

1918?

MINERAL RESOURCE
RECORDS DIVISION
Schroyer, C.R.
Ms 1 -
ILLINOIS STATE
GEOLOGICAL SURVEY

Silica Refractory Material in Southern Illinois.

The present production of "ganister" in southern Illinois is from northern Alexander and south central Union counties. Four different workings have reached sufficient size to be properly termed mines and other small prospects have been dug. The mines are as follows:--

Novaculite Paving Co's Mine--Sec.1, T.14 S; R.2 W;
Manager Edw.Bryden, Tamms, Illinois.

J.W.Joynt's Mine (Tamms)))	} Sec.18, T.14 S; R. 1 W;
Western Fire Brick Co's Mine)	
Geo. Hartline's Mine (Elco))	

They are in a belt which extends east of south and lies east of the town of Elco.

Geological Relations.

The workings are all in the "Siliceous shales and chert" in a narrow belt, scarcely more than a mile in width, extending from Iron Mountain in the N.W.1/4 of Sec.34, T.11S; R.2W; a little east of south to the southwest corner of T.13S; R. 1W; where they turn slightly more to the east in Alexander County to about 2 1/2 miles south east of Elco. South east of this the beds if present are covered by later deposits*. Ganister has been obtained only from the southern part of this area.

Origin of the "Ganister".

The origin of the ganister, similar to the "silica", farther west, was by decomposition, in sites of the chert beds and siliceous shales.

* See Northern County Reports.

The bedding may be traced distinctly along the walls of the mines and more compact beds still preserve their identity. The difference between the residual products "ganister" and "silica" is to be accounted for by difference in original composition of the bed rock, the former having more non-siliceous material which furnished the bond for the ganister.

Mines and Production.

The present production is not large owing to the freight embargo. Mr. Edw. Bryden of the Novaculite Paving Co. has shipped about seventy cars from their pit, to the St. Louis Refractory Co's Plant at Crawford, Illinois, the Murphysboro Paving Brick Co., Murphysboro, Illinois, and the Parker Russell Mining and Manufacturing Co. of St. Louis. Over one hundred acres is said to be underlain by the ganister and the present tunnel has been driven 150 feet. The haul from the mine to the Mobile and Ohio Railroad, a distance of about $3/4$ of a mile is made by team and wagon. Construction of a train from the mine to the railroad is being considered if the demand justifies the outlay.

The output from the pit of the Western Fire Brick Co. now averages one car per week, with a maximum of three cars per week. Fourteen cars in all have been shipped from the present working, to the companies plant at Granite City, Illinois.

The opening is in the form of a large domed tunnel 60 feet in length, which lowers as it is driven backward into the ridge. The height of the tunnel forms a wide open mouth which opens out into a hollow at the side of the ridge. The ganister is blasted down, loaded directly onto the wagons, which are

backed into the mine by teams, and hauled $3/4$ of a mile to the Mobile and Ohio Railroad at Elco. The roof rises slightly as the tunnel is driven back into the ridge and the floor also lowers. Fifteen feet, the height of the tunnel represents the greatest thickness worked. A test pit 32 feet deep, said to have been dug near the mouth of this tunnel, did not penetrate the ganister, but showed a poorer quality with depth. Hard cherty beds not far below make this statement seem questionable and gravel with discolored clayey ganister has cut off the workings on the west side in a way that suggests a dike filling of 2 feet or more in thickness. Red stains of iron oxide follow the traces of former bedding planes and an occasional vertical seam may be seen. Aside from this the color is white or pale buff.

The pit of J.W.Joynt was not being worked when visited, Its total output is reported to have been about the same as that of the one just described. Vertical seams of gravel here again suggest open fracture filling. Bedding planes dip back into the mine at an angle of 5° and are somewhat contorted.

The ganister is taken from the mine in wheelbarrows, dumped from a tressle down into wagons and hauled $1/4$ mile to the Mobile and Ohio Railroad at Elco. The two uses have been for, silica brick, and fire brick, the later by Hanlin and Mills of the Western Fire Brick Co; Granite City, Illinois.

Most of the better quality ganister has been removed from the mine of Mr. Geo. Hartline, north of the two mines described above. One wall is said to be hard bed rock.

Occurrences of ganister are reported elsewhere but as they have not yet been taken over by the men interested in their

development, the exact location was not disclosed. Small loading shoots were seen north of Mill Creek and occurrences are mentioned near Tamms.

Amount of Ganister Available.

The amount of ganister available would supply a larger demand than it is now supplying and it is likely that prospecting along the outcrop of these beds to the northwest toward Iron Mountain may uncover other deposits of commercial value. No attempt was made to find out the entire production of silica, but the supply of raw material now available is adequate for all present demands.

Silica as Used for Refractories.

In addition to the above, extensive experiments have been carried on by several companies, with a view to using "silica" in the manufacture of refractories. In a limited way such brick are now produced in commercial quantities and promise, in the near future, to take an important place in this field.

The Murphysboro Paving Brick Co. have been experimenting during the last year and have received favorable reports from tests of their product by several large users of refractories. The discoloration which in some cases develops in the silica brick is reported not to reduce their refractory value, neither does the small amount of added bond. The greatest difficulty to overcome is the brittleness of the brick. One car load has been shipped to

Texas and many other favorable tests have been run.

The Columbia Clay Co. at Columbia, Illinois is also reported to have used the silica with success in making refractories

Mr. Bautz of the Isco-Bautz Co. Incor. Murphysboro, Ill. has experimented with silica refractories. Stained or discolored silica with but slight impurities can be used for this purpose as the mottling would not render the product less refractory.

Description of Silica Pits.

The silica mines of the Isco-Bautz Co. are 2.2 miles northeast from Wolf Lake, in the N.1/2 of N.E.1/4 Sec.2, T 12 S; R. 3W. They comprise four separate tunnels. One adjoining the north line of the property has been driven back 150 feet or more, and worked by the room and pillar system, leaving huge cylindrical pillars as supports for the roof. Small amounts of silica have been removed through this pit from the S.E. 1/4 of S.E. 1/4 of Sec.35. T.11S. R.3W; and are reported to have been shipped to a fire brick company at ^{Illmo, Mo.} ~~Elmo~~ (Mo?) This mine was idle when visited May 11, 1918. The silica was formerly hauled by wagon to the mill which is a short distance down the hollow or to Wolf Lake Station where it was loaded onto the Chicago and Eastern Illinois or the Iron Mountain Railroad.

The greatest thickness of silica worked in the mine is 15 feet. Surface indications show at least 15 feet additional below that already mined which could be used for refractories, with that in addition to the material now exposed in the present levels, this pit could produce large quantities of silica.

The present operations are confined to smaller and newer openings directly back of the mill, from which the silica

is carried by train either to the mill or to a tipple and dumped into wagons to be hauled to the railroad for shipment.

The output is now about 10 tons per day. This is to be increased to 100 tons per day when the larger plant at Murphysboro is completed. The equipment at the Wolf Lake mill is for the dry process and includes a rotary drier, heated by crude oil and steam, 36 inch burr mill, screen separators of 100 and 170 mesh. The equipment at Murphysboro consists of giratory crushers; eight tube mills, twenty four settling pans and steam driers.

Thirty or more cars of the coarsest screenings from the so-called "novaculite" paving material have been shipped to the St. Louis Refractory Co. by the Novaculite Paving Co. from the latter's pit two miles northwest of Tamms. This is hard angular light colored chert and when ground produced brick of white, pink and other colors, but this discoloration proved harmless and the brick have been shipped in commercial quantities to Pittsburgh where they have found a favorable market.

There are quantities of this material available, the greatest objection to it, is the cost of grinding. It is screened and loaded direct from the tipple into cars to be shipped via either the Chicago Eastern Illinois or the Mobile and Ohio Railroads.

Deposits of silica on the west part of this company's property, in the N 1/2 of N.E. 1/4 Sec. 35, T.14S; R.2W; have been little more than prospected, eight cars having been shipped and a number of small openings made. At one place there are 28 feet of discolored silica exposed and surface indications lead one to believe that large quantities are available. The mines are favorably located for large production and have a haul of but 1/2 mile or less to the loading switch.

The pits of the Tamms Silica Co. in Sec.2 T.5 S;R.2W; are reached by rail and the silica was formerly hauled to the mill at Tamms. At present this plant is using silica from the pit of J.W.Joynt. The equipment and process were described in the Engineering and Mining Journal 1917.

The Alexander Silica Co. has a mill at Tamms, Mr.Wm.Smith is Superintendent. Equipment consists of three chaser mills capacity 8 to 10 tons daily, eight settling vats 10x40 feet each, and steam driers. Silica is taken from the vats to the grinder, an old fashioned French burr mill.

The silica is dug from the company's mines 2 1/2 miles northwest of the mill and hauled by wagon. The estimated cost of the raw silica at the mill is \$4.00 per ton and after being ground in the chaser it would be ready for silica brick, at \$6.00 per ton. Quantity production would reduce these figures.

Mr. Oldsen of the Mineral Grinding Co. Jonesboro is said to be contemplating the construction of a second mill which may produce small amounts of material for refractories in addition to other products.

Geological Relations of the Silica.

The silica is obtained from the decayed siliceous beds of the ~~Oriskanian~~ ^{9 Onondaga age} Clear Creek chert. The Wolf Lake mines are less than 100 feet above the base of the formation and Helderbergian limestone may be seen in the lower parts of the ravines. The mines in Sec. 22 and 27, T.13S; R.2W; and those northwest of Tamms may be at a somewhat higher horizon.

The greatest thickness being mined is not more than 25 or 30 feet but far greater thicknesses of material which promises well for refractory use are exposed in several places.

Physical Properties.

Owing to original lithological variations the present decomposition product varies in composition in the different mines, and even in the same mine. The "silica" at Wolf Lake shows more physical resemblance to the "ganister" than that of the other "silica" mines and may have been used for refractories to some extent as my information for that mine is largely for the last two years production.

Both silica and ganister are blasted down in the mines and then shoveled from the foot of the mine wall. Ganister has somewhat the consistency of cornmeal, with few large masses that will not crumble easily. Silica is a fine gritty powder, when pulverized but shows a greater tendency to occur in angular lumps.

I am sending samples of the ganister and silica as follows:

- Sc-31--Coarse screenings from "Novaculite". From pit of Novaculite Paving Co. 2 miles N.W. of Tamms.
- Sc-32--"Silica"--Isco-Bautz Co. Incor. W. 1/2 of N.E. 1/4 Sec. 2; T. 12S; R. 3W;
- Sc-33--"Ganister"--Novaculite Paving Co's Mine. Sec. 1, T. 14 S; R. 2W.
- Sc-34--"Ganister"--J.W. Joynt--Elco.
- Sc-35--"Ganister"--Western Fire Brick Co.---Elco.
- Sc-36--"Silica"--Screenings-Alexander Silica Co. --Tamms.

Geo. Hartline-Jenkins
Elec

NE 418
T14SR1W

Number One

SiO ₂ -----	92.88	per cent	
R ₂ O ₃ -----	6.24	"	"
CaO -----	trace		
MgO -----	.00	"	"
Loss on Ignition -----	1.22	"	"
K ₂ O -----	<u>.00</u>	"	"
	100.34	"	"

silica
analysis
see Schroyer
Ms.

8c-39 Chalk Bank - Green sand

Number Two

SiO₂ ----- 74.76 Per cent

K₂O ----- 6.22 " " "

CaO ----- .48 " " "

Sec. 16

T 15 SR³ E

Phosphoric acid?
Sulphuric acid.

10%

81.46

~~Prof. Moxier~~

Hayt & Gale U.S.G.S.

Prof. Moxier

J.E. Spurr Res. Mine

wrote

Prof. Sidgeman for analysis

^{g.w.}
Silica-fayut ^{min}

Number Four

NE 1/8 1451W
near Leo

H₂O ----- .41 per cent

SiO₂ ----- 96.54 " "

"Silica" - Wolf Lake Sc. 35. (Granite)

Number Five

SiO ₂ -----	98.00	per cent	
R ₂ O ₃ -----	1.82	"	"
CaO -----	trace		
MgO -----	.00	"	"
Loss on Ignition-----	.68	"	"
K ₂ O -----	.00	"	"
	<u>100.50</u>	"	"

J. W. Bantz
Ch. Eng.

0435
0502

Bydena Sec. 33 - Janietta

Number Three

Novaculite Parang Co, Miss
NE sec 1, T14S R2W

SiO ₂ -----	93.24 per cent
R ₂ O ₃ -----	6.16 " "
CaO-----	trace
MgO -----	.00 " "
Loss on Ignition-----	.72 " "
K ₂ O -----	.00 " "
	<u>100.12</u> " "



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KLG

Attached are a hand written manuscript entitled "Silica refractory material in southern Illinois" by Charles R. Schroyer, a revision of Schroyer's manuscript by T. E. Savage, and second revision of Schroyer's manuscript by W. C. Parmelee. These materials came from the Correspondence File and were lately given to me.

Schroyer was a member of the Survey staff and wrote his manuscript in 1918. T. E. Savage was Professor of Geology at the University of Illinois and worked a goodly number of summers for the Survey in southern Illinois. C. W. Parmelee was Head of the Department of Ceramic Engineering, University of Illinois and carried on numerous laboratory investigations of the uses of Illinois industrial minerals materials in ceramic products.

Of the mines mentioned in Schroyer's report only one is now operating, namely that of the Western Fire Brick Company. Much of the information given in Schroyer's report is no longer available and is not recorded elsewhere to my knowledge. The data regarding some of the mines as recorded by Schroyer controverts some popular ideas now extant in southern Illinois regarding them. I did my first work on the Survey under Schroyer and know him to be a careful and conscientious observer.

I feel that it would be desirable to have Schroyer's manuscript copied and filed permanently for future use. Because the production of ganister is at low ebb at the present time does not mean it may not in the future again assume considerable importance. If this happens the information in Schroyer's report will be of great value.

JEL
5/12/60

1932-24

by Charles R. Schreyer
1918

Silica Refractory Material in Southern Illinois

The present production of "ganister" in southern Illinois is from northern Alexander and south central Union Counties. Four different workings have reached sufficient size to be properly termed mines and other small prospects have been dug. The mines are as follows:

Novaculite Paving Co's mine - Sec. 1, T. 14 S., R. 2 W.,

Manager Edw. Bryden, Tamm, Ill.

J. W. Joynt's mine (Tamm)

Western Fire Brick Co's mine (Sec. 18 T. 14 S., R. 1 W.)

Geo. Hartline's mine (Elico)

They are in a belt which extends east of south and lies east of the town of Elico.

Geological Relations

The workings are all in the "siliceous shales and chert" which overlies the "Upper Devonian Black Shales" and outcrop in a narrow belt, scarcely more than a mile in width, extending from Iron Mountain in

the N. W. $\frac{1}{4}$ of Sec. 34 T. 11 S., R. 2 W., a little east of south to the southwest corner of T. 13 S., R. 1 W., where they turn slightly more to the east in Alexander County to about $2\frac{1}{2}$ miles south east of E. Sec. South east of this the beds if present are covered by later deposits.* Ganiester has been obtained

*See Wrother - County Repts
only from the southern part of this area.

Origin of the "ganiester"

The origin of the ganiester, similar to the "silica", farther west, was by decomposition, in situ of the chert beds and siliceous shales. The bedding may be traced distinctly along the walls of the mines and more compact beds still preserve their identity. The difference between the residual product "ganiester" and "silica" is to be accounted for by difference in original composition of the bed rock, the former having more non-siliceous material which furnished the

bond for the ganieter.

The Mines and Production.

The present production is not large owing to the freight embargo. Mr. Edw. Bryden, of the Noraculite Faving Co., has shipped about seventy cars from their pit, to the St. Louis Refractory Co.'s plant at Crawford, Illinois, the Murphysboro Faving Brick Co., Murphysboro, Ill., and the Parker Russell Mining and Manufacturing Co. of St. Louis. Over one hundred acres is said to be underlain by the ganieter and the present tunnel has been driven 150 ft. The haul from the mine to the Mobile and Ohio Railroad, a distance of about $\frac{3}{4}$ of a mile is made by team and wagon. Construction of a tram from the mine to the railroad is being considered if the demand justifies the outlay.

The output from the pit of the Western Fire Brick Co. now averages one car per week, with a maximum of three cars per week. Fourteen cars in

all have been shipped from the present working to the companies plant at Granite City, Illinois.

The opening is in the form of a large domed tunnel 60 feet in length, which lowers as it is driven backward into the ridge. The height of the tunnel, 15 feet, forms a wide open mouth which opens out into a hollow at the side of the ridge. The granite is blasted down, loaded directly onto the wagons, which are backed into the mine by teams, and hauled $\frac{3}{4}$ of a mile to the Mobile and Ohio Railroad at E. Leo. The roof rises slightly as the tunnel is driven back into the ridge and the floor also lowers. Fifteen feet, the height of the tunnel represents the greatest thickness worked. A test pit 32 feet deep is said to have been dug near the mouth of this tunnel, did not penetrate the granite but showed a poor

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quality with depth. Hard cherty beds not far below the mouth make this statement seem questionable and gravel with discolored clayey gannister ~~have~~ ^{being} cut off the workings on the west side in a way that suggests a dike filling of 2 feet or more in thickness. Red stains of iron oxide follow the traces of former bedding planes and an occasional vertical seam may be seen. Aside from this the color is white or pale buff.

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mine in wheelbarrows, dumped from a trestle down into wagons and hauled $\frac{1}{4}$ mile to the Mobile and Ohio Railroad at Eled. The two uses have been for silica brick, and fire brick, the latter by Harlin and Mills of the Western Fire Brick Co., Granite City, Illinois.

Most of the better quality granite has been removed from the mine of Mr Geo. Hartline, north of the two mines described above. One wall is said to be hard bed rock.

Occurrences of granite are reported elsewhere but as they have not yet been taken over by the men interested in their development, the exact location was not disclosed. Small loading shoots were seen north of Mill Creek and occurrences as mentioned near Tammie.

Amount of Granite Available.

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The amount of quartz available, would supply a larger demand than it is now supplying and it is likely that prospecting along the outcrop of these beds to the north west toward Iron Mountain may uncover other deposits of commercial value. No attempt was made to find out the entire production of silica, but the supply of raw material now available is adequate for all present demands.

Silica as Used for Refractories.

In addition to the above, extensive experiments have been carried on by several companies, with a view to using "silica" in the manufacture of refractories. In a limited way, such brick are now produced in commercial quantities and promise, in the near future, to take an important place in this field.

The Murphyboro Paving Brick Co. have been experimenting during the last

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year and have received favorable reports from tests of their product by several large users of refractories. The discoloration which in some cases develops in the silica brick is reported not to reduce their refractory value, neither does the small amount of added bond. The greatest difficulty to overcome is the brittleness of the brick. One car load has been shipped to Texas and many other favorable tests have been run.

The Columbia Clay Co. at Columbia Illinois is also reported to have used the silica with success in making refractories.

Mr. Bantz of the Isco-Bantz Co. Incor., Murphysboro Illinois has also experimented with silica refractories. Stained or discolored silica with but slight impurities can be used for this purpose as the mottling would not render the product less refractory.

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Description of Silica Pits

The silica mines of the Iasco-Bantz Co. are 2.2 miles north east from Wolf Lake, in the N. $\frac{1}{2}$ of N.E. $\frac{1}{4}$ Sec. 2 T. 12 S., R. 3 W. They comprise four separate tunnels. One adjoining the north line of the property has been driven back 150 feet or more, and worked by the room and pillar system, leaving huge cylindrical pillars as supports for the roof. Small amounts of silica have been removed through this pit from the S.E. $\frac{1}{4}$ of S.E. $\frac{1}{4}$ of Sec. 35 T. 11 S. R. 3 W. and are reported to have been shipped to a fire brick company at Elmo (Mo.?). This mine was idle when visited May 11, 1918. The silica was formerly hauled by wagon to the mill which is a short distance down the hollow or to Wolf Lake Station where it was loaded onto the Chicago and Eastern Illinois or the Iron Mountain Railroad.

The greatest thickness of silica worked

10.

in the mine is 15 feet. Surface indications show at least 15 feet additional below that already ~~mined~~ ^{mined} which could be used for refractories, with that in addition ^{to the material now exposed in the} present levels, this pit could produce large quantities of silica.

The present operations are confined to smaller and newer openings directly back of the mill, from which the silica is carried by tram either to the mill or to a tippie and dumped into wagons to be hauled to the railroad for shipment.

The output is now about 10 tons per day. This is to be increased to 100 tons per day when the larger plant at Murphysboro is completed.

The equipment at the Wolf Lake mill is for the dry process and includes a rotary drier, heated by crude oil and steam, 36 inch burr mill, screen separator of 100 and 170 mesh. The equipment at Murphysboro consists of quatory enclosure,

eight tube mills, twentyfour settling pans and steam driers.

Thirty or more cars of the coarse screenings from the so called "novaculite" paving material have been shipped to the St. Louis Refractory Co. by the Novaculite Paving Co. from the lath's pit two miles north west of Tamm. This is hard angular light colored chert and when ground this produced a brick of white, pink and other colors, but this discoloration proved harmless and the brick have been shipped in commercial quantities to Pittsburg where they have found a favorable market. There are quantities of this material available, the great^{est} objection to it is the cost of grinding. It is screened and loaded direct from the tipple into the cars to be shipped via either the Chicago and Eastern Illinois or the Mobile and Ohio Railroads.

12.

Deposits of silica on the west part of this company's property, in the N $\frac{1}{2}$ of N.E. $\frac{1}{4}$ Sec. 35 T 14 S., R. 2 W., have been little more than prospected, eight cars having been shipped and a number of small openings made. At one place there are 28 feet of discolored silica exposed and surface indications lead one to believe that large quantities are available. The mines are favorably located for large production and have a haul of but $\frac{1}{2}$ mile or less to the loading switch.

The pits of the Tamme Silica Co. in Sec. 2 T 15 S., R. 2 W. are reached by rail and the silica was formerly hauled to the mill at Tamme. At present this plant is using silica from the pit of J. W. Joynt. The equipment and process were described in the Engineering and Mining Journal for 1917.

The Alexander Silica Co. has a mill at Tamme, Mr. W. M. Smith is Superintendent

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Equipment consists of three chaser mills capacity 8 to 10 tons daily, eight settling vats 10×40 feet ^{each} and steam driers. Silica is taken from the vats to the grinder, an old fashioned French burr mill.

The silica is dug from the companies mines $2\frac{1}{2}$ miles northwest of the mill and hauled by wagon.

The estimated cost of the raw silica at the mill is \$4.00 per ton and after being ground in the chaser when it would be ready for silica brick, at \$6.00 per ton. Quantity production would reduce these figures.

Mr. Oldsen of the Mineral Grinding Co., Jonesboro is said to be contemplating the construction of a second mill which may produce small amounts of material for refractories in addition to other products.

Geological Relations of the Silica

The silica is obtained from the decayed siliceous beds of the Oriskanian Clear Creek chert. The Wolf Lake

14.

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Physical Properties

Owing to original lithological variations the present decomposition product varies in composition in the different mines, and even in the same mine. The "silica" at Wolf Lake shows more physical resemblance to the "ganister" than that of the other "silica" mines and may have been used for refractories to some extent as my information for that mine is largely for

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for the last two years production.

Both ^{silica and ganister} are blasted down in the mine and then shoveled from the foot of the mine wall. Ganister has somewhat the consistency of cornmeal, with few large masses that will not crumble easily. Silica is a fine gritty powder, when pulverized but shows a greater tendency to occur in angular lumps.

I am sending samples of the ganister and silica as follows:

- Sc-31 - coarse screenings from "Novaculite"
From pit of Novaculite Paving Co 2 mi N.W. [of town]
- Sc-32 - "Silica" - Inco-Bantz Co Inco.
W 1/2 of N.E. 1/4 Sec 2, T. 128, R. 3W.
- Sc-33 - "ganister" - Novaculite Paving Co's mine
Sec. 1 T. 148, R. 2W.
- Sc-34 - "ganister" - J.W. Joynt - Elec.
- Sc-35 - "ganister" - Western Fire Brick Co. - Elec.
- Sc-36 - "Silica" - Screenings - Alexander Silica Co. - Gamms.

The "Ganister" or "Silica" of Southwestern Illinois.

"Ganister".

1932-24

In northern Alexander County and central and southern parts of Union County in this state there are extensive deposits of siliceous material which are known locally as "Ganister", "Silica" and "Novaculite" depending upon their character.

The "Ganister" is a decomposed siliceous rock which is obtained in the form of a coarsely granular material, the larger particles of which are about one quarter of an inch in diameter. Four small mines have been worked, and four small prospects have been dug in this deposit. The mines are as follows:--

- 1--Novaculite Paving Co's Mine in Sec.1,T.14 S; R.2 W; Mgr. Ed. Bryden, Tamms, Illinois.
- 2--J.W.Joynt's Mine at Tamms, Illinois, in Sec.18, T.14, R.1.
- 3--Western Fire Brick Co's Mine, Sec.18, T 14. R.1.
- 4--Geo. Hartline's Mine at Elco, Illinois.Sec.18,T.14; R.1.
- 5--Isco-Bautz Co's Mine 2 miles N.E. of Wolf Lake. N 1/2; N.E. 1/4; Sec. 2 T 12 S; R. 3 W.

The workings are all in the more decomposed parts of chert beds from which it has been derived. The greatest thickness at present worked at a single place is 25 or 30 feet but far greater thicknesses are available in places. Its occurrence is reported in several places in the counties above mentioned, and no doubt a great quantity can be had if desired.

Mines and Users.

The Novaculite Paving Co. has shipped to the Murphysboro Paving Brick Co. at Murphysboro, Illinois and the Parker-Russell Mining and Mfg. Co. of St. Louis. The Western Fire Brick Co. has shipped to its plant at Granite City, Illinois. The pit of J.W.Joynt has furnished material for the manufacturing of silica brick and fire brick by Hanlin and Mills of the Western Fire Brick Co. at Granite City, Illinois.

"Silica".

The "Silica" is obtained from the decayed beds of chert. It varies in character at different localities and even in the same mine. At "Wolf Lake" it shows more physical resemblance to the "Ganister". The "Silica" occurs in beds of consolidated material which is blasted out and afterwards crushed by suitable machinery. Some of it is so friable as to be readily crushed between the fingers. When finely ground and sized by floating it is extensively used as a mild abrasive or polishing powder.

Extensive experiments have been carried on by several companies with a view of using "silica" in the manufacture of refractories. In a limited way, such brick are now produced in commercial quantities. The following parties have been experimenting:--

The Murphysboro Paving Brick Co. Murphysboro, Illinois.

The Columbia Clay Co. of Columbia, Illinois.
Mr. Bautz of the Isco-Bautz Co. of Murphysboro, Illinois.

"Novaculite".

This material consists of angular lumps of chert. The deposits are being worked for road material and the coarse screenings have been shipped to the St. Louis Refractory Co. for use. It is reported that brick made from "novaculite" have been used with good results in Pittsburg. Large quantities of the material are available. An objection to its use is the difficulty of grinding this flinty material.

- been dug in this deposit. The mines are as follows:-
- 1--Novaculite Paving Co's Mine in Sec.1, T.14 S; R.2 W; Mgr. Ed. Bryden, Tamm, Illinois.
 - 2--J.W. Joynt's Mine at Tamm, Illinois, in Sec.13, T.14, R.1.
 - 3--Western Fire Brick Co's Mine, Sec.13, T.14, R.1.
 - 4--Geo. Hartline's Mine at Elca, Illinois. Sec.18, T.14; R.1.
 - 5--Isco-Bautz Co's Mine 2 miles N.E. of Wolf Lake, N 1/2; S.E. 1/4; Sec. 2 T 13 S; R. 3 W.

The workings are all in the more decomposed parts of chert beds from which it has been derived. The greatest thickness at present worked at a single place is 20 or 30 feet but far greater thicknesses are available in places. Its occurrence is reported in several places in the counties above mentioned, and no doubt a great quantity can be had if desired.

Mines and Users.

The Novaculite Paving Co. has shipped to the Murphysboro Paving Brick Co. at Murphysboro, Illinois and the Parker-Russell Mining and Mfg. Co. of St. Louis. The Western Fire Brick Co. has shipped to its plant at Granite City, Illinois. The pit of J.W. Joynt has furnished material for the manufacturing of silica brick and fire brick by Hanlin and Hill of the Western Fire Brick Co. at Granite City, Illinois.

"Silica".

The "Silica" is obtained from the decayed beds of chert. It varies in character at different localities and even in the same mine. At "Wolf Lake" it shows more physical resemblance to the "Ganister". The "Silica" occurs in beds of consolidated material which is blasted out and afterwards crushed by suitable machinery. Some of it is so friable as to be readily crushed between the fingers. When finely ground and sized by floating it is extensively used as a mild abrasive or polishing powder.

Extensive experiments have been carried on by several companies with a view of using "silica" in the manufacture of refractories. In a limited way, such brick are now produced in commercial quantities. The following parties have been mentioned:-

The Murphysboro Paving Brick Co., Murphysboro, Illinois.

Revision by Savage

Savage
1932-24
Revision

~~7-15-32~~
~~1932-24~~
~~Revised~~

THE "GANISTER" OR "SILICA" DEPOSITS in length
OF SOUTHWESTERN ILLINOIS
and 15 feet high. The ganister is dug down and loaded

directly. The present production of ganister in southern Illinois
is from northern Alexander County and the central and southern
parts of Union County. Four small mines have been worked, and
many other small prospects have been dug. The mines are as
follows:

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1. Novaculite Paving Co.'s mine, in sec.1, T.14 S.,
R.2 W., Mgr. Edw. Bryden, Tamms, Illinois.
2. J. W. Joynt's mine, at Tamms, Illinois, in
sec.18, T.14, R.1.
3. Western Fire Brick Co.'s mine, sec.18, T.14, R.1.
4. Geo. Hartline's mine, at Elco, Ill., sec.18, T.14, R.1.
5. Isco-Brazz Co.'s mine, 2 miles N.E. of Wolf Lake,
N.1/2 NE.1/4 sec.2, T.12 S., R.3 W.

The workings are all in the cherts of the Upper
Oriskany, or Clear Creek, formation of the Devonian, only the
more decomposed parts of the chert beds being used. The greatest
thicknesses at present worked at a single place is 25 or 30 feet,
but far greater thicknesses are in places available. Different
levels of the chert are worked in different places.

The "ganister" or "silica" was derived from the de-
composition of the chert. In some places the bedding can be
traced along the walls of the mines, and the more compact beds
still preserve their identity. The silica is the manufacture of
refractories, and the Mines and Production in limited quan-
tities. The Novaculite Paving Co., has shipped about 70 cars
from their pit to the St. Louis Refractory Co.'s plant at Crawford,
Illinois, the Murphysboro Paving Brick Co., at Murphysboro, Illin-
ois, and the Parker-Russell Mining and Mfg. Co., of St. Louis.

More than 100 acres held by this company is said to be underlain
by "ganister", and the present tunnel has been driven 150 feet.
The present output from the pit of the Western Fire
Brick Co. averages one car per week, with a maximum of three cars
per week. In all, 14 cars have been shipped from this working
to the plant of this company at Granite City, Illinois.

Their pit is a large domed tunnel 60 feet in length and 15 feet high. The "ganister" is blasted down and loaded directly into wagons. A test pit 32 feet deep is said to have been dug near the mouth of this tunnel, and did not reach the bottom of the "ganister", but showed a poorer quality with depth.

The pit of J. W. Joynt is reported to have produced about the same quantity as that of the Western Fire Brick Co. The material has been used in the manufacture of silica brick, and fire brick, the latter by Hanlin and Mills of the Western Fire Brick Co., at Granite City, Illinois.

The mines of the Isco-Bautz Co., near Wolf Lake, have worked a thickness of 15 feet of silica, and an additional 15 feet below the present workings could be used for refractories. The output is now about 10 tons per day, but is soon to be increased to 100 tons per day.

Occurrences of "ganister" are reported in several other places in the parts of the counties above mentioned, and there seems no doubt that a large amount could be made available if the demand was developed.

Experiments are said to have been made by several companies with a view to using this silica in the manufacture of refractories, and such brick are now produced in limited quantities, with satisfactory results regarding quality. Such experiments were made by the Murphysboro Paving Brick Co. and the Isco-Bautz Co., both of Murphysboro, Illinois.

Thirty cars or more of the coarser screenings from the so-called Novaculite Paving material have been shipped to the St. Louis Refractory Co. by the Novaculite Paving Co from the pit two miles north of Tamms. This is hard, angular, light-colored chert and when ground produced brick of white to pink color which have been shipped in commercial quantities to Pittsburg, and other places. There are great quantities of this harder chert material available, the greatest drawback being the cost of grinding.

Both Silica and Ganister are blasted down in the mines and then shoveled into wagons from the floor. The "ganister" has about

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THE "GASTHER" OR "SILICA" DEPOSITS OF SOUTHWESTERN ILLINOIS

the consistency of cornmeal, with a few larger masses that will not crumble easily. The "silica" is a fine gritty powder, when pulverized, but shows a greater tendency to occur in angular lumps.

Four small mines have been worked, and many other small prospects have been dug. The mines are as follows:

1. Novasulite Mining Co.'s mine, in sec. 1, T.14 S., R.2 W., 1/2 mi. S.W. of Danon, Tanis, Illinois.
2. J. W. Joyce's mine, at Tanis, Illinois, in sec. 18, T.14, R.1.
3. Western Fire Brick Co.'s mine, sec. 18, T.14, R.1.
4. Gen. Hartling's mine, 2 1/2 miles N.W. of Tanis, Ill., sec. 18, T.14, R.1.
5. Inco-Brazza Co.'s mine, 2 miles N.W. of Tanis, Ill., 1/2 mi. S.W. of Tanis, sec. 18, T.14 S., R.2 W.

The workings are all in the cherts of the Upper Ordovician, or Clear Creek, formation of the Devonian, only the more decomposed parts of the chert beds being used. The greatest thickness of deposit worked at a single place is 25 or 30 feet, but far greater thicknesses are in places available. Different levels of the chert are worked in different places.

The "gasther" or "silica" was derived from the decomposition of the chert. In some places the bedding can be traced along the walls of the mine, and the more compact beds still preserve their identity.

Mines and Production

The Novasulite Mining Co. has shipped about 10 cars







