude that has been the experience in the past, it is a very safe assumption to say that the efficiency in the use of synthetic resin adhesives will result in high quality plus lowered usage and at less cost per M square feet of plywood.

At the present time, due to the very high prices for farm products, the trend in the cost of protein type adhesive has been upward. Coupling this with the downward trend of resin adhesive formulation costs, the production of some of the lower grades of plywood is being accomplished with greater extension of phenolic resins. Production with these formulations is somewhat lower due to the time cycle required, but the quality of the glue line produced is better.

These conditions will not always exist, for it is the thinking of quite a few of the people in the industry that protein glues will never be supplanted and will tend to hold their present volume. This means that any increased production will essentially be made with synthetic resin adhesives.

The industry is tending toward the use of hard-wood veneers and decorative overlays for fir plywood which go into the lower volume, higher priced decorative markets. These materials pose special adhesive problems that are being met by new resin adhesive formulations.

At the present time, the chemical raw materials for this synthetic resin industry are not produced on the West Coast in any volume. However, with the trend for higher usage it is safe to assume that this

picture will materially change. Projecting the business that exists and that which can be safely predicted for 1950, West Coast industry will use the following materials produced for the plywood market:

Phenol	**20,000,000 lbs.**
Formaldehyde	**42,500,000 lbs.**
Caustic soda 50%	**6,000,000 lbs.**
Extenders, walnut shell, flour, etc.	**10,000,000 lbs.**
Paper pulp for overlays	**60,000,000 lbs.**
Miscellaneous chemicals [urea melamine, resorcinol	**2,500,000 lbs.**

Knowledge and understanding of the chemical industry is as valuable to the chemist or chemical engineer as his technical training. Without an understanding of economics the man cannot do a good job in his applied research. It appears that the broad aims of the American Chemical Society at the present time are designed to instill this economic thinking into the minds and actions of its members.

Faced with a particular problem of whether a program on research is to be instigated, the following facts must be determined:

1. *The volume requirements of industry in using the product.*
2. *Use requirements.*
3. *Determination of those materials that can be economically used to do the job.*
4. *Determination of your ability to sell the material, i.e. do you have to train a new sales force?*
5. *Capacity of your own plant for handling the new product—whether expansion is necessary.*
6. *Determine financial ability to handle the problem and the resulting product.*
7. *Get the time requirements to develop and put the material on the market.*
8. *Determine profits to be made from the investment necessary.*
9. *Do the job.*

A.C.S. CALENDAR

Meetings of Sections in the Northwest Area which have been definitely scheduled.

VANCOUVER SECTION CHEMICAL INSTITUTE OF CANADA

APRIL MEETING

Monday, April 12

SPEAKER

DR. E. C. LINGAFELTER

SUBJECT

"Colloidal Electrolytes"

Communicate with Regional Activities Committee Chairman, Dr. V. Sivertz, concerning arrangements to attend. All Puget Sound members invited.

OREGON SECTION, A.C.S

APRIL MEETING

Saturday, April 10

SPEAKER

DR. EUGENE G. ROCHOW

General Electric Company

PROFESSIONALISM

by ARTHUR J. NORTON

The following points seem to be consistently stressed in the numerous publications and discussions on the subject of the chemist as a professional man and on the subject of the profession of chemistry.

(a) The chemist wants to attain and maintain a professional status. He is temperamentally suited for the professional work, and a professional status appears advantageous for the advancement of the science of chemistry as well as for the happiness of the individual.

(b) Breadth of education, both formal and post graduate, seems necessary to attain and maintain professional status.

(c) The present status of a chemist is somewhat confused by the fact that a person with chemical training is often a member of another profession—as teachers, patent lawyers, salesmen, plant managers and business executives.

The following suggestions are offered as approaches to the method of placing the chemist on a truly professional level:

(1) The American Chemical Society can urge the universities to establish Schools of Science. The admission requirements should be a Bachelors degree from a four-year general arts course with only the equivalent of freshman chemistry allowed for those planning to follow chemistry at the School of Science. The four year course at the School of Science could lead to a degree of Doctor of Chemistry, or Doctor of Physics, and the degree of Doctor of Philosophy could be elevated to an honorary degree for those who achieve the status of true philosophers.

At present the formal education of chemists really stops at high school—or at best the sophomore year in college. From then on we are vocationally trained in chemistry—and the longer we study the narrower our field becomes. The broader basic training or education under the proposed system would present a better educated man with as good or better vocational training in his selected field of science.

(2) The A.C.S. should expand its broad base, which was indicated by the Hancock report as being one of the best and distinguishing features of the Society. This might be done by establishing a section which would help point the way for the practicing chemist to continue his education and which would stress the broader and professional side rather than the scientific. Merging with, or cooperating closely with, the American Institute of Chemists might be the quickest and most effective way of doing this.

(3) A state licensing system would define the practicing chemist over the other professional groups who use chemistry incidental to their profession.

We have talked a lot about professionalism. I suggest that the Puget Sound Section take the lead in doing something about it and help stem the slow but steady drift into mere craftsmanship.

MEET YOUR OFFICERS

(Continued from page 8)

College of Puget Sound in Tacoma, excepting four years spent in Chemical Warfare Service. Dr. Fehlandt is head of the Department of Chemistry at College of Puget Sound. He has many outside interests, and is an ardent camellia and rose grower.

DR. O. GOLDSCHMID, *Alternate Councilor*, was born in Vienna, Austria, on May 1, 1910. He attended the Technical University at Stuttgart, and received the degree Dipl. Ing. in 1934. In 1936 he entered the University of Vienna, where he carried on post-graduate work under Professor Herman Mark. In 1938 he came to the Berkeley campus of the University of California, from where he received his Ph.D. degree in 1939. Since receiving his Ph.D., he has been associated with Rayonier, Inc., at Shelton. He is known as an amateur photographer of unusual ability, and likes summer sailing on Puget Sound.

DR. V. SIVERTZ, *Alternate Councilor*, has been associated with the American Chemical Society for many years. He graduated from the University of Washington, receiving his B.S. degree in 1922. M.S. degree was received from West Vir-

(Continued on page 21)

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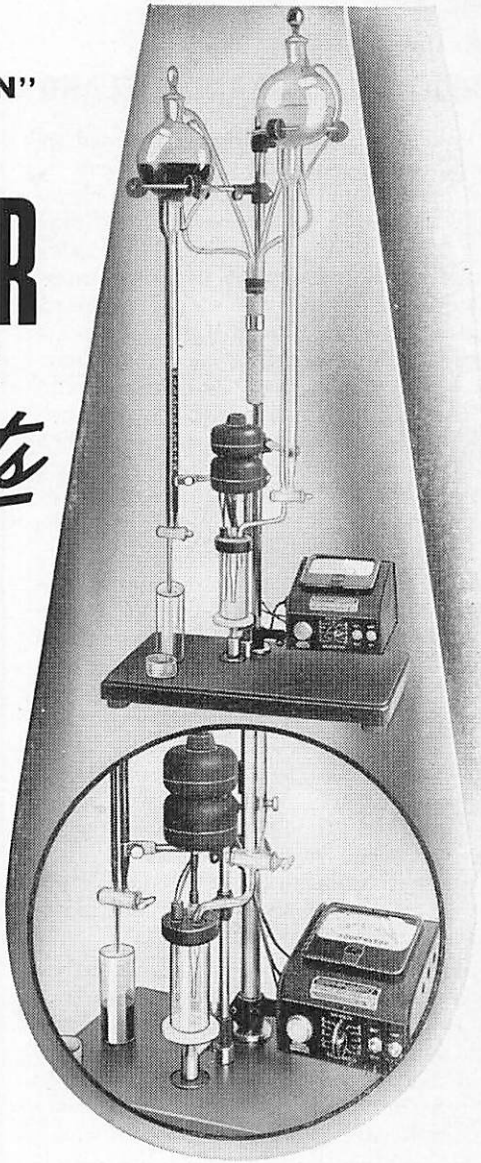

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THE ROYAL INSTITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND

Founded in 1877 and incorporated by Royal Charter in 1885, the Institute is the professional organization for chemists. Having as its primary object "the elevation of the profession of Chemistry and the maintenance of the proficiency, integrity and usefulness of persons practicing the same," the Institute demands a high standard of qualification in chemistry for election to its Associateship (A.R.I.C.) and further specialized knowledge and experience in a selected branch of chemistry for election to the Fellowship (F.R.I.C.), and requires from its members — Fellows and Associates — the observance of professional ethics.

Membership of the Institute (which is restricted to persons of British nationality) exceeds 10,000 and includes men and women holding every type of post in which a knowledge of chemistry is necessary or desirable—in almost every branch of industry, in research institutions, in Government and municipal services and in teaching (in universities, technical colleges and schools) as well as in private practice. There are also about 1,400 Registered Students of the Institute undergoing training in universities and recognized technical colleges.

Lectures, including certain established memorial lectures, are given from time to time under the auspices of the Institute and extensive programs of lectures and discussions are arranged at various centers in the British Isles and overseas by the Local Sections of the Institute.

The publications of the Institute include the *Journal and Proceedings* (issued in six parts annually) and various lectures and monographs on subjects of current interest. The Institute has also published "The Profession of Chemistry," "Official Chemical Appointments," a Register of Fellows and Associates and a Directory of Independent Consultants in Chemistry and related subjects.

Through the Chemical Council the Institute collaborates with the other two chartered chemical bodies—the Chemical Society and the Society of Chemical Industry—and with other more specialized societies in providing the wide variety of services that are required by chemists for the advancement of their science and the development of their usefulness to the community. Through the Joint Council of Professional Scientists the Institute maintains contacts with other professional organizations such as the Institute of Physics and the Institution of Metallurgists. Cordial relations have also been established with the corresponding chemical institutes in other parts of the British Commonwealth — in Australia, Canada, New Zealand and South Africa.

OUR COVER PHOTO

Courtesy of

NORTHWESTERN MUTUAL FIRE ASSOCIATION

THE MATTERHORN
in Glacier National Park

This mountain was first climbed by Dr. Lyman B. Sperry, now of Oberlin College, and the late J. H. Edwards, former chairman of the Board of Northwestern Mutual Fire Association.

KINETICS

American-Marietta Company, Adhesives, Resins and Chemicals Division, has recently been joined by the following personnel: GEORGE BECKETT, who hails from Boston, Mass. Mr. Beckett received his B.S. degree from Northwestern University. He will be in charge of American-Marietta's new laboratory in New Westminster, B.C. KEITH BINDER, formerly of Bendix Aviation Corporation, Plastics Division, in Detroit, Mich. Mr. Binder is a graduate of Michigan University, and will work in the Seattle research laboratory. HENRY W. HAIGH, who is a graduate of the University of Washington. Mr. Haigh will be in charge of the analytical laboratory at American-Marietta's Seattle resin plant.

Numerous members of the staff of the University of Washington Chemistry Department, including our chairman, were in Camas during the week of January 11 at a TAPPI meeting.

M. H. SCOTT, Pacific Coast manager of Carbide and Carbon Chemicals Corporation, was a recent visitor to the Northwest.

WILSON COMPTON, JR., formerly with Reichhold Chemicals, Inc., is now located at the Seattle mill of U. S. Plywood Corporation.

Past Chairman HERBERT ERICKSON recently was in the East on an extended business trip.

R. B. BLACK of Reichhold Chemicals, Inc., moved to Portland in December, and is now permanently located in that city.

THE EDITOR'S RETORT

(Continued from page 3)

profession to be derived from pursuing such a course are, however, severely limited.

It seems well established that the Pacific Northwest is destined one day to become a leading industrial center. Further, it is inevitable that chemistry must play a leading role in the development which is to take place. The interests of the American Chemical Society would be well served by any assistance which could be given to the development of an integrated chemical process industry in this area. Yet it may be safely said that an overwhelming majority of the leaders of our communities are not aware of the chemical facts implicit in the Northwest resources structure. As a result, nearly all civic efforts toward increased industrial integration are in the area of fabrication industry, with a pronounced lack of emphasis on chemical development.

It is high time that this situation be corrected. Certainly there is no local group better qualified to speak on the chemical aspects of industrial development than our own Section. We should therefore establish a program for the use of the technical knowledge of our group in the development of Northwest Industry, with the emphasis on chemical development.

The methods for accomplishing this aim are almost without limit. For example, officers and members of the Section could, and we think should, appear before civic groups such as committees of the Chamber of Commerce, for the purpose of outlining the scope and purpose of the Society and the Section, and the plans and programs which may be formulated. The assistance of press and radio should be sought, and we feel sure it would be gladly given. A special meeting could be arranged, based on brief talks by members in the various chemical industries now active in the community outlining their processes, their plans and their importance to the industrial structure. Key members of the various civic and industrial groups could be invited to attend such a meeting. Indeed, it could be aired as part of an informal discussion broadcast, similar to "Meet the Press."

A dynamic program of this type will require much effort. As has been previously pointed out by the Puget Sound CHEMIST, however, the privilege of membership in the Society entails responsibilities, both to the group and to the community. It is hoped that these responsibilities will be assumed, to the benefit of all.

It is with great pleasure that we learn of the formulation of definite plans for a meeting of the Vancouver Section of the Chemical Institute of Canada to be addressed by one of the members of this Section. This meeting is scheduled to be held in Vancouver, B. C., on Monday, April 12, and the speaker will be Dr. E. C. Lingafelter of the University of Washington who will deliver his excellent paper on the subject "Colloidal Electrolytes." Members of the Puget Sound Section are cordially invited to attend this meeting, and it is suggested that those interested get in touch with Dr. V. Sivertz at the University of Washington concerning arrangements. At this writing it is hoped that sufficient transportation will be available to take at least two carloads from Seattle. This will also present an excellent opportunity for the members in the northern part of the section to hear this paper which they may have missed when it was presented before the Puget Sound Section last Fall.

At this writing we have just attended the joint meeting of the Puget Sound Section with the Washington-Oregon Section of the American Institute of Chemical Engineers, held in Tacoma on February 18. While time limitations will not permit a complete report in this issue, we wish to express the sincere thanks of the Section to the Tacoma group which was responsible for this excellent meeting.

The outstanding attendance—a total of 234 at last report, evidences the strong interest in chemical affairs which exists in the area. We sincerely hope that many more successful programs of this type may be arranged.

MARSHALL T. RAMSTAD

Appointed Industrial Engineer for Tacoma Chamber of Commerce

A recent announcement has been made of the appointment of Marshall T. Ramstad as Industrial Engineer for the Tacoma Chamber of Commerce. Mr. Ramstad, a native of Seattle and a graduate of the University of Washington, has served for the past two years as consultant chemical engineer to the Tacoma Chamber of Commerce Industrial Department.

Following graduation from the University he was employed as a chemical engineer for the Monsanto Chemical Company at Nitro, West Virginia. After four years he left a position of division supervisor of the Nitro plant to enter the Navy in 1941. Leaving at the end of five years at the rank of Lieutenant Commander he returned to the Pacific Northwest to make his home.

He is at present serving as Vice Chairman of the Washington-Oregon Section of the American Institute of Chemical Engineers.

MEET YOUR OFFICERS

(Continued from page 16)

ginia University in 1924, and his Ph.D. was taken at McGill University in 1926. He has been with the University of Washington since then. His work has been in the Physical Chemistry field—specialization in non-aqueous solvents and colloidal electrolytes. His activities in American Chemical Society include Secretaryship from 1930-44, and Chairmanship in 1945. He has a son, age 14, who, it is rumored makes straight A in chemistry. Small wonder!

INDEX TO ADVERTISERS