THE MINNESOTA GEOLOGIST

OFFICIAL BULLETIN OF THE GEOLOGICAL SOCIETY OF MINNESOTA

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GEOLOGICAL SOCIETY OF MINNESOTA

831 SECOND AVE. SO.
MINNEAPOLIS, MINN.

The Geological Society of Minnesota is devoted to the study of geology and mineralogy for their cultural value.

OFFICERS

Charles H. Preston, President
Elmer H. Brown, Vice President
Alger R. Syme, Secretary
Joseph S. Zalusky, Treasurer
Edward P. Burch, Director
Eva F. Jones, Director
Theo. Zickrick, Director
Edward P. Burch, Counselor

PAST PRESIDENTS

Edward P. Burch
Junior F. Hayden
Alger R. Syme

Our Society meets every Monday evening, not a holiday, in the large auditorium in the Museum, on the 4th floor of the Public Library at Hennepin Avenue and 10th Street, Minneapolis, Minnesota, at 7:30 P. M., from October to May. From May until October, we endeavor to have a field trip each week (when gasoline rationing doesn't interfere). Visitors are very welcome. Dues are $3.00 annually, and $1.00 additional for your wife or husband, or dependent family members.

CHARLES HERBERT PRESTON * A THUMBNAIL SKETCH

The subject of this sketch is our President, Charles Herbert Preston. He was born, not too long ago, (and we are not speaking geologically now) somewhere near the shore of Puckaway Lake, Green Lake County, Wisconsin. Both his father and mother are of old, very old, New England Ancestry. His mother was Elizabeth Dewey, who was, and therefore our President is, a direct descendant of Governor Bradford of Plymouth Colony. It was Governer Bradford, you remember, who furnished the leadership which saved and preserved Plymouth Colony. Mr. Preston's forebears came to this country from England before 1635. If being able to trace one's ancestry back to the Mayflower is a test of American "Blueblood", then Mr. Preston is indeed a member of that aristocracy.

Mr. Preston's father moved to Wisconsin in 1850, and there met his mother. His father fought throughout the Civil War, and was wounded at the Battle of Gettysburgh. He established a sash, door and blind factory, but later operated a grocery store in Westfield, Wisconsin, where Charles was raised.

Mr. Preston attended the local grade and high schools of the county of his birth, and then took a complete course in Business Administration at the University of Wisconsin, graduating in 1906. Following graduation, he taught business subjects in the high schools of Aurora, Illinois, and Oshkosh, Milwaukee and Superior, Wisconsin.

He came to Minneapolis in 1910 to accept a position on the faculty in the Economic Department of the University of Minnesota. He later organized the Extension Division courses on business subjects, particularly accounting and business law, and for five years was in charge of the extension work in these subjects.

In 1918, he opened his own office for the practice of Accountancy, and in 1920, became a Certified Public Accountant. He continued, however, to maintain his interest in the Extension Division work of the University and to teach accountancy, and Income Tax until 1938. In connection with his professional work, he has built a well-rounded organization. For over 20 years, he has been Tax Consultant for the Minnesota Bankers' Association, serving over 250 banks throughout the State. In 1926-7, he was President of the Minnesota Society of Certified Public Accountants. He is also a member of the American Institute of Accounting, and is an enthusiastic member of the Rotary Club of Minneapolis. Quite incidentally, he is also a member of A.F. & A.M.

He has never been particularly interested in sports, except that great American indoor sport, "Contract Bridge". At times in the past, he has played "at" golf.

In 1902, he married Ruth Peirce, who also was a resident of Green Lake County, Wisconsin. That he exercised the best of judgment in soliciting her to be his life companion, all who know her will readily admit. Together, they are a very genial and charming couple. The Prestons have two daughters, Katherine, married to Firman Bradway, Commercial Artist, living in San Francisco, California, and Lucile, married to DeVaughn Jesson. At present, she lives in New York. Her husband is also an accountant, and a member of Mr. Preston's organization. Since the War, he has spent some time in Greenland and during the last year, has been doing accounting work for a large construction company, in Africa.

The Prestons live very comfortably at Linwood, overlooking beautiful Lake Minnetonka.

Politically, Mr. Preston is "nominally" a Republican. The Prestons belong to the Unitarian Church.

Shortly after moving to Lake Minnetonka in 1938, Mr. Preston noticed an article in the paper, authored by Mr. Burch, Founder of our Society, announcing the organization of a group to study Geology. Mr. Preston attended this meeting, and ever since that time, has had a deep and abiding interest in Geology.

Shortly after joining the Geological Society of Minnesota, Mr. Preston was elected Director and Secretary of our Society, and at present, holds the office of President. Upon being elected Secretary, he proposed and carried through the incorporation of our Society. Mr. Preston takes his Geology seriously and has given unstintingly of his time and talent to the Society.

Mr. Preston has a humor all his own, and upon occasion can convulse his audience. He enjoys no little fame as a toastmaster, and has been guilty at times of extremely witty repartee. He is a jolly companion and loyal friend. If you don't happen to know him as such, we suggest that you get better acquainted with both him and Mrs. Preston.

ARS.

MISCELLANEOUS

You will find the article on Salt in this issue very interesting. If you haven't time to read it in full, you can skip through it and still get quite a little information on the many uses to which salt is put. We have reprinted this article by special permission of the Compressed Air Magazine, in which it first appeared.

In the next issue, we expect to print, as the Article of the Month, an article on Historical Geology by Clinton R. Stauffer, PhD., Professor of Geology, University of Minnesota.

"NE-SAW-JE-WON" in the Ottawa Indian language means, "A tale of the waters that run down from Lake Superior to the sea." This is the title of a short book of 80 pages, including 10 or more full-page illustrations and maps, describing the geologic history of the Great Lakes, by Helen M. Martin, a geologist of the Michigan State Geological Survey. This book sells for 60¢ in paper covering. If you would like a copy of it, please notify the Secretary. We have already received orders for 32 copies, and have ordered a few extra in case someone did not hear the announcement in the regular meeting two weeks ago. The book is based on the exhaustive work of Dr. Frank Leverett and Dr. Frank B. Taylor, who were mainly responsible for what is known of the origin and development of the Great Lakes.

Mr. Joseph Zalusky, our Treasurer, has contributed the mimeographing necessary to publish this issue, and to him, we express our sincere appreciation.

FIELD NOTES

GEOLOGY IS LIKE THAT:

Gracie, why are you and Fred studying French?

Oh, we adopted a French baby, and want to be able to understand it when it starts talking.

(NOTE: Some of us are attending classes in Geology at the University to learn the language of Geology. For instance, Dr. Gruner told his class in Mineralogy the other night that, "The dispersion of light in the diamond gives it fire."

ECONOMIC GEOLOGY:

Have you heard about the moron who wouldn't talk about crude oil because it wasn't refined?

TOPOGRAPHY:

Soldier home from Italy: "I certainly saw a lot of beautiful panoramas."

Girl Friend (ignorant of Geology): "I thought you told me you didn't run around with any of those native girls over there."

MINERALS--GEMS

QUARTZ:

Discovery of very fine quartz crystals has been made on Diamond Point Mountain, near Hot Springs, Montana, and "Water Clear Crystal Mining Company" has been organized to exploit the find. Crystals have been pronounced entirely satisfactory, for use in Radar, and other fine equipment. This is the only deposit of this quality so far found in the United States. Good crystals are worth $10.00 a pound, and production is estimated at 5 Tons a day. Heretofore, all such crystals have come from Brazil. Only a small part of the production is of the $10.00 quality.

TIN:

Some Placer Tin has been found in upper Basin Creek, Montana, in the form of Cassiterite, or tin oxide. The only other tin found in the United States is found in the Black Hills.

OIL:

Dr. Per K. Frolich of Standard Oil Company states that the world has sufficient oil reserves to last 300 years, at present rate of consumption. United States, having only 5% of the land area of the world, has 15% of favorable oil lands. To convert crude oil into gasoline (at $2.00 per barrel), costs 8½¢ per gallon of gasoline, and to obtain the same amount of gasoline from coal, synthetically, costs 20¢ per gallon.

EDITORIAL — ALGER R. SYME, EDITOR

This is the second issue of THE MINNESOTA GEOLOGIST. We don't know yet whether this little effort will 'die aborning" or not. We are going to make every effort to continue it, but the item of expense continues to worry us, and as yet, remains unsolved. As nearly as we can estimate it, publication for eight months would cost approximately $100.00. It is still, therefore, an experiment.

It occurred to us that you would like to know some thing about our officers, and other prominent members of our Society. Accordingly, with your permission, therefore, we will include a "Thumbnail Sketch" of one of them in each successive issue of this publication. Your comment on this feature will be welcomed.

Mr. Hanley's condition is unchanged. He is mentally alert as ever, and enjoys keeping up with the news. If you haven't sent him a card, you might do so at Thanksgiving time.

Dr. Thiel's course on Historical Geology is well started, and is being immensely enjoyed by those in attendance. Average attendance so far is over 80.

The officers regret that it was necessary to put off the meeting on November 8th, but as the subject of this lecture is, The Biwabik Iron Formations of the Mesabi Range, they felt that no one would want to miss it, and that in fairness to those who couldn't attend, it was better to continue this lecture until November 15. The date of all future lectures in this course will be put ahead one week.

We have received a number of complimentary letters upon the first issue of this publication, with such expressions as "splendid, well worthwhile, very fine, good for the Society", etc., etc. We would like to hear from more of you, as to whether you think there is sufficient benefit to the Society to warrant the effort involved.

THE BULLETIN BOARD

Dr. Thiel's lectures for the next month are as follows:

11-15-43 THE UPPER HURONIAN PERIOD:
Minnesota, Biwabik Iron Formations of the Mesabi Iron Range.

11-22-43 THE KEWEENAWAN PERIOD:
Minnesota, History of the Lake Superior Region.

PALEOZOIC ERA

11-29-43 EARLY PALEOZOIC HISTORY:
Minnesota, transgressions of the Cambrian Seas.

12-6-43 THE ORDOVICIAN PERIOD:
Its major Geologic and Biologic Events.

12-13-43 EARLY ORDOVICIAN ROCKS OF MINNESOTA.

* * * * *

It is not too late, by any means, to interest a friend. Bring one or two with you to each lecture.

ARTICLE OF THE MONTH

SALT OF THE EARTH

by FREMONT KUTNEWSKY

(Reprinted from "Compressed Air" magazine, with their consent)

The Biblical statement, "Ye are the salt of the earth," (Matthew V. 13) was no idle phrase. Primitive peoples were keenly conscious of salt's worth, perhaps more so than we of today who are prone to take most everything that is readily available for granted. To early man, salt represented something that was both imperishable and that would keep other things from perishing. Aside from these qualities, he was aware that it made food good to eat and that it possessed healing powers, which he exaggerated.

Salt is one of the world's most widely distributed minerals. This is fortunate, because it is essential to life. We are told that the Phoenicians carried cargoes of salt in the ships in which they first ventured across the Mediterranean, and salt is believed to have been the first important article of commerce. Its economic importance in these ancient times is emphasized by the fact that the salt trade not infrequently was a government monopoly, and even to this day some countries in the Far East impose a tax on salt. Roman soldiers were originally paid in salt, which explains the saying that a man "is not worth his salt." Each fighter's allowance was called his salarium, or his portion of sal, the Latin word for salt. Later, when money was introduced, the term stuck, and we commemorate that early Roman practice in our use of the word salary.

Today, salt's contribution to our needs and well-being is manifold. The per capita production in the United States increased from 97 pounds in 1910 to 151 pounds in 1940. During that period our chemists made great strides in discovering substitute materials for manufacturing purposes, and in that work they found common salt to be of inestimable value to them. In creating new products out of salt and its derivatives they struck a telling blow at Japan's silk industry some years ago by giving us rayon, as artificial silk is generally called in this country. The fabric is manufactured by means of caustic soda, which comes from salt. Our modern plastics that are making history owe their existence to one or another of the well-known salt derivatives and compounds. If this country should, in the not-too-far-distant future, free itself from dependence on natural rubber, it will probably be attributable in part to a synthetic material obtained from coal, lime, water and salt.

Salt is an ingredient in most of the commodities we use in everyday life. Are you wondering how long your automobile will carry on? Its chances of serving you are greatly enhanced by the fact that its bearings and parts have been case-hardened with a salt derivative. If your tires wear out and you manage to get them recapped, or you are able to buy new ones of reclaimed rubber, you will have salt to thank, because caustic soda makes it possible at reasonable cost to recover the pure rubber that remains on worn-out tires. There is salt in the steering wheel and other plastic parts of

your car, and this is also true of the antiknock in gasoline (if you can get it) that makes your engine last longer.

Your home life has been generously showered with the benefits of salt. Whether you keep foods fresh in an icebox or in a mechanical refrigerator, salt is behind the scenes. The shining chrome edging around your kitchen sink, the smoothly plated cutlery and doorknobs, the gleaming faucet and drinking water that flows from it, the snowy linens that stay white though frequently laundered, the clothing that comes back from the dry cleaner looking and smelling like new, the zeolite water softener and numerous soaps, cleaners, bleaches, cosmetics, and dentifrices--all contain salt in one form or another. If you are bothered by rats or insects and rid yourself of these pests by the use of hydrocyanic gas, or if you clear out a clogged drainpipe by pouring into it something that you get for the purpose at the grocer's, give salt the credit, for these and many other destructive agents are extracted from that common white mineral.

Every housewife knows, of course, that no dish can be made really palatable without salt, that no table is completely set without it. Tasty pickles, olives, and many condiments, relishes, and sauces are prepared and preserved with salt or one of its substances. Baking soda and its compound, baking powder, come from the same source, being obtained in the production of sodium carbonate. It is from the latter that we get our caustic soda and sal soda, and it plays a part in the manufacture of soap and glass. Baking soda (sodium bicarbonate) is the basis of many popular indigestion tablets, and is no feeble antacid in itself.

Flake salt, a variation of table salt, makes pretzels tasty and is used for salting fish, curing ham and bacon, and purifying sausage casings. A great deal of it is required in making butter, as is also granulated salt, the kind you put in the saltcellar. The latter serves in processing self-rising flour, in baking bread, in making cheese, pickling cucumbers, canning fruits and vegetables, preserving and packing meats, and manufacturing dyes.

The body tissues of both man and beast contain salt, and the supply must be continually renewed to compensate for loss through perspiration. Some foods provide that essential element, but rarely in sufficient quantity. For that reason workers in boiler rooms, foundries, laundries, and in hot places generally, are cautioned to take an occasional salt tablet in order to restore the saline balance of the system. It is well known that "being overcome by the heat" is usually attributable to the fact that the body lacks salt. Blood is saline, so are tears, and doctors sometimes give a saline injection in case of excessive loss of blood. Salt water has many curative uses, too numerous to mention here. Chemically speaking, salt is sodium chloride--a union of metallic sodium and chlorine gas. Upon receiving salt, the stomach changes its chloride component into hydrochloric acid for digestive purposes. The body divides the salt into its chemical constituents with the greatest of ease, but it takes elaborate equipment to do the same thing industrially.

The first commercial use of salt was for preserving foodstuffs. Since it kept them from spoiling, primitive peoples thought of salt as a protection

against devils and demons. You probably have seen people throw a pinch of salt over the shoulder when they spilt some accidentally. This practice originated in the belief that salt had the power of driving away evil forces and thus warding off bad luck. Ancient travelers carried a little packet of it just as some of us today carry a rabbit's foot.

Down through the years the mineral became a sign of everlasting loyalty and friendship. "It is a covenant of salt for ever before the Lord," (Numbers XVIII, 19). Elisha threw salt into the fountain of Jericho (2 Kings II, 21) saying: "Thus saveth the Lord, I have healed these waters; and for the future they shall not be the occasion either of death or barrenness." It was therefore only natural that man of ancient times regarded salt as a symbol of immortality, as well as the purifier and healer that it really is. There is little doubt that salus, the Latin word for health, was derived from the root sal--salt. Because the latter was essential to the enjoyment of food and was also a token of longevity and a means of propitiating the gods, the Romans placed the saltcellar first on the table and all other things in relation to it. The seat of honor was near the salt. In referring to the cultured Greeks of Athens in her Golden Age the term "Attic salt" came to mean delicate, refined wit.

The alchemists of the middle centuries considered salt one of the three basic elements from which the seven noble minerals originated. Mercury symbolized the spirit, sulphur the soul, and salt the body. Nor were the alchemists far wrong. Salt ranks fifth among the 150 most important materials used by the chemical industry today, being exceeded only by water, air, coal, and sulphur. The brine derived from it ranks eighth. Modern chemists have done what their forerunners of long ago hoped to do. They have broken down salt into its components and from them obtained many new materials such as metallic sodium, caustic soda, chlorine, hydrogen, soda ash, and sodium carbonate. All are immensely important to industry.

Metallic sodium is converted into sodium peroxide, a valuable ingredient in tooth powder and an antacid in mouth washes. And, by the way, if you want to whiten your teeth you'll find salt a very effective agent. Many people use it. By another chemical sleight-of-hand, metallic sodium enters into the production of peroxide of zinc. This goes into bleaching creams and is a powerful deodorant. Still another conversion yields hydrocyanic gas, which is widely employed for fumigating.

Caustic soda is extremely adaptable and is doing a good deal of war work. One of its largest industrial fields is the manufacture of rayon--now the preferred fabric for heavy-duty tires for military vehicles. Soapmakers consume great quantities of caustic soda. Among their by-products is glycerin, which is of growing importance in the manufacture of synthetic resins and drying oils. It is also used extensively in the production of ammunition and explosives. Caustic soda kills the bad taste--sulphur--in mineral oil; eats the fabric out of old tires to free pure rubber; and, as lye, takes the hair off animal hides in the process of tanning. It plays a part in making phenol, from which we get sensitive explosives and dyestuffs. It is an ingredient in paint and varnish removers, destroys insects, softens water. In still other roles it meets a need in electroplating, alcohol rectification, purification

of coal and coke by-products, and in the manufacture of pulp and paper.

Chlorine, the other half of the sodium-chloride partnership, has been much in the news since it was placed under full priority on July, 26, 1941. First to feel the effects of chlorine restrictions were the paper and textile mills and laundries. If the paper on which this is printed does not happen to be as white as formerly, that can be accounted for by the fact that chlorine has gone to war. In the first place, the army requires lots of smokeless powder, so chlorine has been drafted to bleach the necessary cotton linters. It also helps to make a smoke-screen substance.

The bleaching qualities of chlorine are attributable to its affinity for hydrogen. Since the latter is a key coloring agent for organic materials and readily combines with chlorine upon contact, chlorine is a favorite bleach in many industries. It is indispensable for a wide variety of cleaning jobs because it removes what is not wanted. It purifies pharmaceuticals, extracts fat and oil from soybeans, nuts, grains, feathers, and slaughter-house tankage. It sterilizes sewage and makes drinking water safe for public consumption. To chlorine belongs much of the credit for eliminating typhoid from the list of diseases that once seriously threatened centers of population.

In several forms, under the head of chlorinated hydrocarbons, chlorine is the base of solvents that have made modern dry cleaning possible. These solvents remove the fats and oils that are responsible for most stains and are safe to use on all kinds of fabrics. They are not flammable. On the contrary, your fire extinguisher most likely contains one of these liquids. Chlorine performs an important service in the extraction of bromine from sea water, and in another guise it shows up in Freon, a cooling agent for household and commercial refrigeration and air-conditioning systems.

By treating salt and sulphuric acid in a certain way chemists obtain salt cake, or sodium sulphate, which Johann Rudolf Glauber discovered 300 years ago and which goes under the name of Glauber's Salt. Glauber thought that he had found the long-sought universal solvent and panacea for all human ills. He cited 26 uses for his salt in medicine, 21 in the arts, and twelve in alchemy. Before the day of priorities, the kraft-pulp and paper industry absorbed 70 per cent of the sodium-sulphate output of this country. If we have to carry our groceries home in old-fashioned net instead of brown-paper bags it will be for the reason that sodium sulphate can do its share in fighting the Axis powers. Further, there is a demand for it in glass making, ceramic glazing, and in manufacturing other sodium salts and detergents.

Hydrochloric acid, commonly known as spirits of salt, is a by-product of salt cake. A good deal of it is used in making synthetic rubber such as Neoprene, Koroseal, and Flamenal. It cleans steel and wire for galvanizing, enters into the production of solid carbon dioxide (dry ice), and helps to give us glucose, synthetic perfumes and dyes, as well as wood alcohol. It is used in tanning leather and in the manufacture and refining of sugar. Soda ash is another of salt's prolific offspring, and finds application in making glass, soap, chemicals, cleaners, pulp and paper, water softeners, boiler compounds, and in

of the things that we have been buying at
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In other sections wells are put down and the
ated. There are some natural brine reservoirs,
ice to circulate water through dry salt beds and
surface. Salt is also obtained from saline lakes

Salt was first discovered in the United States near Syracuse, N.Y., and its production begun in 1788 or 1789. History has it that the Indians sold it to American settlers as early as 1670. Rock salt was found at Avery Island, La., in 1862. It proved to be of strategic value to the Confederate side during the Civil War because the South was more or less effectually blockaded and had to depend on its own resources. Today, this country leads the world in output and consumption, accounting for 35 per cent of the total annual production of 29,000,000 short tons.

MARY A. MAYOTTE
5906 CLINTON AVE.
MINNEAPOLIS, MINN