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ILLINOIS MINERALS NOTE 62

ILLINOIS MINERAL INDUSTRY IN 1973

and Review of Preliminary Mineral Production Data for 1974

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ILLINOIS MINERAL INDUSTRY

Three types of operation make up the mineral industry of Illinois. First is the actual removal of the mineral materials from the ground by mining or other means of extraction. Second is the processing of crude mineral materials, most of them mined outside of Illinois, into basic industrial raw materials. Third is the manufacturing of mineral products, such as coke, cement, and lime, from mineral materials, most of which are extracted and processed in Illinois. Table 1 lists the commodities in all three categories and gives their production and values from 1971 through 1973.

Illinois in 1973 ranked tenth among the states in value of mineral production, according to figures from the U.S. Bureau of Mines. Table 2 shows Illinois mineral production for 1973, by mineral commodity, and its percentage of the total national output.

Mineral Materials Mined

The 1973 value of mineral commodities mined in Illinois was 759.3 million dollars, about 8.3 percent above the 1972 value (table 1). The mineral fuels—coal, crude oil, and natural gas—accounted for 71.9 percent of the 1973 total, industrial and construction materials—clays, fluorspar, sand and gravel, stone, and tripoli—added 27.6 percent, while the metals—lead, zinc, and silver—along with other minerals such as peat and gemstones made up the remaining 0.5 percent.

TABLE 1—PRODUCTION AND VALUE OF MINERAL MATERIALS MINED AND/OR PROCESSED AND MINERAL PRODUCTS MANUFACTURED IN ILLINOIS, 1971-1973

Commodity	Unit	1973 Quantity	1973 Value ($1000)	1973 Average unit value ($)	1972 Quantity	1972 Value ($1000)	1972 Average unit value ($)	1971 Quantity	1971 Value ($1000)	1971 Average unit value ($)
MINERAL MATERIALS MINED										
FUELS										
Coal	thousand tons	61,549	$412,992	$ 6.71	65,521	$402,301	$ 6.14	58,415	$318,947	$ 5.46
Crude oil	thousand bbl	30,669	132,490	4.32	34,874	121,013	3.47	39,084	135,621	3.47
Natural gas	million cu ft	1,638	573	0.35	1,194	334	0.28	498	139	0.28
Natural gas liquids*	thousand bbl	—	—	—	168	566	3.37	184	620	3.37
TOTAL			546,055			524,214			455,327	
INDUSTRIAL AND CONSTRUCTION MATERIALS										
Clays										
Common	thousand tons	1,660	3,003	1.81	1,610	2,652	1.65	1,622	2,675	1.64
Refractory	thousand tons	97	609	6.28	106	662	6.24	90	513	5.72
Absorbent	thousand tons	W	W	W	W	W	W	W	W	W
Fluorspar (shipments)	tons	165,813	12,278	74.05	132,405	9,961	75.23	138,051	9,883	71.59
Sand and gravel										
Sand, construction	thousand tons	19,508	24,234	1.24	17,023	19,109	1.12	18,793	20,578	1.09
Sand, industrial	thousand tons	4,976	21,537	3.92	5,173	19,218	3.71	4,728	16,781	3.55
Gravel, common	thousand tons	21,692	31,387	1.45	17,734	23,367	1.32	23,466	29,581	1.26
Stone (limestone and dolomite)										
Crushed and broken	thousand tons	66,650	114,007	1.71	56,260	94,225	1.67	57,346	93,997	1.69
Dimension	thousand tons	W	W	W	W	W	W	4	60	15.00
Tripoli	thousand tons	W	W	W	W	W	W	W	W	W
TOTAL			207,055			169,194			174,068	
METALS										
Lead	tons	541	176	325.32	1,335	401	300.55	1,238	342	276.00
Zinc	tons	5,250	2,169	413.14	11,378	4,039	355.00	12,706	4,091	322.00
Silver	tons	W	W	W	W	W	W	W	W	W
TOTAL			2,345			4,440			4,433	
OTHERS										
Peat	thousand tons	72	1,037	W	74	W	W	72	W	W
Oem stones		—	W	—	—	W	—	—	W	—
Oermanium		—	NA	—	—	NA	—	—	NA	—
TOTAL			W			W			W	
Values that cannot be disclosed (W)			2,792			3,393			3,020	
Total value of mineral materials mined†			759,284			701,242			636,848	
MINERAL MATERIALS PROCESSED										
Natural gas liquids†	thousand bbl	8,650	$ 23,919	$ 2.77	8,610	$ 17,908	$ 2.08	8,154	$ 16,960	$ 2.08
Rare earths		NA	NA	NA	NA	NA	NA	NA	NA	NA
Oround mica		—	W	—	—	W	—	—	W	—
Expanded perlite		—	W	—	—	W	—	—	W	—
Barite, ground		—	W	—	—	W	—	—	W	—
Gypsum, calcined		—	W	—	—	W	—	—	W	—
Exfoliated vermiculite		—	W	—	—	W	—	—	W	—
Iron oxide pigments		—	W	—	—	W	—	—	W	—
Bismuth		NA	NA	NA	NA	NA	NA	NA	NA	NA
Primary slab zinc		NA	NA	NA	NA	NA	NA	NA	NA	NA
Secondary slab zinc		NA	NA	NA	NA	NA	NA	NA	NA	NA
Columbium		NA	NA	NA	NA	NA	NA	NA	NA	NA
Pig iron	thousand tons	7,964	585,054	75.24	7,197	542,883	75.43	6,500	448,882	69.06
TOTAL			608,973			560,791			465,842	
Values that cannot be disclosed (W)			26,435			21,157			16,124	
Total value of mineral materials processed†			635,408			581,948			481,966	

(Concluded on next page)

Illinois in 1973 was the nation's foremost shipper of fluorspar and tripoli, was second in the production of peat and stone, third in sand and gravel production, and was the fourth largest coal producer. Extraction of mineral materials was reported by 99 of the state's 102 counties (tables 3 and 4). Perry County had the highest production value of any Illinois county. Although it produced only coal and crude oil, its mineral production value was 75.3 million dollars, approximately 10 percent of the total value for the entire state.

Mineral Materials Processed

Processing of foreign raw mineral materials, most of them produced in other states, was done in 13 Illinois counties (tables 3 and 4). Pig iron, natural gas liquids, ground mica, expanded perlite, ground barite, calcined gypsum, exfoliated vermiculite, iron oxide pigments, and both primary and secondary slab zinc were processed and had a total value of 635 million dollars. Of that total, 92 percent was contributed by pig iron produced in Cook and Madison Counties. In addition, elemental sulfur was recovered, the value of which is included with lime to avoid disclosing confidential data from individual companies.

The state's production of expanded perlite and iron oxide pigments was the highest in the United States. Illinois ranked fifth in the quantity and sixth in the value of elemental sulfur recovered.

TABLE I - *Continued*

Commodity	Unit	1973 Quantity	1973 Value ($1000)	1973 Average unit value ($)	1972 Quantity	1972 Value ($1000)	1972 Average unit value ($)	1971 Quantity	1971 Value ($1000)	1971 Average unit value ($)
MINERAL PRODUCTS MANUFACTURED										
Cement (shipments)										
Portland	thousand tons	1,572	36,064	22.94	1,571	33,124	21.08	1,425	25,975	18.23
Masonry	tons	88	2,901	32.97	80	2,483	31.18	73	2,336	31.98
Clay products, estimated		—	56,453	—	—	69,248	—	—	59,759	—
Lime	tons	W	W	17.78	W	W	W	W	W	W
Sulfur*	tons	W	W	W	W	W	W	W	W	W
Coke	thousand tons	1,941	83,308	42.92	2,085	82,816	39.72	2,144	80,207	37.41
Glass		NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL			178,726			187,671			168,277	
Values that cannot be disclosed (W)			21,974			18,025			17,046	
Total value of mineral products manufactured			200,700			205,696			185,323	
STATE TOTAL†			$1,594,985			$1,488,886			$1,304,137	

Source: U.S. Bureau of Mines, Illinois Department of Mines and Minerals, Illinois State Geological Survey.
* Produced in Illinois, according to the American Petroleum Institute.
† Data may not add to totals shown because figures have been rounded.
‡ Processed in Illinois.
‡ Values and amounts of sulfur processed are included with total of mineral products manufactured to avoid disclosing individual company confidential data on lime.
W - Withheld to avoid disclosing individual company confidential data.
NA - Not available.

Mineral Products Manufactured

The manufacture of mineral products in Illinois, mainly from materials mined within the state, included cement, coke, lime, clay products, and glass. Their combined value was 201 million dollars in 1973, a decrease from the 205.7 million reported in 1972. Coke was responsible for 42 percent of the total value, and clay products accounted for 27 percent. No figures were available for the value of glass manufactured in Illinois.

Employment and Wages

Illinois Department of Labor data indicate the Illinois mineral industry provided employment for 148,000 people in 1973. This included 22,900 people in mining, quarrying, and oil and gas extraction, 84,000 people in mineral processing, and 41,800 people in manufacturing mineral products (table 5).

TABLE 2—ILLINOIS MINERAL PRODUCTION, ITS VALUE, AND ITS PERCENTAGE OF UNITED STATES MINERAL PRODUCTION, 1973

Commodity	Unit	Illinois		United States		Illinois percentage of United States production	
		Quantity	Value ($1000)	Quantity	Value ($1000)	Quantity	Value
Fluorspar shipments	thousand tons	165	12,278	241	17,880	68.46	68.67
Peat, commercial sales	thousand tons	72	1,037	635	7,547	11.34	13.74
Coal	thousand tons	61,549	412,992	589,788	3,715,664	10.44	11.12
Pig iron	thousand tons	7,964	585,054	100,837	7,774,533	7.90	7.53
Stone	thousand tons	66,650	114,007	1,060,124	1,990,463	6.29	5.73
Sand and gravel	thousand tons	46,176	77,158	983,629	1,359,370	4.69	5.68
Coke	thousand tons	1,941	83,308	64,325	2,575,150	3.02	3.24
Clays	thousand tons	1,758	3,613	64,814	354,531	2.71	1.01
Zinc	thousand tons	5	2,169	485	204,670	1.03	1.06
Cement shipments	thousand tons	1,660	38,965	86,399	1,890,270	1.92	2.06
Crude oil	thousand bbl	30,669	132,490	3,356,000	13,057,905	0.91	1.01
Lead	thousand tons	0.5	176	603	198,990	0.08	0.09
Natural gas liquids produced	thousand bbl	8,650	23,919	633,000	1,753,410	1.37	1.36
Natural gas	million cu ft	1,638	573	22,647,549	4,894,000	*	0.012
Lime	thousand tons	W	W	21,082	421,050	W	W

Source: United States Bureau of Mines, Illinois State Geological Survey, Illinois Department of Mines and Minerals, and American Petroleum Institute.

* Less than one one-hundreth.

W - Withheld to avoid disclosing confidential data from individual companies.

TABLE 3—VALUE OF MINERAL MATERIALS MINED AND/OR PROCESSED AND MINERAL PRODUCTS MANUFACTURED IN ILLINOIS IN 1973, BY COUNTY

County	Mineral materials mined, in order of value	Value ($1000)	Mineral materials processed, in order of value	Value ($1000)	Mineral products manufactured, in order of value	Value ($1000)	Total value ($1000)
Adams	Stone, sand and gravel, crude oil	2,608	Iron oxide pigments	W	Lime	W	W
Alexander	Tripoli, sand and gravel	W	—	—	—	—	W
Bond	Sand and gravel, crude oil, clay	W	—	—	—	—	W
Boone	Stone, sand and gravel	W	—	—	—	—	W
Brown	Sand and gravel, clay, crude oil	33	—	—	Clay products	W	W
Bureau	Sand and gravel, stone	581	—	—	Clay products	W	W
Calhoun	Stone, sand and gravel	W	—	—	—	—	W
Carroll	Stone, sand and gravel	423	—	—	—	—	423
Cass	—	—	—	—	—	—	—
Champaign	Sand and gravel	701	—	—	—	—	701
Christian	Coal, crude oil, stone	W	—	—	—	—	W
Clark	Stone, crude oil, sand and gravel	W	—	—	—	—	W
Clay	Crude oil, stone	W	—	—	—	—	W
Clinton	Crude oil, stone, sand and gravel	W	—	—	—	—	W
Coles	Stone, crude oil, natural gas, sand and gravel	2,988	—	—	—	—	2,988
Cook	Stone, sand and gravel, clay, peat*	34,011	Pig iron*, expanded perlite, sulfur†, ground mica, secondary slab zinc†, bismuth†	2,221	Coke*, lime, clay products, glass	27,037	63,269
Crawford	Crude oil, sand and gravel	6,081	Sulfur†	W	Clay products	W	15,869
Cumberland	Crude oil, sand and gravel, stone	828	—	—	—	—	828
De Kalb	Sand and gravel, stone	W	Exfoliated vermioulite, expanded perlite	W	—	—	25,198
De Witt	Crude oil, sand and gravel	776	—	—	—	—	776
Douglas	Coal, stone, crude oil	W	Natural gas liquids	—	—	—	W
Du Page	Sand and gravel, stone	W	Exfoliated vermiculite, rare earths	W	Glass	W	W
Edgar	Crude oil	484	—	—	—	—	484
Edwards	Crude oil	1,961	—	—	Clay products	W	W
Effingham	Crude oil	1,114	—	—	—	—	1,114
Fayette	Crude oil, stone, sand and gravel, clay	W	—	—	Clay products	W	14,881
Ford	Sand and gravel	628	—	—	—	—	628
Franklin	Coal, crude oil	46,002	—	—	—	—	46,002
Fulton	Coal, sand and gravel	21,436	—	—	—	—	21,436
Gallatin	Coal, crude oil, sand and gravel	15,232	—	—	—	—	15,232
Greene	Stone	W	—	—	Clay products	W	W
Grundy	Sand and gravel, coal, clay	4,561	—	—	Clay products	W	W
Hamilton	Crude oil	4,055	—	—	—	—	4,055
Hancock	Stone	1,085	—	—	—	—	1,085
Hardin	Fluorspar, stone, zinc, lead, silver, sand and gravel, germanium	12,281	—	—	—	—	12,281
Henderson	Stone	W	—	—	—	—	W
Henry	Stone	W	—	—	—	—	W
Iroquois	Stone, sand and gravel	W	—	—	—	—	W
Jackson	Stone, sand and gravel, coal	782	—	—	—	—	782
Jasper	Crude oil, sand and gravel	2,840	—	—	—	—	2,840
Jefferson	Coal, crude oil	52,692	—	—	—	—	52,692
Jersey	Stone	219	—	—	—	—	219
Jo Daviess	Sand and gravel, zinc, stone, lead, silver	2,214	—	—	—	—	2,214
Johnson	Stone, coal	W	—	—	—	—	W
Kane	Sand and gravel, stone, peat*	10,042	Iron oxide pigments	W	Clay products	W	W

(Continued on next page)

TABLE 3—*Continued*

County	Mineral materials mined, in order of value	Value ($1000)	Mineral materials processed, in order of value	Value ($1000)	Mineral products manufactured, in order of value	Value ($1000)	Total value ($1000)
Kankakee	Stone, sand and gravel, clay	1,401	—	—	Clay products	W	W
Kendall	Stone, sand and gravel	692	—	—	—	—	692
Knox	Coal, stone, olay	W	—	—	Clay products	W	14,141
Lake	Sand and gravel, stone, peat*	W	Calcined gypsum, expanded perlite, columbium†	1,930	Clay products, glass, fiber glass	W	4,982
La Salle	Sand and gravel, olay, stone	W	—	—	Clay products, cement, glass	W	38,312
Lawrence	Crude oil, sand and gravel	16,674	—	—	—	—	16,674
Lee	Stone, sand and gravel	W	—	—	Cement	W	16,616
Livingston	Stone, clay, sand and gravel	W	—	—	Clay products	W	5,111
Logan	Sand and gravel, stone	W	—	—	Glass	W	W
McDonough	Stone, crude oil, olay	1,054	—	—	Clay products	W	W
McHenry	Sand and gravel	10,073	—	NA	—	—	W
McLean	Sand and gravel	746	—	—	Fiber glass	—	W
Macon	Sand and gravel, crude oil	934	—	—	Glass	W	W
Macoupin	Coal, stone	W	Exfoliated vermioulite	W	—	—	20,501
Madison	Stone, crude oil, sand and gravel	3,102	Pig iron*, sulfur†	W	Coke*, olay products, glass	W	W
Marion	Crude oil, stone	W	Secondary slab zinc†	NA	Glass	W	W
Marshall	Sand and gravel	59	—	—	—	—	59
Mason	Sand and gravel	41	—	—	—	—	41
Massac	Stone, sand and gravel	W	—	—	Cement	W	16,572
Menard	Stone	W	—	—	—	—	W
Mercer	Stone, coal	W	—	—	—	—	W
Monroe	Stone	W	—	—	—	—	W
Montgomery	Coal, stone, crude oil	17,158	—	—	Glass	W	W
Morgan	—	—	—	—	—	—	—
Moultrie	Sand and gravel, crude oil	22	—	—	—	—	22
Ogle	Sand and gravel, stone	W	—	—	—	—	W
Peoria	Coal, sand and gravel, stone	14,203	—	—	—	—	—
Perry	Coal, crude oil	75,282	—	—	—	—	75,282
Piatt	—	—	—	—	—	—	—
Pike	Stone, sand and gravel	W	—	—	—	—	W
Pope	Fluorspar‡, sand and gravel, zinc, lead, silver, germanium	5,953	—	—	—	—	5,953
Pulaski	Clay, stone, sand and gravel	1,327	—	—	Clay products	W	W
Putnam	Sand and gravel	11	—	—	—	—	11
Randolph	Coal, stone, sand and gravel, crude oil	W	—	—	—	—	W
Richland	Crude oil	4,605	—	—	—	—	4,605
Rock Island	Stone, sand and gravel	2,955	—	—	—	—	2,955
St. Clair	Coal, stone, crude oil, sand and gravel	W	Iron oxide pigments, primary slab zinc†, ground barite	W	Glass	W	65,205
Saline	Coal, crude oil, natural gas	17,835	—	—	—	—	17,835
Sangamon	Coal, sand and gravel, crude oil, stone	W	—	—	—	—	W
Schuyler	Sand and gravel, stone	W	—	—	—	—	W
Scott	Stone, clay, sand and gravel	W	—	—	—	—	W
Shelby	Stone, sand and gravel, crude oil	565	—	—	—	—	565
Stark	Coal, sand and gravel	W	—	—	—	—	W
Stephenson	Stone, sand and gravel	845	—	—	—	—	845
Tazewell	Sand and gravel, clay	W	—	—	Clay products	W	2,376
Union	Stone, sand and gravel	W	—	—	—	—	W
Vermilion	Stone, sand and gravel, coal, clay	2,406	—	—	—	—	2,406

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TABLE 3—*Concluded*

County	Mineral materials mined, in order of value	Value ($1000)	Mineral materials processed, in order of value	Value ($1000)	Mineral products manufaotured, in order of value	Value ($1000)	Total value ($1000)
Wabash	Crude oil, coal, sand and gravel	5,313	—	—	—	—	5,313
Warren	Stone	W	—	—	Clay products	W	4,692
Washington	Crude oil, stone	W	—	—	—	—	W
Wayne	Crude oil	13,862	—	—	—	—	13,862
White	Crude oil, sand and gravel	16,260	—	—	—	—	16,260
Whiteside	Stone, sand and gravel, peat*	1,544	—	—	—	—	1,544
Will	Stone, sand and gravel, coal	15,674	Expanded perlite, sulfur†	W	Clay products, glass	W	22,906
Williamson	Coal, crude oil, natural gas, stone	25,095	—	—	—	—	25,095
Winnebago	Stone, sand and gravel	2,953	—	—	—	—	2,953
Woodford	Sand and gravel	2,026	—	—	—	—	2,026
Values that cannot be disclosed#		270,919	—	46,203	—	90,355	407,477
Undistributed	Peat*	1,037	Pig iron*	585,054	Coke*	83,308	668,362
Total		759,284		635,408		200,700	1,594,985

Source: U.S. Bureau of Mines, Illinois Department of Mines and Minerals, and Illinois State Geological Survey.
* Peat, pig iron, and coke values not available by county.
† Sulfur values included with mineral products manufactured to avoid disclosing individual company confidential data on lime.
† Value unknown; not included in total.
‡ Fluorspar and metals values included with Hardin County.
# Includes values indicated by symbol W and gem stones that cannot be assigned to specific counties.
W - Withheld to avoid disclosing individual company confidential data; included with "Undistributed."
NA - Not available.

TABLE 4—MINERAL MATERIALS PRODUCED IN ILLINOIS, BY COMMODITY, 1973

Commodity	Type of production*	Number of producing counties	County rank, by quantity produced†	Commodity	Type of production*	Number of producing counties	County rank, by quantity produced†
Barite, ground	P	1	St. Clair	Lime	Mf	2	Cook, Adams
Bismuth	P	1	Cook	Mica, ground	P	1	Cook
Cement	Mf	3	Lee, Massac, La Salle	Natural gas	M	4	Coles, Saline, Williamson, Gallatin
Clays	M	14	La Salle, Cook, Livingston, Vermilion, Pulaski, Bond, Grundy, Kankakee, Knox, Soott	Natural gas liquids	P	1	Douglas
				Peat	M	4	Lake, Whiteside, Kane, Cook‡
Clay products	Mf	21	QNA†	Perlite, expanded	P	4	Will, Cook, Lake, De Kalb
Coal	M	22	Perry, Jefferson, St. Clair, Franklin, Randolph, Williamson, Pulton, Macoupin, Saline, Montgomery	Pig iron	P	2	Cook, Madiaon‡
				Rare earths	P	1	Du Page
				Sand and gravel, common	M	69	McHenry, Kane, Will, La Salle, Grundy, Du Page, Lake, Cook, Sangamon, Peoria
Coke	Mf	2	Cook, Madison				
Columbium	P	1	Lake	Sand, industrial	M	4	La Salle, Ogle, White, Fayette
Crude oil	M	39	Lawrenoe, White, Fayette, Wayne, Marion, Clay, Crawford, Wabash, Richland, Hamilton	Silver	M	3	Hardin, Pope, Jo Daviess
				Stone, crushed and broken	M	64	Cook, Will, St. Clair, Hardin, Livingston, Clark, Lee, Randolph, Montgomery, Kane
Fluorspar	M	2	Hardin, Pope				
Gem stones	M	NA	NA	Stone, dimension	M	1	Kane
Germanium	M	2	Hardin, Pope	Sulfur	P	4	Madison, Will, Crawford
Glass	Mf	9	QNA†	Tripoli	M	1	Alexander
Gypsum, calcined	P	1	Lake	Vermiculite, exfoliated	P	3	Du Page, De Kalb, Macoupin
Iron oxide pigments	P	3	St. Clair, Adams, Kane	Zinc, primary	P, M	4	St. Clair, Hardin, Jo Daviess, Pope
Lead	M	3	Hardin, Jo Daviess, Pope	Zinc, secondary slab	P	2	Marion, Cook‡

Source: U.S. Bureau of Mines, Illinois Department of Mines and Minerals, and Illinois State Geological Survey.
* M - mined or otherwise extracted, P - processed, Mf - manufactured.
† Por commodities produced in more than 10 counties, only the first 10 counties are listed.
† Quantity not applicable.
‡ County rank estimated.
NA - Not available.

TABLE 5—NUMBER OF EMPLOYEES, AVERAGE WEEKLY EARNINGS, HOURS WORKED AND HOURLY WAGES IN ILLINOIS MINERAL INDUSTRY, 1972 AND 1973

Class of employment	1973 Number of employeee (x 1000)	1973 Average weekly earnings ($)	1973 Average number of houre worked per week	1973 Average hourly earnings ($)	1972 Number of employeee (x 1000)	1972 Average weekly earnings ($)	1972 Average number of houre worked per week	1972 Average hourly earnings ($)
Mining	22.9	241.57	43.6	5.54	23.5	225.54	43.7	5.16
Bituminous coal	11.4	260.81	42.7	6.10	11.2	247.07	43.4	5.69
Oil and gae extraction	4.1	185.92	40.8	4.55	5.3	173.55	40.5	4.28
Other	6.5	255.33	46.2	4.87	6.9	203.59	45.6	4.47
Mineral processing								
Blast furnaces and basio eteel	51.2	231.48	42.2	5.48	48.5	211.07	41.2	5.12
Primary metal industries	20.6	213.69	43.9	4.87	18.7	193.64	42.6	4.54
Petroleum refining	12.2	237.37	41.9	5.67	10.7	223.93	42.2	5.30
Mineral product manufacturing								
Olass and glass products	13.8	202.69	41.8	4.84	13.7	187.79	42.1	4.46
Cement and clay products	5.0	158.82	39.1	4.07	5.1	154.43	40.5	3.81
Stone and other mineral products	18.4	197.81	43.0	4.60	18.1	183.07	42.4	4.32
Petroleum and coal products	4.6	204.40	44.7	4.58	4.6	190.27	44.6	4.26

Source: Illinois Department of Labor, Bureau of Employment Security.

Average weekly earnings of workers engaged in the extraction aspect of the Illinois mineral industry in 1973 were $241.57, an increase of $16.03 over the 1972 average earnings. The average number of hours worked per week was 43.6, about the same as in 1972. Weekly earnings of bituminous coal miners averaged $260.81, the highest in the Illinois mineral industry.

The average weekly and hourly earnings, number of hours worked per week, and number of people engaged in mineral processing and the manufacturing of mineral products in Illinois in 1972 and 1973 are shown in table 5.

Transportation of Minerals and Mineral Products

A considerable part of the transportation industry of Illinois is involved with the shipment of mineral materials. More than 100 million tons of mineral materials mined in Illinois was shipped by truck in 1973, and at least 67 million tons went by railroad. More than 50 percent of the total tonnage shipped by truck was crushed stone, and most of the rest was sand and gravel. Of the total amount of mineral material shipped by railroad more than 90 percent was coal. Other mined materials, such as pig iron, coke, and clay products, also were shipped by railroad, truck, and barge. Crude oil and natural gas were shipped largely by pipeline.

Consumption of Minerals and Energy in Illinois

Illinois is a leading manufacturing state, and it therefore consumes a large variety of mineral materials each year. Data for some of the mineral materials used in Illinois during 1972 and 1973 are shown in table 6.

On the average, Illinois consumption of most mineral commodities is about 6 percent of the total consumed in the nation. According to the U.S. Census Bureau, 5.5 percent of the nation's total population resides in Illinois. Mineral consumption in the state, therefore, is approximately in proportion to its population.

Illinois consumed an estimated 3537.5 trillion Btu of energy in 1973, or 4.68 percent of the total energy consumed in the United States (table 7). A large portion of energy used came from mineral fuels. In 1972, Illinois energy consumption was estimated at 3515.2 trillion Btu, or 4.88 percent of total U.S. energy consumed.

Trends in gross energy used in Illinois are shown in figure 1. In spite of an increase in total energy consumption in Illinois from 2215 trillion Btu in 1957 to 3537 trillion Btu in 1973, the role of coal as an energy source has declined while that of natural gas and oil products has grown. Nuclear power also is growing rapidly and partly replacing coal in the Illinois energy market.

INDIVIDUAL COMMODITIES

Mineral Materials Mined

Four major groups of mineral materials were mined in Illinois during 1973—fuels, industrial and construction materials, metals, and other minerals.

TABLE 6—MINERAL MATERIALS USED IN ILLINOIS, 1972 AND 1973

Commodity	Unit	1973			1972		
		United States	Illinois	Illinois percentage of U.S. consumption	United States	Illinois	Illinois percentage of U.S. consumption
FUELS							
Coal	million tons	589.8	40.6	6.88	519.7	42.0	8.08
Coke	million tons	64.3	3.8	5.91	59.9R	3.4	5.68R
Distillate fuel oil	million bbl	1,130.7	53.9	4.77	1,066.1	55.3	5.18
Gasoline	million bbl	2,448.0	120.6	4.93	2,350.7	115.2	4.90
Kerosine	million bbl	78.7	4.5	5.72	85.9	4.3	5.01
Liquefied petroleum gases	million bbl	527.3	15.7	2.98	519.8R	15.5R	2.98R
Natural gas	trillion cu ft	23.0	1.2	5.22	23.0	1.2	5.20
Residual fuel oil	million bbl	1,019.9	29.2	2.86	925.7	29.6	3.19
METALS							
Iron and stssl scrap	million tons	102.3	NA	NA	94.3	NA	NA
Pig iron	million tons	100.8	7.9	7.84	89.1	NA	NA
Lead	thousand tons	1,541.2	NA	NA	1,485.3	NA	NA
Zinc (slab)	thousand tons	1,520.0*	NA	NA	1,418.3	NA	NA
CONSTRUCTION MATERIALS							
Air-cooled slag	million tons	23.7	1.19*	5.02	20.9R	1.2*	5.74R
Asphalt	million tons	34.4	2.0	5.81	31.1R	1.9	6.11R
Cement (portland)	million tons	89.7	4.1	4.58	88.9	3.6	4.05
Lightweight aggregate	million tons	NA	NA	NA	10.7R	0.6*	5.61R
Road oil	million tons	1.4	0.2	14.29	1.4	0.2	14.29
Sand and gravel	million tons	983.6	43.6	4.43	902.0	34.7	3.85
Stone	million tons	1,060.1	66.7	6.29	920.4R	56.3R	6.11R
AGRICULTURAL AND CHEMICAL MATERIALS							
Feldspar	thousand tons	791.9	W	W	732.6	W	W
Fluorspar	thousand tons	1,351.7	86.7	6.41	1,352.0	67.4	4.98
Lime†	thousand tons	21,132.0	1,202.3	5.69	20,290.0	1,023.0	5.04
Potash							
Agricultural	thousand tons	NA	NA	NA	NA	NA	NA
Chemical	thousand tons	NA	NA	NA	NA	NA	NA
Salt							
Evaporated	thousand tons	5,905.0	365.0	6.18	5,926.0	353.0	5.96
Rock	thousand tons	12,024.0	1,046.0	8.70	15,044.0	1,304.0	8.66

Source: U.S. Bureau of Mines.
* Estimated.
† Excludes regenerated lime.
NA - Not available.
W - Withheld to avoid disclosing individual company confidential data.
R - Revised.

The commodities in each of these categories and the statistical data for each are discussed below.

Fuels

Coal

Production—Illinois in 1973 was once again the fourth largest coal-producing state in the nation as it produced a total of 61.5 million tons valued at $413.0 million. Although value increased 2.7 percent, production declined 6 percent. The increase in value was due to the rise in average f.o.b. mine price from $6.14 per ton in 1972 to $6.71 per ton in 1973. The decline in production has several causes. Losses have occurred at several strip mining operations because of disputes over land reclamation, at several mines making adjustments to the shrinking high-sulfur coal market, at others for lack of railroad hopper cars for shipping the coal, and at a number of operations because of wildcat strikes.

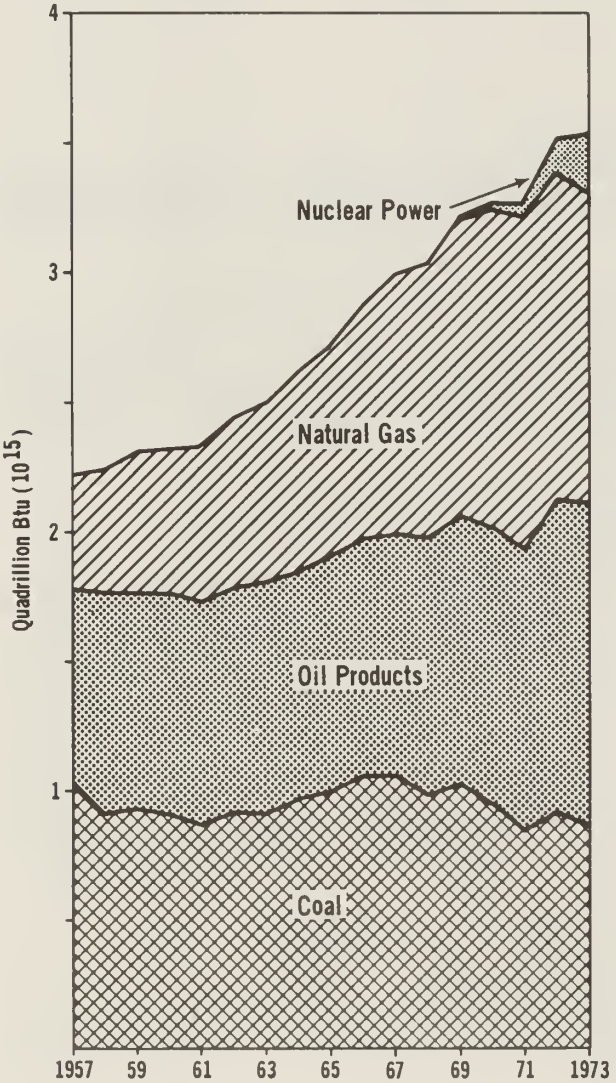

Fig. 1 - Gross energy used in Illinois from 1957 through 1973, by type of fuel or energy source. Hydropower's contribution is too small to show. Nuclear power began in 1960, but its contribution was too small to show prior to 1969.

Coal was mined in 25 Illinois counties during 1973. Seven counties—Perry, Jefferson, St. Clair, Franklin, Randolph, Williamson, and Fulton—contributed over 70 percent of the total coal produced (table 8). Strip mines were operated in 16 counties. The counties leading in strip-mine production included Perry (38.7 percent), St. Clair (14.8 percent), Fulton (10.8 percent), and Randolph (9.8 percent). Underground mining of coal was reported

TABLE 7--FUELS AND ENERGY CONSUMED IN ILLINOIS, 1972 AND 1973

Fuel	Units	1973	1972	Change from 1972-1973 (%)	Trillion Btu 1973	Trillion Btu 1972
Coal	thousand tons	40,628	42,028	- 3.33	893.8	924.6
Natural gas	million cu ft	1,163,800	1,220,635	- 4.66	1,199.9	1,258.5
Gasoline	thousand bbl	120,558	115,526	+ 4.17	632.7	606.3
Kerosine	thousand bbl	4,485	4,317	+ 3.75	25.4	24.5
Distillate fuel oil	thousand bbl	53,865	55,276	- 2.56	313.8	322.0
Residual fuel oil	thousand bbl	29,195	29,581	- 1.30	183.5	186.0
Liquid petroleum gases	thousand bbl	15,727	15,544	+ 1.18	63.1	62.4
Hydropower	thousand kilowatt hr	98,343*	150,070	-34.46	1.0	1.6
Nuclear power	million kilowatt hr	21,041	12,131	+173.4	224.3	129.3
Total				+ 0.63	3,537.5	3,515.2
Illinois percentage of Unitsd States total energy consumption					4.68	4.88
Percentage of total energy consumed in Illinois, by sources:						
Coal					25.27	26.30
Natural gas					33.92	35.80
Oil products					34.44	34.17
Nuclear power					6.34	3.68
Hydropower					0.03	0.05
					100.00	100.00

Source: U.S. Bureau of Mines, American Petroleum Institute, and Federal Power Commission.
Fuel conversion factors:
Coal - 22,000,000 Btu/ton (@ 11,000 Btu/lb)
Natural gas - 1,031 Btu/Mcf
LPG - 4,011,000 Btu/bbl
Gasoline - 5,248,000 Btu/bbl
Kerosine - 5,670,000 Btu/bbl
Distillate fuel oil - 5,825,000 Btu/bbl
Residual fuel oil - 6,287,000 Btu/bbl
Nuclear power - 10,660 Btu/net kwh
Hydropower - 10,478 Btu/kwh
* Estimated; based on 6-month average.

TABLE 8—ILLINOIS COAL PRODUCTION BY COUNTY IN 1972 AND 1973

County	1973 Production					1972 Production				
	Number of mines	Underground (tons)	Strip (tons)	Total (tons)	Value†	Number of mines	Underground (tons)	Strip (tons)	Total (tons)	Value†
Christian	1†	1,736,673	—	1,736,673	$ 11,653,075	1†	2,036,524	—	2,036,524	$ 12,504,257
Douglas	2	1,624,793	—	1,624,793	10,902,361	1	1,241,316	—	1,241,316	7,621,680
Franklin	3	6,482,077	—	6,482,077	43,494,737	4	7,269,942	—	7,269,942	44,637,444
Fulton	3	—	3,136,175	3,136,175	21,043,734	4	—	4,375,307	4,375,307	26,864,385
Gallatin	3	1,556,685	303,875	1,860,560	12,484,358	3	1,746,245	646,244	2,392,489	14,689,882
Grundy	1‡	—	186,427	186,427	1,250,925	1‡	—	256,574	256,574	1,575,364
Jackson	1	—	4,675	4,675	31,369	2	—	142,238	142,238	873,341
Jefferson	4	6,625,881	663,195	7,289,076	48,909,700	4	6,427,931	945,256	7,373,187	45,271,368
Johnson	2	—	4,938	4,938	33,134	1	—	4,095	4,095	25,143
Knox	1	—	1,015,777	1,015,777	6,815,864	1	—	1,518,728	1,518,728	9,324,990
Macoupin	1	2,694,505	—	2,694,505	18,080,129	1	1,974,355	—	1,974,355	12,122,540
Mercer	2	12,292	5,627	17,919	120,236	2	29,638	10,623	40,261	247,203
Montgomery	2†	2,196,913	—	2,196,913	14,741,286	2†	3,565,886	—	3,565,886	21,894,540
Peoria	3	—	1,754,569	1,754,569	11,773,158	3	—	2,514,313	2,514,313	15,437,882
Perry	5	—	11,209,541	11,209,541	75,216,020	4	—	11,177,355	11,177,355	68,628,960
Pope	—	—	—	—	—	1	—	3,205	3,205	19,679
Randolph	4	2,133,718	2,833,015	4,966,733	33,326,778	4	940,786	3,041,174	3,981,960	24,449,234
St. Clair	2	2,229,604	4,296,663	6,526,267	43,791,252	3	2,325,849	4,996,866	7,322,715	44,961,470
Saline	6	1,390,557	1,092,589	2,483,146	16,661,910	8	1,236,918	1,212,613	2,449,531	15,040,120
Sangamon	1†	2,107,972	—	2,107,972	14,144,492	1†	1,081,689	—	1,081,689	6,641,570
Stark	1	—	379,038	379,038	2,543,345	1	—	502,231	502,231	3,083,698
Vermilion	1	422	—	422	2,832	1	16,203	—	16,203	99,486
Wabash	1	38,313	—	38,313	257,080	—	—	—	—	—
Will	1‡	—	227,673	227,673	1,527,686	1‡	—	262,184	262,184	1,609,810
Williamson	8	1,746,948	1,857,540	3,604,488	24,186,114	8	1,822,513	2,196,593	4,019,106	24,677,311
Total	56	32,577,353	28,971,317	61,548,670	$412,991,575	59	31,715,795	33,805,599	65,521,394	$402,301,359
Percentage mined by each method		53.0	47.0				48.4	51.6		

* Production figures from Illinois State Department of Mines and Minerals Annual Coal, Oil and Gas Reports for 1972 and 1973.
† Value calculated at an average of $6.14 per ton for 1972 and $6.71 for 1973.
† One mine operated at junction of Christian, Montgomery, and Sangamon Counties.
‡ One mine operated at junction of Grundy and Will Counties.

in 15 counties. Counties producing over 2 million tons of coal mined underground included Jefferson, Franklin, Macoupin, Montgomery, St. Clair, Randolph, and Sangamon.

Cumulative coal production by county is shown in table 9. A total of 4441 million tons has been produced from Illinois coal mines since 1833. Of this amount nearly 20 percent is estimated to have been extracted by strip mining and 80 percent by underground mining. Extensive strip mining did not begin in Illinois until the late 1920s.

The number of coal mines operating in Illinois continued to decline from 59 in 1972 to 56 in 1973, when 24 underground and 32 strip mines were in operation. The 32.6 million tons produced from the 24 underground mines was 53 percent of the total Illinois coal production (table 8), 2.7 percent higher than the 1972 level. Since 1966 the amount of coal produced in Illinois by underground mining has been gradually increasing, whereas production by strip mining has been declining (fig. 2). In 1973 production from the 32 strip mines totaled 28.9 million tons—14.3 percent less than the amount produced in 1972. In 1967, the peak year for strip mining in Illinois, 44 strip mines reported operation and produced 37.1 million tons of coal. The principal factors responsible for this steady decline in strip mine production in Illinois are the growing concern for reclamation of mined land and the depletion of shallow, easily minable coal deposits.

TABLE 9—CUMULATIVE COAL PRODUCTION IN ILLINOIS BY COUNTY, 1883-1973

County	Cumulative production* (tons)	Years active	Last year active	County	Cumulative production* (tons)	Years active	Last year active
Adams	341,924	26	1969	Marshall	12,516,141	70	1951
Bond	7,355,569	57	1942	Menard	13,462,005	84	1965
Brown	65,347	40	1963	Mercer	15,519,862	86	1973
Bureau	53,823,055	80	1964	Monroe	8,284	13	1941
Calhoun	96,247	27	1912	Montgomery	129,768,263	92	1973
Cass	212,477	53	1941	Morgan	190,787	64	1951
Christian	294,884,277	89	1973	Moultrie	2,032,236	16	1924
Clark	4,482	2	1955	Peoria	90,286,039	92	1973
Clay	801	1	1963	Perry	274,691,821	92	1973
Clinton	38,656,325	79	1960	Pike	5,081	8	1942
Coles	198,932	6	1888	Pope	23,747	14	1972
Crawford	45,400	16	1961	Putnam	10,071,893	29	1938
Douglas	14,516,115	28	1973	Randolph	121,119,667	92	1973
Edgar	915,698	41	1952	Richland	154	1	1890
Effingham	796	1	1890	Rock Island	3,846,169	67	1948
Franklin	581,001,049	75	1973	St. Clair	328,098,082	92	1973
Fulton	286,221,214	92	1973	Saline	240,944,002	92	1973
Gallatin	19,534,026	89	1973	Sangamon	239,580,452	87	1973
Greene	693,191	84	1967	Schuyler	7,747,691	84	1966
Grundy	44,494,989	90	1973	Scott	612,476	61	1942
Hamilton	22,097	16	1905	Shelby	4,119,763	67	1950
Hancock	771,281	72	1958	Stark	8,640,436	83	1973
Hardin	40	1	1890	Tazewell	17,633,802	75	1956
Henry	22,910,053	84	1965	Vermilion	164,951,503	92	1973
Jackson	97,516,102	92	1973	Wabash	236,539	37	1973
Jasper	23,739	11	1939	Warren	685,466	73	1954
Jefferson	83,284,493	70	1973	Washington	18,165,386	88	1969
Jersey	120,350	59	1951	White	1,676,741	36	1940
Johnson	296,851	58	1973	Will	44,125,049	92	1973
Kankakee	8,858,008	44	1969	Williamson	408,392,532	92	1973
Knox	59,035,437	92	1973	Woodford	7,810,160	70	1951
La Salle	65,547,638	79	1960				
Livingston	10,111,437	80	1961	Total cumulative production, 1882-1973			4,367,863,036
Logan	14,533,376	84	1968				
Macon	11,000,468	65	1947	Estimated production, all counties, 1833-1881			73,386,123
Macoupin	272,084,987	91	1973				
McDonough	2,634,903	69	1951				
McLean	5,544,139	47	1928				
Madison	164,295,772	83	1964	Total cumulative production, 1833-1973			4,441,249,159
Marion	39,247,722	82	1963				

* Production figures: Illinois State Department of Mines and Minerals Annual Coal, Oil and Gas Report, 1973.

The average production and average number of men employed for both underground and strip mining are shown in table 10. Average output per underground mine increased from 1,219,838 tons in 1972 to 1,357,390 tons in 1973. The average output per strip mine declined from 1,024,412 tons in 1972 to 905,353 tons in 1973. The average number of men employed at both strip and underground mining operations, however, increased in 1973. As is apparent from table 10, the average output per strip mine in Illinois seems to have leveled off, whereas the average output per underground mine is steadily increasing.

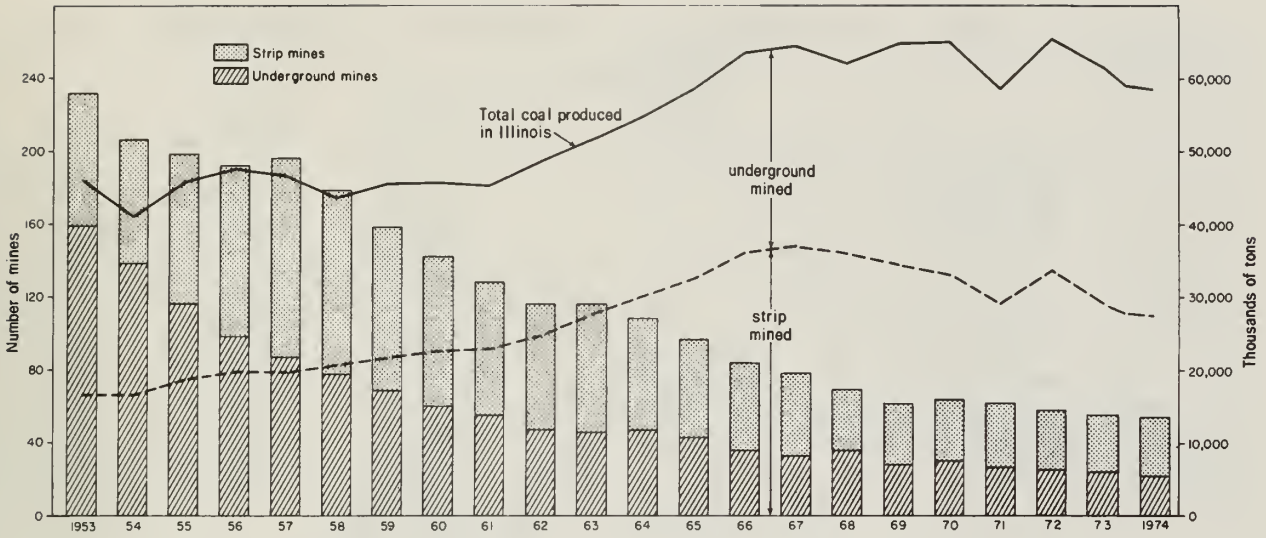

Fig. 2 - Trends in coal production in Illinois.

A part of this increase in average output per underground mine is attributable to the closing down of small underground mining operations.

During 1973, 26 coal mining companies were operating in Illinois. The production of each company is shown in table 11.

Employment and Wages—Of the 11,409 men employed in the Illinois coal mining industry, 7794 were in underground mining operations and 3615 in strip mine operations. In 1972, 11,237 men were employed—7870 in underground operations and 3367 in strip operations.

Although average hourly earnings for bituminous coal miners increased from $5.69 in 1972 to $6.10 in 1973, the number of hours worked per week dropped 0.7 hour to 42.7 (table 5). In 1971 average hours worked per week were 47.0 and average hourly earnings were $5.35.

TABLE 10—COAL MINES, MINING EMPLOYEES, AVERAGE PRODUCTION AND AVERAGE NUMBER OF EMPLOYEES BY METHOD OF MINING IN ILLINOIS, 1964-1973

	Underground				Strip			
Year	No. of mines	No. of employees	Av. output per mine (tons)	Av. number of employees per mine	No. of mines	No. of employees	Av. output per mine (tons)	Av. number of employees per mine
1973	24	7,794	1,357,390	325	32	3,615	905,353	113
1972	26	7,870	1,219,838	303	33	3,367	1,024,412	102
1971	27	7,088	1,090,886	262	36	3,483	804,480	97
1970	29	6,785	1,090,192	233	35	3,429	950,530	98
1969	28	5,944	1,077,237	212	34	3,647	1,019,411	107
1968	36	6,028	724,568	167	33	3,510	1,092,535	106
1967	33	5,392	837,879	163	44	3,413	844,654	78
1966	36	5,566	753,671	155	48	3,428	751,678	71
1965	43	5,470	594,685	127	54	3,320	604,834	61
1964	46	5,703	540,834	124	62	3,376	483,330	54

Source: Illinois State Department of Mines and Minerals Annual Coal, Oil and Gas Report, 1973.

TABLE 11—ILLINOIS COAL PRODUCTION BY COMPANY, 1973

Rank	Company	Number of mines		Production (tons)	Percentage of total production	Employees
		Underground	Strip			
1	Peabody Coal	5	4	15,097,985	24.53	3,240
2	Consolidation Coal	1	4	6,509,027	10.57	1,085
3	Old Ben Coal	3	-	6,482,077	10.53	1,234
4	Southwestern Illinois Coal	-	2	5,897,046	9.58	398
5	Freeman Coal	3	-	5,291,689	8.60	1,463
6	AMAX Coal	1	3	4,733,994	7.69	451
7	United Electric Coal	-	3	3,373,799	5.48	466
8	Ziegler Coal	4	-	2,891,118	4.70	763
9	Monterey Coal	1	-	2,694,505	4.38	453
10	Midland Coal	-	4	2,668,061	4.33	544
11	Inland Steel	1	-	2,588,482	4.21	555
12	Sahara Coal	2	1	2,278,135	3.70	563
13	Eads Coal	-	1	663,195	1.08	71
14	Big Ridge Coal	-	1	76,055		11
15	Jader Coal	-	1	74,930		8
16	Harrisburg Coal	1	-	69,447		27
17	Tab Mining	-	1	58,891		15
18	Brown Brothers Excavating	-	1	54,026		11
19	Hazel Dell Coal	1	-	12,292	0.62	11
20	Cold Water Coal	-	1	10,908		3
21	Houston Coal	-	1	7,346		2
22	Viola Materials	-	1	5,627		10
23	Elk Coal	-	1	4,675		5
24	E & L Coal	-	1	3,238		3
25	Deaton Coal	-	1	1,700		2
26	V-Day Coal	1	-	422		15
	Totals	24	32	61,548,670	100.00	11,409
						Underground: 7,794
						Strip: 3,615

Source: Illinois Department of Mines and Minerals, Annual Coal, Oil and Gas Report, 1973.

Employment provided by bituminous coal mining in 1973 represented less than 0.3 percent of the state total employment. However, in Gallatin County, coal mining accounted for 63.1 percent of that county's total employment (fig. 3). In Jefferson, Franklin, and Perry Counties, bituminous coal mining employed more than 15 percent of the total employment roll.

Mine Productivity—Average productivity of underground mines in Illinois, which had started to decline in 1970 when the Federal Health and Safety Act of December 1969 went into effect, showed its first recovery in 1973. According to U.S. Bureau of Mines data, the average productivity of Illinois underground mines in 1973 was 18.07 tons per man-day—1.12 percent higher than the 1972 level. Once again the productivity level achieved by Illinois underground mines was one of the highest in the nation.

For strip mining, the average productivity level achieved by Illinois mines was 35.80 tons per man per day—3.48 percent less than the 1972 level. The decline in strip-mine productivity is due in part to the increase in average thickness of overburden that must be removed before the coal can be extracted and in part to the production losses that various Illinois strip mines experienced during 1973.

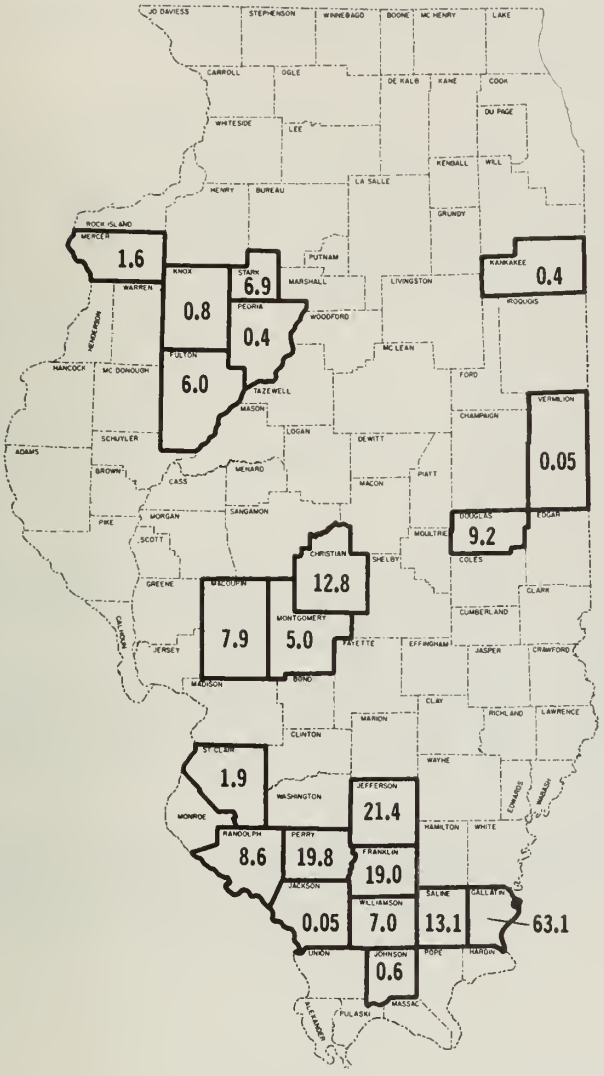

Fig. 3 - Percentage of employment in bituminous coal mining, by county, in percentage of total employment for each county, 1973. (Source: U.S. Bureau of the Census, 1972 Illinois County Business Patterns and Illinois Department of Mines and Minerals, 1973 Annual Coal, Oil and Gas Report.)

The trends in Illinois coal mine productivity in relation to national averages is shown in figure 4. The average productivity level achieved by Illinois underground mines is considerably higher than the nation's average. Two basic reasons for the higher productivity are (1) seam thickness mined, which for Illinois averages 7 feet 5 inches—about 2 feet 2 inches more than the average for the United States, and (2) size of operation. In 1973 the output of coal per year per underground mine in Illinois averaged 1.4 million tons, whereas the average output for the United States was 160,000 tons.

The productivity of Illinois strip mines in the last 4 years has varied little from the national average. Prior to 1970, average productivity of Illinois strip mines was about 5 to 7 tons per man-day higher than the national average reported by the U.S. Bureau of Mines.

Prices—The average price of Illinois coal, f.o.b. the mine, in 1973 was $6.71 per ton, 9.28 percent higher than the 1972 level. The trends in Illinois coal prices, by method of mining, are shown in figure 5. The sharp rise in price for coal mined underground, compared to strip-mined coal, is attributable to two factors. One is the increase in the production of metallurgical coal, which in 1973, on the average, sold for about 2 to 3 dollars per ton higher than utility coal. In 1962, 914,000 tons of metallurgical coal was produced in Illinois, compared to 4.4 million tons in 1973. Because all metallurgical coal produced in Illinois comes from underground mines, this increase in production has a positive influence on the average price (f.o.b. mine) of underground-mined coal. The second factor responsible for the rapid increase is the adjustment for the increase in cost of production in underground mine operations since the enforcement of the health and safety act of 1969. The average price, f.o.b. the mine, of coal mined underground in Illinois in 1973 was $7.27 per ton—$1.15 higher than the price of strip-mined coal.

Shipments—Illinois coal is shipped to various parts of the United States for use by electric utilities, for manufacturing raw steel, and for other industrial uses. Of the 62.5 million tons of Illinois coal shipped in 1973, including mine stocks, 49.7 million tons was used by electric utilities, 4.4 million tons by coke plants manufacturing metallurgical coke, and 7.7 million tons by other industrial plants. Some 663,000 tons was sold at retail (table 12). About 48 percent of the Illinois coal shipped to electric utilities was consumed within the state and the rest was shipped to surrounding midwestern and southeastern states. The market for Illinois utility coal is showing definite growth in Missouri and in the southeastern states of Alabama, Mississippi, Georgia, Tennessee, and Florida, where electric power demands are growing rapidly and high-sulfur coal can still be burned. However, in Minnesota, Iowa, and Wisconsin, Illinois coal is losing its utility market to the low-sulfur coals from western states that meet the required standards for sulfur oxides emission.

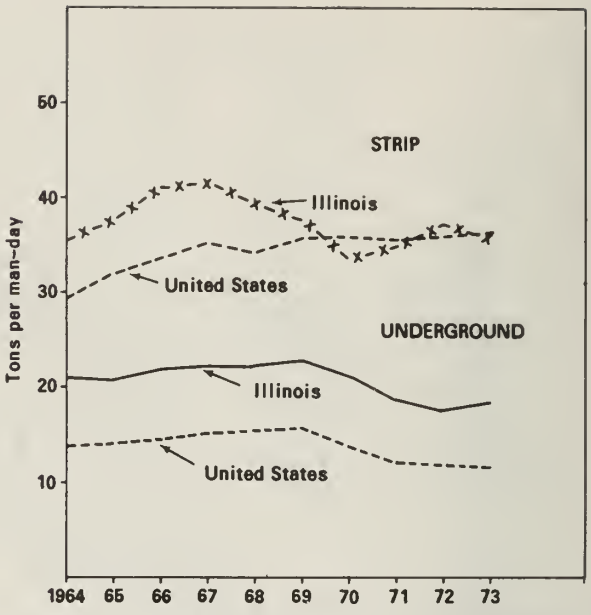

Fig. 4 - Trends in coal mine productivity (1964-1973).

More than 25 percent of the Illinois coal shipped for coking purposes was consumed in Illinois, and the bulk of the remainder was shipped to near-by coke plants in northwestern Indiana. Since 1969 some coking coal from Illinois mines has been shipped to Mexico. In 1973, coking coal shipments to Mexico totaled 126,000 tons.

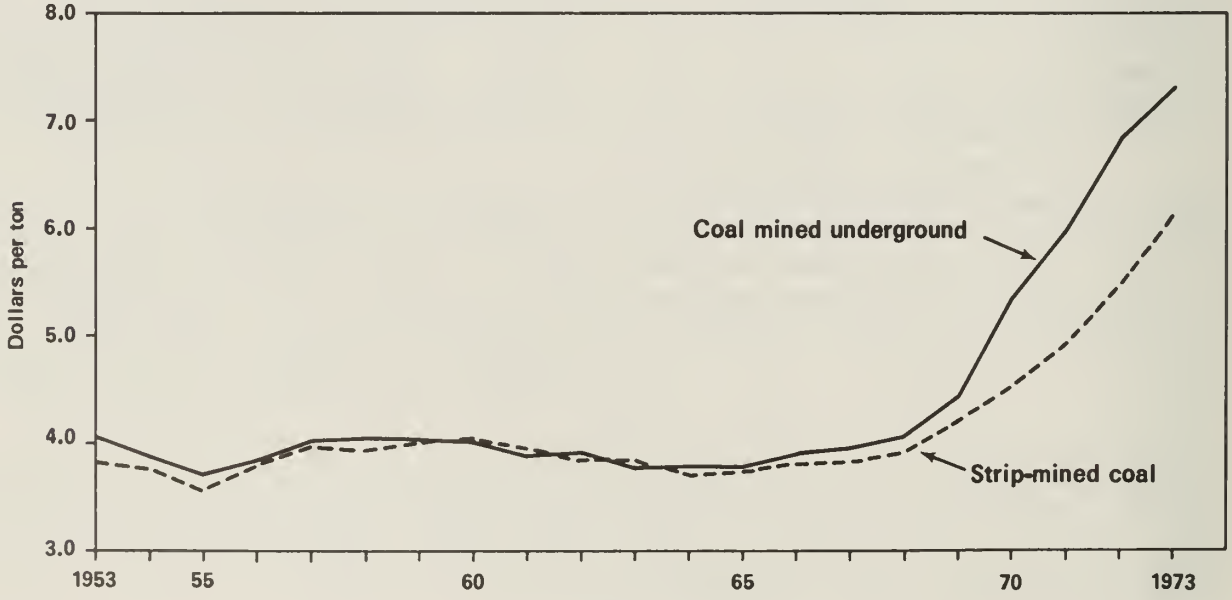

Fig. 5 - Illinois coal price trends (average value per ton, f.o.b. mine).

TABLE 12—ILLINOIS COAL SHIPMENTS BY STATE DESTINATION AND CONSUMING SECTOR, 1969-1973
(thousand tons)

Consuming sector	Wisconsin	Minnesota	Iowa	Michigan	Missouri	Indiana	Kentucky	Southern states*	Exports‡ and other uses	Illinois	Total
Electric utilities											
1969	4826	2905	2204	286	5029	2623	2447	1188	916	26,622	49,046
1970	6115	2917	2731	154	5702	2667	2804	1475	492	25,688	50,745
1971	5206	2258	3043	424	5934	2409	3803	2271†	4	22,204	47,556
1972	5526	2490	3306	323	7042	2731†	3595	2795†	—	25,329	53,137
1973	4599	1574	2714	680	8014	2167†	2923	2892†	51	24,091	49,705
Coke and gas plants											
1969	—	—	—	—	—	1806	—	—	32	1,538	3,376
1970	—	—	—	—	—	2871	—	—	128	1,618	4,617
1971	—	—	—	—	—	2589	—	41	172	1,424	4,226
1972	—	—	—	—	—	2810†	—	—	182	1,288	4,280
1973	—	—	—	—	—	3164†	—	—	126	1,148	4,438
Retail dealers											
1969	85	45	62	25	74	14	—	—	8	1,141	1,454
1970	66	29	40	22	79	22	—	—	9	1,015	1,282
1971	50	26	17	18	43	19	—	—	3	723	899
1972	15	27	16	1	79	220	—	—	3	630	991
1973	2	17	14	—	168	43	—	—	2	417	663
All others											
1969	1080	101	1368	759	1426	938	—	—	47	7,102	12,821
1970	1078	88	1320	605	1258	844	—	66	69	5,657	10,985
1971	746	64	965	446	1156	526	—	—	7	4,189	8,099
1972	793	59	1130	318	1553	492	—	—	14	4,084	8,443
1973	645	106	1151	397	1367	639	—	—	12	3,419	7,736
Totals											
1969	5991	3051	3634	1070	6529	5381	2447	1188	1003	36,403	66,697
1970	7259	3034	4091	781	7039	6404	2804	1541	698	33,978	67,629
1971	6002	2348	4025	888	7133	5543	3803	2312	186	28,540	60,780
1972	6334	2576	4452	642	8674	6253	3595	2795	199	31,331	66,851
1973	5246	1697	3879	1077	9549	6013	2923	2892	191	29,075	62,542

Source: U.S. Bureau of Mines Bituminous Coal and Lignite Distribution Quarterly, 1969-1973.
* Includes Alabama and Mississippi (1970-1973), Georgia and Florida (1970-1973), and Tennessee (1969-1973).
† Estimated.
+ Includes minor amount of industrial and/or retail coal.
‡ Primarily to Mexico.

Slightly more than 63 percent of the retail coal shipped from Illinois mines in 1973 was consumed within the state. The rest was shipped to near-by upper midwestern states, of which Indiana and Missouri were the largest consumers.

Approximately half of the Illinois coal used for other industrial purposes in 1973 was consumed within the state. In order of amount consumed, the other important consumers of industrial coal from Illinois were Missouri, Iowa, Wisconsin, and Indiana.

Transportation—Illinois coal was shipped from mine to consuming sector by railroad, barge, truck, or conveyor belt in 1973. At mine sites 51.3 million tons of coal were loaded on railroad cars for shipment. Of this amount, 19.8 percent (10.2 million tons) was moved to docks for shipment by barge. Total coal shipped by barge was 15.5 million tons. Coal shipped by truck totaled 1.5 million tons. The other 3.8 million tons was shipped to mine-mouth electric generating plants by conveyor belt.

Tonnages of Illinois coal handled by specific railroads in 1973 are shown on the following page.

	Tons
Illinois Central Gulf Railroad Co.	16,325,262
Burlington Northern, Incorporated	8,174,188
Missouri Pacific Lines	6,320,373
Penn Central Transportation Co.	2,696,960
Chicago and Northwestern Transportation Co.	3,616,974
Chicago and Eastern Illinois Railroad	1,931,410
Chicago, Rock Island & Pacific Railroad Co.	961,872
Others	11,262,281
Total coal shipped by rail	51,289,310

Consumption—Coal consumed in Illinois during 1973 totaled 40.6 million tons (table 13). This was 3.3 percent lower than the amount consumed in 1972. The coal consuming sectors included electric utilities (79.9 percent), coke and gas plants (7.3 percent), retail dealers (2.3 percent), and industrial and other users (10.5 percent).

Of the total 40.6 million tons of coal used in Illinois in 1973, 29.1 million tons, or 71.6 percent, was shipped from mines within the state. The amount of coal shipped from mines in Illinois for use in Illinois is steadily declining. In 1969, 36.4 million tons, or 80.5 percent, had come from Illinois mines. The decline in the use of Illinois coal within the state is mainly attributable to the replacement of Illinois coal in the utility market by low-sulfur coal from Wyoming and Montana and in the industrial market by low-sulfur Appalachian coal, natural gas, and fuel oil. In 1973, 15.3 percent of the total coal consumed in Illinois came from western states, including Wyoming, Montana, and Colorado. This was six times more than the amount that had been shipped to Illinois in 1970 from the western states.

In addition to Illinois coal, most of the coal burned by electric utilities in Illinois came from Wyoming, Montana, western and eastern Kentucky, Indiana, and West Virginia (table 13). In 1973, of the total 32.5 million tons consumed by Illinois electric utilities about 19.2 percent came from western states, an increase of approximately six times the 1970 level. The delivered cost of western coal is about twice as much, on an equivalent heat basis, as the cost of Illinois coal. In spite of the high cost, the use of western coal by Illinois electric utilities is expected to grow until a commercial technology to remove sulfur from Illinois coal is developed. The Federal Power Commission in 1973 estimated that more than 85 percent of the coal now being burned by Illinois electric utilities would be prohibited from use when sulfur emission standards are enforced. Sulfur content of Illinois coal is too high to meet requirements of the Federal Environmental Protection Agency (EPA).

Thirty-nine percent of the coal used at coke and gas plants in 1973 came from Illinois mines and 61 percent from mines in West Virginia and eastern Kentucky. In the past some coal from mines in Indiana, Ohio, and eastern Pennsylvania was used.

The amount of coal used for industrial and other purposes in Illinois has declined considerably (table 13). In 1973, 4.3 million tons of coal was used for industrial purposes, 48 percent less than the amount consumed in 1968. The principal regions, excluding Illinois, that supply coal for Illinois indus-

TABLE 13—SHIPMENT OF COAL INTO ILLINOIS BY STATE OF ORIGIN AND BY CONSUMING SECTOR, 1969-1973
(in thousand tons)

Consuming sector	Illinois	Western Kentucky	Indiana	West Virginia and eastern Kentucky*	Ohio and eastern Pennsylvania	Wyoming and Montana	Total coal consumed in Illinois†
Electric utilities							
1969	26,622	3,063	656	4	—	—	30,345†
1970	25,688	2,175	514	1	—	1,075	29,453
1971	22,204	1,431	604‡	43	—	3,648‡	27,930
1972	25,329	1,586	393	200	—	4,786	32,294
1973	24,091	1,662	341‡	142	—	6,229#	32,465
Coke and gas plants							
1969	1,538	—	—	2,175	—	—	3,713
1970	1,618	—	—	2,070	—	—	3,688
1971	1,424	—	50‡	1,847	26	‡	3,347
1972	1,288	—	—	1,955	—	—	3,243
1973	1,148	—	—	1,820	—	—	2,968
Retail dealers							
1969	1,141	587	48	1,287	14	—	3,077
1970	1,015	237	2	1,329	5	3†	2,591
1971	723	59	1‡	1,082	4	2‡	1,871
1972	630	13	9	759	2	2†	1,415
1973	417	6	—	511	—	—	934
Industrial and other							
1969	7,102	254	282	401	22	—	8,061
1970	5,657	188	245	476	13	—	6,579
1971	4,189	92	170‡	689	1	‡	5,141
1972	4,084	118	51	823	—	—	5,076
1973	3,419	111	84‡	647	—	—	4,261
Totals							
1969	36,403	3,904	986	3,867	36	—	45,244†
1970	33,978	2,600	761	3,876	18	1,078	42,311
1971	28,540	1,582	825	3,661	31	3,650	38,289
1972	31,331	1,717	453	3,737	2	4,788	42,028
1973	29,075	1,779	425	3,120	—	6,229#	40,628

Source: U.S. Bureau of Mines, Bituminous Coal and Lignite Distribution Quarterly, 1969-1973.
* Includes tonnages from Virginia and northeastern Tennessee.
† From District 15 (Kansas, Missouri, and northeastern Oklahoma).
† Includes 48,000 tons not accounted for; origin unknown.
‡ Estimated.
# Includes tonnage from southern Colorado (20,000 tons) and Arkansas and Oklahoma (67,000 tons).

trial use are eastern and western Kentucky and West Virginia. Some coal was shipped from Indiana for industrial use.

Illinois mines supplied 44.6 percent of the coal sold by Illinois retail dealers and West Virginia and Kentucky mines supplied 55.4 percent.

Crude Oil

Production—Illinois crude oil production in 1973 totaled 30.7 million barrels—12.1 percent less than that of 1972. At an average unit value of $4.32 per barrel, the production was valued at 132.5 million dollars (table 14). Of the 30.7 million barrels produced in 1973, 9.0 million barrels were recovered by waterflooding, a secondary recovery method. The number of wells actively operating in Illinois during 1973 totaled 24,283.

Thirty-nine counties produced crude oil in 1973. The 10 that contributed more than 74 percent of the oil production in 1973 were:

County	(%)	County	(%)
Lawrence	12.3	Clay	4.4
White	11.8	Crawford	4.3
Fayette	10.6	Wabash	3.7
Wayne	10.5	Richland	3.5
Marion	9.9	Hamilton	3.1

In 1973, 347 oil fields were producing in Illinois, but more than 66 percent of the production came from the 10 fields listed in table 15. The southeastern Illinois area, which includes a number of fields, accounted for 18 percent of the state's total production. The four largest fields—Southeastern Illinois, Clay City Consolidated, Louden, and Salem Consolidated—accounted for nearly half of the crude oil production in Illinois in 1973.

The trend in Illinois oil production is shown in figure 6. The highest production was achieved in 1940. From 1941 through 1953 total crude oil production steadily declined. Primary production, after remaining stable from 1947 through 1949, declined until the introduction of the Hydrofrac method of well completion in 1954. This technique, coupled with greatly increased activity in waterflood development, momentarily reversed a downward trend in production. When major emphasis shifted to waterflood development, nearly stable production was maintained from 1955 through 1963. Since then both waterflood and primary production rates have been in a steady decline. The extent of depletion of reserves can be seen when the January 1, 1956, figure of 701,300,000 barrels is compared with the 164,500,000 barrels reported for January 1, 1974.

TABLE 14—CUMULATIVE CRUDE OIL PRODUCTION IN ILLINOIS, 1888-1973

County	Cumulative production, 1888-1973* (1000 bbl)	1973 production (1000 bbl)	% of total Illinois production	Value† (in $1000)
Adams	182	3	0.0	11
Bond	7,166	44	0.1	188
Brown	227	2	0.0	9
Champaign	7	—	—	—
Christian	24,546	314	1.0	1,355
Clark-Cumberland	89,050	333	1.1	1,437
Clay	128,456	1,350	4.4	5,831
Clinton	82,479	574	1.9	2,482
Coles	22,487	192	0.6	831
Crawford	225,369	1,332	4.3	5,752
De Witt	2,438	143	0.5	619
Douglas	3,558	15	0.0	66
Edgar	3,379	112	0.4	484
Edwards	44,721	454	1.5	1,961
Effingham	15,282	258	0.8	1,114
Fayette	381,616	3,261	10.6	14,086
Franklin	69,423	580	1.9	2,507
Gallatin	48,625	563	1.8	2,431
Hamilton	129,897	939	3.1	4,055
Jasper	49,040	653	2.1	2,822
Jefferson	79,949	876	2.9	3,782
Lawrence	379,350	3,764	12.3	16,259
Macon	890	5	0.0	22
Macoupin	236	—	—	—
Madison	17,003	103	0.3	444
Marion	397,292	3,053	10.0	13,187
McDonough-Hancock‡	5,380	35	0.1	151
Monroe	2	—	—	—
Montgomery	116	‡	0.0	1
Moultrie	93	2	0.0	9
Perry	740	15	0.0	66
Randolph	4,215	76	0.2	327
Richland	97,771	1,066	3.5	4,605
St. Clair	3,267	28	0.1	122
Saline	20,533	264	0.9	1,140
Sangamon	2,554	204	0.7	883
Schuyler	1	—	—	—
Shelby	1,552	33	0.1	142
Wabash	104,370	1,136	3.7	4,909
Washington	28,475	766	2.5	3,309
Wayne	230,849	3,209	10.5	13,862
White	270,115	3,619	11.8	15,636
Williamson	1,522	201	0.7	867
Other*	1,994	1,093	3.6	4,723
Totals#	2,976,216	30,669	100.0	$132,490

* 1973 production includes 1,093 thousand barrels that could not be assigned to individual fields or counties.
† Value calculated at average price of $4.32 per barrel.
‡ No oil production reported for Hancock County in 1972-1973.
‡ Less than 500 barrels.
# Totals will not add up because individual figures are rounded.

Refineries—According to the U.S. Bureau of Mines, 11 refineries were operating in Illinois on January 1, 1974. They had a total capacity of 1,155,200 barrels per calendar day—11.0 percent more than the capacity a year earlier.

During 1973, 313.2 million barrels of crude oil were received at Illinois refineries, including 282.5 million barrels from other states or foreign countries; the rest was of Illinois origin.

Substitute Natural Gas Plants—During 1972 and 1973, five petroleum substitute natural gas (SNG) plants were slated for construction in Illinois.

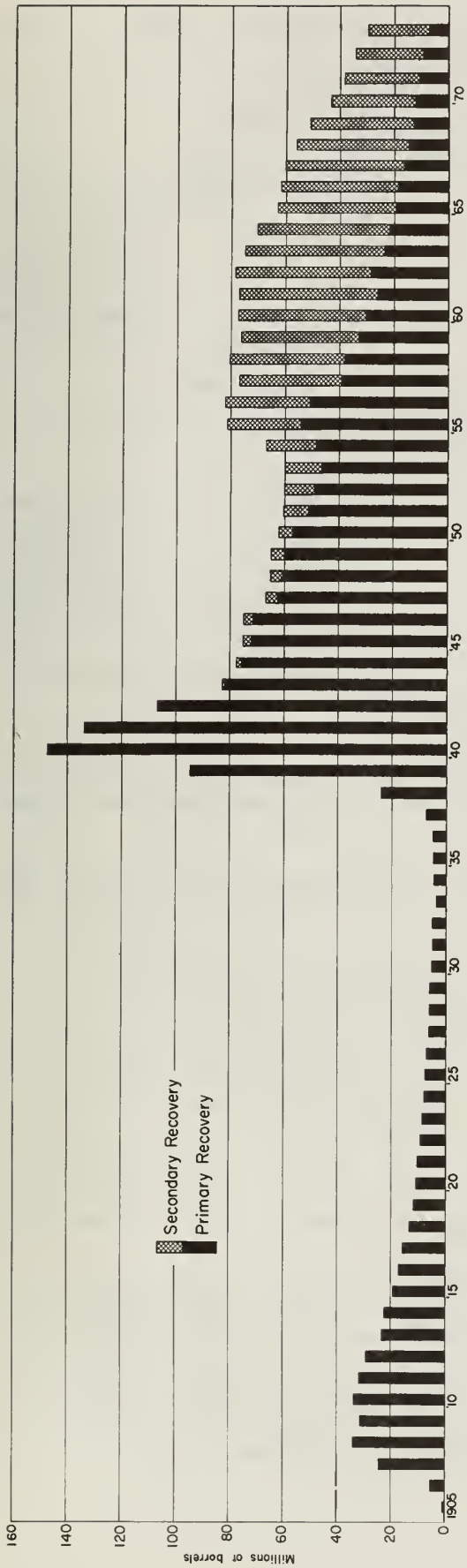

Fig. 6 - Annual crude oil production in Illinois, 1905-1973.

TABLE 15—ILLINOIS CRUDE OIL PRODUCTION, BY MAJOR FIELD, 1973

Field	County	Crude oil production (1000 bbl)	Percentage of state total
Southeastern Illinois	Wabash, Lawrence, Crawford, Clark, Cumberland, Jasper	5,478	17.9
Clay City Consolidated	Clay, Wayne, Richland, Jasper	3,664	11.9
Louden	Fayette, Effingham	2,987	9.7
Salem Consolidated	Marion, Jefferson	2,891	9.4
New Harmony Consolidated	White, Wabash, Edwards	1,541	5.0
Roland Consolidated	White, Gallatin	945	3.1
Sailor Springe Consolidated	Clay, Jasper, Effingham	919	3.0
Dale Consolidated	Franklin, Hamilton, Saline	720	2.4
Johnsonville Consolidated	Wayne	594	1.9
Phillipstown Consolidated	White, Edwards	548	1.8
Subtotal		20,287	66.1
Others		10,382	33.9
Total		30,669	100.0

Source: Illinois State Geological Survey Oil and Gas Section.

According to the *Oil and Gas Journal* of August 26, 1974, plans for three of the five plants had been temporarily shelved because of uncertain feedstock supply (table 16). The only SNG plant operating in Illinois in 1974 is at Minooka, Grundy County. The plant is operated by the Northern Illinois Gas Company, and the gas produced is supplied to the Chicago suburban area. A second plant, expected to come on stream in 1975, is owned by the Peoples Gas, Light and Coke Company of Chicago.

Consumption—Consumption of major petroleum products in Illinois from 1969 through 1973 is shown in table 17. In 1973, gasoline consumption in Illinois increased by 4.36 percent and represented almost 5 percent of the total gasoline consumed in the United States. In spite of the increase in

TABLE 16—STATUS OF PETROLEUM (SUBSTITUTE) NATURAL GAS (SNG) PLANTS IN ILLINOIS, 1974

Company	Petroleum product used		Synthetic natural gas output (million cu ft/day)	Plant			
	Type	Quantity (1000 bbl/day)		Investment (million dollars)	Contractor	Location	Status
Trunkline Gas Company	Naphtha	30	130	50	—	Blue Mound	Project suspended pending feedstock availability
Central Illinois Light Company	Naphtha	12	60	20	Foster Wheeler	Peoria	Preliminary planning and design completed; deferred for feedstock
Continental Oil Company	Naphtha or liquid petroleum gas	33	125	—	—	Northern Illinois	Re-evaluating
Northern Illinois Gas Company	Natural gas liquids (or naphtha) if available	52	166	80	Bechtell	Minooka	In operation
Peoples Gas, Light and Coke Company	Naphtha	33	160	77	Kellogg	Will County	Preliminary design work in progress; completion due in 1975; 13,000 b/d from Union Oil and 20,000 b/d from Amoco

Source: Oil and Gas Journal, Aug. 26, 1974.

consumption, Illinois continued to export more gasoline than it imported because of the number of refineries in the state.

The consumption of distillate and residual fuel oil decreased in 1973. Distillate fuel oil use decreased 2.6 percent and use of residual fuel oil decreased 1.3 percent.

During 1973, kerosine and liquefied gas consumption in Illinois increased 3.9 and 1.2 percent, respectively. The use of asphalt products increased 12.5 percent in 1973.

TABLE 17—CONSUMPTION OF MAJOR PETROLEUM PRODUCTS IN ILLINOIS, 1969-1973

Product	Unit	1973	1972	1971	1970	1969
Gasoline (excluding naphtha)*	thousand bbl	120,558	115,526	109,818	105,323	103,067
Kerosine†	thousand bbl	4,485	4,317	3,234	3,583	3,468
Distillate fuel oil†	thousand bbl	53,865	55,276	49,467	45,517	44,498
Residual fuel oil†	thousand bbl	29,195	29,581	22,835	28,618	25,456
Liquefied gases†	thousand gal					
Propane		650,115	644,123	587,372	586,713	621,916
Butane		9,597	7,176	7,602	7,466	3,687
Butane-propane mix		801	1,546	1,101	1,429	1,132
Total		660,513	652,845	596,075	595,608	626,735
Asphalt products‡	tons	2,060,144	1,865,675#	1,910,674	2,105,700	2,134,852
Road oil‡	tons	236,972	210,660	236,917	322,629	293,055

* American Petroleum Institute Weekly Statistical Bulletins.
† U.S. Bureau of Mines Sales of Fuel Oil and Kerosine, Annual Statements, 1969-1973.
† U.S. Bureau of Mines Sales of Liquefied Petroleum Gases and Ethane, Annual Statements, 1969-1973.
‡ U.S. Bureau of Mines Sales of Asphalt, Annual Statements, 1969-1973.
# Revised.

Natural Gas

Production—Natural gas in Illinois is produced from gas wells and oil wells. No gas from oil wells is marketed; it is either used for lease fuel in oil-producing operations or it is flared. In 1973, 1638 million cubic feet of natural gas from gas reservoirs was marketed (table 18) at a well head price of 35 cents per thousand cubic feet. The value of the marketed gas is calculated as $573,300.

The amount of natural gas marketed from Illinois fields has increased considerably in the last few years. In 1970, 198 million cubic feet was marketed, but the 1973 marketed production was more than 8 times that. The sharp rise in marketed production results mainly from (1) new production of gas from the Devonian formations of the Mattoon field (table 19), and (2) increase in the well-head price.

At present natural gas is recovered in four counties—Coles, Williamson, Saline, and Gallatin (table 19). The leading fields include Mattoon in Coles County, Eldorado East in Saline and Gallatin Counties, Raleigh in Saline County, and Johnson City East in Williamson County.

Consumption—In Illinois 1164 billion cubic feet of natural gas was consumed in 1973 (table 20) compared to 1221 billion cubic feet in 1972 and 1243 billion cubic feet in 1971. The 6.4 percent decline in consumption from the 1971 level is by no means an indication of a diminished demand for the commodity, but, rather, reflects the decreasing supply of natural gas.

TABLE 18—PRODUCTION OF NATURAL GAS IN ILLINOIS, 1969-1973

	Production (million cu ft)				
	Withdrawals			Disposition	
Year	From gas wells	From oil wells	Total	Marketed	Flared
1969	158	3,735	3,893	158	3,735
1970	198	4,774	4,972	198	4,774
1971	498	3,997	4,495	498	3,997
1972	1,194	1,806	3,000	1,194	1,806
1973	1,638	—	1,638	1,638	NA

Source: U.S. Bureau of Mines, Minerals Yearbooks, 1969-1973.
NA - Data not available.

TABLE 19—PRODUCTION OF NATURAL GAS IN ILLINOIS, BY FIELD AND COUNTY, 1972-1973

Pool	County	Production (million cu ft) 1973	1972	Change from 1972 to 1973 (%)	Year of field discovery
Corinth South	Williamson	—	19.0	—	1970
Eldorado East	Saline and Gallatin	71.4	135.2	-47.2	1953
Harco East	Saline	21.0	51.9	-59.5	1954
Johnson City East	Williamson	44.2	80.8	-45.3	1965
Mattoon	Coles	1,394.1	777.3	+79.4	1948
Omaha	Gallatin	39.7	—	—	1940
Pittsburg North	Williameon	1.4	8.2	-82.9	1962
Raleigh	Saline	47.2	103.9	-54.6	1962
Stiritz	Williamson	18.6	17.6	+ 5.7	1971
Total		1,637.6	1,193.9	+37.2	

Source: Illinois State Geological Survey Oil and Gas Section.

TABLE 20—CONSUMPTION OF NATURAL GAS IN ILLINOIS, BY CONSUMER CLASS IN 1972 AND 1973

Consumer class	1973 Quantity (million cu ft)	1972 Quantity (million cu ft)	Change from 1972 to 1973	Percentage of total consumption
Residential	445,723	487,845	- 8.6	38.3
Commercial	212,922	218,160	- 2.4	18.3
Industrial	424,573	398,617	+ 6.5	36.5
Electric utilities	39,823	72,796	-45.3	3.4
Other consumers*	5,608	6,328	-11.4	0.5
Total delivered to consumers	1,128,649	1,183,746	- 4.6	
Other uses†	35,151	36,889	- 4.7	3.0
Total consumption	1,163,800	1,220,635	- 4.7	100.0

Source: U.S. Bureau of Mines.
* Includes municipalities and public authorities that use natural gas for institutional heating, street lighting, and other purposes.
† Includes lease and plant fuel, pipeline fuel, and extraction loss.

In 1973, of the total gas consumed in Illinois (1164 billion cubic feet), 97.0 percent (1129 billion cubic feet) was delivered to consumers and the remaining 3 percent was lost in extraction, used for pipeline fuel, or burned as lease plant fuel. The consumption of natural gas by consumer class is shown in figure 7. All except the industrial sector showed a decline in use. The largest decline (45.3 percent) in consumption was shown by electric utilities.

Industrial and Construction Materials

Clays

Production—The types of clays mined in Illinois include common clay, refractory or fire clay, and absorbent clay (also referred to as fuller's earth). In 1973, a total of 1,757,576 tons of clay was produced in Illinois—about the same amount produced in 1972. It included 1,660,306 tons of common clay and 97,270 tons of refractory clay. In addition, a small amount of absorbent clay was also produced in Illinois during 1973. At an average unit value of $2.06 per ton, the clays produced in Illinois were valued at $3.6 million—about 9 percent higher than the value reported for 1972.

Clays were mined in 14 Illinois counties. The largest amount, 943,967 tons, was mined in La Salle County. Eleven counties and 16 companies reported production of common clay and shale, the same as in 1972. In 1973, refractory clay was mined in three counties by three companies; in 1972, four companies mined refractory clay in four counties. Absorbent clay was mined only in Pulaski County by a single company in 1973.

Trends in Illinois clay production are shown in figure 8. Production,

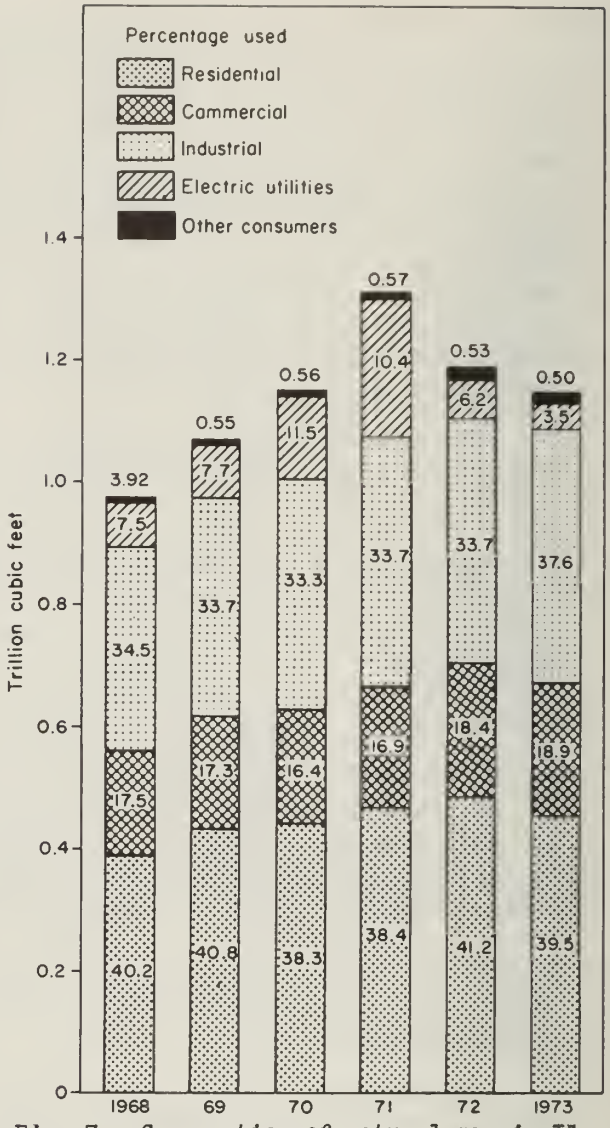

Fig. 7 - Consumption of natural gas in Illinois, 1968-1973.

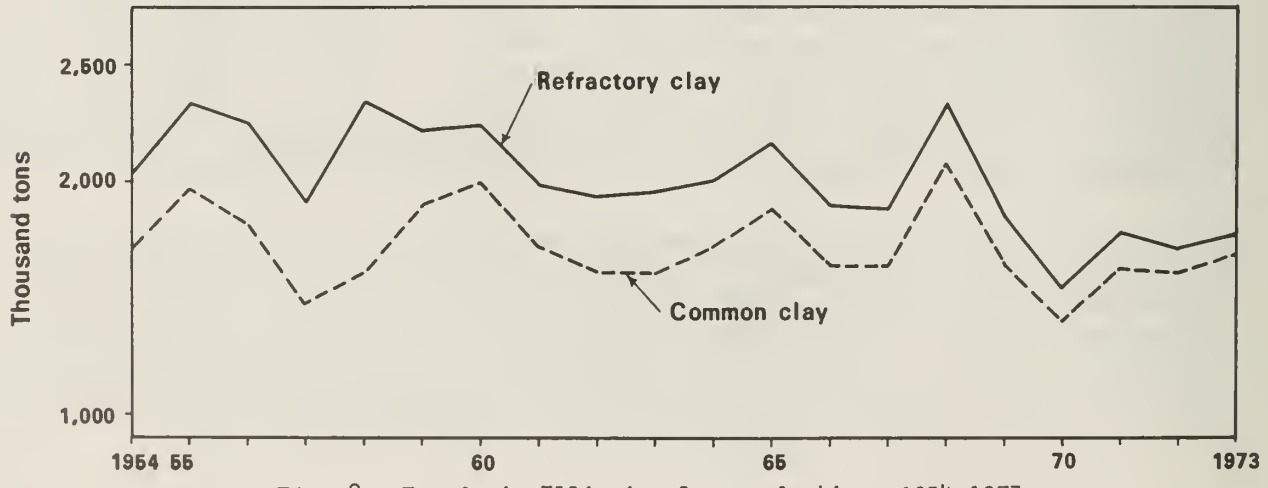

Fig. 8 - Trends in Illinois clay production, 1954-1973.

which declined sharply in 1969, has now stabilized at around 1.8 million tons per year.

Consumption and Uses—The common clays and shales produced in Illinois are used principally in the manufacture of brick, sewer pipe, drain tile, cement, and lightweight aggregate. Of the 1.7 million tons of common clays produced in 1973, 34.0 percent was used in the production of common and face brick, 6.0 percent in the manufacture of sewer pipe and drain tile, and most of the rest in the production of cement and lightweight aggregates.

In 1973 production of clays for common and face brick increased by 8 percent over the 1972 production level. The production of clays for sewer pipe and drain tile meanwhile showed a 2 percent decline. The production of clay for use in the manufacture of cement in 1973 was about 20 percent higher than the amount produced in 1972, which basically reflects improvement in the cement industry as a whole.

Refractory clay produced in Illinois was used in the manufacture of refractory brick, stoneware, and other clay products. During the past 5 years the amount of refractory clay produced has declined by 61 percent—from 246,740 tons in 1968 to 97,270 tons in 1973.

Illinois production of absorbent clay also has declined in the past 6 years. Most of the absorbent clay produced in Illinois is used as animal litter, in pesticides, and in related products.

Fluorspar

Production—Illinois continued to be the leading fluorspar-producing state, contributing 67 percent of the nation's total fluorspar shipments. Illinois produced 152,950 tons and, with the addition of 7,958 tons from stocks on hand, shipped 165,813 tons of finished fluorspar during 1973. Of the total shipped, 93,062 tons were of acid grade (more than 97 percent calcium fluoride) and 72,751 tons were of metallurgical grade (less than 97 percent calcium fluoride) (table 21).

All the fluorspar ore mined in Illinois came from Hardin and Pope Counties, where mining operations on a regular basis are carried out by the

TABLE 21 - FLUORSPAR SHIPMENTS AND CONSUMPTION, ILLINOIS AND UNITED STATES, 1964-1973

Year	Shipments (tons)					Consumption (tons)		
	Illinois			United States total	Illinois shipments as percentage of U.S. shipments	Illinois	United States*	Illinois consumption as percentage of U.S. consumption
	Acid grade	Metallurgical grade	Total					
1964	84,151	43,303	127,454	217,137	58.7	54,972	831,561	6.61
1965	88,700	70,440	159,140	240,932	66.1	56,697	930,127	6.10
1966	103,568	72,607	176,175	253,068	69.6	56,772	1,065,124	5.33
1967	120,388	89,819	210,207	295,643	71.1	60,521	1,091,158	5.55
1968	87,152	101,173	188,325	252,411	74.6	64,521	1,243,414	5.19
1969	47,776	40,704	88,480	182,567	48.5	78,727	1,356,624	5.80
1970	86,729	61,479	148,208	269,221	55.1	89,065	1,372,404	6.49
1971	72,514	65,537	138,051	272,071	50.7	89,971	1,344,742	6.69
1972	75,188	57,217	132,405	250,347	52.9	67,428	1,352,149	4.99
1973	93,062	72,751	165,813	248,601	66.7	86,715	1,351,705	6.42

Source: U.S. Bureau of Mines.

* Fluorspar consumed includes domestic and foreign material.

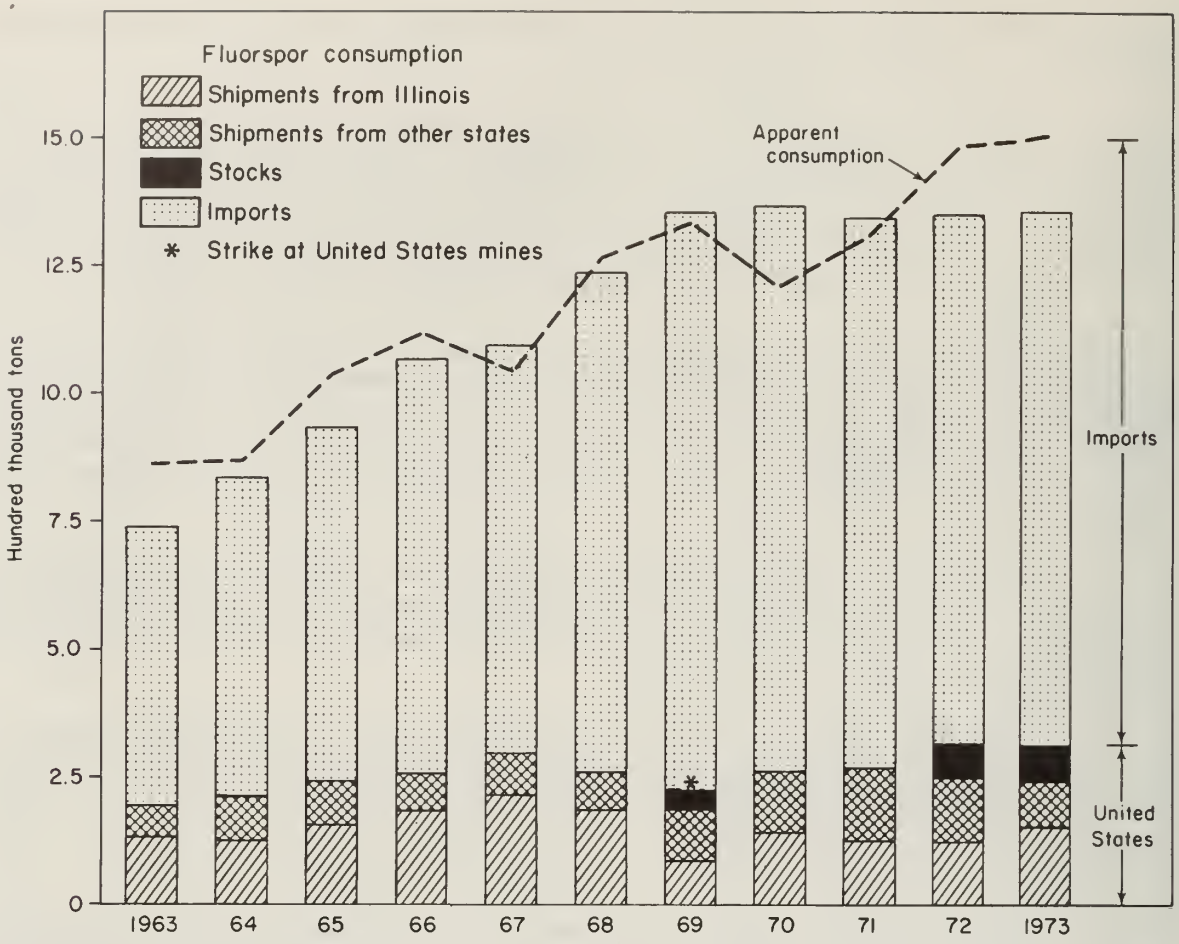

Fig. 9 - Reported consumption of fluorspar in the United States, by source of origin, 1963-1973. Source: U.S. Bureau of Mines.

Minerva Oil Company and the Ozark-Mahoning Company. The Minerva Oil Company employed 170 men during 1973 and produced 228,538 tons of crude ore. Their mining operations were carried out at Deardorff-Crystal Mine, Gaskins Mine, Minerva Mine No. 1, and Spivey Mine. The Spivey Mine was in the development stage in 1973 and therefore produced only 813 tons of crude fluorspar ore.

The Ozark-Mahoning Company reported employment of 152 men and production of 247,709 tons of crude fluorspar ore during 1973. No production was reported from mines operated by Rosiclare Lead and Fluorspar Mining Company, Tamora Mining Company, or O. R. Austin and Sons. Hastie Mining Company, which has been in operation intermittently for the past 10 years, produced 1269 tons of fluorspar ore during 1973.

Shipments—In 1973, Illinois producers shipped 1332 tons of fluorspar to foreign countries and 145,528 tons to other states. This accounted for 88.6 percent of the total Illinois shipments. The remainder of 18,953 tons was shipped to Illinois consumers.

Consumption—The reported consumption of fluorspar in the United States decreased from 1,352,149 tons in 1972 to 1,351,705 tons in 1973 (fig. 9).

The apparent U.S. consumption (production + imports - exports + change in stocks) in 1973 totaled 1,508,757, slightly higher (19,824 tons) than the apparent consumption in 1972.

In 1973, Illinois consumed 86,715 tons of fluorspar, or about 6.4 percent of the total fluorspar consumed in the United States. Illinois consumption as a percentage of the total United States consumption, as well as Illinois shipments as a percentage of United States shipments, increased in 1973 (table 21). The increase in Illinois consumption of fluorspar is due primarily to the rise in raw steel production. In 1973, Illinois raw steel production totaled 13.4 million tons—10.5 percent higher than the 1972 level. Fluorspar is used as a flux in the steel industry.

Sand and Gravel

Production—Sand and gravel deposits are widely distributed throughout Illinois. The principal sources of commercial sand and gravel are glacial deposits, chiefly valley trains and outwash plains. In 1973, Illinois produced 24.5 million tons of sand and 21.7 million tons of gravel. At a per ton value of $1.67, Illinois sand and gravel production was valued at $77.2 million (table 22). The 1973 sand and gravel production increased 15.6 percent in tonnage and 25.1 percent in value over the 1972 levels. The number of counties producing sand and gravel in 1973 totaled 69 (table 23 and fig. 10).

Sand was produced at 181 operations by 140 companies. Nine operations produced silica sand and sand for other industrial purposes. The quantity of industrial sand produced in Illinois during 1973 totaled 5.0 million tons—4 percent lower than the 1972 production. At a unit value of $4.33, the value of silica sand produced in Illinois is estimated to be 21.5 million dollars. Production of industrial sand was reported from La Salle, Ogle, Fayette, and White Counties at 9 operations. Operations producing common sand totaled 172 and accounted for 19.5 million tons valued at $24.2 million. In 1973, only 4 noncommercial (government and contractor) sand-producing operations were reported.

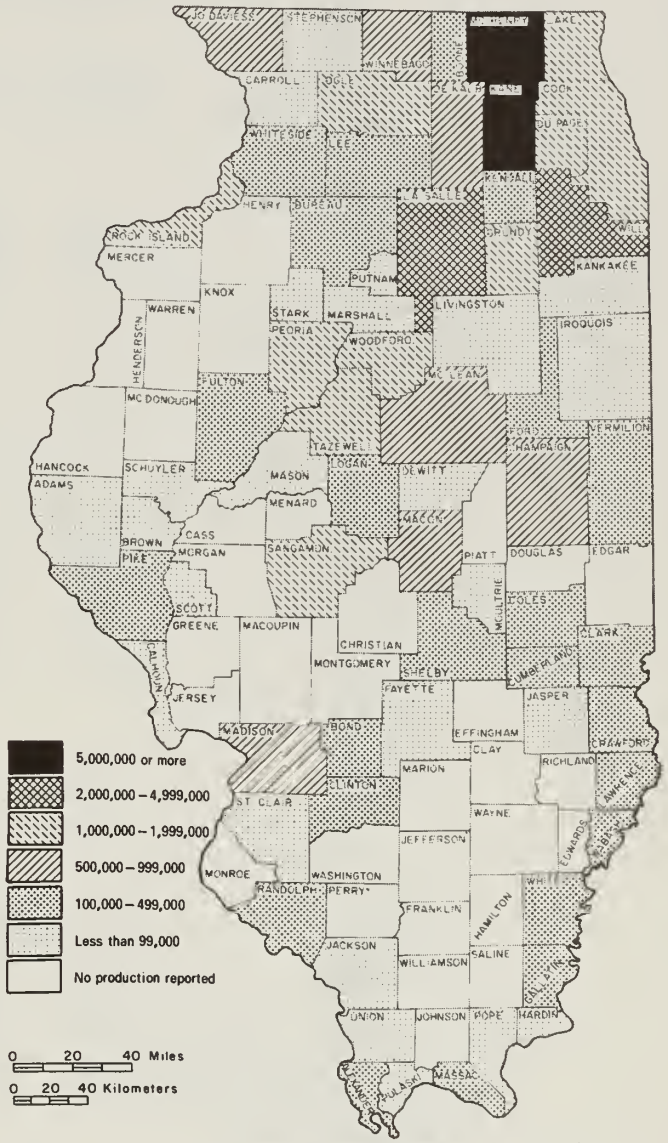

Fig. 10 - Illinois sand and gravel production, by county, 1973. Source: U.S. Bureau of Mines.

Gravel was produced at 204 operations by 158 companies. Of these operations 184 were commercial and 20 noncommercial (government and contractor).

The number of operations producing sand and gravel is rapidly declining, although total production of sand and gravel in Illinois is steadily increasing (fig. 11). The increase in production in the face of the decline in number of operations basically reflects increase in production from large-size operations. Within the last 10 years, the number of plants producing more than 300,000 tons of sand and gravel has increased from 25 to 42. In table 24 sand and gravel production by size of operation for 1972 and 1973 is shown.

TABLE 22—ILLINOIS SAND AND GRAVEL SOLD OR USED BY PRODUCER, BY CLASS OF OPERATION AND USE, 1972 AND 1973

Class of operation and use	1973 Quantity (1000 tons)	1973 Value ($1000)	1972 Quantity (1000 tons)	1972 Value ($1000)	Change in quantity from 1972 to 1973 (%)	Change in value from 1972 to 1973 (%)
Construction aggregates						
Sand						
Commercial operations						
Building	6,960	8,829	6,585	7,753	5.69	13.88
Paving	9,769	12,641	7,819	8,998	24.94	40.49
Fill	2,764	2,746	2,541	2,312	8.78	18.77
Total#	19,494	24,215	16,945	19,063	15.04	27.03
Government and contractor operations						
Building	—	—	*	*	—	—
Paving	12	18	42	44	-71.43	-59.09
Fill	2	1	36	2	-94.44	-50.00
Total#	14	19	78	46	-82.05	-58.69
Gravel						
Commercial operations						
Building	7,675	10,596	6,632	8,574	15.73	23.58
Paving	11,320	17,701	8,590	12,175	31.78	45.39
Fill	1,526	1,658	1,528	1,504	0.13	10.24
Miscellaneous	428	609	312	371	37.18	64.15
Other Uses†	276	371	352	419	21.59	-11.46
Total#	21,227	30,936	17,416	23,044	21.88	34.25
Government and contractor operations						
Building	—	—	3	2	—	—
Paving	463	449	298	286	55.37	56.99
Fill	2	2	18	35	-88.89	-94.29
Other uses	—	—	*	*	—	—
Total#	465	451	318	323	46.23	-39.63
Industrial sand‡						
Blast	W	W	134	W	W	NA
Molding	1,700	NA	1,362	5,668	24.82	NA
Glass	2,308	NA	2,367	7,330	- 2.49	NA
Other uses‡‡	968	NA	1,310	6,220	-26.11	NA
Total#	4,976	21,537	5,173	19,218	- 3.81	12.09
Total sand and gravel	46,176	77,158	39,930	61,694	15.64	25.07

Source: U.S. Bureau of Mines.
Numbers are rounded and totals do not necessarily add up.
* Less than one-half unit.
† Includes railroad ballast.
‡ Estimated.
‡‡ Includes engine, filtration, foundry use, grinding and polishing, oil hydrofrac, pottery, abrasives, chemicals, enamel, and other uses.
W - Withheld to avoid disclosing confidential data of individual companies; included under "Other uses."
NA - Not available.

TABLE 23—SAND AND GRAVEL PRODUCED IN ILLINOIS BY COUNTY IN 1973

County	Number of companies	Number of operations	Quantity (1000 tons)					Value ($1000)
			Sand	Gravel	Industrial sand	Undifferentiated	Total produced	
Adams	1	1	W	W	—	—	W	W
Alexander	3	3	W	W	—	—	W	W
Bond	3	3	W	W	—	—	W	W
Boone	4	4	68	79	—	—	147	W
Brown	1	1	13	—	—	—	13	13
Bureau	8	8	128	273	—	—	401	575
Calhoun	1	1	1	3	—	—	4	2
Carroll	1	1	W	W	—	—	W	W
Champaign	6	8	392	264	—	—	656	701
Clark	4	4	88	279	—	—	367	480
Clinton	5	5	175	21	—	—	196	207
Coles	1	2	137	16	—	—	153	177
Cook	6	6	709	766	—	—	1,475	2,050
Crawford	3	3	69	421	—	—	490	329
Cumberland	1	1	29	36	—	—	65	102
De Kalb	5	5	295	239	—	—	534	676
De Witt	2	2	W	W	—	—	W	W
Du Page	3	4	W	W	—	—	W	W
Fayette*	2	2	W	W	W	—	W	W
Ford	5	7	80	346	—	71	497	628
Fulton	3	3	W	W	—	—	W	W
Gallatin	2	2	W	W	—	—	W	W
Grundy	1	1	W	—	—	—	W	W
Hardin	1	1	—	3	—	—	3	3
Iroquois	2	2	W	W	—	—	W	W
Jackson	1	1	W	W	—	—	W	W
Jasper	1	1	—	—	—	13	13	18
Jo Daviess	1	1	W	W	—	—	W	W
Kane	10	11	1,533	3,849	—	33	5,415	7,517
Kankakee	2	2	W	W	—	—	W	W
Kendall	3	3	W	W	—	—	W	W
Lake	7	7	W	W	—	—	1,483	W
La Salle*	10	15	405	498	4,255	—	5,158	19,743
Lawrence	4	4	118	199	—	—	317	415
Lee	2	2	W	W	—	—	W	W
Livingston	2	2	W	W	—	—	W	W
Logan	4	5	292	194	—	—	486	661
McHenry	14	15	3,242	4,500	—	2	7,744	10,073
McLean	5	5	246	327	—	—	573	746
Macon	4	4	W	W	—	—	W	912
Madison	2	2	W	W	—	—	W	W
Marshall	1	1	—	39	—	—	39	59
Mason	1	1	27	—	—	—	27	41
Massac	3	3	W	W	—	—	W	W
Moultrie	1	1	13	W	—	—	13	W
Ogle*	3	4	W	W	W	—	W	W
Peoria	2	3	W	W	—	—	W	W
Pike	1	1	W	W	—	—	W	W
Pope	1	1	4	—	—	—	4	3
Pulaski	1	1	—	5	—	—	5	3
Putnam	1	1	—	8	—	—	8	11
Randolph	1	2	W	—	—	—	W	W
Rock Island	3	4	W	W	—	—	W	W
St. Clair	1	1	W	—	—	—	W	W
Sangamon	4	4	1,092	—	—	—	1,092	1,702
Schuyler	1	1	W	W	—	—	W	W
Scott	1	1	W	—	—	—	W	W
Shelby	2	2	W	W	—	—	W	W
Stark	1	1	W	W	—	—	W	W
Stephenson	1	1	55	38	—	—	93	156
Tazewell	3	8	W	W	—	—	W	W
Union	2	2	—	20	—	—	20	15
Vermilion	6	6	177	147	—	—	324	231
Wabash	3	3	105	46	—	—	151	147
White*	4	4	328	138	10	—	476	624
Whiteside	2	2	178	52	—	—	230	325
Will	10	10	1,313	1,987	—	13	3,313	5,128
Winnebago	7	8	612	281	—	—	893	953
Woodford	5	5	288	769	—	—	1,057	2,026
Undistributed*	4	4	632	—	—	—	632	728
State total	222	246					46,176	$77,158

Source: U.S. Bureau of Mines.

* County location not reported by producer.

W - Withheld to avoid divulging individual company data; included in total production and value figures.

TABLE 24—ILLINOIS SAND AND GRAVEL PRODUCTION BY SIZE OF OPERATION* IN 1972 AND 1973

Size of operation (tons per year)	1973			1972		
	Number of operations	Production (thousand tons)	Percentage of commercial production	Number of operations	Production (thousand tons)	Percentage of commercial production
less than 25,000	53	488	1.1	68	630	1.6
25,000 to 49,999	34	1,251	2.7	39	1,364	3.4
50,000 to 99,999	45	3,324	7.3	43	2,864	7.2
100,000 to 199,999	38	5,377	11.8	44	6,230	15.8
200,000 to 299,999	13	3,208	7.0	17	4,059	10.3
300,000 to 399,999	12	4,263	9.3	10	3,424	8.7
400,000 to 499,999	8	3,532	7.7	9	4,010	10.1
500,000 to 599,999	5	2,794	6.1	5	2,686	6.8
600,000 to 699,999	3	2,019	4.4	3	1,937	4.9
700,000 to 799,999	2	1,418	3.1	2	1,530	3.9
800,000 to 899,999	2	1,742	3.8	—	—	—
900,000 to 999,999	2	1,923	4.2	2	1,900	4.8
1,000,000 and over	8	14,358	31.5	7	8,902	22.5
Total	225	45,697	100.0	249	39,536	100.0

Source: U.S. Bureau of Mines.
* Commercial operations only, does not include government and contractor operations.

Transportation—The shipment of sand and gravel, bulk commodities, is largely restricted to areas within a radius of less than 100 miles from the pit site. Shipments are made mainly by truck. In 1973, 95.6 percent of the shipments of Illinois sand and gravel were made by truck, 4.2 percent by rail, and the rest (0.2 percent) by barge (table 25).

Consumption and Uses—Common sand and gravel produced in Illinois are used primarily for construction aggregate. Of the 19.5 million tons of common sand produced in 1973, over 50 percent was used for paving, 36 percent for building construction, and the remaining 14 percent as fill. In comparison with 1972 figures, the quantity of common sand used for paving increased 24.4 percent, for building, 5.7 percent, and for fill, 7.3 percent.

Over 54 percent of the 21.7 million tons of gravel produced in 1973 was used for paving, 35.4 percent for building, 7.0 percent for fill, and the remainder was used for railroad ballast and miscellaneous purposes. In 1972, 48 percent was used for paving, 38 percent for building, 12 percent for fill, and the rest for other purposes.

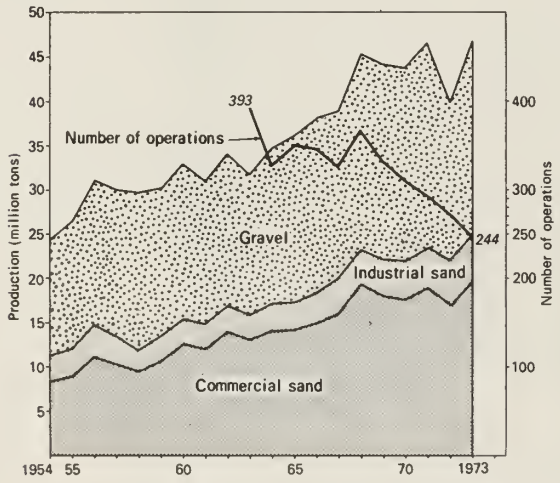

Fig. 11 - Trends in production of sand and gravel in Illinois, 1959-1973.

More than 75 percent of the 5 million tons of industrial sand produced in 1973 was sold in unground form for use in glass manufacturing, as molding sand, blasting sand, grinding and polishing sand, engine sand, sand for filtration, and sand for hydrofracturing in oil wells. Ground sand was sold for use in making chemicals, abrasives, enamels, glass, pottery, porcelain, and tile, and for fillers and foundry purposes.

Stone

Production—All crushed and broken stone produced in Illinois is either limestone or dolomite. In 1973, the quantity of stone produced totaled 66.7 million tons—an 18.5 percent increase over the 1972 production level. At a per ton value of $1.71, Illinois crushed and broken stone production was valued at $114 million (table 26).

Of the 66.7 million tons of crushed and broken stone produced in 1973, 42.3 million tons were limestone and 24.4 million tons were dolomite (table 27). In addition to crushed and broken stone, Illinois also produced a small amount of dimension stone (stone quarried and prepared in blocks according to specifications) in Kane County.

In 1973, one dimension stone quarry and 314 limestone and/or dolomite quarries were operating in Illinois. Sixty-four counties reported stone production in 1973—four less than in 1972 (fig. 12). The number of companies producing stone in 1973 was 124.

Illinois stone production by size of operation is shown in table 28. The number of quarries producing less than 100,000 tons of stone per year seems to be declining, while the number of quarries producing between 100,000 and 500,000 tons per year is steadily increasing. Quarries producing over 500,000 tons per year also are in-

TABLE 25—ILLINOIS SAND AND GRAVEL SHIPMENTS* BY MODE OF TRANSPORTATION, 1973

Mode of transportation	1973 (1000 tons)	1972 (1000 tons)	Percent change 1972-1973
Truck	43,680	37,978	+15.0
Rail	1,907	1,411	+35.1
Barge	100	122	-18.0
Undistributed†	10	23	-56.5
Total	45,697	39,534	+15.6

Source: U.S. Bureau of Mines.

* From commercial operations only; does not include government and contractor operations.

† Mode of transportation not reported by producer.

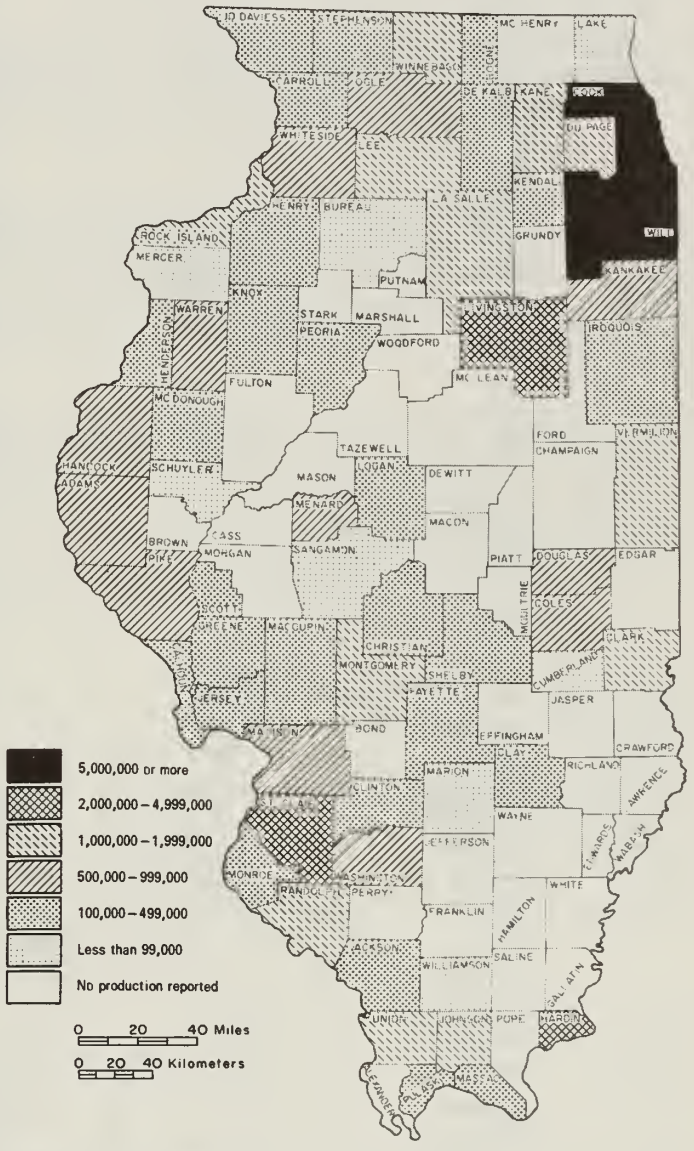

Fig. 12 - Illinois stone production, by county, 1973. Source: U.S. Bureau of Mines.

TABLE 26—PRODUCTION AND VALUE OF ILLINOIS STONE, BY COUNTY AND MODE OF TRANSPORTATION, 1973

County	Number of quarries	Crushed and broken		Production		Mode of transportation		
		Limestone (tons)	Dolomite	tons	$ Value	Truck (tons)	Rail (tons)	Barge (tons)
Adams	9	956,810	—	956,810	W	689,774	246,158	20,878
Boone	2	W	W	W	W	W	—	—
Bureau	1	3,000	W	3,000	6,000	3,000	—	—
Calhoun	3	W	—	W	W	W	—	W
Carroll	11	334,428	—	334,428	419,604	334,428	—	—
Christian	2	W	—	W	W	W	—	—
Clark	5	333,164	W	W	W	W	W	—
Clay	2	W	—	W	W	W	—	—
Clinton	1	W	—	W	W	W	—	—
Coles	3	742,030	—	742,030	1,492,127	742,030	—	—
Cook	10	2,091,487	W	W	W	W	W	—
Cumberland	2	4,042	—	4,042	8,108	4,042	—	—
De Kalb	1	—	W	W	W	W	—	—
Douglas	1	W	—	W	W	W	—	—
Du Page	2	15,121	W	W	W	W	—	—
Fayette	2	W	—	W	W	W	—	—
Greene	4	401,547	—	401,547	W	401,547	—	—
Hancock	6	646,111	—	646,111	1,084,915	646,111	—	—
Hardin	8	2,543,456	—	2,543,456	3,545,903	1,541,589	—	1,001,867
Henderson	4	W	833	W	W	W	—	—
Henry	1	W	—	W	W	W	—	—
Iroquois	2	W	—	W	W	W	—	—
Jackson	1	366,000	—	366,000	W	366,000	—	—
Jersey	3	117,845	—	117,845	219,494	117,845	—	—
Jo Daviess	19	W	W	381,630	389,037	381,630	—	—
Johnson	4	W	—	W	W	W	W	—
Kane	6*	1,332,846	—	1,332,846	2,463,605	1,332,846	—	—
Kankakee	5	W	W	W	W	W	W	—
Kendall	1	W	—	W	W	W	—	—
Knox	1	W	—	W	W	W	—	—
Lake	2	813	—	813	1,220	813	—	—
La Salle	3	W	—	W	W	W	—	—
Lee	11	1,352,448	405,459	1,757,907	2,426,610	1,757,907	—	—
Livingston	8	2,231,413	—	2,231,413	3,899,156	2,231,413	—	—
Logan	2	W	—	W	W	W	—	—
McDonough	2	W	—	W	W	W	—	—
Macoupin	2	W	—	W	W	W	—	—
Madison	3	W	—	W	W	W	—	—
Marion	1	W	—	W	W	W	—	—
Massac	1	W	—	W	402,810	W	—	—
Menard	3	W	—	W	W	W	—	—
Mercer	2	W	—	W	W	W	—	—
Monroe	2	W	—	W	W	W	W	—
Montgomery	7	1,383,357	—	1,383,357	2,416,241	1,383,357	—	—
Ogle	15	741,148	—	741,148	1,191,750	741,148	—	—
Peoria	2	W	—	W	W	W	—	—
Pike	6	558,796	—	558,796	961,108	558,796	—	—
Pulaski	4	W	—	W	W	W	W	—
Randolph	4	1,470,083	—	1,470,083	2,536,848	633,944	836,139	—
Rock Island	7	W	—	W	W	W	—	—
St. Clair	6	3,259,351	—	3,259,351	5,932,198	2,934,743	324,608	—
Sangamon	1	10,000	—	10,000	19,000	10,000	—	—
Schuyler	1	W	—	W	W	W	—	—
Scott	1	214,700	—	214,700	426,030	214,700	—	—
Shelby	1	W	—	W	W	W	—	—
Stephenson	14	494,870	—	494,870	689,065	494,870	—	—
Union	3	W	—	W	W	W	W	—
Vermilion	1	W	—	W	W	W	—	—
Warren	2	W	—	W	W	W	—	—
Washington	4	W	—	W	W	W	—	—
Whiteside	5	780,093	—	780,093	1,219,262	780,903	—	—
Will	9	W	W	5,410,340	9,017,757	3,071,818	866,283	1,472,239
Williamson	1	13,500	—	13,500	20,250	13,500	—	—
Winnebago	26	W	W	1,102,058	1,999,584	1,102,058	—	—
Undistributed†	31	1,625,308	—	1,625,308	2,059,541	1,625,308	—	—
Total	315	42,260,682	24,389,573	66,650,255	$114,006,525	59,431,345	4,555,626	2,660,154

* Some tonnage of dimension stone is not included in total.

† County location not reported by producer.

W - Withheld to avoid disclosing individual company confidential data; included in total.

TABLE 27—PRODUCTION AND USE OF CRUSHED AND BROKEN STONE IN ILLINOIS IN 1973

Use	Limestone (tons)	Dolomite (tons)	Total (tons)	Percentage of total	Percentage of change from 1972	Average value per ton
Road base stone	13,636,876	6,756,284	20,393,160	30.6	+18.61	$1.69
Concrete aggregate	6,188,064	5,458,969	11,647,033	17.5	+14.84	1.76
Surface treatment aggregate	4,303,488	W	6,946,001	10.4	+23.70	1.79
Bituminous aggregate	2,198,049	W	5,579,969	8.4	+ 7.51	1.86
Unspecified construction aggregate and road stone	4,609,048	1,230,945	5,839,993	8.8	+45.07	1.56
Agricultural purposes*	3,905,463	627,190	4,532,653	6.8	+12.64	1.71
Cement	2,184,244	—	2,184,244	3.3	-12.84	1.16
Macadam aggregate	1,938,158	W	2,321,926	3.5	+55.13	1.76
Flux stone	W	W	962,811	1.4	+23.57	1.84
Riprap and jetty stone	807,832	W	950,503	1.4	+51.12	1.72
Railroad ballast	207,156	W	489,004	0.7	+ 7.82	1.61
Other uses†	2,018,278	2,784,680	4,802,958	7.2	—	1.81
Total	42,260,682	24,389,573	66,650,255	100.0	+18.47	$1.71

Source: U.S. Bureau of Mines.
* Includes agricultural limestone and poultry grit.
† Includes stone for asphalt filler, chemicals, lime manufacture, mine dusting, filler, roofing aggregate, fill, waste material, whiting, and other uses.
W - Withheld to avoid disclosing confidential data of individual companies; included in total.

TABLE 28—ILLINOIS STONE PRODUCTION BY SIZE OF OPERATION, 1972 AND 1973

Size of operation (tons per year)	1973 Number of quarries	1973 Production (tons)	1973 Percentage of total	1972 Number of quarries	1972 Production (tons)	1972 Percentage of total
Less than 25,000	105	875,532	1.3	159	1,463,707	2.6
25,000 to 49,999	69	2,911,367	4.4	23	855,767	1.5
50,000 to 74,999	14	846,926	1.3	18	1,098,341	2.0
75,000 to 99,999	12	1,082,912	1.6	12	1,032,305	1.8
100,000 to 199,999	38	6,008,232	9.0	32	4,584,051	8.1
200,000 to 299,999	18	4,405,163	6.6	21	4,978,856	8.8
300,000 to 399,999	21	7,222,913	10.9	18	6,269,982	11.2
400,000 to 499,999	9	4,020,360	6.0	11	4,988,930	8.9
500,000 to 599,999	5	2,751,844	4.1	4	2,093,255	3.7
600,000 to 699,999	3	1,954,473	2.9	7	4,559,436	8.1
700,000 to 799,999	5	3,707,113	5.6	—	—	.0
800,000 to 899,999	1	802,000	1.2	3	2,622,982	4.7
900,000 and over	15	30,061,420	45.1	10	21,712,631	38.6
Total	315	66,650,255	100.0	318	56,260,245	100.0

Source: U.S. Bureau of Mines.

creasing. The increase in size of operation basically reflects the entry of larger companies into the aggregate business. Large companies have sufficient capital to expand an operation, and, as a result, benefit from economies of scale.

Shipment—Shipment of stone, a bulk commodity, is to a large extent confined to areas near the quarry. Because the hauling distance is short, most stone is shipped by truck. In 1973, of the state's total stone production (66.7 million tons), 89.1 percent, or 59.4 million tons, was shipped by truck (table 26). Other modes of shipment included rail (4.6 million tons), and barge (2.7 million tons).

Consumption and Uses—Stone produced in Illinois may be classified as (1) stone for construction aggregate, (2) stone for industrial and chemical use, and (3) stone for agricultural purposes. In 1973, of the 66.7 million tons of stone produced in Illinois, 54.3 million tons (81.3 percent) was used for construction aggregate, 4.5 million tons for agricultural purposes (fig. 13), and 7.9 million tons for industrial, chemical, and other uses.

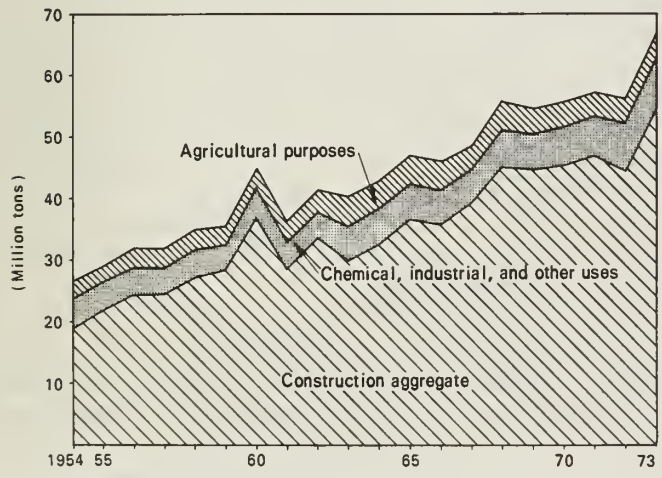

Fig. 13 - Trends in uses of crushed and broken stone produced in Illinois, 1954-1973.

Of the 54.3 million tons used for construction aggregate, 37.6 percent was used as road base stone, 21.5 percent for concrete aggregate, 12.8 percent for surface treatment aggregate, 10.3 percent for bituminous aggregate, and the rest (17.8 percent) was used as macadam and unspecified aggregate.

Stone used for industrial and chemical purposes is high in calcium, usually over 95 percent CaO. High-calcium limestone was used in 1973 in the manufacture of cement and lime, in iron and steel making (as flux-stone), for rock dusting mines, and in various chemical industries.

Illinois consumes more limestone for agricultural purposes than any other state in the nation. Primarily because of this large market, Illinois is the leading producer of agstone and ground limestone for other agricultural uses. In 1973, Illinois produced 4.5 million tons of stone for agricultural uses.

More than 80 percent of the dimension stone produced in Illinois was used as flagstone. The rest was used for veneer in house construction.

Tripoli (Amorphous Silica)

Production—The term "tripoli" comprises several fine-grained, porous, siliceous materials mined in five states. Tripoli is produced in Arkansas, Missouri, and Oklahoma; amorphous, or soft, silica is mined in Illinois; and rottenstone is produced in Pennsylvania. Illinois has been the largest producer of these siliceous materials in recent years, accounting for more than 60 percent of the total United States production (fig. 14).

During 1973, amorphous silica was produced from underground mines in Alexander County by two companies—the Illinois Minerals Company near Elco and Tammsco, Inc., near Tamms. The value of unprocessed material used or sold increased 20.0 percent, whereas the quantity produced increased 23.8 percent over the 1972 levels. Most of the Illinois production was processed in the state.

Consumption and Uses—The amorphous silica processed in Illinois was used for abrasives and fillers. Between 1972 and 1973, the finished material sold for abrasives increased from 48.6 to 49.3 percent, while that sold for filler decreased from 47.9 to 47.0 percent.

Metals

Lead, Zinc, and Silver

Production—The metals recovered from ore mined in Illinois include lead, zinc, and silver. During 1973, these metals were recovered from fluorspar ore mined in Hardin and Pope Counties, by the Minerva Oil Company and Ozark-Mahoning Company, and from lead-zinc ore mined in Jo Daviess County by Eagle-Picher Industries, Inc., which operated the Bautsch mine until it was shut down in May 1973. The Bautsch mine was the last mine in Illinois that produced only lead and zinc.

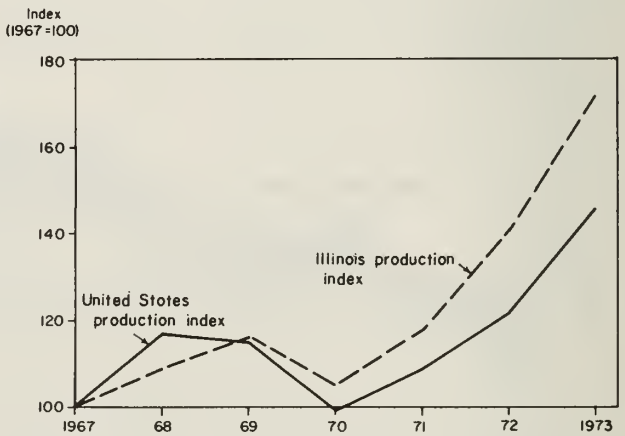

Fig. 14 - Index of production of processed tripoli sold or used by producers in the United States and in Illinois, 1967-1973. Source: U.S. Bureau of Mines.

In 1973, 358,000 tons of fluorspar ore and 67,000 tons of lead-zinc ore were treated to recover 5250 tons of zinc, 541 tons of lead, and a small amount of silver (table 29). In terms of recoverable metal, the pro-

TABLE 29—PRODUCTION AND VALUE OF LEAD, ZINC, AND SILVER IN ILLINOIS, 1972-1973

	1973	1972
Mines producing, lode*	1	2
Material sold or treated (tons)		
Fluorspar ore	358,209	346,000
Lead-zinc ore	66,848	211,000
Production, recoverable metal (tons)		
Zinc	5,250	11,378
Lead	541	1,335
Silver (tray ounces)	W	W
Value ($1000)		
Zinc	$2,169	$4,039
Lead	176	401
Silver	W	W

Source: U.S. Bureau of Mines.
* Fluorspar operations producing by-product lead and zinc not included in mine count.
W - Withheld to avoid disclosing confidential data of individual companies.

duction of lead decreased 59.5 percent, and zinc production decreased 53.9 percent from the 1972 level. The value of lead production declined 56.1 percent and that of zinc 46.3 percent. The closing of both Eagle-Picher mines, the Gray in 1972 and the Bautsch in 1973, is responsible for the more than 50 percent drop in production of lead and zinc in Illinois since 1972.

No silver production was reported for Illinois for the years 1957 through 1970, but because of the recent rise in the price of silver it was again recovered from both fluorspar and lead-zinc ores in 1971. Primarily because of the closing down of the Bautsch mine, the amount and value of silver recovered in 1973 dropped 44.3 percent from the 1972 level. The total amount of silver produced in Illinois remained very small. Data for silver production by individual companies is confidential and cannot be published.

Other Minerals

Peat

Other minerals mined in Illinois include peat, gemstones, and germanium. Although peat is classified as a fuel by the U.S. Bureau of Mines, it has never been used to any great extent for such purpose in this country. In the United States, more than 85 percent of the commercial sales (excluding imports) of peat is used for soil improvement.

In 1973, Illinois ranked second, after Michigan, among the 22 peat-producing states and accounted for 11 percent of the nation's total peat production. Six companies produced 71,552 tons of peat from Cook, Kane, Lake, and Whiteside Counties. Production increased by 2.9 percent during 1973, while quantity of sales decreased by 3.3 percent (table 30). The three major kinds of peat—reed-sedge, moss, and peat humus—were produced in Illinois.

Gemstones

The gemstone produced in Illinois is fluorspar. The stones contribute very little to the value of total mineral production. The 1973 estimated value for gemstones remained about the same as for 1972 and cannot be disclosed without revealing data from individual companies.

Germanium

Germanium is a minor by-product of the Illinois fluorspar-lead-zinc industry in Hardin and Pope Counties. It is recovered from residues from zinc

TABLE 30—PRODUCTION AND COMMERCIAL SALES OF PEAT IN ILLINOIS, 1969-1973

Year	Number of plants	Production (tons)	Commercial sales (tons)	Value	Average value per ton	Illinois production (%)*
1969	8	67,330	67,330	$ 958,000	$14.22	11.77
1970	6	62,990	63,341	711,000	11.23	12.19
1971	7	72,523	71,823	W	W	12.03
1972	5	69,523	74,003	W	W	12.06
1973	6	71,552	71,551	1,037,000	14.49	8.78

Source: U.S. Bureau of Mines.
* Illinois production as percentage of United States production.
W - Withheld to avoid disclosing data from individual companies.

concentrates by Eagle-Picher Industries, Inc., at its plant at Miami, Oklahoma. The main uses for germanium are in the manufacture of semiconductor devices and in optical instruments.

Mineral Materials Processed

Mineral materials produced in other states but processed in Illinois in 1973 included bismuth, calcined gypsum, columbium, exfoliated vermiculite, expanded perlite, ground barite, ground mica, iron oxide pigments, natural gas liquids, pig iron, primary slab zinc, rare earths, recovered elemental sulfur, and secondary slab zinc.

Bismuth—A small amount of metallic bismuth, about 8 percent of the 1973 domestic production, was recovered as a secondary product from metal scrap in Illinois by United Refining and Smelting Company in Franklin Park, Cook County. Bismuth is used as a metallurgical additive, in fusible alloys, and in pharmaceutical-chemical applications.

Calcined Gypsum—Gypsum, which is imported from out-of-state mines, was calcined at Waukegan, Lake County, by the National Gypsum Company. In 1973 the quantity of gypsum calcined was 16 percent more than in 1972 and the value was 18 percent above the levels of 1972. Both quantity and value established new annual records.

Columbium—Columbium concentrate from foreign sources and from tin smelter slags was processed by Fansteel, Inc., in North Chicago, Lake County. Columbium is used as a ferro-alloy in the steel industry. Figures are not available.

Exfoliated Vermiculite—Crude vermiculite mined outside the state was processed at West Chicago, Du Page County, by the Construction Products Division of W. R. Grace and Company; at De Kalb, De Kalb County, by Mica Pellets, Inc.; and at Girard, Macoupin County, by the International Vermiculite Company. More than 43.0 percent of the total amount of exfoliated vermiculite processed was used for loose-fill insulation. The 1973 consumption of vermiculite for concrete aggregates and for horticultural uses was 14.5 percent and 11.1 percent

of the total, respectively. Block insulation, plaster aggregate, and unspecified uses accounted for the other 31.4 percent of the total. The quantity of exfoliated vermiculite processed in 1973 was 1.8 percent higher than in 1972 and the value increased by 33.3 percent.

Expanded Perlite—Crude perlite mined outside the state was processed by Silbrico Corp. in Cook County, Mica Pellets in De Kalb County, Filter Products Corp. and National Gypsum Company in Lake County, and Johns-Manville Perlite Corp. in Will County. Expanded perlite is used as an aggregate for concrete and plaster, for horticultural aggregate, in roof insulating board, for low-temperature insulation, as a filter aid, and for miscellaneous purposes. The quantity of expanded perlite produced in 1973 showed a 3.0 percent increase and the value a 64.0 percent increase over the 1972 levels. Illinois led the nation in production and in producer use and sales of expanded perlite.

Ground Barite—Ground barite was processed at East St. Louis in St. Clair County in 1973 by Pfizer, Inc. The 1973 value was 22.8 percent higher than that of 1972. Production increased 32.2 percent above the 1972 level. Barite is used mainly as a weighting agent in oil and gas well-drilling muds. It is also used as a filler or extender in paint manufacture, in the glass and rubber industries, and in the production of barium chemicals.

Ground Mica—Scrap and flake mica was ground and processed in Forest Park, Cook County, by the U.S. Mica Company, Inc. More than 70 percent of the ground mica produced in 1973 was used in cement for wall board joints and in roofing material; the rest was used in the plastics industry, in rubber molded products, as a coating agent on welding rods, for cable and wire insulation, in paint as a pigment extender, in well-drilling muds, and for decorative and miscellaneous uses. A drop of about 3.4 percent occurred in the production of ground mica in Illinois from 1972 to 1973. The value of the product rose more than 6 percent above the 1972 value.

Iron Oxide Pigments—Iron oxide pigments processed in Illinois in 1973 showed a 7.0 percent increase in quantity and an 11.4 percent increase in value over 1972 levels. The finished pigments were produced from iron ore imported from other states by the Prince Manufacturing Co. of Quincy in Adams County; G. B. Smith Chemical Works of Maple Park in Kane County; and Pfizer, Inc., of East St. Louis in St. Clair County. Illinois was the leading producer of finished iron oxide pigments in 1973.

Natural Gas Liquids—Natural gas liquids include ethane, propane, isobutane, unsplit butane, and a combination of gasoline and liquefied petroleum gas (LPG). Natural gas was processed in 1973 in Douglas County at the Tuscola plant of the United States Industrial Chemical Co., a Division of National Distillers and Chemical Corp. A slightly greater quantity of natural gas liquids was produced than in 1972. Their value increased 33.6 percent above the 1972 value.

Pig Iron and Raw Steel—During 1973, 7.9 million tons of pig iron, valued at 585.0 million dollars was produced in blast furnaces in Illinois. This was an increase in production of 9.7 percent, or 700,000 tons, from the 1972 level of 7.2 million tons. Four out of the five Illinois steel plants are located in Cook County—Interlake Steel Co., International Harvester Com-

pany's Wisconsin Steel Division, United States Steel Corp., and Republic Steel Corp. The fifth plant, Granite City Steel Division of National Steel Corp., is in Madison County. According to the American Iron and Steel Institute, 13.4 million tons of raw steel was produced in Illinois in 1973, an increase of 10.5 percent over the 1972 level.

Primary Slab Zinc—In May 1973 the electrolytic zinc plant at Sauget in St. Clair County, bought by American Metal Climax, Inc. (AMAX) from American Zinc Co. in June 1972 and extensively rehabilitated, began production. Special high-grade zinc was processed from domestic and foreign ores and concentrates. The Sauget plant is expected to reach its full capacity of 84,000 tons of high-grade zinc some time in 1975.

Rare Earths—Imported monazite, a rare earth phosphate, was processed by Lindsay Rare Earths Division of Kerr-McGee Chemical Corp. at West Chicago in Du Page County during 1973. The plant has ceased operation because of inability to meet antipollution standards for waste water.

Recovered Elemental Sulfur—During 1973, elemental sulfur was recovered by four companies: The Anlin Co. of Illinois at its chemical plant in Madison County, Union Oil Co. of California at its Chicago refinery in Will County, Marathon Oil Co. at its Robinson refinery in Crawford County, and Mobil Oil Corp. at its new Joliet refinery in Will County. The Anlin Co. of Illinois processed gas streams to recover sulfur from the refineries of Shell Oil Co. and Amoco Oil Co. at Wood River and from the Clark Oil and Refining Corp. refinery at Hartford.

The amount of sulfur recovered in 1973 was 28.9 percent more than that recovered in 1972 and over 40 percent more than that recovered in 1971. Illinois ranked fifth in the nation in quantity of recovered elemental sulfur and sixth in value.

Secondary Slab Zinc—During 1973, secondary slab zinc was produced by Apex Smelting Co. at Chicago, Cook County, and by Sandoval Zinc Co. at Sandoval, Marion County.

Mineral Products Manufactured

The mineral products manufactured in 1973 from crude mineral materials mined in Illinois and/or elsewhere included cement, clay products, coke, lime, and glass. Available statistical data on production, consumption, and uses are given below.

Cement

Production—In Illinois 1,530,833 tons of finished portland cement and 84,575 tons of prepared masonry cement were manufactured in 1973, a 0.6 percent decrease in production of portland cement and an 11.3 percent increase in production of masonry cement since 1972. The value of portland cement increased 8.9 percent and that of masonry cement 16.8 percent during that time.

TABLE 31—PRODUCTION AND VALUE OF CEMENT MANUFACTURED IN ILLINOIS, 1972-1973

	Finished portland cement			Prepared masonry cement		
	1973	1972	Percentage of change from 1972 to 1973	1973	1972	Percentage of change from 1972 to 1973
Number of active plants	3	3	—	3	3	—
Production (tons)	1,530,833	1,540,281	- 0.6	84,575	76,004	+11.3
Shipments from mills						
Quantity (tons)	1,571,813	1,571,188	+ 0.04	88,318	79,661	+10.9
Value	$36,064,129	$33,124,461	+ 8.9	$2,900,675	$2,483,457	+16.8
Average value per ton	$22.94	$21.08	+ 8.8	$32.84	$31.18	+ 5.3
Stocks at mills, Dec. 31 (tons)	108,690	180,135	-39.7	5,430	9,173	-40.8

Source: U.S. Bureau of Mines.

Cement was produced by three companies in Illinois—Marquette Cement Manufacturing Co. at Oglesby in La Salle County, Medusa Cement Co. at Dixon in Lee County, and Missouri Portland Cement Co. at Joppa in Massac County.

Finished portland cement shipments totaled 1,571,813 tons and were valued at $36 million, a 0.04 percent increase in quantity and an 8.9 percent increase in value over 1972 levels. Prepared masonry cement shipments totaled 88,318 tons and were valued at $2.9 million, a 10.9 percent increase in quantity and 16.8 percent increase in value over 1972 levels (table 31). Production and shipments of finished portland cement are shown by user class in figure 15.

The raw material used in the manufacture of portland cement included limestone, sandstone, shale, clay, sand, slag, fly ash, and gypsum. Of the total 2,184,244 tons of crushed limestone produced in Illinois for use in cement manufacture in 1973, 93.7 percent was consumed within the state and 6.3 percent was exported to other states.

Bulk shipments of cement from Illinois plants to customers were made by truck, rail, and barge. Of the 1,495,667 tons shipped in bulk, 96 percent was transported by truck. Container shipments totaled 76,146 tons, with 71,619 tons shipped by truck and 4,527 tons shipped by rail.

Consumption—A total of 4,149,000 tons of portland cement was consumed in Illinois in 1973, 543,000 tons more than the amount consumed during 1972 (fig. 16). The increase indicates a resurgence of new construction in the state during 1973. Plants in Illinois produced only 37.0 percent of the portland cement consumed in Illinois. The other 63.0 percent was imported from other states.

Illinois consumption of masonry cement in 1973 reached a record high for the decade, 129,000 tons, an increase of 11.2 percent over 1972 and 15.2 percent above the previous record consumption set in 1969 (fig. 17). Shipments of masonry cement from Illinois plants increased by 11 percent during 1973 but accounted for only 68.5 percent of the total Illinois consumption of masonry cement. The amount of masonry cement imported into the state has been steadily increasing for the past 6 years.

Coke

Production—In 1973, a total of 1,941,000 tons of coke was produced and 223,000 tons of coke breeze was recovered from four oven-coke operations—three in Cook County and one in Madison County. Production was down 6.9 percent for coke but up 19.9 percent for breeze compared with 1972 figures (table 32). On the basis of the national average value of $42.92 per ton received by producers for all grades of coke, Illinois coke production for 1973 was worth $83.3 million, 0.6 percent more than the 1972 value. Of the coke produced in 1973, 98 percent was used in blast furnaces by the producing companies, and the remainder was sold. By-products, other than coke breeze, recovered at Illinois oven-coke plants included coke-oven gas, tar, crude light-oil, and ammonia.

The coal used for the manufacture of coke in Illinois in 1973 came from five other states—Kentucky, West Virginia, Pennsylvania, Virginia, and Arkansas—as well as from Illinois. Illinois contributed 37.4 percent and Kentucky 35.3 percent (table 33). The amount of Illinois coal used for coking has declined for the past 5 years, while the use of Pennsylvania coal has increased. Arkansas sent coking coal to Illinois in 1972 for the first time, shipping 105,000 tons. In 1973 it increased shipments to 150,000 tons.

Illinois coal used for coking purposes in 1973 was shipped primarily from mines in Franklin County, Jefferson County, and Saline County, according to the U.S. Bureau of Mines.

Consumption and Uses—Illinois consumed 3,843,000 tons of coke and 241,000 tons of coke breeze in 1973

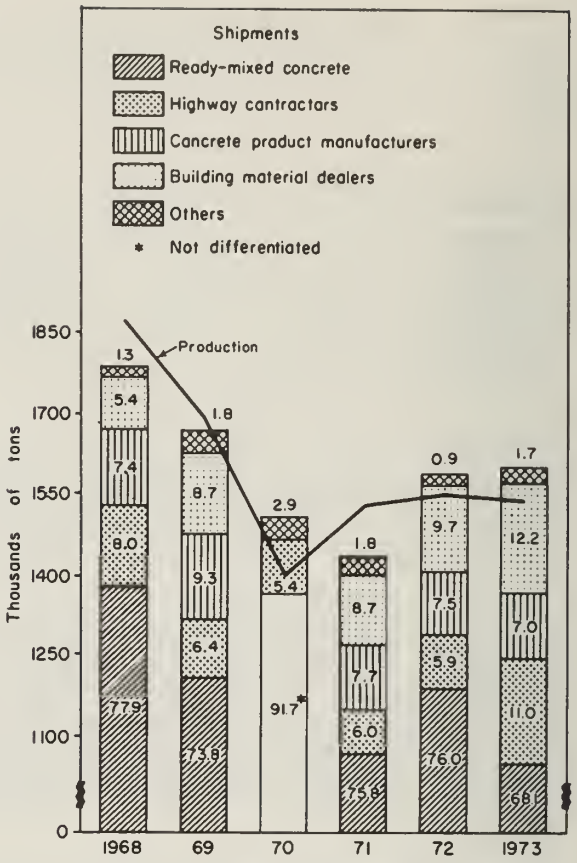

Fig. 15 - Percentage of production and shipshipments of finished portland cement in Illinois, by customer type, 1968-1973.

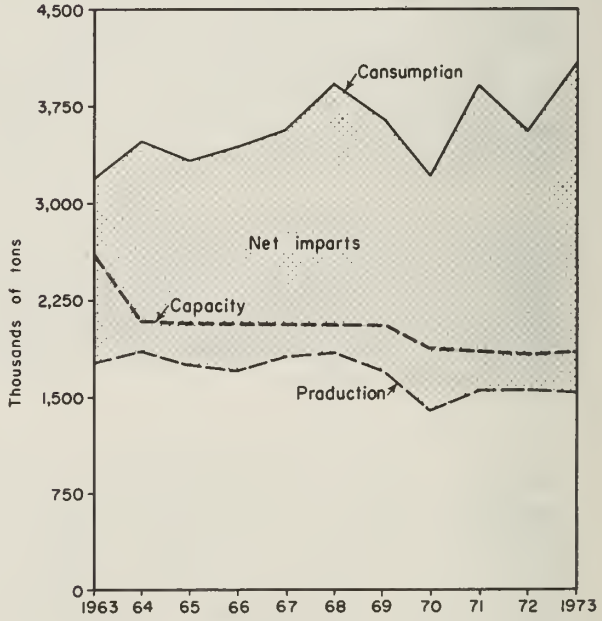

Fig. 16 - Production and consumption of finished protland cement in Illinois, 1963-1973.

(table 32), a 20 percent increase in coke and a 13 percent decline in breeze from the 1972 consumption levels. The increase in consumption of coke during 1973 basically reflects the increase in pig iron production. Coke is also used for foundry and other industrial purposes, and a very small amount is used for residential heating. Coke breeze was used for fuel in steam plants, in agglomerating plants, and for other industrial uses.

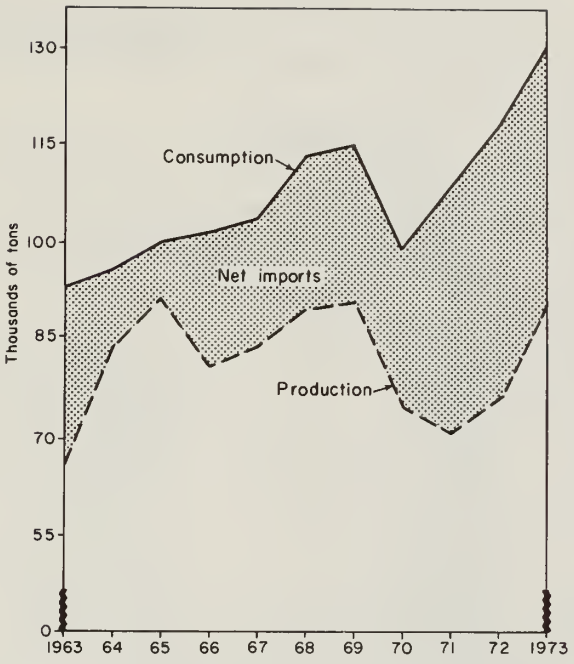

Fig. 17 - Production and consumption of prepared masonry cement in Illinois, 1963-1973.

Lime

Production—In 1973, Illinois ranked sixth in the nation in lime production. Hydrated and quicklime were produced by two companies—Marblehead Lime Co. has four plants, two in Adams County and two in Cook County; Vulcan Materials Co. has one plant in Cook County. The total amount produced in 1973 was 13.4 percent higher than the 1972 level and surpassed by 8.5 percent the 1969 production record (fig. 18). The lime was shipped to consumers in Illinois, adjoining states, and Canada.

Consumption and Uses—A total of 1,202,292 tons of lime was consumed in Illinois, 17.5 percent more than in 1972 (fig. 19). The lime was used in steel furnaces, in refractories, for water purification, for sewage treatment, and for other purposes. In spite of being a major lime producer, Illinois continued to be a net importing state.

Clay Products

To obtain accurate, current information about the amount and value of clay products manufactured in Illinois, the Illinois State Geological Survey

TABLE 32—PRODUCTION AND CONSUMPTION, BY USE, OF COKE IN ILLINOIS, 1969-1973
(thousand tons)

Year	Coke production	Coke uses (1000 tons)				Total coke consumption*	Breeze production	Total breeze consumption
		Blast furnace	Foundry	Other industrial plants	Residential heating			
1973	1,941	3,610	204	28	1	3,843	223	241
1972	2,085	2,993	189	16	4	3,201	186	278
1971	2,144	3,298	178	26	3	3,505	189	367
1970	2,356	3,705	183	27	3	3,917	206	461
1969	2,341	2,621	219	27	4	2,871	199	252

Source: U.S. Bureau of Mines.
* Data may not add to totals shown because of independent rounding.

TABLE 33—QUANTITY AND VALUE OF COKE AND BY-PRODUCTS PRODUCED, SOLD, OR USED BY PRODUCER IN ILLINOIS, 1972-1973

Coke and by-products	Unit	1973 Quantity	1973 Value at plant Total (thousand $)	1973 Value at plant Average ($ per ton)	1972 Quantity	1972 Value at plant Total (thousand $)	1972 Value at plant Average ($ per ton)
Plants in operation		4			4		
Coal, carbonized	thousand tons	3,108	50,177	16.14	3,312	49,474	14.94
Coal per ton of coke	tons	1.60	—	25.82	1.59	—	23.75
Coke produced	thousand tons	1,941	83,308	42.92	2,085	82,816	39.72
Coke yield, percent of coal carbonized	percent	62.45	—	—	62.95	—	—
Source of coal carbonized							
Illinois	thousand tons	1,150	—	—	1,242	—	—
Kentucky	thousand tons	1,084	—	—	1,138	—	—
West Virginia	thousand tons	592	—	—	716		
Pennsylvania	thousand tons	53	—	—	63	—	—
Virginia	thousand tons	42	—	—	7	—	—
Arkansas	thousand tons	150	—	—	105	—	—
Total	thousand tons	3,071	—	—	3,271	—	—
From stock	thousand tons	37	—	—	41		
Coke sold or used by producer							
Blast furnace	thousand tons	1,974	73,131	—	2,042	67,068	—
Other purposes	thousand tons	W	W	—	W	W	—
Commercial sales							
Blast furnaces	thousand tons	W	W	—	W	W	—
Other industrial plants	thousand tons	—	—	—	—	—	—
Residential	thousand tons	—	—	—	—	—	—
Coke oven by-products							
Amonia produced (sulfate equivalent)	thousand tons	23	—	—	22	—	—
Per ton of coal coked	lbs	14.80	—	—	13.28	—	—
Sulfate equivalent sold	thousand tons	25	524	—	20	303	—
Coke oven gas produced	million cu ft	31,841	—	—	33,524	—	—
Per ton of coal	thousand cu ft	20.24	—	—	10.12	—	—
Used in heating coke ovens	million cu ft	12,888	—	—	13,948	—	—
Surplus used or sold	million cu ft	17,755	4,407	0.248/Mcf	16,908	4,178	0.247/Mcf
Wasted	million cu ft	1,148	—	—	2,668	—	—
Light oil and derivatives sold	thousand gal	W	W	W	W	W	W
Tar produced	thousand gal	21,488	—	—	22,152	—	—
Per ton of coal coked	gal	6.91	—	—	6.69	—	—
Used by producers	thousand gal	W	—	—	W	—	—
Sold for refining	thousand gal	17,331	1,923	0.111/gal	21,204	2,318	0.109/gal
Total coke and by-products sold or used (excluding light oil and derivatives sold)			90,162			86,615	

Source: U.S. Bureau of Mines

W - Withheld to avoid disclosure of data from individual companies.

each year sends questionnaires to all producers in the state. Twenty-seven companies responded to the canvass for 1973. Fourteen companies reported clay mining operations. The information obtained is recorded in table 34.

Clay products valued at $56.5 million were produced in Illinois in 1973. Included in this value are whiteware and pottery ($31.2 million), structural clay products (brick, drain tile, and sewer pipe) ($12.7 million), refractories ($5.6 million), and lightweight aggregate and other products ($6.9 million).

Glass

Much of the high-purity silica sand produced in La Salle and Ogle Counties is used in the manufacture of glass. According to the *American Glass Review*, 22 glass manufacturing firms were operating at 27 plants in Illinois in 1973. Two companies manufactured fiber glass and related products.

Preliminary figures for the United States showed that total shipments of glass containers were 4 percent higher in 1973 than in 1972. Third quarter 1973 figures showed that most glass companies were ahead of 1972 in both gross sales and earnings.

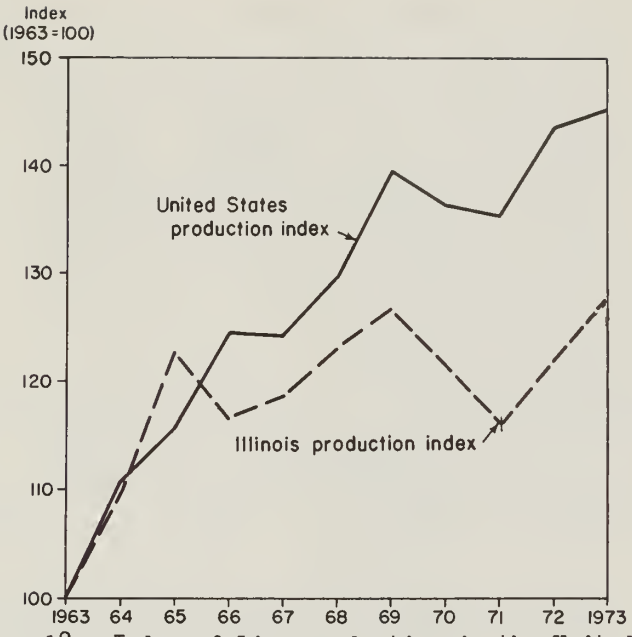

Fig. 18 - Index of lime production in the United States and in Illinois, 1963-1973.

REVIEW OF PRELIMINARY MINERAL PRODUCTION DATA FOR 1974

According to the United States Bureau of Mines, preliminary figures for 1974 show that Illinois led the nation in the production of fluorspar and tripoli, ranked second in the output of stone and peat, was fourth in the output of coal, and was fifth in the output of sand and gravel.

Coal was the mineral commodity leading in value in 1974, accounting for 58.8 percent of the total value of Illinois mineral materials.

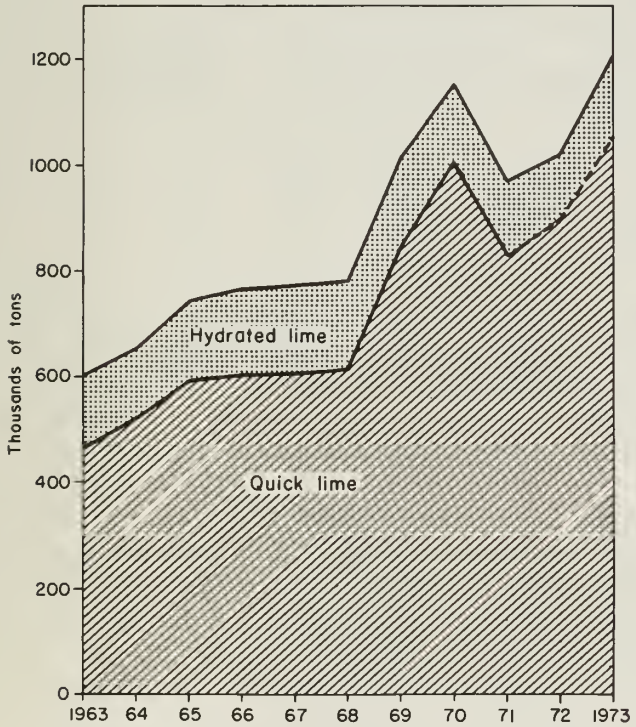

Fig. 19 - Trends in consumption of quick and hydrated lime in Illinois, 1963-1973. Source: U.S. Bureau of Mines.

Mineral Materials Mined

Preliminary production data for Illinois indicate that, in spite of a decline in the quantity of various mineral materials mined, their value reached a record high of $988 million —a 30 percent increase over the value reported for 1973 (table 35). The principal factor responsible for this increase was the sharp rise in mineral commodity prices.

Fuels

Mineral fuels produced during 1974 included coal, oil, and natural gas and were valued at $788.7 million. Of this amount, 73.6 percent came from coal, 26.3 percent from oil, and the remaining 0.1 percent from natural gas. In 1973, the value of mineral fuels produced totaled $546.1 million.

TABLE 34—VALUE AND TYPE OF CLAY PRODUCTS MANUFACTURED IN ILLINOIS, 1972-1973

Produots	1973 Number of producers reporting	1973 Production (thousands)	1973 Value (thousand $)	1972 Number of produoers reporting	1972 Production (thousands)	1972 Value (thousand $)
Common brick	3	120,677 units	5,692	3	79,312 units	3,344
Faoe brick	5	93,717 units	5,896	7	127,982 units	6,245
Drain tile Sewer pipe*	4	73.8 tons	1,096	5 3	114.7 tons	7,270
Lightweight aggregate Other†	2 1	594.0 tons	6,932	2 2	650.0 tons	4,863
Refractories	4	88.4 tons	5,627	7	223.7 tons	15,834‡
Whiteware and pottery	8	—	31,208	7	—	31,692
Number of companies reporting	27#	—	—	34	—	—
Total			56,451			69,248

Source: Illinois State Geological Survey annual canvass.
* Production in 1972 only.
† Includes other structural and miscellaneous products.
‡ Includes some non-clay refractories; rounded for total.
# Reporting producers only; four other producers thought to be in operation did not report.

TABLE 35—PRELIMINARY MINERAL PRODUCTION DATA FOR 1974

Commodity	Unit	1974 Quantity	1974 Value (thousand $)	1973 Quantity	1973 Value (thousand $)	Percentage of change from 1973 to 1974 Quantity	Percentage of change from 1973 to 1974 Value
MINERAL MATERIALS MINED							
Fuels							
Coal	thousand tons	58,079	580,790	61,548	412,992	- 5.6	+40.6
Crude oil	thousand bbl	27,554	207,206	30,669	132,490	-10.2	+56.4
Natural gas	thousand Mcf	1,436	696	1,638	573	-12.3	+21.5
Industrial and construction materials							
Stone*	thousand tons	63,274	116,041	66,650	114,007	- 5.1	+ 1.8
Sand and gravel	thousand tons	37,102	59,734	46,176	77,158	-19.7	-22.6
Clays†	thousand tons	1,696	3,735	1,758	3,612	- 3.5	+ 3.4
Fluorspar	thousand tons	153	11,952	165	12,278	- 7.3	- 2.7
Tripoli	thousand tons	W	W	W	W	W	W
Metals							
Lead	thousand lb	908	203	1,082	176	-16.1	+15.3
Zinc	thousand lb	8,112	2,912	10,500	2,169	-22.7	+34.3
Silver	lb	W	W	W	W	W	W
Others							
Peat	thousand tons	94	1,479	72	1,037	+30.6	+42.6
Gem stones	—	NA	NA	NA	W	NA	NA
Oermanium	—	NA	NA	NA	NA	NA	NA
Barite	tons	W	W	—	—	—	—
Values that cannot be disclosed (W)		—	3,361	—	2,792	—	+20.4
Total value of mineral materials mined		—	988,108	—	759,284	—	+30.1

Sources: U.S. Bureau of Mines, Illinois Department of Mines and Minerals, and Oil and Oas Seotion of the Illinois State Oeologioal Survey.
* Exoludes dimension stone; included with value of items indicated by symbol W.
† Excludes fuller's earth; included with value of items indicated by symbol W.
W - Withheld to avoid disclosing individual oompany confidential data.
NA - Not available.

Coal

Because of the nationwide strike that affected operations at various coal mines in Illinois during November and December 1974, Illinois coal production, which had been 65.1 million tons in 1973, dropped to 58.1 million tons. However, the average f.o.b. mine value of coal increased from $6.71 per ton in 1973 to $10.00 in 1974, and, as a result, the value of coal produced showed a 40.6 percent increase over the 1973 level. Of the total 58.1 million tons of coal produced in Illinois, 31.1 million tons, or 54.0 percent, came from underground mines, and 27.0 million tons, or 46.0 percent, came from strip mines.

In 1974, 21 counties reported coal production, one less than the number reported in 1973. According to the Illinois Department of Mines and Minerals, 55 coal mines actively operated in Illinois during the year. These included 23 underground mines and 32 strip mines. The number of men employed in coal mines increased from 11,409 in 1973 to 12,467 in 1974. This is the fifth consecutive year in which employment in Illinois coal mines has increased, although the number of mines has decreased from 64 in 1970 to 55.

A U.S. Bureau of Mines report indicates that Illinois coal shipments to the various consuming sectors were made as shown in table 36.

TABLE 36—COAL SHIPMENTS TO CONSUMING SECTORS, 1973-1974

Consuming sector	Jan.-Sept. 1973 (1000 tons)	Jan.-Sept. 1974 (1000 tons)	Percentage of change
Electric utilities	38,139	37,849	- 0.8
Coke and gas plants	3,196	3,838	+20.1
Retail dealers	467	363	-22.3
All others	5,796	5,790	- 0.1
Railroads	7	2	-71.4
Used at mine	29	34	+17.2
Mine stock (adjusted)	-36	-37	
Total	47,598	47,839	+ 0.5

The states to which Illinois coal was shipped in 1974 were as shown in table 37.

TABLE 37—COAL SHIPMENTS TO CONSUMING STATES, 1973-1974

Consuming state	Jan.-Sept. 1973 (1000 tons)	Jan.-Sept. 1974 (1000 tons)	Percentage of change
Illinois	22,398	21,344	- 4.7
Missouri	6,792	8,829	+30.0
Indiana	4,496	5,725	+27.3
Wisconsin	3,823	3,625	- 5.2
Iowa	3,046	2,580	-15.3
Kentucky	2,436	1,598	-34.4
Minnesota	1,289	1,245	- 3.4
Alabama-Mississippi	947	963	+ 1.7
Michigan	864	646	-25.2
Georgia-Florida	681	760	+11.6
Tennessee	699	268	-61.7
Other states	58	51	-12.1
Export (Mexico)	69	206	+198.5
Total	47,598	47,840	+ 0.5

To meet the projected increase in demand for coal, several new mines are being constructed or planned in Illinois. New mines that have been officially announced as of April 1975 are listed in table 38.

Crude Oil and Natural Gas

The production of crude oil in Illinois declined further in 1974 to a new low of 27.6 million barrels, 10.1 percent less than the 1973 production. At an average value of $7.52 per barrel, the production was valued at $207.2 million. The marketed production of natural gas declined in spite of an increase in demand. Total natural gas marketed from Illinois fields in 1974 was 1436 million cubic feet—a 12.3 percent decline from the 1973 production level. However, the average price increased and, therefore, the value of natural gas marketed showed a 21.5 percent increase.

Increased prices for natural gas and crude oil spurred drilling in Illinois. In 1974, a total of 2,146,632 feet was drilled—a 14.4 percent increase over the total footage drilled in 1973. Of the total, 2,023,761 feet was drilled by the oil and gas industry for production and the remaining 122,871 feet was drilled for input wells by the natural gas storage industry. Drilling for natural gas storage was down 71.5 percent from the 1973 level, while drilling by the oil and gas industry showed a 39.9 percent increase. The 762 new holes drilled for oil and gas in 1974 (up 40.6 percent from 1973) resulted in 333 oil wells, 11 gas wells, and 418 dry holes. As a result, 5 oil fields, 1 gas field, 19 extensions to fields, and 10 new pay zones in existing fields were discovered in 1974. However, none of the 1974 discoveries was large enough to increase Illinois oil and gas reserves by any substantial amount. The only discovery worthy of note was in the Lillyville North field

TABLE 38—NEW COAL MINES PLANNED OR UNDER CONSTRUCTION IN ILLINOIS

Company/name of mine	Location	Scheduled initial production	Designed capacity at full operation (1000 tons)	Coal seam	Status
Monterey Coal Co. Monterey #2 (Underground mine)	Near Albers Clinton County	1976	3,600	Herrin (No. 6)	Under construction
Consolidation Coal Co. Burning Star #5 (Strip mine)	Near De Sota Jackson County	1976	2,800	Harrisburg (No. 5) and Herrin (No. 6)	Under construction
Freeman Coal Mining Co. Crown #2 (Underground mine)	Near Virden Macoupin County	1977	3,000	Herrin (No. 6)	Under construction
Inland Steel Co. (Underground mine)	Near McLeansboro Hamilton County	1978	2,500	Harrisburg (No. 5)	Under construction
AMAX Coal Co. Ayrcat (strip mine)	Near Catlin Vermilion County	1978	2,500	Danville (No. 7)	Announced
Old Ben Coal Co. (Two underground mines)	Near West Frankfort	1981	4,000	NA	Announced
Zeigler Coal Co. No. 6 (Underground mine)	NA	1976	2,000	NA	Reported in Coal Age Feb. 1975 p. 136
No. 11 (Underground mine)	NA	1978	2,500	NA	Reported in Coal Age Feb. 1975 p. 136

in Cumberland County. In that field, of four wells completed, three had initial production figures of approximately 500, 600, and 700 barrels of oil per day in 1974. The fourth had only 18 barrels of oil per day initial production.

In 1974, at least 24 new waterfloods were started in Illinois, compared to 8 new projects in 1973. This spurt of waterflood activity does not mean that there is a revival of waterflooding operations, but, rather, suggests marginal waterfloods are being started that were not economically feasible at the former low crude oil prices.

In Illinois during the second half of 1974, Marathon Oil Co. received permits for two large tertiary recovery projects. These projects—called Maraflood projects and located in western Crawford County—cover an area of approximately 400 acres. In addition, Shell Oil Co. drilled two wells at its Benton tertiary recovery project, and Texaco drilled one or two observation wells at its tertiary recovery project in the Salem Consolidated pool.

Industrial and Construction Materials

The depressed construction and industrial markets caused a decline in production of stone, sand and gravel, clay, and fluorspar in 1974. According to U.S. Bureau of Mines estimates, Illinois stone production declined 5.1 percent, sand and gravel production declined 19.7 percent, and the production of clays declined 3.5 percent. The production of fluorspar from Illinois mines in 1974 declined by 7.3 percent, but as a percentage of the total national fluorspar shipments it increased from 67 percent in 1973 to 79 percent.

In 1974, fluorspar production was started at Ozark Mahoning Co.'s new mine, Knight Mine. Production was resumed at the Lafayette Mine, leased from U.S. Steel by the Minerva Oil Co., and at the Crystal Mine, owned and operated by Minerva Oil Co. A small heavy-media separation plant on Spar Mountain, near Cave in Rock, has been erected by Robin Hastie and Sons. The plant produced a small tonnage of metallurgical grade fluorspar in 1974. Cerro Corporation is at present conducting exploratory drilling on its large optioned and leased lands in both Illinois and Kentucky.

Metals and Other Minerals

With the closing of the last lead-zinc mine in Illinois in 1973, Illinois metal production has declined considerably. In 1974, 454 tons of lead and 4056 tons of zinc were recovered at fluorspar mining operations. In addition to lead and zinc, some silver and barite were also recovered as by-products of fluorspar production.

In 1974, Illinois peat production totaled 94,000 tons. The peat was valued at $1,479,000.

Mineral Materials Processed

Preliminary data for mineral materials processed in Illinois during 1974 are not yet available.

Mineral Products Manufactured

Mineral products manufactured in Illinois in 1974, for which preliminary data are available, include cement, coke, and lime. Portland cement (1,454,000 tons), valued at $38.7 million, and masonry cement (67,000 tons), valued at $2.5 million, were produced. The amount of lime manufactured was about 5 percent less than the 1973 production. The quantity of coke manufactured is estimated at 1,944,000 tons. At an average value of $43.00 a ton, the production was valued at $83.6 million.

Acknowledgments

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