267

CHINA

TIENTSIN No. 83.12

ISSUED FEBRUARY 1, 1943

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AIR OBJECTIVE FOLDER

No. 83.12

Tientsin Area

CHINA

INTELLIGENCE SERVICE
U. S. ARMY AIR FORCES
WASHINGTON, D. C.

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ON OFFENSIVE MISSIONS

83.12

Issued February 1, 1943

AIR OBJECTIVE FOLDER No. 83.12 CHINA

TIENTSIN AREA

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3573-T-1-Tientsin-1-27-43

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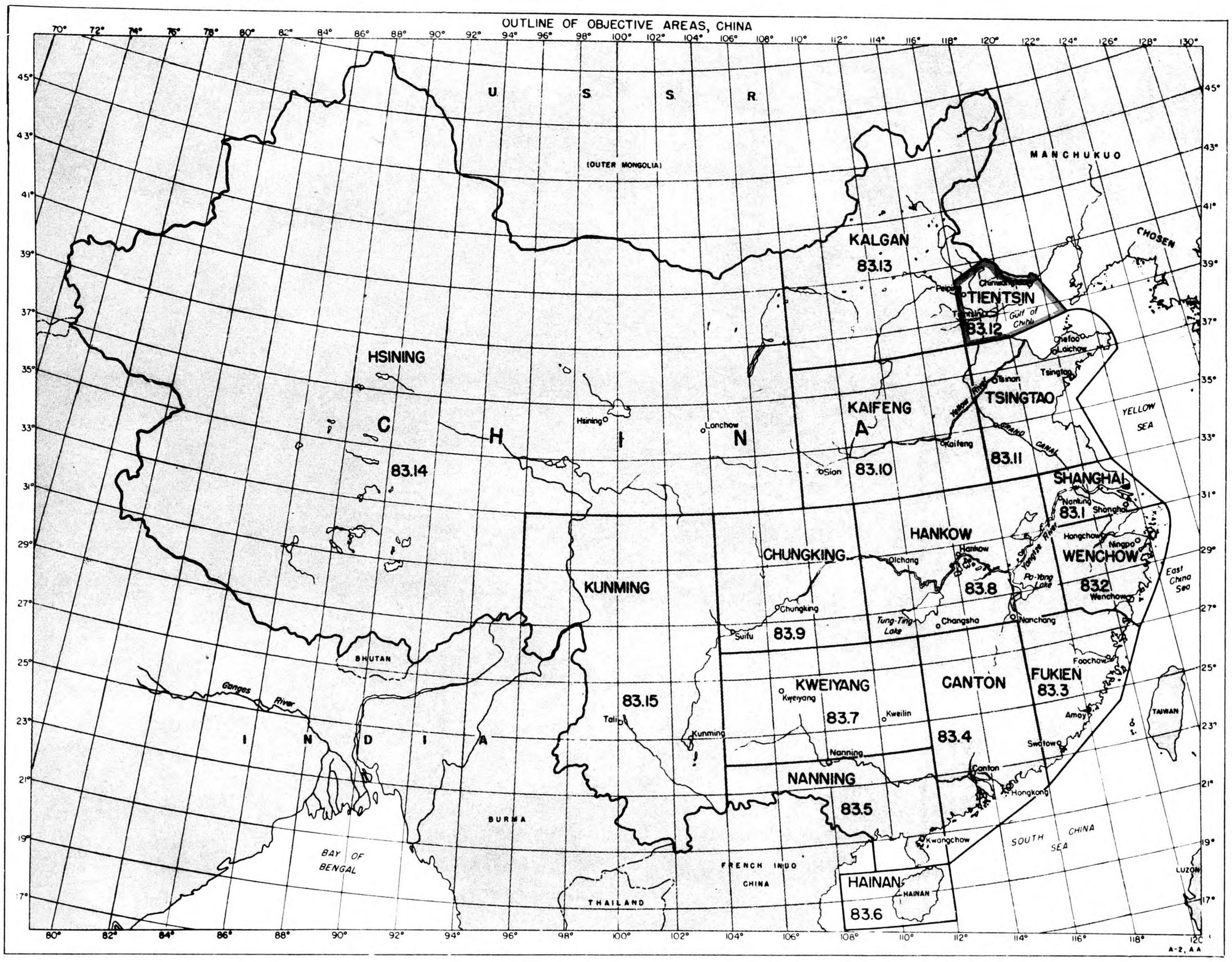


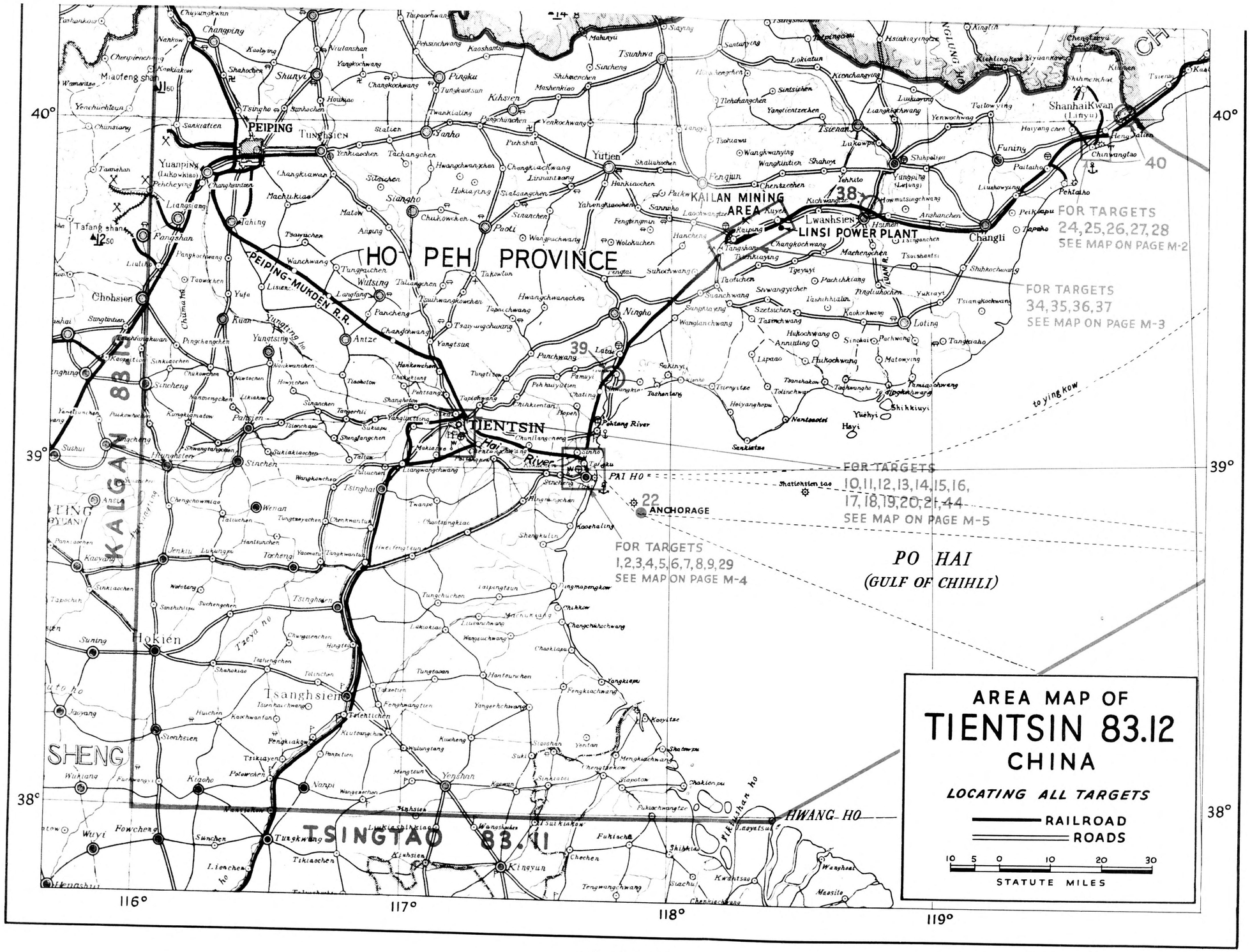
EXPLANATION OF FOLDER

This folder is primarily for the use of group and squadron commanders and intelligence officers in the planning of operations and the briefing of crews. Neither the folder nor any part of it may be taken into the air on offensive missions.

Targets and objective areas are numbered from one to infinity within each country. These numbers are combined into a code showing the country, objective area, and target. For example, 83.12-26 indicates China (83), Tientsin Area (12), and **TARGET 26** China series.

Supplementing the objective folder, target charts are provided separately for the use of air crews. Each chart is centered on a target; it spots other targets lying within a four-mile radius; and it identifies landmarks within a twenty-mile radius. Each chart is numbered according to the target on which it is centered.

3573M—T-3—Tientsin



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SUMMARY AND EVALUATION OF TIENTSIN AREA 83.12

NOTE: This folder is the result of an effort to obtain the best information thus far available in the U. S. A. Every effort should be made in the field to correct by photo reconnaissance the data given herein.

DESCRIPTION: The Tientsin area comprises the region south of the Great Wall of China, that is, south of the northern boundary of Hopei (Ho Peh) Province and east of longitude 116° E. It is bounded on the south by latitude 38° N and on the east by the Gulf of Chihli.

IMPORTANCE: This is the most important area in occupied China for Japanese industry. It is the chief source of coking coal for steel manufacture, and its export of salt is indispensable to the chemical industries of Japan. Exports of iron ore, cotton, wool, and hides are considerable.

As of the date of this folder mined coking coal reserves in Japan are small or non-existent. Japanese production of coal for metallurgical coke (exclusive of Karafuto) is chiefly confined to Hokkaido and amounts only to about 15% of steel industry requirements. Kailan Mines coal is essential to the maintenance of budgeted steel production in Japan, Korea, and Manchukuo.

Salt is derived from sea water by solar evaporation in the flats on the coast around Tangku and Taku. Estimated annual shipments of salt to Japan through Tangku amount to 300,000 tons, or 20% of Japanese requirements. Shipments of salt from Tangku are increasing.

Iron ore moves out of the interior by railroad and is transshipped at Tangku **TARGET 1.** This shipment amounts to 300,000 tons per annum.

Annual shipments of cotton, wool, and hides amount to 100,000 tons.

DEFENSES AND VULNERABILITY: The following airfields have been reported:

Name	Location
Peiyang Military Field	East of Tientsin City
East Tung Chu Tze Airfield (emergency?)	6 miles east of Tientsin City
West Tung Chu Tze Airfield (emergency?)	About 2 miles east of Tientsin City
Chang Kuei Chang Airfield (emergency?)	Unknown
Tangku Airfield (emergency?)	Unknown
Chinwangtao Airfield (emergency?)	Unknown

TABULATION OF TARGET INFORMATION

TARGET NO.	TARGET NAME	APPROXIMATE COORDINATES	DESCRIPTION AND SIGNIFICANCE	TARGET CHART NO.
			BUILDING MATERIALS	
37	New Cement Works (Tangshan)	39° 40′ N 118° 12′ E	Large cement works. Cement distributed over whole area and Manchukuo. (See photo A on page P-1; map on page M-3.)	35
			CHEMICAL PLANTS	
8	Yung Li Alkali Plant (Tangku)	39° 01′ N 117° 40′ E	Ferro-concrete bldg. Produced in 1940: 60,000 tons soda ash, 50,000 tons ammonium sulphate. (See photo G on page P-3; map on page M-4.)	4
			ELECTRIC POWER	
15	Belgian Tramway and Light Co (Tientsin City)	39° 08′ N 117° 11′ E	Two-story, brick and ferro-concrete, flat roof, two brick smokestacks. Cap 22,000 kw. Largest in Tientsin City. (See map on page M-5.)	11
16	British Electric Co (Tientsin City)	39° 07′ N 117° 11′ E	Ferro-concrete bldg. (See map on page M-5.)	11
26	Port Power House (Chinwangtao)	39° 56′ N 119° 37′ E	Ferro-concrete bldg. (See map on page M-2.)	26
34	Linsi Power House (Linsi)	39° 42′ N 118° 26′ E	Primary target in this area. Brick and ferro-concrete bldg. Boiler house adjacent. (See text on page T-8; map on page M-3.)	34
35	Tangshan Power House (Tangshan)	39° 38′ N 118° 14′ E	Brick and ferro-concrete bldg. Boiler house adjacent. (See map on page M-3.)	35

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REVIEW OF TARGETS FOR TIENTSIN AREA

ELECTRIC POWER: The primary target in this area is the Linsi Power Plant **TARGET 34.** This plant is the only source of power for the pumps of the group of coal mines known as the Kailan Mines. The water seepage in these mines is such that the destruction of this plant would cause the mines to flood and stop production for at least a year. Reconditioning would require new electrical equipment throughout.

HARBOR FACILITIES: The ports of Tientsin City and Tangku are situated on the shallow Hai Ho (river). Only ships drawing less than 15 feet cross the bar off the entrance of the river. Ships of greater draft lie some 10 miles off the mouth of the river and receive cargo from lighters. Port improvements have been made by the Japanese, and equipment consisting of dredges, tugs and steel lighters is extensive. It is estimated that at least 1,500,000 tons of cargo pass through this port yearly, and, based on this estimate, at least five ships will be found in the port area at any given time.

Chinwangtao is the port for the Kailan Mining district. Based on an annual export of 4,500,000 tons of coking coal to Japan and Korea, ten ships will be found in this port at any given time. To handle this tonnage, ships must work continuously, and any ships sunk alongside the piers **TARGET 24** would block free access to the railroad cars. Due to a withdrawal of shipping from the North China coast trade during the first half of 1942, there is an accumulation of several million tons in the mining area. Chinwangtao is ice-free and its importance will increase after ice has stopped coking coal shipments from Karafuto.

RAILROAD TRANSPORTATION: It is reported that traffic on the Peiping-Mukden Railroad is heavy. There is a serious shortage of rolling stock and repair facilities are limited. It is reported that the railroad shop at Shanhaikwan **TARGET 40** has been enlarged and is the most important in occupied China.

SHIPYARDS: These are relatively unimportant except for repairs to local craft and lighters.

LIST OF TARGET CHARTS AVAILABLE FOR TIENTSIN AREA

Charts are numbered according to the targets on which they are centered, (January 1943 edition)

Target chart No.	Targets appearing on chart	Target chart No.	Targets appearing on chart	Target chart No.	Targets appearing on chart	Target chart No.	Targets appearing on chart
4	**1, 2, 3, 4, 5, 6, 7, 8, 9, 29.**	11	**10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 44.**	26	**24, 25, 26, 27, 28.**	38	**38.**
				34	**34.**	39	**39.**
				35	**35, 36, 37.**	40	**40.**

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Chinwangtao Airfield (emergency?)	Unknown

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			CHEMICAL PLANTS	
8	Yung Li Alkali Plant (Tangku)	39° 01′ N 117° 40′ E	Ferro-concrete bldg. Produced in 1940: 60,000 tons soda ash, 50,000 tons ammonium sulphate. (See photo G on page P-3; map on page M-4.)	4
			ELECTRIC POWER	
15	Belgian Tramway and Light Co (Tientsin City)	39° 08′ N 117° 11′ E	Two-story, brick and ferro-concrete, flat roof, two brick smokestacks. Cap 22,000 kw. Largest in Tientsin City. (See map on page M-5.)	11
16	British Electric Co (Tientsin City)	39° 07′ N 117° 11′ E	Ferro-concrete bldg. (See map on page M-5.)	11
26	Port Power House (Chinwangtao)	39° 56′ N 119° 37′ E	Ferro-concrete bldg. (See map on page M-2.)	26
34	Linsi Power House (Linsi)	39° 42′ N 118° 26′ E	Primary target in this area. Brick and ferro-concrete bldg. Boiler house adjacent. (See text on page T-8; map on page M-3.)	34
35	Tangshan Power House (Tangshan)	39° 38′ N 118° 14′ E	Brick and ferro-concrete bldg. Boiler house adjacent. (See map on page M-3.)	35

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TABULATION OF TARGET INFORMATION

TARGET NO.	TARGET NAME	APPROXIMATE COORDINATES	DESCRIPTION AND SIGNIFICANCE	TARGET CHART NO.
			HARBOR FACILITIES	
1	New Japanese Coal and Ore Wharf (Tangku)	39° 01′ N 117° 39′ E	New wharf built by Japanese to relieve congestion in port of Chinwangtao and scheduled for completion June 1942. To be recognized by network of RR spurs to bring coal and ore to ship side. (See map on page M-4.)	4
3	Butterfield and Swire Co Wharves (Taku)	39° 00′ N 117° 41′ E	Primary target. Shipping. (See map on page M-4.)	4
14	Jardine Matheson Wharves (Tientsin)	39° 07′ N 117° 12′ E	Adjacent district up river reported used by Japanese Army for storage and transshipment. Numerous new whses reported built by Japanese. (See map on page M-5.)	11
22	Anchorage (Taku Bar)	38° 50′ N 117° 50′ E	Anchorage E of Taku Light Ship, about 10 mi E of R mouth. Ships drawing more than 14 ft anchor and lighter cargo.	None
24	Piers (Chinwangtao)	39° 55′ N 119° 37′ E	Steel piling, stone revetment, sand fill, concrete surfacing. Mechanical coal loaders may be installed. As many as 6 or 8 ships may be loading coal. (See text on page T-8; photo C on page P-2; map on page M-2.)	26
7	General Wharf Area (Tangku)	39° 00′ N 117° 40′ E	Primary target. Shipping. (See map on page M-4.)	4
			PETROLEUM	
4	Asiatic Petroleum Co (Taku)	38° 59′ N 117° 40′ E	Two large storage tanks. (See photo E on page P-2; map on page M-4.)	4
5	Japanese Oil Storage (Taku)	38° 59′ N 117° 40′ E	(See map on page M-4.)	4
9	Standard Vacuum, Ta Hwa, Idemitsu Cos (above Tanku)	39° 02′ N 117° 38′ E	These three companies are almost adjacent to each other. Storage cap believed to be extensive. (See map on page M-4.)	4
10	Asiatic Petroleum Co (Tientsin City)	39° 08′ N 117° 12′ E	Three tanks. Total cap 85,000 bbls. L shaped bldg W of tanks contains tin fcty, powerhouse, and repair shop. Two rectangular bldgs adjacent to tin fcty are whses. (See map on page M-5.)	11
13	Standard Vacuum Oil Co (Tientsin City)	39° 07′ N 117° 13′ E	Eleven tanks of various sizes. (See map on page M-5.)	11
21	Texas Co (Tientsin City)	39° 08′ N 117° 11′ E	Five tanks of various sizes. Smallest 8200 bbls, largest 64,000 bbls. (See map on page M-5.)	11
			RAILROAD TRANSPORTATION	
11	East Station (Tientsin City)	39° 08′ N 117° 11′ E	Primary target. Locomotives and RR car concentration. (See map on page M-5.)	11
12	Central Station and Yards (Tientsin City)	39° 10′ N 117° 11′ E	Primary target. Locomotive and RR car concentration. (See map on page M-5.)	11
19	West Station Yards (Tientsin City)	39° 09′ N 117° 09′ E	Primary target. Locomotive and RR car concentration. (See map on page M-5.)	11
17	Hsin Kai River RR Bridge (Tientsin City)	39° 10′ N 117° 11′ E	Steel. (See map on page M-5.)	11

3573—T-6—Tientsin 1-27-43—Final Proof

TABULATION OF TARGET INFORMATION

TARGET NO.	TARGET NAME	APPROXIMATE COORDINATES	DESCRIPTION AND SIGNIFICANCE	TARGET CHART NO.
	Railroad Transportation . . . continued			
18	Hai River RR Bridge (Tientsin City)	39° 09′ N 117° 10′ E	Steel. (See map on page M-5.)	11
25	Kailaun Mining Administration RR Yards and Shops (Chinwangtao)	39° 56′ N 119° 37′ E	Primary target. Locomotive and RR car concentration. (See map on page M-2.)	26
28	Peiping-Mukden RR Station and Yards (Chinwangtao)	39° 56′ N 119° 36′ E	Primary target. Locomotive and RR car concentration. (See map on page M-2.)	26
44	RR Shops (Tientsin City)	39° 10′ N 117° 11′ E	RR maintenance. (See map on page M-5.)	11
38	Lwan River RR Bridge	39° 46′ N 118° 47′ E	Steel. Only RR line between Kailan Mining district and Manchukuo steel mills.	38
39	Pehtang River RR Bridge	39° 17′ N 117° 45′ E	Steel. Only RR line to Manchukuo.	39
40	RR Shops (Shanhaikwan)	40° 01′ N 119° 45′ E	Most important shop in area. Locomotive and RR car bldg and repairs. Br construction and repairs. Reported enlarged. (See text on page T-8.)	40
36	Tangshan RR Shops (Tangshan)	39° 40′ N 118° 12′ E	Brick and ferro-concrete. Locomotive and RR car construction. (See photo B on page P-1; map on page M-3.)	35
	SHIPYARDS			
2	Taku Tug and Lighterage Co (Taku)	39° 00′ N 117° 42′ E	Repair shop, concentration of tugs, lighters and equipment for transshipment at Taku Bar. (See map on page M-4.)	4
6	Chinese Naval Dockyard (Taku)	38° 59′ N 117° 40′ E	Best drydocking equipment in port. (See photo F on page P-2; map on page M-4.)	4
20	Hai Ho Conservation Board Dockyard (Tientsin City)	39° 06′ N 117° 13′ E	Repair shop, concentration of dredges and equipment for keeping R open to navigation. (See map on page M-5.)	11
29	Tientsin Lighter Co (Taku)	39° 00′ N 117° 41′ E	Shop, concentration of lighters, tugs and cargo handling equipment. (See map on page M-4.)	4
	MISCELLANEOUS			
27	Yao Hua Glass Works (Chinwangtao)	39° 56′ N 119° 36′ E	Has own power plant and extensive mechanical equipment. (See photo D on page P-2; map on page M-2.)	26

. . . concluded

3573—T-7—Tientsin—1-27-43—Final Proof

REVIEW OF TARGETS FOR TIENTSIN AREA

ELECTRIC POWER: The primary target in this area is the Linsi Power Plant **TARGET 34.** This plant is the only source of power for the pumps of the group of coal mines known as the Kailan Mines. The water seepage in these mines is such that the destruction of this plant would cause the mines to flood and stop production for at least a year. Reconditioning would require new electrical equipment throughout.

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				34	**34.**	39	**39.**
				35	**35, 36, 37.**	40	**40.**

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PHOTOGRAPHS OF TIENTSIN AREA 83.12

3573—P-1—Tientsin—1-27-43—Final Proof

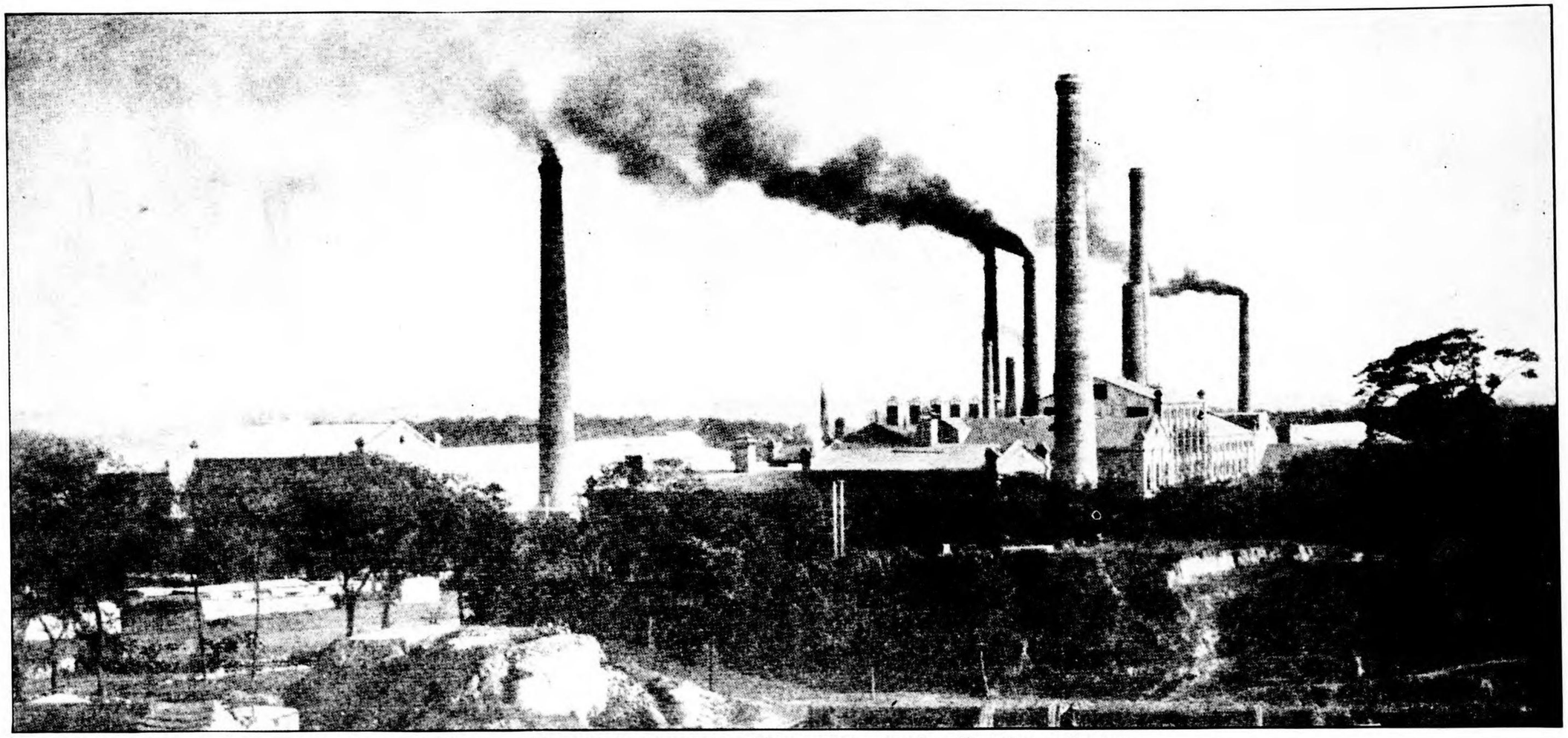


PHOTO A . . . Tangshan **TARGET 37** New cement works, direction unknown.

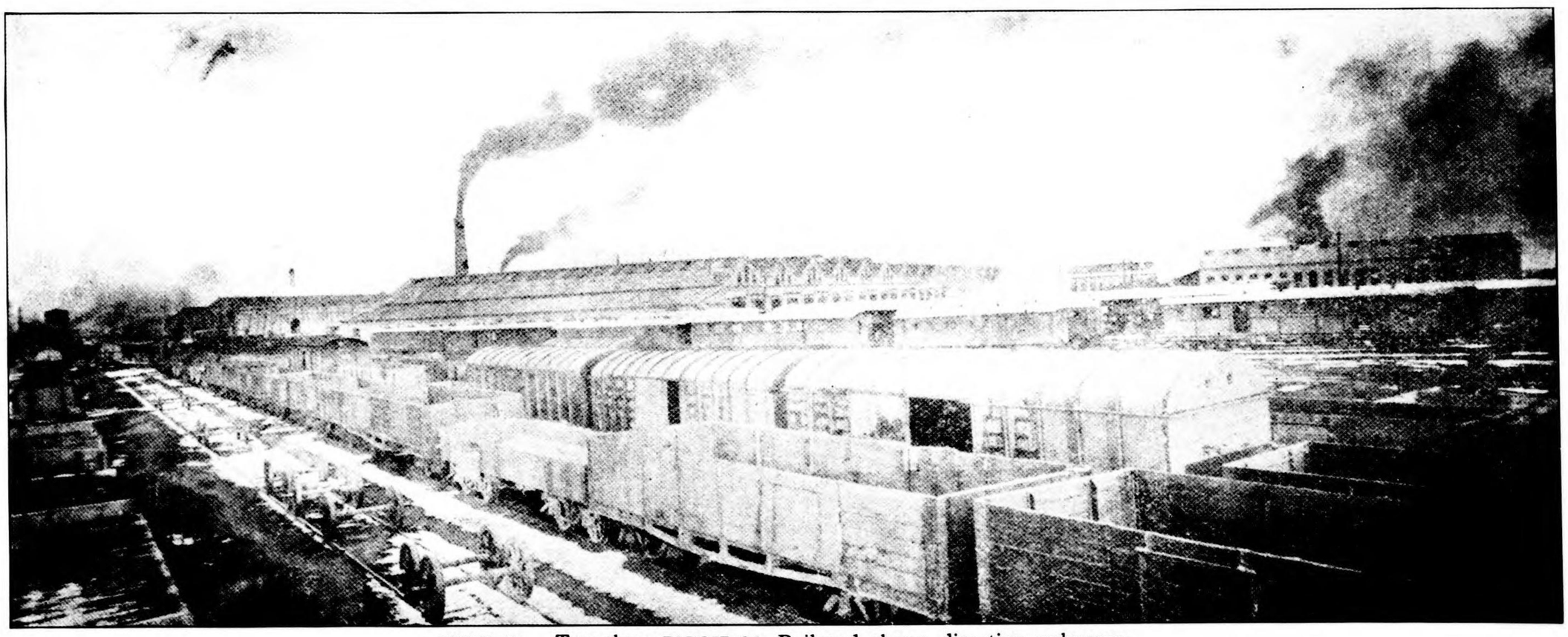


PHOTO B . . . Tangshan **TARGET 36** Railroad shops, direction unknown.

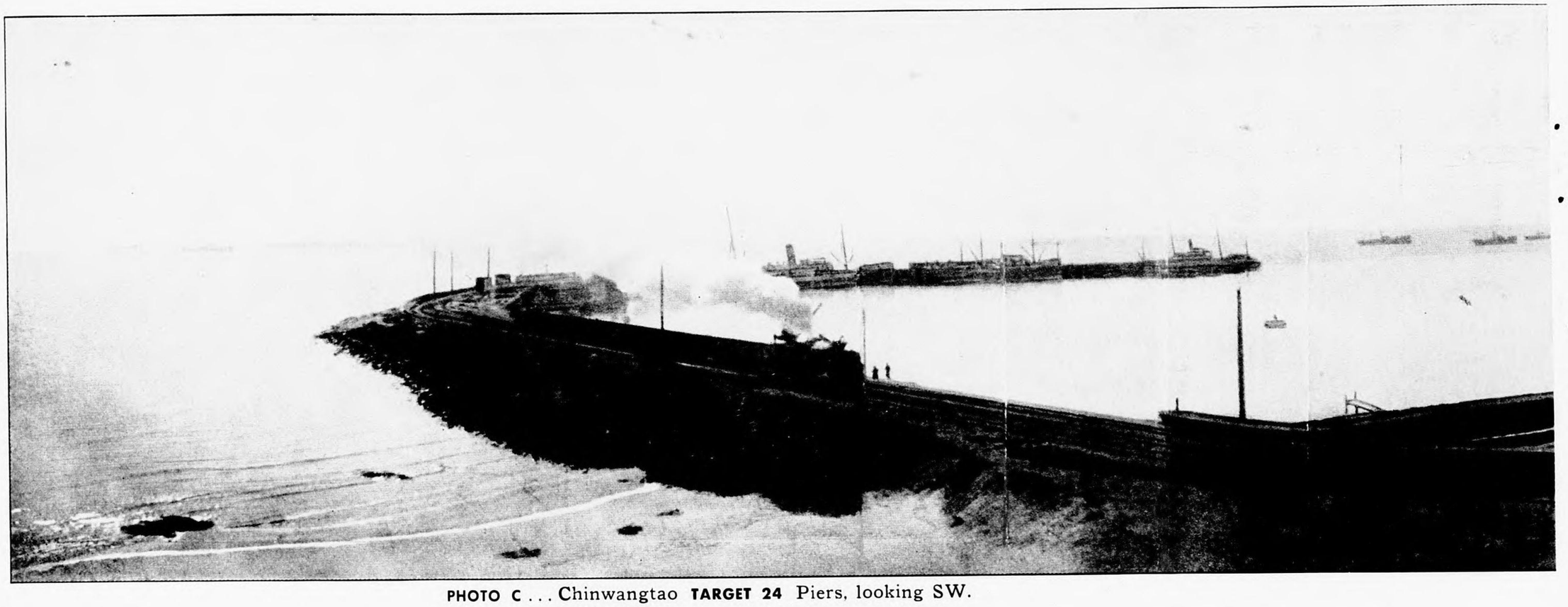


PHOTO C . . . Chinwangtao **TARGET 24** Piers, looking SW.

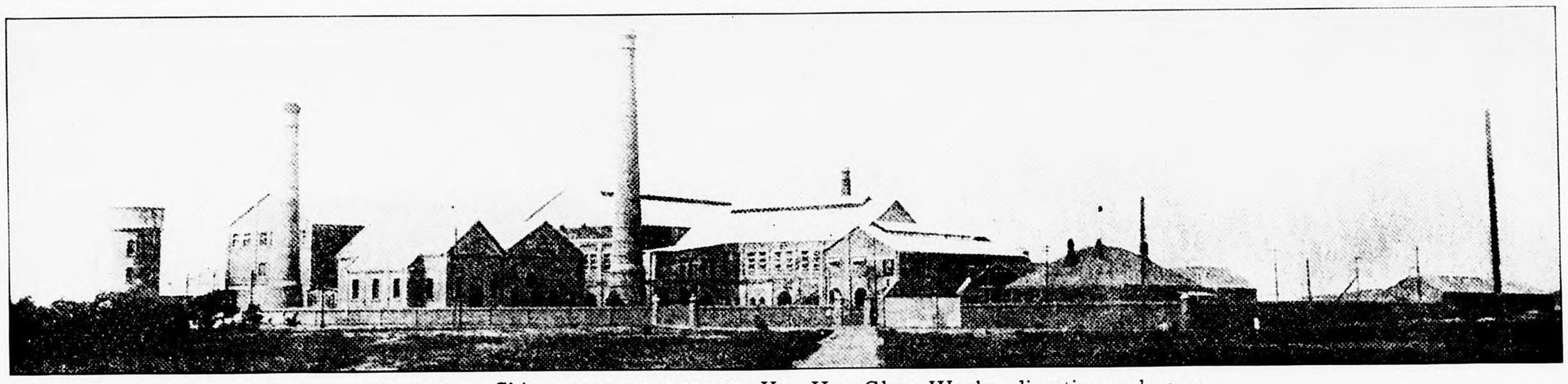


PHOTO D . . . Chinwangtao **TARGET 27** Yao Hua Glass Works, direction unknown.

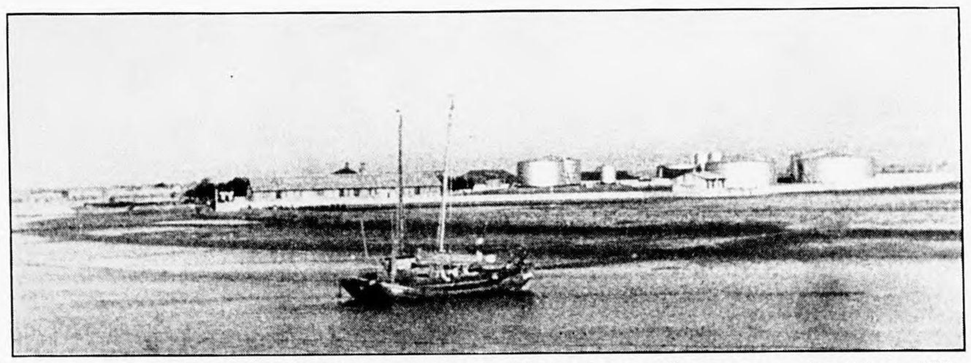


PHOTO E . . . Taku **TARGET 4** Asiatic Petroleum Company, looking W.

PHOTO F . . . Taku **TARGET 6** Chinese Naval Dockyard, looking S.

3573—P-2—Tientsin—1-27-43—Final Proof

3573—P-3—Tientsin— 1-27-43—Final Proof

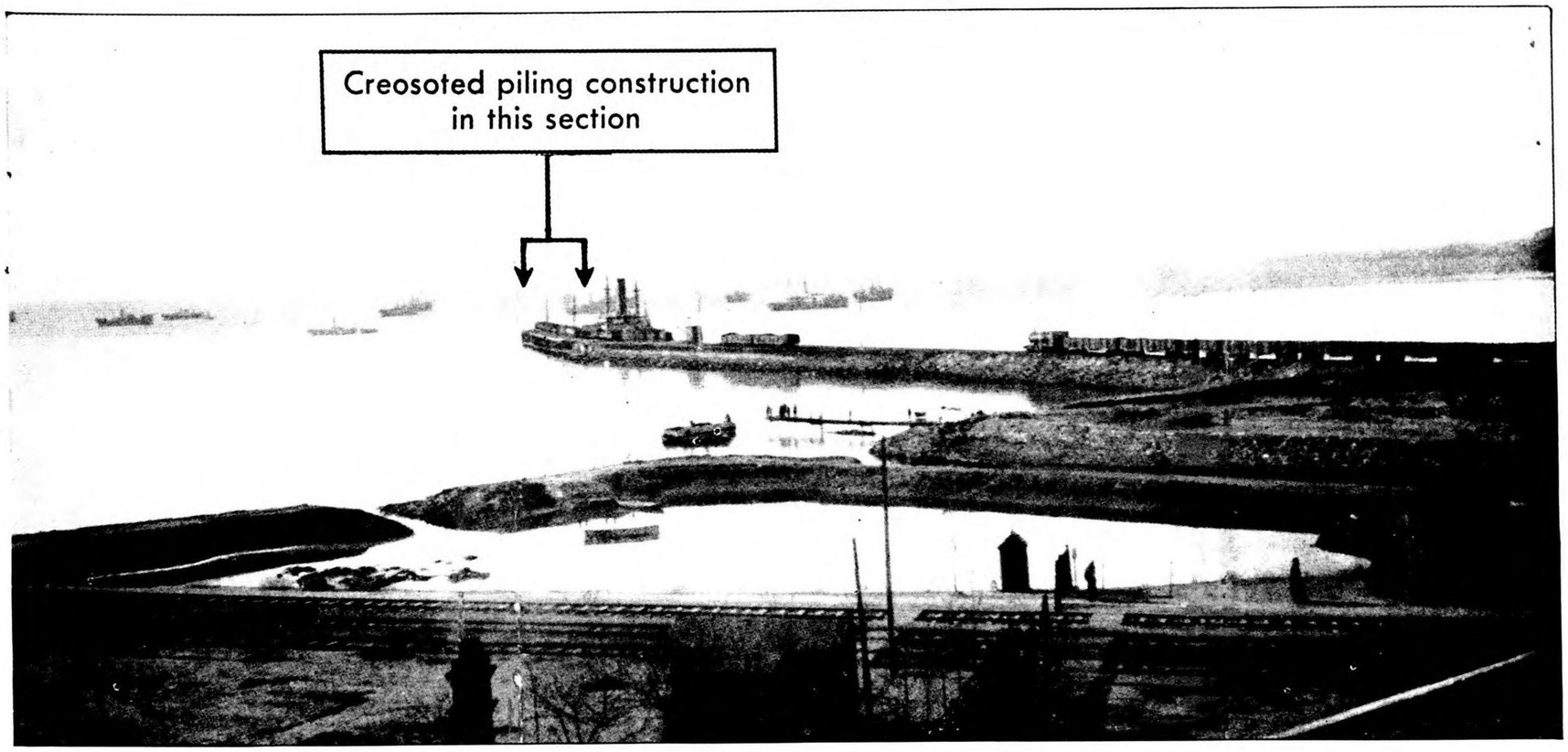
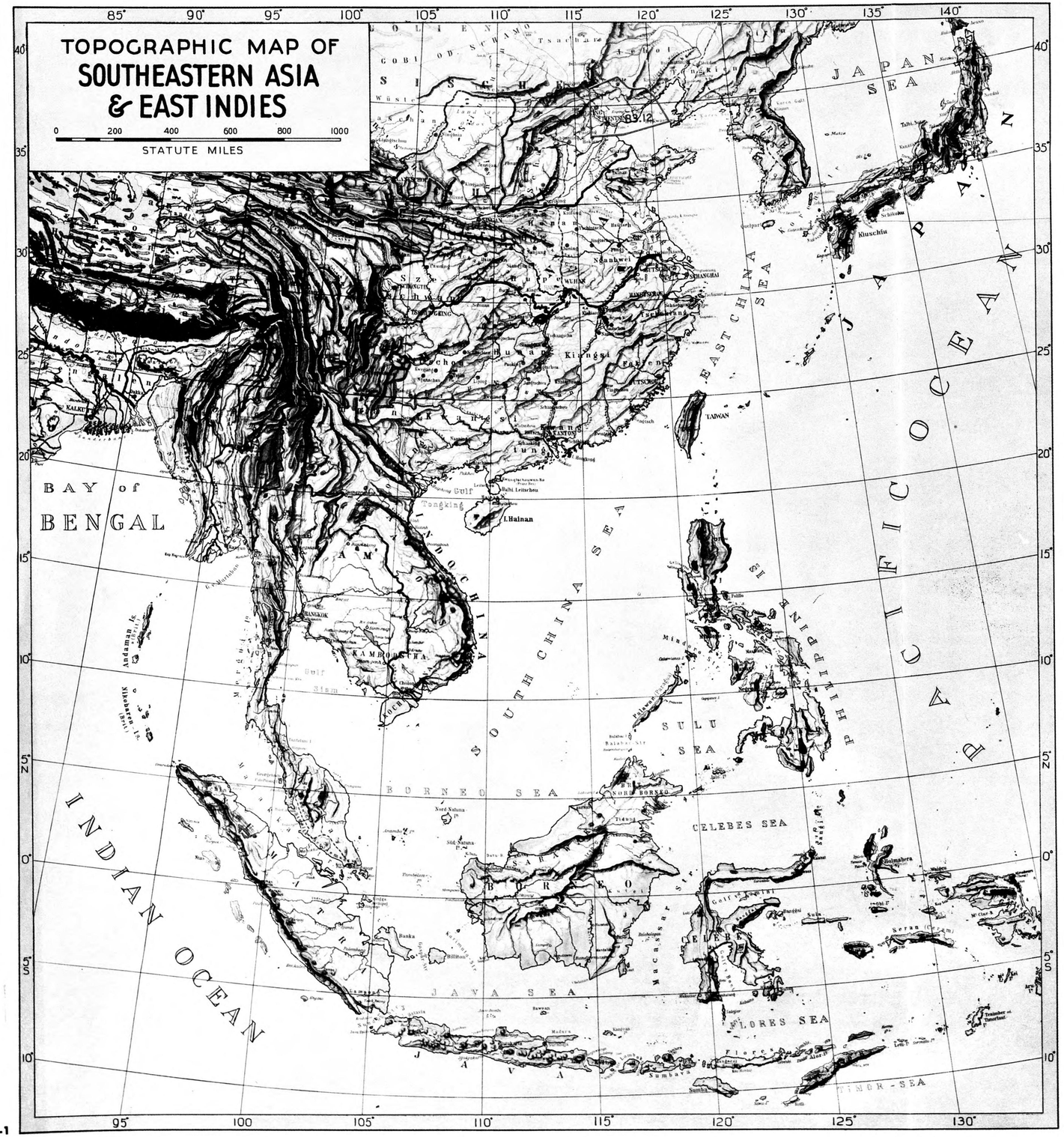
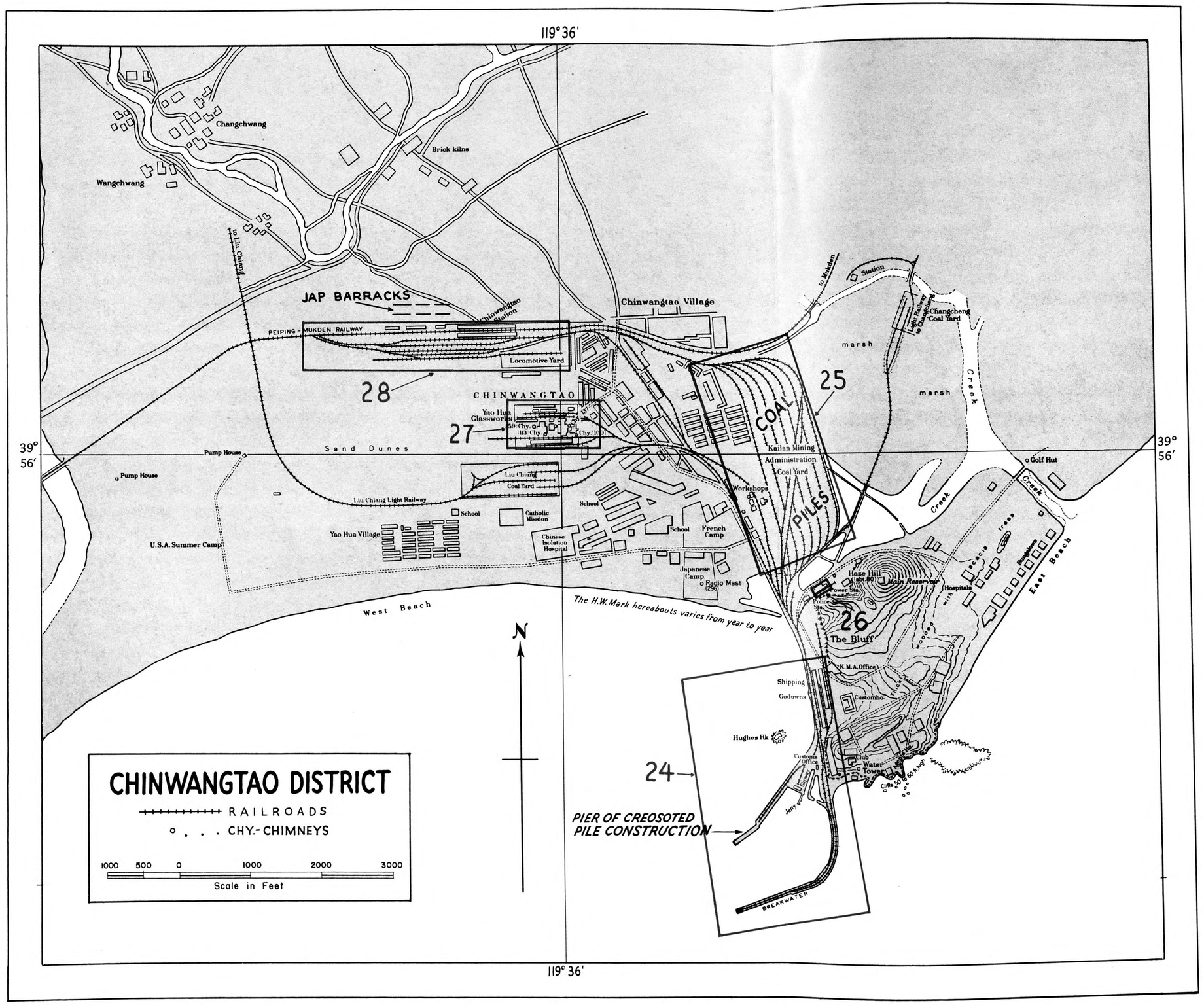


PHOTO G . . . Tangku **TARGET 8** Yung Li Alkali Plant looking NE from opposite railroad station.



M-1

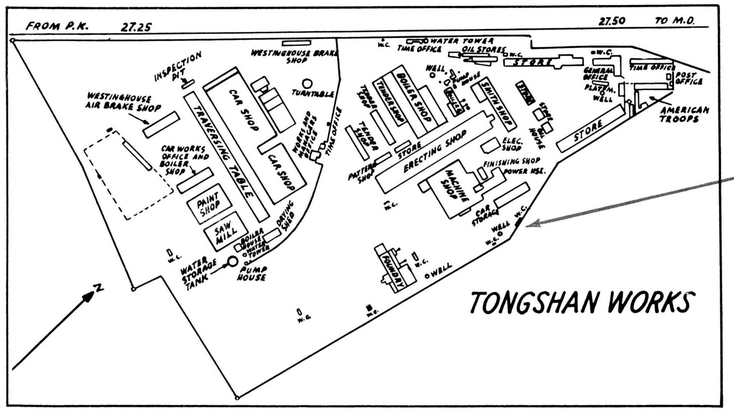
3574M—M-1—Tientsin

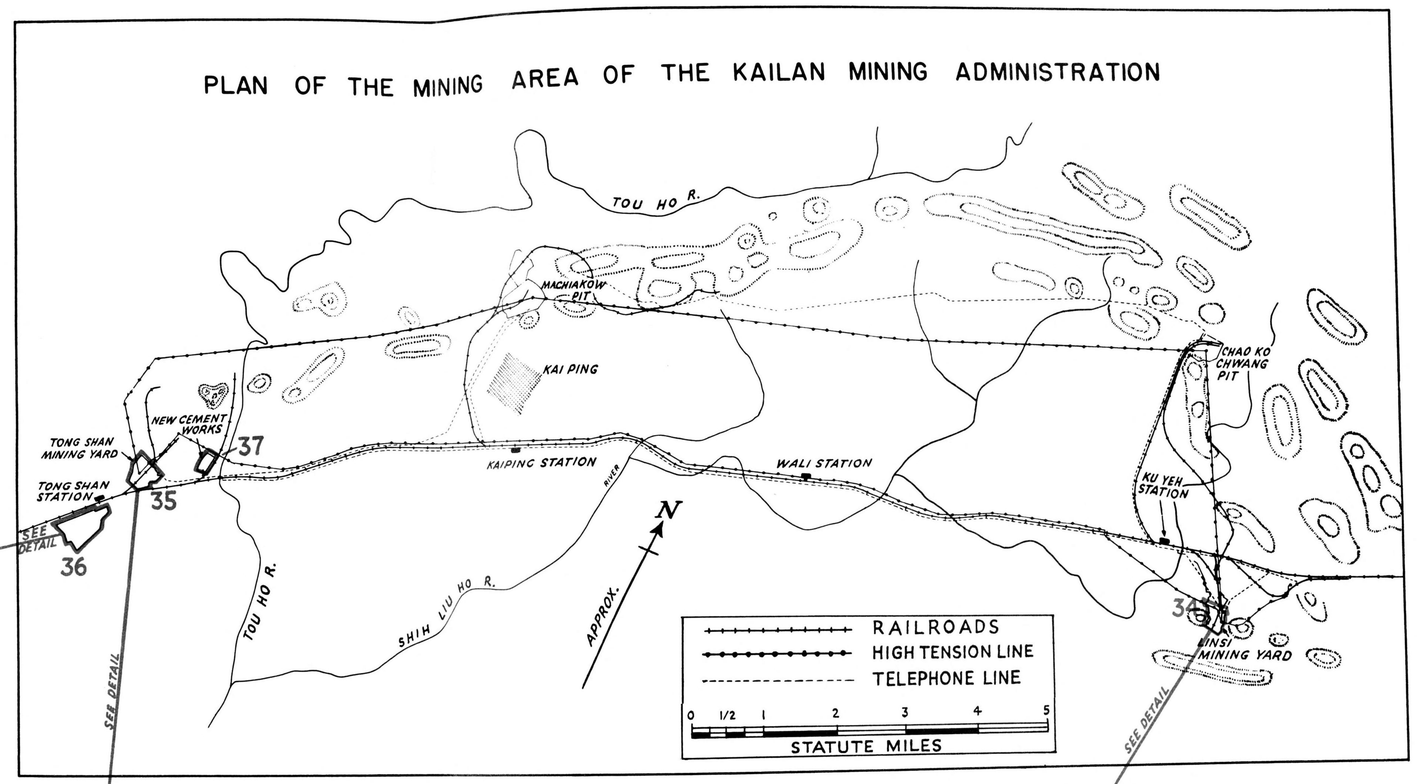


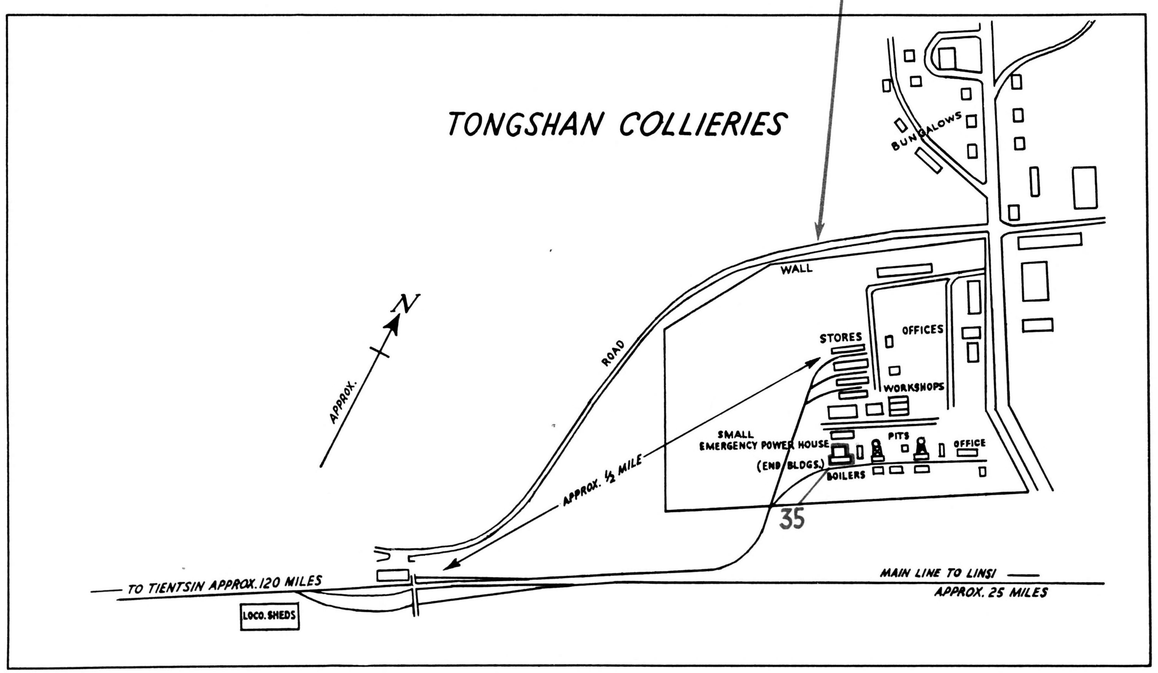
M-2

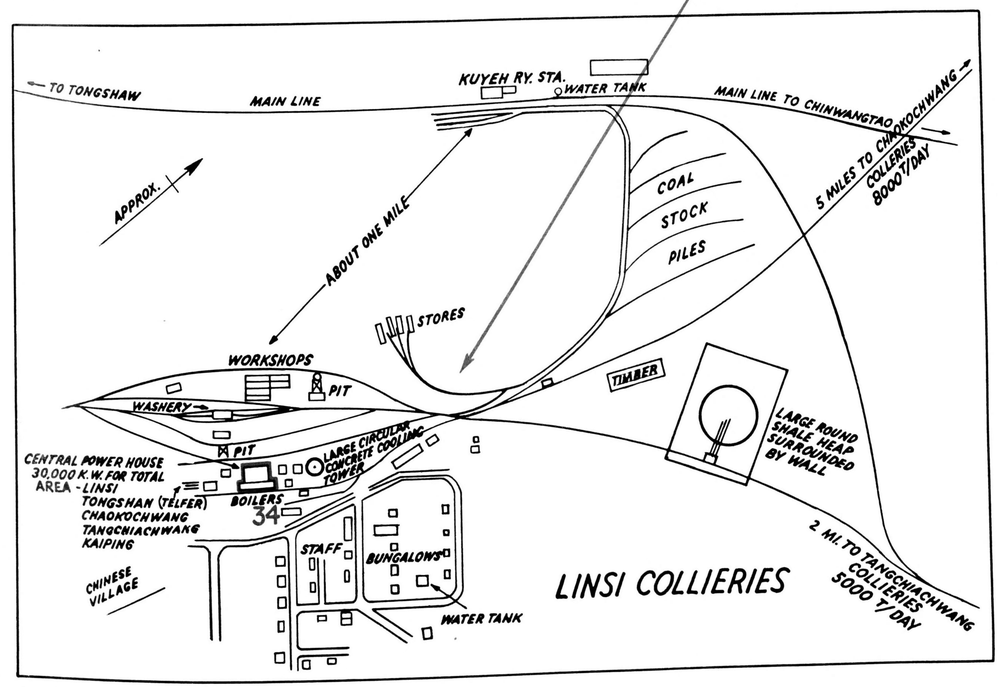
3573M—M-2—Tientsin

KAILAN MINES









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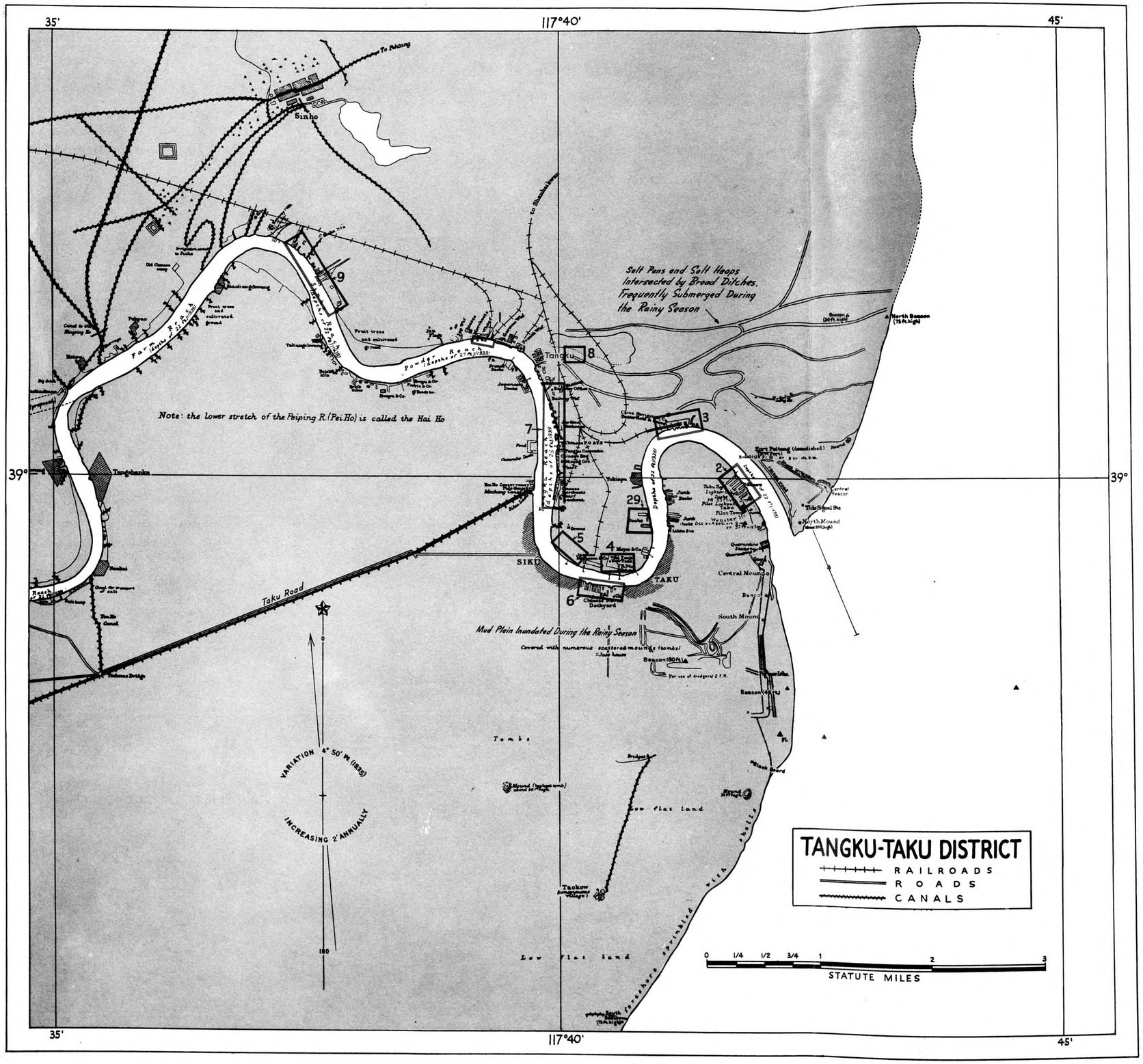
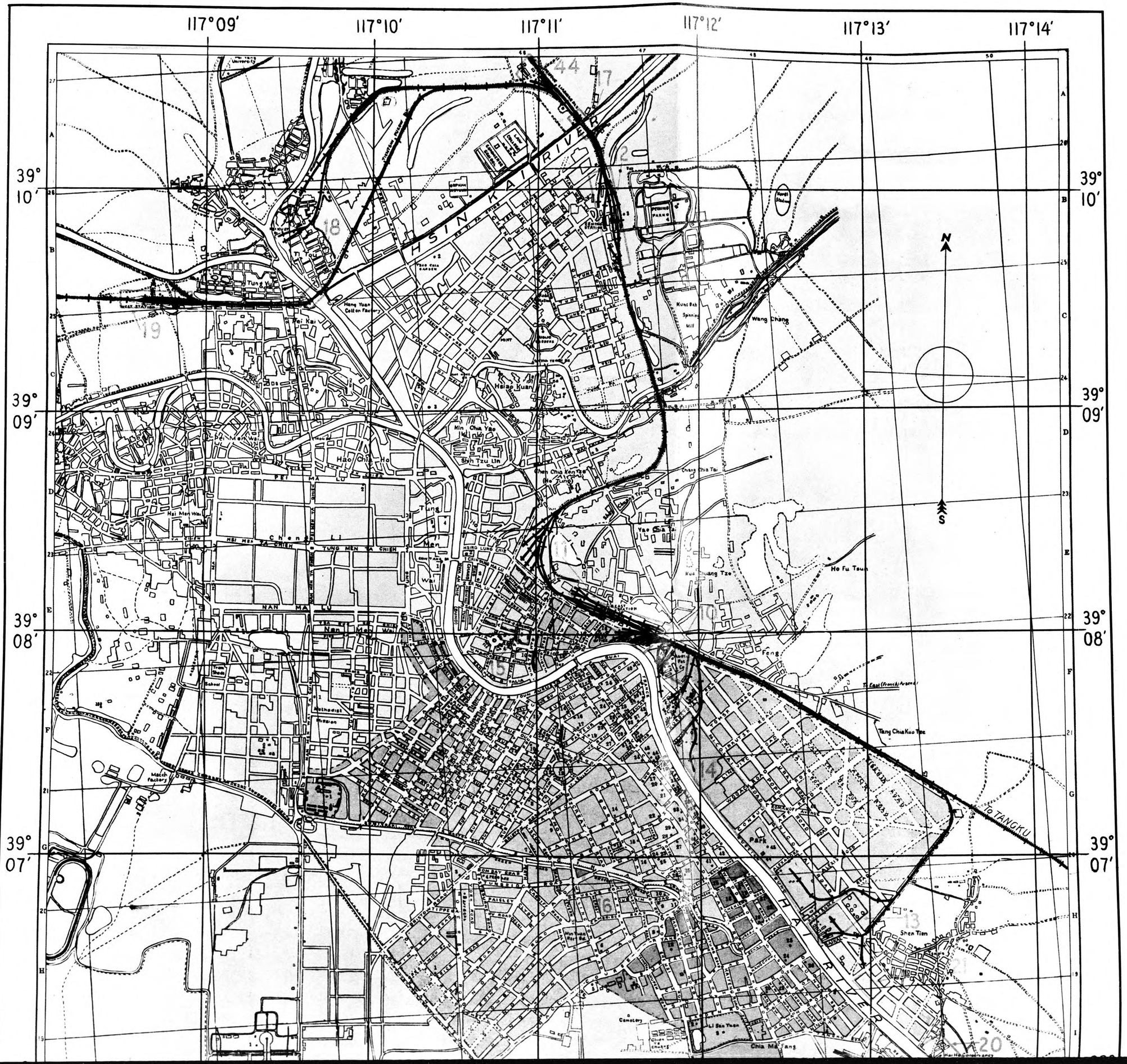


M-4

3573M—M-4—Tientsin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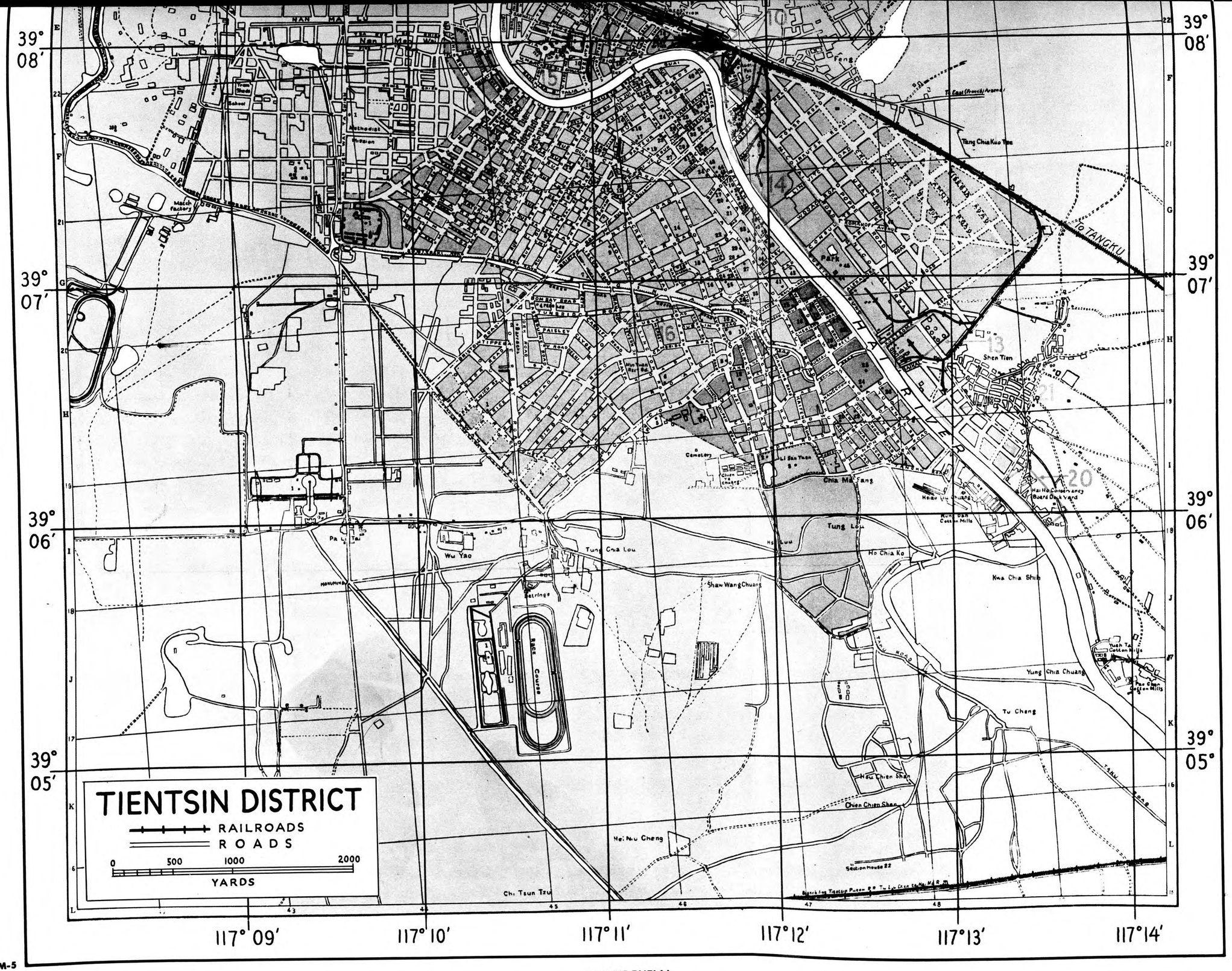
117°10′
117°11′
117°12′
117°13′
117°14′
39° 10′
39° 09′
39° 08′
39° 07′
HSIN KAI RIVER
HAI RIVER
N
S
Tung Yu
Hsi Kai
Hang Yuan Cotton Factory
Hsiao Kuan
Min Chia Yao
Shih Tzu Lin
Hao Chia Ho
PEI MA LU
Hsi Men Wai
Chen Li
HSI MEN TA CHIEH
TUNG MEN TA CHIEH
Tung Men Wai
NAN MA LU
Nan Men Wai
Methodist Mission
Wang Chang
Kung Pao Spinning Mill
Chang Chia Tai
Yao Chia Tai
Ho Fu Tsun
Feng
To East (French) Arsenal
Tang Chia Kuo Tzu
To TANGKU
Park
Shen Tien
Cemetery
Chia Ma Fang
Li Sao Tsun
Hai He Conservancy



M-5

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3573M Map—Tientsin

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AIR OBJECTIVE FOLDER

Korea Areas

No. 84.1 Seishin	No. 84.5 Korea East
No. 84.2 Konan	No. 84.6 Keijo
No. 84.3 Heijo	No. 84.7 Fusan
No. 84.4 Genzan	No. 84.8 Koshu

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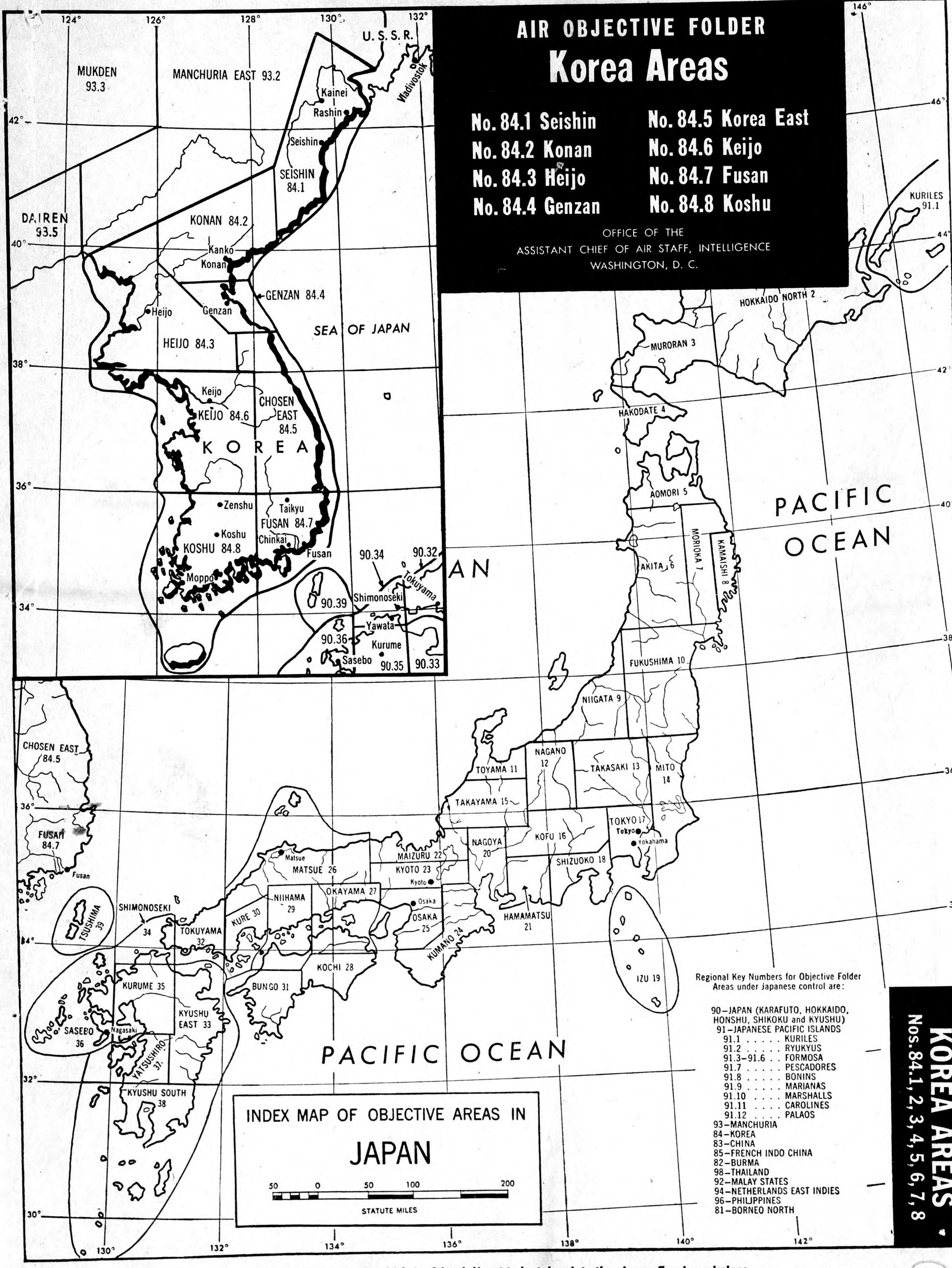

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AIR OBJECTIVE FOLDER

KOREA AREAS, Nos. 84.1, 2, 3, 4, 5, 6, 7, 8

No. 84.1 SEISHIN
No. 84.2 KONAN
No. 84.3 HEIJO
No. 84.4 GENZAN
No. 84.5 KOREA EAST
No. 84.6 KEIJO
No. 84.7 FUSAN
No. 84.8 KOSHU

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212	Kyosen Hydro-electric Plant No. 1	55

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AIRCRAFT						
Showa Aircraft Factory	65	Mirin	39° 01′N 125° 51′E	25	M-6, 11	
ARMS—MUNITIONS						
Chosen Nitrogen Explosives Factory	2	Konan	39° 49′N 127° 35′E	32	M-13	32
Japan Explosives Co.	60	Kaishu	38° 02′N 125° 41′E	50	M-6	
Heijo Army Arsenal	61	Heijo	39° 00′N 125° 44′E	24	M-6, 11	
CEMENT						
Onoda Cement Co.	82	Shokori	38° 59′N 125° 59′E	25	M-6	25
Chosen Cement Co.	109	Kaishu	38° 09′N 125° 42′E	50	M-6	50
Asano Cement Co.	110	Bunsei	38° 27′N 125° 49′E	51		
CHEMICALS						
Chosen Nitrogen Fertilizer Co. (See also Non-Ferrous Metals)	1	Konan	39° 50′N 127° 38′E	31	M-13, 14	31, M-14, M-15
Motomiya Chemical Plant	3	Konan	39° 51′N 127° 35′E	33	M-13	33
Chosen Chemical Industry	59	Junsen	39° 25′N 125° 57′E	51		
ELECTRIC POWER						
Choshin Hydro-electric Plant No. 1	4		40° 13′N 127° 18′E	34	M-3, 12	34, 35
Choshin Hydro-electric Plant No. 2	5		40° 10′N 127° 19′E	34	M-3, 12	
Fusen Hydro-electric Plant No. 1	8		40° 21′N 127° 34′E	37	M-3, 12	37
Sanchoku Steam Power Plant	112	Sanchoku	37° 26′N 129° 10′E	49	M-3	
Neietsu Steam Power Plant	113	Neietsu	37° 11′N 128° 26′E	49	M-3	
Kasen Hydro-electric Plant	122	Kitakan River	38° 06′N 127° 42′E	49	M-3	
Seihei Hydro-electric Plant	123	Kitakan River	37° 43′N 127° 25′E	49	M-3	
Kyosen Hydro-electric Plant No. 1	212		40° 45′N 128° 30′E	55	M-3	
HARBOR FACILITIES						
Seishin Harbor	13	Seishin	41° 47′N 129° 50′E	41	M-16	41
Rashin Harbor	14	Rashin	42° 13′N 130° 18′E	41	M-17	41, 42
Yuki Harbor	15	Yuki	42° 20′N 130° 24′E	41	M-18	41, 42
Jinsen Harbor & Tidal Basin	45	Jinsen	37° 28′N 126° 37′E	19	M-6, 7	19, 20
Chinnampo Harbor	76	Chinnampo	38° 43′N 125° 24′E	25	M-6, 12	25, 26
Chinnampo Coal Depot	77	Chinnampo	38° 43′N 125° 25′E	26	M-6, 12	26
Genzan Harbor	89	Genzan	39° 10′N 127° 26′E	52	M-23	
Fusan Harbor	97	Fusan	35° 07′N 129° 03′E	12	M-4	12
Reisui Harbor	98	Reisui	34° 45′N 127° 44′E	46	M-19	
Moppo Harbor	99	Moppo	34° 47′N 126° 23′E	46	M-20, 22	46
Gunzan Harbor	100	Gunzan	35° 59′N 126° 43′E	48	M-6, 20, 21	48, 49
Masan Harbor	130	Masan	35° 12′N 128° 33′E	14	M-5	14
Joshin Harbor	132	Joshin	40° 40′N 129° 12′E	54	M-24	54
IRON AND STEEL						
Japan Iron Works (Seishin)	28	Seishin	41° 45′N 129° 46′E	41	M-16	
Mitsubishi Iron Co.	29	Seishin	41° 46′N 129° 47′E	41	M-16	
Japan High Frequency Heavy Industry Co.	31	Joshin	40° 41′N 129° 12′E	54	M-24	
Mozan Iron Mine	32	Mozan	42° 14′N 129° 16′E	44		44
Japan Iron Works (Kenjiho)	66	Kenjiho	38° 44′N 125° 37′E	27	M-6, 10	27, 28, 29
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Chinkai Naval Base	101	Chinkai	35° 09′N 128° 38′E	13	M-3, 5	13
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Chosen Riken Metals Co.	67	Chinnampo	38° 43′N 125° 23′E	26	M-6, 12	
Japan Mining Co. Smelter	68	Chinnampo	38° 44′N 125° 26′E	26	M-6, 12	26
Korea Refining Co.	116	Choko	36° 01′N 126° 42′E	48		

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CLASSIFIED INDEX OF TARGETS IN KOREA AREAS, Nos. 84.1, 2, 3, 4, 5, 6, 7, 8—Continued

CLASSIFICATION AND NAME	TARGET NUMBER	LOCATION (GENERAL)	APPROXIMATE COORDINATES	TEXT ON PAGE	MAP ON PAGE	PHOTO ON PAGE
PETROLEUM						
Chosen Oil Refinery	88	Genzan	39° 09′N 127° 28′E	52	M-23	52
Rising Sun Petroleum Co. Storage	90	Bumpyo	39° 14′N 127° 22′E	52	M-23	
Agochi Coal Liquefaction Plant	125	Agochi	42° 33′N 130° 21′E	43		
Korean Coal Industry Co.	126	Eian	41° 15′N 129° 30′E	55		55
TRANSPORTATION						
Seishin RR Yards	16	Seishin	41° 47′N 129° 49′E	41	M-16	
Seishin Railway Workshops	17	Seishin	41° 47′N 129° 48′E	41	M-16	
Rashin RR Yards	18	Rashin	42° 15′N 130° 18′E	41	M-17	
Tumen River Bridge No. 1	19	Nanyo	42° 59′N 129° 48′E	43		43
Tumen River Bridge No. 2	20	Kamisanpo	42° 42′N 129° 45′E	43		
Han River RR Bridges	42	Keijo	37° 31′N 126° 57′E	17	M-6, 8, 10	16, 17
Ryuzan RR Shops & Yards	43	Keijo	37° 32′N 126° 58′E	17	M-6, 8, 9, 10	16, 17, M-8
Heijo RR Shops & Yards	73	Heijo	39° 00′N 125° 44′E	22	M-6, 11	22
Heijo Shunting Yards	74	Heijo	39° 03′N 125° 44′E	24	M-6, 11	
Teishu RR Workshops	75	Teishu	39° 41′N 125° 13′E	51	M-6	
Daido River RR Bridges	91	Heijo	38° 59′N 125° 45′E	23	M-6, 11	23
Fusan Railroad Workshops	105	Fusan	35° 07′N 129° 03′E	12	M-4	12
Rakuto River RR Bridges	106	Waikin	36° 00′N 128° 23′E	47		
Suishoku Freight Yards	124	Keijo	37° 35′N 126° 54′E	17	M-6, 10	
Ryuzan Manufacturing Co.	210	Keijo	37° 32′N 126° 59′E	17	M-6, 8, 9, 10	
Seisen River RR Bridges	211	Shinanshu	39° 37′N 125° 32′E	51	M-6	

Summary and Evaluation of Korea Areas, Nos. 84.1, 2, 3, 4, 5, 6, 7, 8

This folder treats Objective Area Nos. 84.1 through 84.8 as an integral whole. The regional break-downs are unrelated to objective areas.

GENERAL: Northeastern Korea is one of the principal iron ore and pig iron centers under Japanese control, and a corridor to the sea for northern Manchuria. The intermediate Konan region is the Far East's greatest integrated hydroelectric-chemicals-light metals development. The southern half of Korea has older industry and most of the population, is a sizable rice bowl and provides the Mainland with an all-rail route terminating only 125 sea miles from Japan Proper.

Although there has been aggressive industry development in northern Korea in recent years, Japanese industrial exploitation of Korea in general has not kept pace with that in Manchuria. Korea, however, makes important contributions to Japan's war industry and provides two of the key transportation links by which Japan draws on the resources of the Asiatic Mainland.

Fusan, located where the mainland is closest to Japan Proper, is the trans-shipment point between the mainland all-rail route and the shuttle traffic with Shimonoseki Strait. The importance of the port has been substantially increased by the exposure to attack of the longer water routes between Japan and the northern mainland, and the deteriorating Japanese shipping position. The double-track mainline railroad to Manchuria links Fusan with the west coast regions of Keijo-Jinsen and Heijo-Kenjiho-Chinnampo, around which southern Korea population and industry centers. Keijo, the capital of Korea, has no large industry but is reported to have had relatively recent development of smaller plants; Jinsen is an old west-coast port which has been a major export point for rice. The Heijo Arsenal, with a comparable output in many items but no heavy ordnance production, is a smaller edition of the great arsenal complex at Mukden in Manchuria; Heijo City also is a railroad focal point. Kenjiho is the site of the important Japan Iron Works blast furnaces and some steel units. Chinnampo is the largest west coast port, handling rice and coal and has some non-ferrous

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SUMMARY AND EVALUATION OF KOREA AREAS, Nos. 84.1, 2, 3, 4, 5 ,6, 7, 8—Continued

metals capacity. This less mountainous west coast of Korea, shelving off into coastal plains and vast mud flats exposed by a wide range of tide levels, is one of the principal rice-growing areas under Japanese control. It has been estimated presently producing around 700,000 tons of rice for export to Japan and has been increased in importance by the Japanese difficulty in moving rice from Southeast Asia areas.

Konan, a relatively isolated region on the upper east coast, is the site of the Empire's largest basic chemicals plant and integrated development of hydro-electric resources. The unusual hydro advantages provided by the high mountain chain along the Japan Sea have been extensively exploited to provide large amounts of year-round hydro-electric power for chemical and non-ferrous metals production at Konan and for supplying the North Korean power network.

The upper northeastern section of Korea includes the largest iron ore mine under Japan's control, related iron/steel production centering in Seishin and providing materials for further processing in Japan Proper, synthetic oil capacity and the rail and port facilities which have been developed to provide an eastern corridor to the sea for Manchuria. This development in effect has been an extension of the long-term Kwantung Army - South Manchuria Railway plan for the exploitation of the northern mainland, differing from the type of industrial expansion in southern Korea.

As in the case of Manchuria, particularly in view of the large hydro-electric power developed, there have been many reports of important wartime industrial expansion in both northern and west coast Korea. There has been little tangible evidence, however, of Korean development on a scale comparable to the exploitation of the more extensive resources that have been staked out in Manchuria.

Korea's war importance to Japan is heavily dependent on the railroad system and the considerable number of both older and more recently developed ports. Rail and port facilities are a proportionately large number of the total targets listed. The key rail line is the double-tracked, standard gauge route from Manchuria down the west coast and across to Fusan. The deteriorating Japanese shipping position has diverted steadily increasing tonnage to this overland route, subject to the limitations imposed by reported shortage in rail equipment. Of increasing importance are the rail lines in northeastern Korea, which connect Manchuria with the relatively protected sea route to Japan via the new ports of Rashin and Seishin. Japan's ability to utilize Korean iron ore, pig iron and Konan products and bulk materials from Manchuria, is heavily dependent on the extensive and modern harbor facilities in Rashin, Seishin, Konan, Fusan, etc.

The system of ports and the rail routes are shown on the special map on page M-2, which indicates the relationship of these facilities to Korea's geography.

This folder lists 61 objectives, of which, on the basis of available information, the following are rated as Key Targets in Japan's wartime economy:

KEY OBJECTIVES

No.	Name	Location	Page
1	Chosen Nitrogen Fertilizer Co.	Konan	31
28	Japan Iron Works (Seishin)	Seishin	41
66	Japan Iron Works (Kenjiho)	Kenjiho	27
125	Agochi Coal Liquefaction Plant	Agochi	43

In addition to these Key and other targets, the folder mentions and includes graphic material on a number of other installations, as an aid in evaluation of reconnaissance and other intelligence. Among such installations are sizable plants, the importance of which can not be closely evaluated on the basis of available intelligence. As noted, there have been many reports of wartime industry development in these Areas and reconnaissance may identify additional installations.

AIRFIELDS: Although detailed information as to the number of airports and their facilities is limited, Korea is believed to have a well-developed and extensive network of military airfields connecting with those in Manchuria and providing bases for air cover of Korea Strait. Since airfields are a special category of targets, the characteristics and importance of which are subject to considerable change, none are listed as objectives.

AIRCRAFT: As in the case of Manchuria, there have been many reports of aircraft plant and production development in Korea but available information indicates that such development has been relatively limited.

The Showa Aircraft Factory **TARGET 65** is reported to be located across the Daido River about five miles east of Heijo, and to be assembling aircraft and producing parts. There have been reports that in part this plant was equipped by machinery shipments from Showa Aircraft in Japan; there is inadequate basis for evaluating these reports, or possible aircraft types and output from this plant.

The Heijo Army Arsenal **TARGET 61** has an Air Arsenal reported to be located across the Daido River immediately east of the large Heijo Airport. Parts and ordnance are known to be produced, and engine production has been reported.

There has been some evidence of aircraft production in the Konan district, but no information as to plant importance and location. Several unconfirmed reports have also located a new aircraft plant near Kenjiho, about 20 miles south of Heijo.

ARMS—MUNITIONS: The Heijo Army Arsenal **TARGET 61** is one of the two major arsenal centers on the Asiatic Mainland. The production of small arms and ammunition, artillery shells, hand grenades, bombs and mines is reported to approach that of the Mukden Arsenal in Manchuria, but Heijo does not produce the heavy ordnance turned out at Mukden. Some transport and artillery vehicles are produced, but no artillery. Much of the small and household industry in Heijo is integrated with the activities of the Ar-

3632—5—Korea—7-24-44—First Proof

SUMMARY AND EVALUATION OF KOREA AREAS, Nos. 84.1, 2, 3, 4, 5, 6, 7, 8—Continued

senal, and numbers of small machine shops supply the shell loading plant. The Arsenal is reported to maintain direct control over most of the explosives and munitions plants in the country.

Because of excess capacity in manufacture and the dispersed nature of the plants, explosives factories are not major targets and only the large installations have been listed. The Chosen Nitrogen Fertilizer Co. **TARGET 1** is the largest Japanese producer of basic war chemicals. Production of nitrogen is nearly double the capacity of any other plant and the output of nitric acid, glycerine and sulphuric acid is believed to be the largest in the Empire. The Motomiya plant of this company **TARGET 3** is believed to have the largest Japanese production of chlorine. The Chosen Nitrogen Explosives Factory **TARGET 2** about two miles southwest of Konan, and the Japan Explosives Co. **TARGET 60** just south of Kaishu, about 70 miles south of Heijo, were large pre-war producers of industrial explosives, fuses, percussion caps, etc.

Several small munitions works, alcohol plants and mills reported converted to military production are located on the maps.

CEMENT: The program for the development of port facilities, the continuing of great hydro-electric projects and the increase in industrial plant construction has required heavy cement production in Korea. The known major plants are located within a short radius of Heijo. The largest plant, with a 1938 capacity of 540,000 metric tons and accounting for approximately 34% of Korean production, is that of Chosen Cement Co. **TARGET 109** near Kaishu, about 65 miles south of Heijo. The Onoda Cement plant at Shokori **TARGET 82,** about 12 miles east of Heijo, had a 1938 capacity of 256,000 metric tons. A small plant of the Asano Cement Co. **TARGET 110** with annual capacity of 195,000 metric tons is located near Shariin, about 40 miles south of Heijo. Two other small plants are not listed as targets. One at Sennai (39°22′N, 127°12′E) northwest of Genzan had a 1931 capacity of 130,000 metric tons. A plant at Komozan (42°08′N, 129°42′E) north of Seishin has an estimated capacity of 142,500 metric tons.

CHEMICALS: Konan, on the east coast of Korea, is one of the great chemical centers in the Japanese Empire.

Three plants, all subsidiaries of Japan Nitrogen Fertilizer Co, in and near Konan village, are among the largest under Japanese control making the heavy chemicals necessary for both munitions production and essential industry.

The main plant at Konan **TARGET 1** has double the nitrogen fixation and chemical fertilizer capacity of any other Japanese plant, probably the largest capacity for production of nitric and sulphuric acids and very large capacity for glycerine, hydrochloric acid and other heavy chemicals. Its light metal production is highly important (See Non-Ferrous Metals) and it produces a substantial amount of electric steel.

The Motomiya plant northwest of Konan **TARGET 3** is believed to be the largest Japanese chlorine plant. It also produces a considerable amount of carbide, calcium cyanamide fertilizer, and bean cake fertilizer.

The explosives plant **TARGET 2** was a large pre-war producer of industrial explosives.

The only other important chemical production in Korea is at the coke oven by-product plants of Japan Iron Works.

Chosen Chemical Industry at Junsen **TARGET 59** is a small plant. It manufactures ammonia, sulphuric acid and fertilizer for local use.

Chemical plants not listed as targets include a very large alcohol plant at Kijo, about 35 miles north of the mouth of the Seisen River, and a plant manufacturing rayon pulp and possibly alcohol at Kisshu, on the Nantai River, 25 miles north of Joshin.

COAL AND COKE: Korean coal production, for the most part anthracite, and lignite used for synthetic oil, was 2,500,000 metric tons in 1936 and is estimated to have been doubled by 1940. There is some bituminous production but no known coal deposit in Korea is suitable for metallurgical coke. Coking coal for Korea's blast furnaces has been extensively imported from North China. The bulk of anthracite production is from the extensive field in the Heijo region. Lignite, or brown coal, production is more concentrated near Agochi and Eian, where it is used for hydrogenation **TARGETS 125 and 126.** Chinnampo has been the shipping point for anthracite coal to Japan for briquettes formerly used extensively by the Japanese Navy.

No coal targets as such are listed. On the basis of Korean pig iron capacity, related cokeoven installations would represent about 10% of total Japanese capacity. Cokeoven batteries at the Japan Iron Works at Kenjiho **TARGET 66** and those in connection with the company's blast furnaces at Seishin **TARGET 28** are included in the plant sites.

ELECTRIC POWER: Six hydro-electric developments in North Korea and two large steam stations in South Korea provide the country with a large year-round supply of electric energy which is basic in Korea's industrial production.

The two steam plants represent 75% of the capacity available to the South Korea network which serves much of the area south of the Keijo Region. (See Map on page M-3.)

The North Korea network interconnects hydro plants with capacity of more than 1,500,000 KW to supply the electro-chemical and non-ferrous metal installations at Konan and to serve the Heijo-Chinnampo and Keijo-Jinsen industrial districts. These two networks operate at the same frequency but there is no evidence that they have been interconnected. The North Korea network is set off from the Manchurian Network by a difference in frequency, but the Suiho hydro plant (Manchuria 93.2, **TARGET 56**) on the Yalu River boundary between the two countries is equipped to supply Korea with at least 270,000 KW out of its current 450,000 KW output, although the bulk of this power normally feeds into Manchuria. Of the five principal hydro developments

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feeding exclusively into the North Korea network, four utilize the Choshin, Fusen and Kyosen branches of the Yalu River, north and northeast of Konan and, like the Suiho plant, have storage reservoirs permitting year-round operation at a high rate. For three of the projects the impounded water is carried southeast through the mountain divide, with a series of hydro-electric stations utilizing the rapid fall to the Japan Sea. The similar Kokai development impounds the lower Choshin River, which is then diverted southwest into the Tokuro River basin to operate three, and possibly four, plants. Two relatively large run-off-stream hydro stations **TARGETS 122 and 123** are located on the Kitakan River east and northeast of Keijo.

While large volumes of power are required in electro-chemical and non-ferrous metals production, the multiplicity of large inter-connected hydro plants with high year-round output makes essential activity served by the North Korea network relatively difficult to affect by attack upon electric power facilities. In addition to the Suiho hydro plant it would be necessary to eliminate the relatively vulnerable No. 1 plants **TARGETS 4, 8, and 212** of the Choshin, Fusen, and Kyosen developments to achieve a significant reduction in war industry. Destruction of the latter three targets would halt operations in the downstream plants of each development until repairs were completed. As indicated above, 75% of the generating capacity in the south Korea network is concentrated in two steam plants at Sanchoku and Neietsu **TARGETS 112 and 113.**

HARBOR FACILITIES: Fusan, 125 miles from Shimonoseki and terminus of the all-rail route from North China, and the northeast coast port of Rashin are the two most important transhipment ports in Korea.

The port of Fusan **TARGET 97** currently the most congested port in Korea, is a relatively small breakwater-protected inner harbor. The port's pre-war capacity with 4,000 feet of deep-water pier berthage, unequal to the port's railroad capacity, is believed to have been extended by dredging the quays north of the piers. The anchorage is deep and used for lightering.

Masan **TARGET 130,** a newly developed port 25 miles northwest of Fusan, and Reisui **TARGET 98,** reported much more extensively developed, are supplementary ports for the increasing use of the short-run Fusan-Shimonoseki link in Japan's traffic with the Mainland.

The extreme northeast corner of Korea with the ports of Rashin, Seishin and Yuki under the control of the South Manchurian Railways, has become a short rail-haul corridor for Manchurian traffic with Japan. Rashin port **TARGET 14** with 12,000 feet of modern berthage is the most extensive modern port development in Korea and was planned for naval/military use as well as a general purpose port.

Seishin **TARGET 13,** an older port, long a fishing center and export point for Manchurian soybeans, bean cake and wheat is now the site of iron/steel production and the shipping point for the largest iron ore mine under Japanese control, Mozan Iron Mine **TARGET 32.** The port provides some 3,000 feet of modern berthing space with breakwater shelter besides a basin which may have been completed. A coastal railroad connection with Rashin has been reported under construction.

Yuki **TARGET 15,** on the railroad seven miles to the north northeast of Rashin, has limited but good quayage for vessels up to 24 foot draft.

These three ports 500 miles from west coast Honshu ports, providing the most direct route from the agricultural, mining and military centers of northern Manchuria, are supplemented by several ports to the south connected by a single-tracked coastal railroad.

Joshin **TARGET 132** is a small exposed lumbering port where breakwater and berthing facilities have been reported under construction.

At Shako, in a well-protected bay, is a steel trestle loader **TARGET 127** for iron ore from the nearby Rigen Iron Mine. Its capacity of 200 tons per hour far in excess of local requirements may, to save loading time and sea-haul, be used for shipment to Japan of iron ore originating in the north.

Konan is a modern port and built as an integral part of the Chosen Nitrogen Fertilizer Co **TARGET 1,** the largest chemical plant in the Far East. It has no other regional export production.

Genzan **TARGET 89,** lying midway between Rashin and Fusan, is the first port north from Fusan. It is in a protected deep-water bay with 900 feet of quayage alongside railroad spurs and is the junction point of the trans-peninsula railroad south to Keijo; there is an oil refinery **TARGET 88** and fuel oil storage **TARGET 90.** The coastal railroad is known to be in operation for 120 miles south of Genzan and reported under construction to close the 100 mile gap to Fusan. There are no developed or natural harbors on this 320 mile coastal stretch.

The west coast, unlike the relatively straight, precipitous and mountainous east coast, is characterized by high tides and coastal indentations filled by numerous islands and great mud flats showing only at low tide. There are strong currents in long approach channels making for slow towage and in the ports a wide tidal range (as much as 30 feet at some places) requires tidal basins and pontoon wharves to adjust deck level to shore equipment.

Moppo **TARGET 99** and Gunzan **TARGET 100** are old ports with a populous rice-growing hinterland. Both are inside river mouths, approached by channels with swift currents through islands and mudflats, and use pontoon wharves with limited facilities. Both are connected to the Mukden-Fusan railroad by a single-tracked branch line running south from Taiden Junction, and to Fusan via the south coast line.

Jinsen **TARGET 45,** the port for Keijo, is inside the estuary of the Kan River and approached by a long but deep channel through islands and mudflats drying at low tide. The tidal range is 30 feet. One of Korea's principal ports, the old lock-gate tidal basin provides 3500 feet of deep-water berthage. A new

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SUMMARY AND EVALUATION OF KOREA AREAS, Nos. 84.1, 2, 3, 4, 5, 6, 7, 8—Continued

lock-gate tidal basin has been reported under construction. Jinsen has shipped rice and magnesite to Japan.

Chinnampo **TARGET 76,** the port for Heijo, has long been an important Korean port with an agricultural, coal/iron ore mining, and industrial hinterland. Situated 20 miles up the relatively broad Daido River estuary, it is a deep-water port with 4000 feet of good berthage, mechanical coal loaders **TARGET 77,** and good anchorage. The port has handled rice, coal, iron ore and general coastal shipping. The approach, typical of the west coast, is through a mudflat/island studded bay with strong currents at change of tide.

Kenjiho, further up the Daido River and site of the Japan Iron Works **TARGET 66** can be reached by vessels of 20 feet draft for lightering but has no wharf facilities.

IRON AND STEEL: Korean pig iron capacity is estimated at approximately 1,000,000 metric tons or about 10% of total capacity under Japanese control. The importance of this mainland capacity is increased by the availability of local ore as against overseas ore on which blast furnaces in Japan Proper have been dependent, by relative accessibility of mainland coking coal and because of economy in sea shipment of pig iron rather than bulk raw materials to Japan. Korean steel capacity considerably below pig iron capacity indicates a substantial pig iron tonnage for export.

The Mozan Mine on the northeast Korean border, is the largest iron mine under Japanese control. The ore is low-grade and the concentrating plant at the mine **TARGET 32** is reported to produce 1,000,000 tons for the Seishin blast furnaces and a 1,500,000 tons export surplus available for the relatively short haul to Japan across the protected Japan Sea. The Rigen Mine on the east coast, with an estimated production of 200,000 tons of high grade ore, may have an export surplus for direct shipment to Japan via Shako ore loading pier **TARGET 127.**

All but a fraction of Korea's pig iron capacity is concentrated in two plants of the Japan Iron Works. The company's plant at Kenjiho **TARGET 66,** is credited with 400,000 metric tons of pig iron, and the bulk of Korea's open hearth steel—240,000 metric tons, or about 2% of Japanese total capacity. Ore, not requiring concentrating, is mined locally from open-cut mines which have not been listed as targets. The plant has the only known rolling mill in Korea, with an estimated capacity of 175,000 metric tons. It is reported that the plant site includes five batteries of by-product coke ovens, representing less than 5% of total Japanese coking capacity.

Utilizing concentrated ore from the Mozan Mine 40 miles to the northwest, the Japan Iron Works plant at Seishin **TARGET 28** is a newer development. The plant is reported to have two blast furnaces with an estimated capacity of 620,000 tons of pig iron. There have been no detailed reports as to the capacity or location of coke oven batteries in connection with the blast furnaces.

The Mitsubishi Iron Company's plant **TARGET 29** at Seishin is reported to have a capacity of 180,000 tons of sponge iron used for special steels. The kilns use lowgrade ore from the Mozan Mines.

It has been reported that the Konan plant of Chosen Nitrogen Fertilizer Co **TARGET 1** has electric steel capacity which may amount to 150,000 tons annually.

The Japan High Frequency Heavy Industry Company's plant at Joshin **TARGET 31** produces special high quality electric furnace steels. Its capacity is reported expanded to 50,000 metric tons with some rolling mill facilities.

In addition to this electric steel production, another 50,000 tons annually of electric-furnace steel has been reported at an unidentified plant at Jinsen, and another 10,000 tons in the Heijo region. There is inadequate available basis for evaluating the extent of such utilization of Korea's large supply of electric power.

NON-FERROUS METALS: A basic part of the long-range Japanese plan for a self-sufficient Empire has been the development of the extensive deposits of aluminous shales, magnesite, copper, lead and zinc ores in Korea and Manchuria. Korea has led in the construction and operation of plants, due in part to the earlier completion of various units in the extensive hydro-electric projects, as well as to the early development of railroads tapping the mining regions. As in the case of Manchuria the Japanese have claimed extensive wartime expansion of non-ferrous metal production in Korea. These claims are subject to reservation, pending definite indication of ability to rapidly expand mine production and to overcome known difficulties in producing aluminum from shale.

Alumina, Aluminum, and Magnesium: The second largest magnesium plant in the Japanese Empire is located in Konan at the Chosen Nitrogen Fertilizer Co **TARGET 1.** With an estimated 1943 capacity of 3000 metric tons from magnesite ores, it accounts for approximately 25% of Japanese capacity. The second largest alumina and aluminum plant on the Mainland is also located at Konan. Estimated 1943 capacity was 24,000 metric tons of alumina, and 12,000 metric tons of aluminum.

The Chosen Riken Metals plant at Chinnampo **TARGET 67** is second to the plants at Konan in the Korean production of aluminum and magnesium. It is estimated that this plant accounts for approximately 6000 metric tons of aluminum, or 3% of Japanese capacity, and approximately 1000 metric tons of magnesium, or 8% of capacity. The magnesium is produced by electrolysis of brine made from salt supplied from the Government salt fields at Koryo Bay.

Copper, Lead and Zinc: Supply of these basic metals is considered one of Japan's more critical problems, with Inner Zone resources of particular importance.

3632—8—Korea—7-24-44—First Proof

SUMMARY AND EVALUATION OF KOREA AREAS, Nos. 84.1, 2, 3, 4, 5, 6, 7, 8—Continued

The significance of lead and zinc production in Korea has been considerably increased by denial to Japan of all but a fraction of the productive capacity of the great Namtu Mine in Burma.

The Japan Mining Co smelter at Chinnampo **TARGET 68,** processing Korean ore, has the largest Mainland lead production. Estimated 1943 capacity was 12,000 metric tons of lead, approximately 20% of Inner Zone capacity, 6000 metric tons of copper, or 4% of capacity, and 12,000 metric tons of low grade zinc, accounting for about 15%.

The only known large copper refinery on the Asiatic Mainland is operated by the Korea Refining Co at Choko **TARGET 116.** With an estimated capacity of 10,000 metric tons from Korean ore, it accounts for 7% of Inner Zone capacity.

There is a tungsten mine and concentrator in the vicinity of Yotoku west of Genzan, which is reported to be large but details of output are not known.

There is a small lead smelter and a small copper smelter and electrolytic copper refinery at Konan.

PETROLEUM: Korea has extensive coal deposits and plants to recover oil from coal were established in the country before such exploitation in Manchuria but in recent years Manchurian synthetic oil development has been much more extensive.

Production of oil in Korea is believed limited to the output of the large synthetic plant **TARGET 125** at Agochi north of Rashin, and the small Korean Coal Industry Plant at Eian south of Seishin **TARGET 126.** The Agochi Coal Liquefaction plant, rated the second largest of its kind in the Empire, has been estimated capable of producing around 1,200,000 barrels of oil products, or approximately 6% of Inner Zone production from all sources.

It is not known whether any refining is carried on at the synthetic plants. It is probable that much of the output is shipped to the Chosen Oil Refinery at Genzan **TARGET 88,** which has a capacity in excess of estimated production. This is the largest refinery in Korea, accounting for approximately 5% of Inner Zone capacity and is equal in size to the Manchurian Petroleum Co refinery at Dairen, the largest in Manchuria.

The Rising Sun Petroleum Co Storage **TARGET 90** at Bumpyo, about six miles north northwest of Genzan, has a capacity of about 165,000 barrels and, while relatively small, is the largest known such installation in Korea. In addition there is some warehouse storage, a can plant and a drum filling plant. Oceangoing ships can bunker from an eight inch, 500 foot, floating pipeline. Bumpyo and Genzan are located on the shore of Eiko Bay, long a fortified minor naval station with unlimited, protected, deep-water anchorage. A naval air station has recently been constructed, and a new submarine base has been reported, on Katsuma Peninsula adjacent to Genzan on the east. Naval vessels and tankers may be expected bunkering at Bumpyo.

TRANSPORTATION: The railways of Korea are a corridor for the flow of traffic between Japan on the one hand and Manchuria and North China on the other. Shipping shortages and exposure to attack have forced the Japanese to utilize this gateway to maximum capacity to avoid the longer sea routes to Manchuria and China. The distance from Shimonoseki to Fusan is 125 miles as compared with 485 to Seishin, 620 to Dairen. The standard-gauge railroads with American type heavy, high-capacity equipment, are well suited for the long-haul bulk traffic involved. The chief limitation on their use is a serious shortage of rolling stock in northeast Asia. This traffic consists principally of inbound shipments of military supplies to Manchuria and China and outbound movements of coal, iron ore, other raw materials and agricultural products to Japan. Most of the important lines are efficiently run under the management of the South Manchurian Railway. In recent years extensive construction has been carried on to provide direct routes between the leading Korean ports and Manchuria.

The principal rail line leaves Mukden, Manchuria's major junction area and enters Korea over the estuary of the Yalu River via the double Antung-Shingishu bridge (Manchuria, No. 93.2, **TARGET 77**). Running down the populous agricultural coastal plains of western Korea, the mainline connects Heijo with Fusan, some 730 rail miles from Mukden. The line is known to be double tracked between Fusan and Heijo and a double track is believed to be completed north to the border.

Korea's other important connection with Manchuria is provided by single tracked lines from Rashin and Seishin crossing the Tumen River by bridges at Nanyo **TARGET 19** and Kamisanpo **TARGET 20,** about 20 miles apart. A coastal railroad connection between Seishin and Rashin is reported under construction. Seishin is connected with the important Mozan Iron Mine **TARGET 32** by a branch line.

A single tracked line continues down the east coast to Genzan where it turns inland and crosses the peninsula and joins the Mukden-Fusan line at Keijo. An alternate line to the east coast railroad, important as a route for Mozan ores to Shako **TARGET 127** for export to Japan, runs south from the mine and joins the mainline at Kisshu. From Genzan the coastal line to Fusan has a 120 mile gap reported under construction. There are no developed ports between Genzan and Fusan.

There are alternate lines of less importance. Two subsidiary connections with Manchuria join the Mukden-Fusan main line north of Heijo. Both are single track and of limited capacity because of steep grades. One runs from Penhsihu (Manchuria) to Teishu, crossing over the Suiho Dam at the border and serves as an alternate to part of the Mukden-Heijo line. The other is from central Manchuria at Ssupingkai through Mampochin (where it crosses the Yalu) to Saiho, just north of Heijo.

Between Fusan and Keijo, a single track alternate to the Mukden-Fusan main line runs through Anto and Keishu. The Fusan-Keishu stretch, connecting

3632—9—Korea—7-24-44—First Proof

SUMMARY AND EVALUATION OF KOREA AREAS, Nos. 84.1, 2, 3, 4, 5, 6, 7, 8—Concluded

with the main line at Taikyu, provides a by-pass for a section of the main line near Sanroshin subject to periodic flooding.

Besides the Tumen River bridges listed as targets there are a number of bridges on the Mukden-Fusan Line. During double tracking, a parallel single track bridge has usually been constructed. Between Antung (Manchuria) and Shingishu (Korea) two 3000 foot single-track bridges **TARGET 93.2-77** carry the line over the Yalu River. There are parallel bridges, 2600 feet in length, over the Seisen River at Shinanshu **TARGET 211**, over which all traffic between the Mukden and Heijo areas must pass unless extremely circuitous routes are employed. At Heijo, two lengthy structures bridging two arms of the Daido River **TARGET 91** are now probably paralleled by bridges carrying the second track. South out of Keijo the Han River is crossed by parallel 2000 foot bridges **TARGET 42**, and in the south, at Waikin (between Taiden and Taikyu) the line crosses the Rakuto River on two long bridges **TARGET 106**.

There are large freight yards in Heijo near the station **TARGET 73**, and extensive new classification yards are being developed north of the city **TARGET 74** to handle traffic with Manchuria over the Antung and Mampochin lines, with the port of Chinnampo and the Japan Iron Co at Kenjiho, served by a spur leaving the main line south of Heijo.

Keijo likewise has extensive yard facilities, located in the Ryuzan industrial section **TARGET 43** and 4 miles west of Keijo at Suishoku, where recently built classification yards **TARGET 124** serve lines radiating out to ports in the east, west and south. At Fusan, there are freight yards in the port area for handling the important transshipment traffic with Japan.

Repair facilities, rolling stock manufacturing plants, and concentrations of freight cars in industrial and railroad freight yards are important targets because of the serious shortage of rolling stock, caused in part by the great increase in volume of traffic and length of haul, and in part by transfer of cars to North China. There are nine known repair shops in Korea, of which the Ryuzan Shops in Keijo **TARGET 43**, manufacturing rolling stock and other railway equipment as well as making all major repairs, are the largest. Also important are the shops at Heijo **TARGET 73** and Fusan **TARGET 105**, which likewise manufacture railway equipment, and at Teishu **TARGET 75** and Seishin **TARGET 17**. Secondary shops are located at Joshin, Taiden, Taikyu, and at Shingishu where only cars are repaired. Additional shops have been reported at Rashin, Yuki, Genzan, and Shinbaku (between Shariin and Kaijo) but have not been confirmed. The Ryuzan Manufacturing Company, with three plants, is the most important manufacturer of rolling stock and railway equipment aside from the railway shops themselves. One of these plants is in the Ryuzan section of Keijo **TARGET 210**. The other two, in the Eitoho industrial region outside Keijo and in Jinsen, have not been precisely located. The Japan Rolling Stock Co (Nippon Sharyo Seizo KK) has a plant in Jinsen.

(See special map on page M-2 and Transportation Map in pocket).

Although there is an extended network of roads in Korea, highway transport is subsidiary to rail. Most of the roads are unpaved, are subject to washout in the summer months, and are in general unsuited for handling the traffic carried by the railroads.

INCENDIARY ATTACK: Korean cities differ substantially from typical Japanese cities in susceptibility to spreading fires. Utilizing considerably more stone and dozo (mud plaster), Korean houses are also generally less closely spaced than Japanese residences. Most cities are generally less congested than Japanese cities of comparable size, being more frequently broken up by wide thoroughfares, patches of trees and other open spaces. Incendiary attacks against large sections of urban centers would probably have to be on a scale comparable with those employed over Europe in order to achieve a substantial degree of destruction. However certain districts in the large Korean cities probably are relatively vulnerable to incendiary attack, as would be large warehouse areas and military barracks areas.

3632—10—Korea—7-24-44—First Proof

Air Objective Folder
FUSAN REGION
KOREA AREAS, Nos. 84.1, 2, 3, 4, 5, 6, 7, 8

INDEX OF TARGETS BY NUMBER, CLASSIFICATION AND NAME

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Summary and Evaluation of Fusan Region

Fusan, located at the mainland point closest to Japan, is the terminus for the Mukden-Fusan mainline railroad and for the heavy traffic which shuttles across the 125 miles of sea between Fusan and Shimonoseki Strait.

This shipping lane is in relatively protected waters and has been considerably increased in importance by the deteriorating Japanese shipping position and exposure to attack of the ship routes from the China coast. There are fortified positions in the Korea Strait and short-range air and naval cover can be provided for the Fusan-Shimonoseki sea lane.

The port has a well protected, breakwater-enclosed inner harbor **TARGET 97** with depths from 24 to 50 feet in the pier and anchorage area, but shoaling to 12 feet on the north side. Two pre-war piers of reclaimed land type provide about 4,000 feet of berthage with railroad spurs and freight sheds. A quay, partly of reclaimed land, extends north of the piers paralleling the railroad. Formerly suitable only for small craft and lighters, the quay may have been dredged alongside for deeper draft vessels. The shallow south entrance to the harbor, between Makino Island and Fusan city, with a pre-war limiting depth of 15 feet, is crossed by a drawbridge.

The Fusan Railroad Workshops **TARGET 105** are one of the three largest in Korea for the repair of both locomotives and rolling stock, and also build freight cars.

Industrial activity in the Fusan Region is largely limited to textile mills, small shops and household types. Two Diesel engine plants were planned for Fusan city. There is a 12,000 KW standby steam power plant. There are limited ship building facilities.

Chinkai, connected to the single track south coast line, is a minor naval station and mine base **TARGET 101.** There are three small harbors, with room for eight destroyers in the west harbor. Mine laying destroyers and mine sweepers usually have been stationed here. The central and east harbors have small shipyard facilities including one 50-ton floating crane, several small slips, an obsolete 2000-ton floating dock, small machine shop and foundry. North of the harbors are four or five storage buildings, for mines and minesweeping gear. South of the harbors are eight 50,000-70,000 barrel oil storage tanks in line on a hill. Ships can bunker at a jetty at the foot of the hill. South of the station is a small seaplane base. Landing and beaching of planes is possible at all tides and there is one slipway 60 feet wide. There is an emergency landing field. It is reported that the islands south of Chinkai are extensively fortified.

Masan Harbor **TARGET 130,** at the head of the bay northwest of Chinkai and 25 miles northwest of Fusan, is an old harbor reported as newly developed with deepwater berthing facilities. It is connected 20 miles to the northeast with the Fusan-Mukden mainline railroad by the single tracked south coast line. Warehouses and a drydock were reported built since 1940.

3632—11—Korea—7-24-44—First Proof

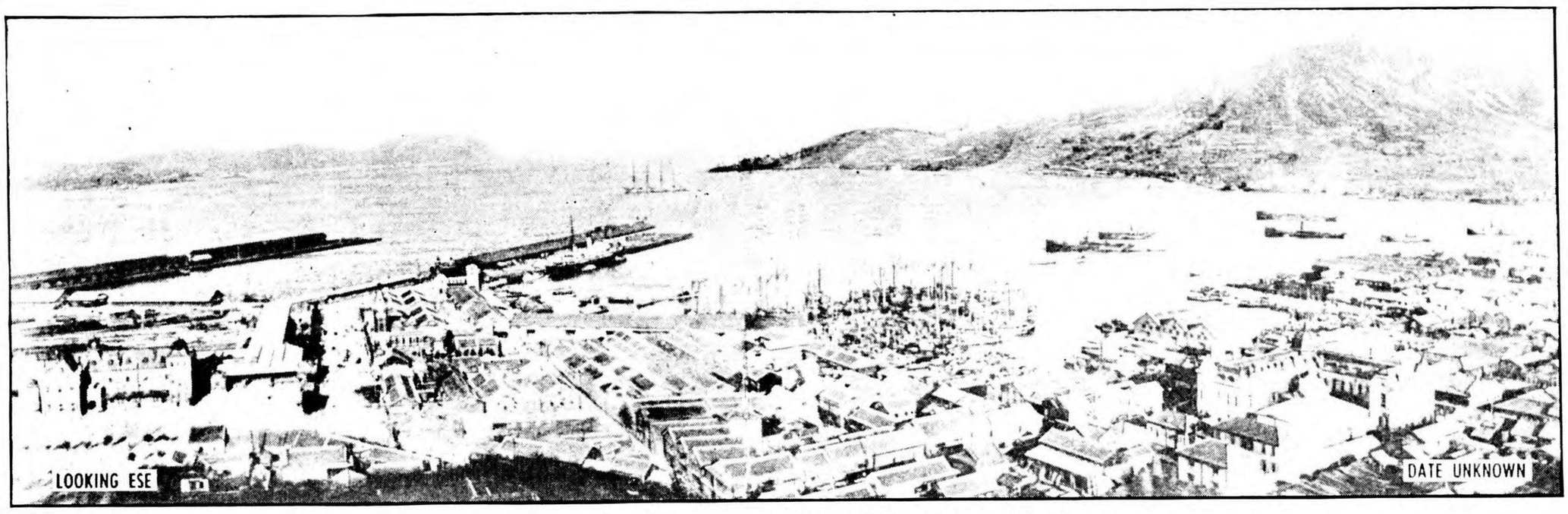
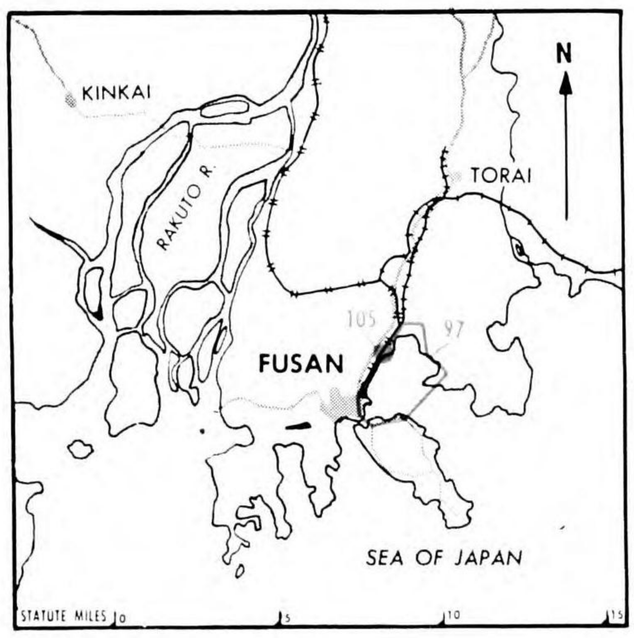


PHOTO 1—Fusan—TARGET 97 Fusan Harbor.



TARGET
105

FUSAN RR WORKSHOPS

FUSAN

(TRANSPORTATION)

35° 07′ N 129° 03′ E (Approx)—One of three largest Korea railway shops for repair of both locomotives and cars. Also builds freight cars. Reported also building railway ferry boats.

(See photo 2; maps on page M-4.)

TARGET
97

FUSAN HARBOR

FUSAN

(HARBOR FACILITIES)

35° 07′ N 129° 03′ E (Approx)—Terminus of Mukden-Fusan mainline and port for shuttle traffic to Shimonoseki 125 mi across the Strait. Most congested port in Korea. Total of 4000 ft of berthage space alongside two piers. No 1 pier 966 ft, No 2 pier 1380 ft long with five freight sheds, 250 by 60 ft each, and seven RR spurs. Several small piers. Quays N of piers believed dredged to expand port cap and accommodate medium draft vessels. Anchorage area deep and readily accessible from sea. Lighterage can be expected as RR cap exceeds freight handling cap for ships alongside. Small 253 ft drydock located on N side of Makino Is.

(See photos 1 and 2; map on page M-4.)

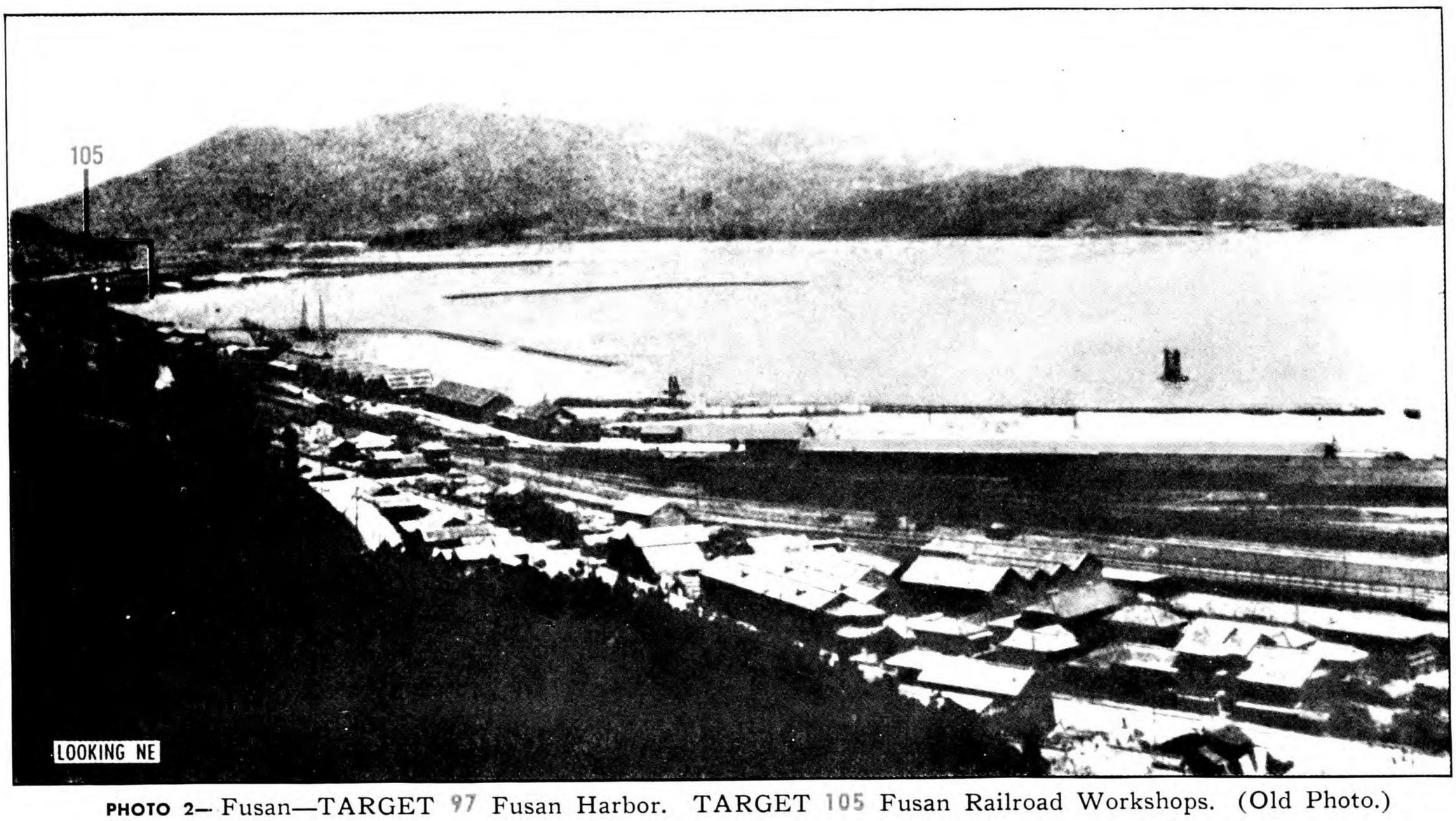


PHOTO 2—Fusan—TARGET 97 Fusan Harbor. TARGET 105 Fusan Railroad Workshops. (Old Photo.)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGETS 97, 105 (FUSAN REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGETS 97, 105 (FUSAN REGION)

3632—12—Korea—7-24-44—First Proof

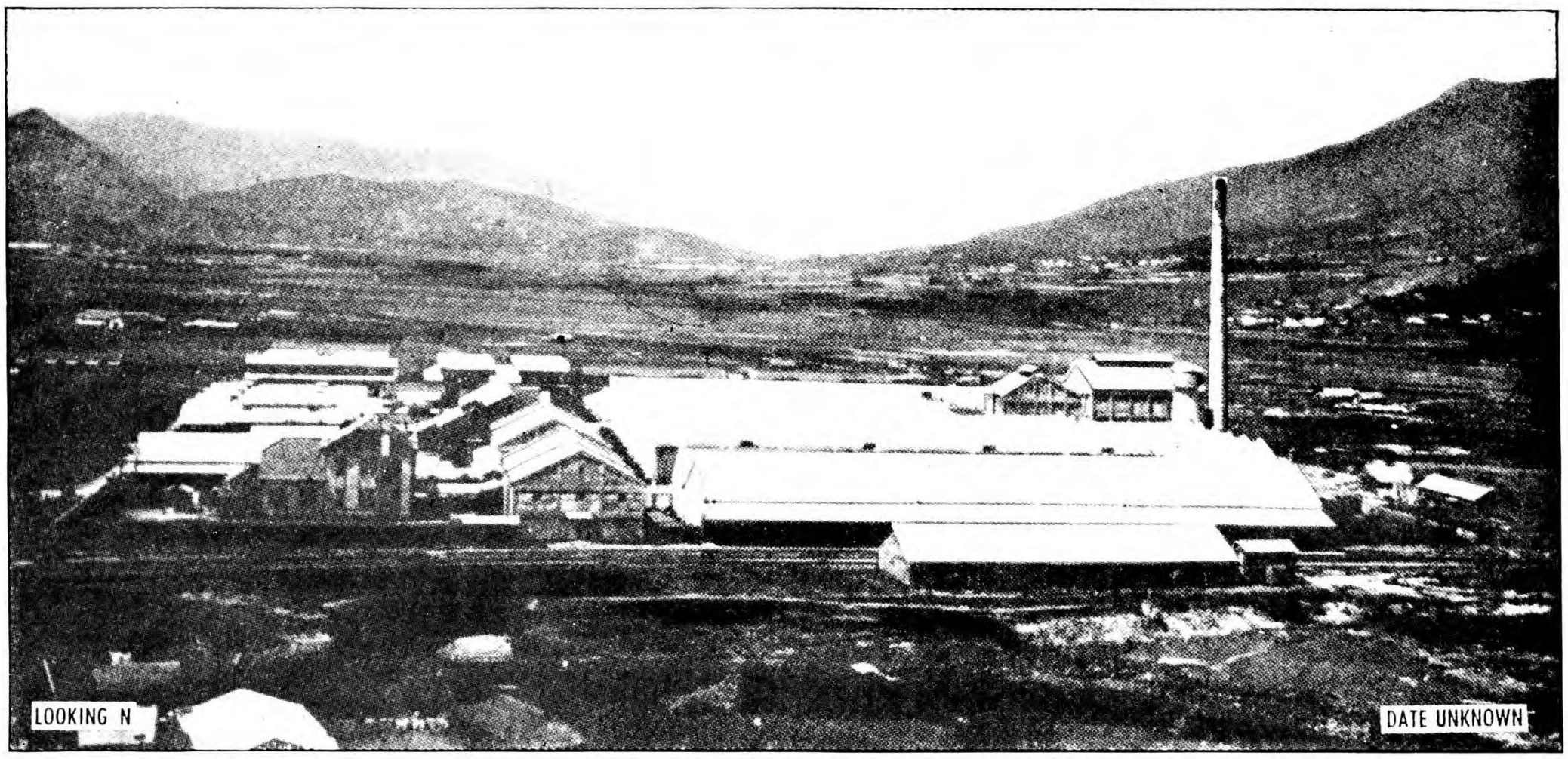


PHOTO 3—Fusan—Chosen Spinning and Weaving Co.

TARGET 101

CHINKAI NAVAL BASE

CHINKAI

(NAVAL BASES)

35° 09′ N 128° 38′ E (Approx)—Minor naval station and mine base. Three small harbors. Room for eight destroyers in W harbor. Central and E harbors used as dockyard. Can do minor repairs to destroyers and mine layers. Equipment includes one 50-ton floating crane, several small cranes, an obsolete 2000 ton floating dock, several small slips, small machine shop and foundry. Several storage bldgs N of the W harbor have cap of several thousand mines. Oil storage area on peninsula separating central and E harbors has cap of about 500,000 bbls in eight large tanks. Ships bunker at jetty at foot of hill. Small naval air station located to S. (See photo 4; maps on pages M-3 and M-5.)

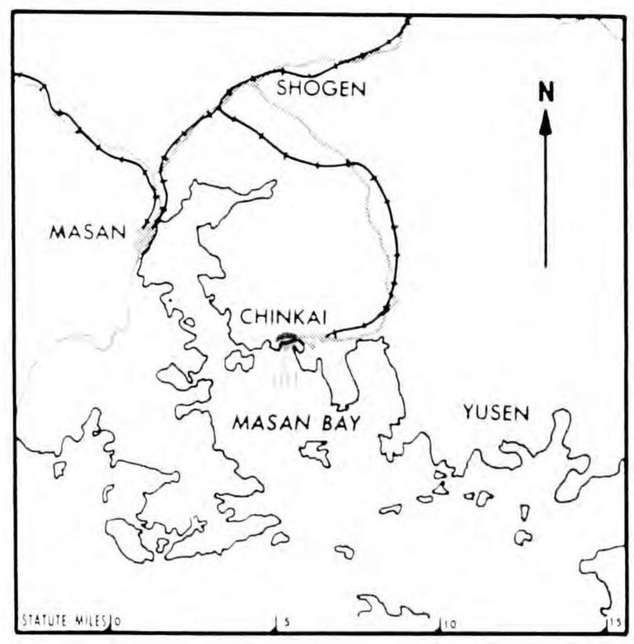


PHOTO 4—Chinkai—TARGET 101 Chinkai Naval Base East Harbor upper left.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 101 (FUSAN REGION)

3632—13—Korea—7-24-44—First Proof

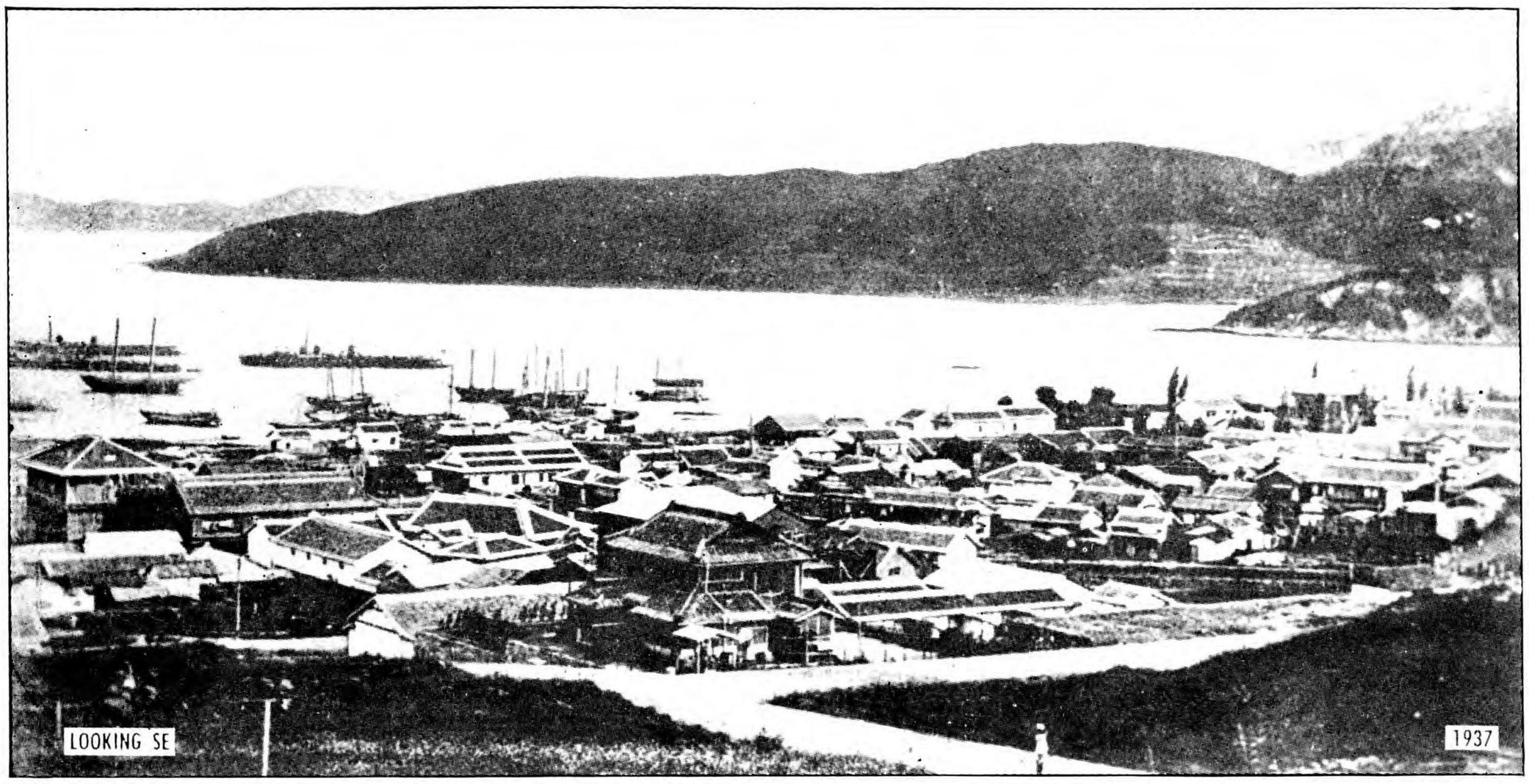


PHOTO 5—Masan—TARGET 130 Masan Harbor.

TARGET 130

MASAN HARBOR

MASAN

(HARBOR FACILITIES)

35° 12′ N 128° 33′ E (Approx)
Approx 25 mi NW of Fusan, 5 mi NW of Chinkai Naval Base (TARGET 101). New port development with whses and drydock facilities reported built since 1940. Believed to supplement Fusan handling Shimonoseki Strait traffic.

(See photos 5 and 6; map on page M-5.)

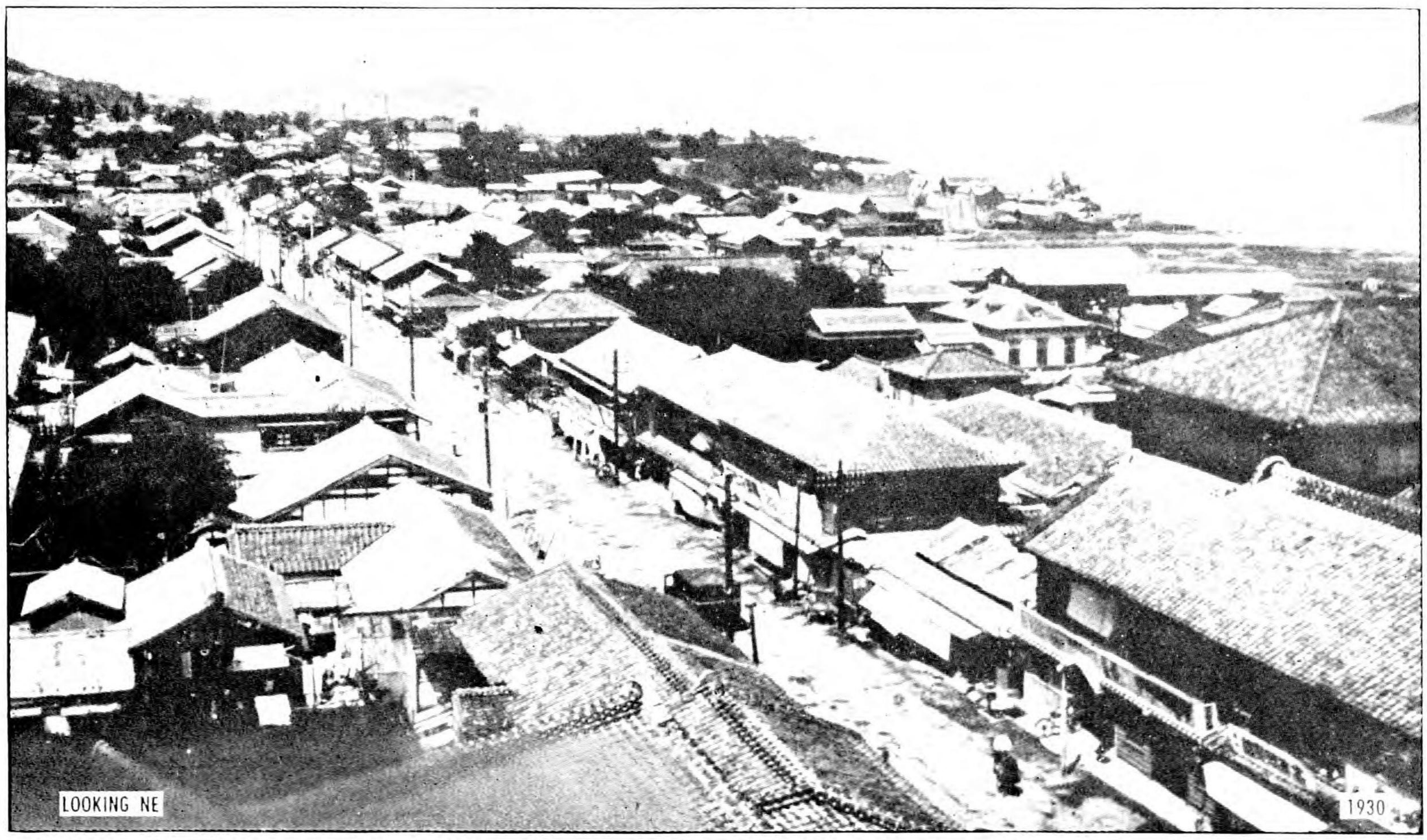


PHOTO 6—Masan—TARGET 130 Masan Harbor.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 130 (FUSAN REGION)
KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 130 (FUSAN REGION)

3632—14 Korea 7-44 First Proof

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Air Objective Folder

KEIJO-JINSEN REGION

KOREA AREAS, Nos. 84.1, 2, 3, 4, 5, 6, 7, 8

INDEX OF TARGETS BY NUMBER, CLASSIFICATION AND NAME

TARGET NUMBER	NAME	PAGE
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	TRANSPORTATION	
42	Han River RR Bridges	17
43	Ryuzan RR Shops & Yards	17
124	Suishoku Freight Yards	17
210	Ryuzan Manufacturing Co.	17

Summary and Evaluation of Keijo-Jinsen Region

Keijo is the most important rail hub in Korea, with all major north-south lines passing through the city. It lies on the main Fusan-Shingishu-Mukden-Harbin line now reported to be doubletracked throughout. It is also the terminus of the circuitous single tracked mountain route from Fusan and the important single-tracked line running overland to Genzan and northeast Korea. There is a double-tracked line to the port of Jinsen 20 miles to the west, and a branch line to Shunsen 45 miles northeast in the center of the peninsula. The mainline from Fusan enters south Keijo via the Han River railroad bridges about five miles west of the city. The alternate route from Fusan and the line to Genzan enter the city from the east after joining at the suburban Seiryori junction.

Keijo, the capitol of Korea, is the largest city in the country with a population of approximately 1,000,000. It has been an important military center and has extensive barracks and other installations in suburban Ryuzan in the southern part of the city. The most important industrial objective is the Ryuzan Railroad Shops and Yards **TARGET 43.** Located just northeast of the Han River Railroad Bridges, this is the largest center for the building and repair of locomotives and rolling stock in Korea. A plant of the Ryuzan Manufacturing Co. **TARGET 210** located along the railroad west of the military area is an important manufacturer of freight cars and railroad equipment as well as mining and engineering machinery. About four miles west of Keijo on the Fusan-Shingishu mainline are the new Suishoku Freight Yards **TARGET 124,** a central distribution point for Korea.

Installations not listed as targets but located on map on page M-8 for purposes of identification include: The Keishun Railway Co., private operator of the Keijo-Shunsen line, which maintain motor car garages and repair shops in the center of the city; the broadcasting studios of the government owned radio station JODK (50 kilowatts), the largest in Korea, just north of the Keijo railroad station; the transmitter, with two large and two small steel towers, located north of the Han River and north of Keijo Airport, which is southwest of the city. The Hironaka Industrial and Commercial Co. has a small plant southeast of the railroad station manufacturing machine tools, mining machinery, and other products.

Jinsen has long been one of Korea's principal deep-water ports. A feature of the port **TARGET 45** is the tidal basin and lock-gate to adjust wharf facilities to a 30-foot tidal range. The lock-gate was completed in 1923 and provides some 3500 lineal feet of wharfage, parallelled on the north side of the basin by railroad spurs. Two breakwater-like training walls from deep water to the lock-gate prevent silting of the channel dredged across flats exposed at low tide. A new lock basin, six times as large as the old one, has been reported under construction along with land reclamation projects and railroad spurs.

The few known industries in Jinsen can be located only approximately (see map on page M-7) and are not listed as targets. The most important of these installations is the Nippon Car Works, an important manufacturer of locomotives and freight cars. Other industries include: The Chosen Riken Metals plant reported to be producing special steel by the rotary kiln process, pig iron by the Riken kiln process, aluminum, and magnesium; a new plant of the Tokyo Shibaura Electric Co., manufacturing electric motors and transformers; the Chosen Machine Manufacturing plant producing ordnance, ordnance parts, heavy machinery, cast steel and special steel products.

An extensive new industrial area has been developed along the Keijo-Jinsen line from Keijo to Fuhei, about 14 miles to the west. Little is known of the location or relative importance of individual installations, but where possible they have been located on map on page M-10.

3632—15—Korea—7-24-44—First Proof

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 INDEX AND SUMMARY (KEIJO-JINSEN REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 INDEX AND SUMMARY (KEIJO-JINSEN REGION)

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In this new area, Eitoho, just southwest of Keijo across the Han River, has undergone rapid expansion as an industrial center in the past few years. A section of land was reported to have been set aside for the development of industries and it was planned to establish about 200 plants. Information concerning the development is fragmentary. The Ryuzan Engineering Co. has a plant at Eitoho, but specific articles manufactured are not known. Other installations known to be in this section include three textile mills, a glass factory, two flour mills, two large breweries, a pottery plant, and two leather plants. Photos 10, 11 and 12, are included as aids to photo interpretation.

A new industrial section has been developed in the vicinity of Sosha, north of the railroad about half-way between Keijo and Jinsen. There is little intelligence concerning these new factories but production is reported to be mainly for military purposes. An aircraft plant has been reported north of the Sosha railroad station. Other installations include a Nikkosha plant making rock drilling machinery, a plant of the New Ilhan Co., making medicines and drugs and the Chosen Nail Co., manufacturing nails and bolts. A large radio station is located near Sosha.

The Fuhei section, just west of the Sosha district, has also undergone an industrial development with some heavy industry reported. North of the Fuhei railroad station the Hironaka Industrial and Commercial Co. has a plant reported producing mining machinery, railway rolling stock and machine tools, with some machinery supplied to the Chosen Nitrogen Fertilizer plant at Konan **TARGET 1.** Plant production in September 1940 was two freight cars a day; doubling of production was planned for 1941. Adjoining this plant are approximately 800 houses and one dormitory for workers. Also approximately spotted on map on page M-10 are the Diesel Automobile Works and a plant of the Mitsubishi Steel Co. Other plants in this section include the Japan High Frequency Heavy Industry Co., manufacturing special steel and the Kowyo Precision Industry using this special steel for the production of bearings. A sizable arsenal, with homes for workers nearby, was reported in operation in 1939.

The Keijo-Jinsen Region draws its electric power from the north Korean network.

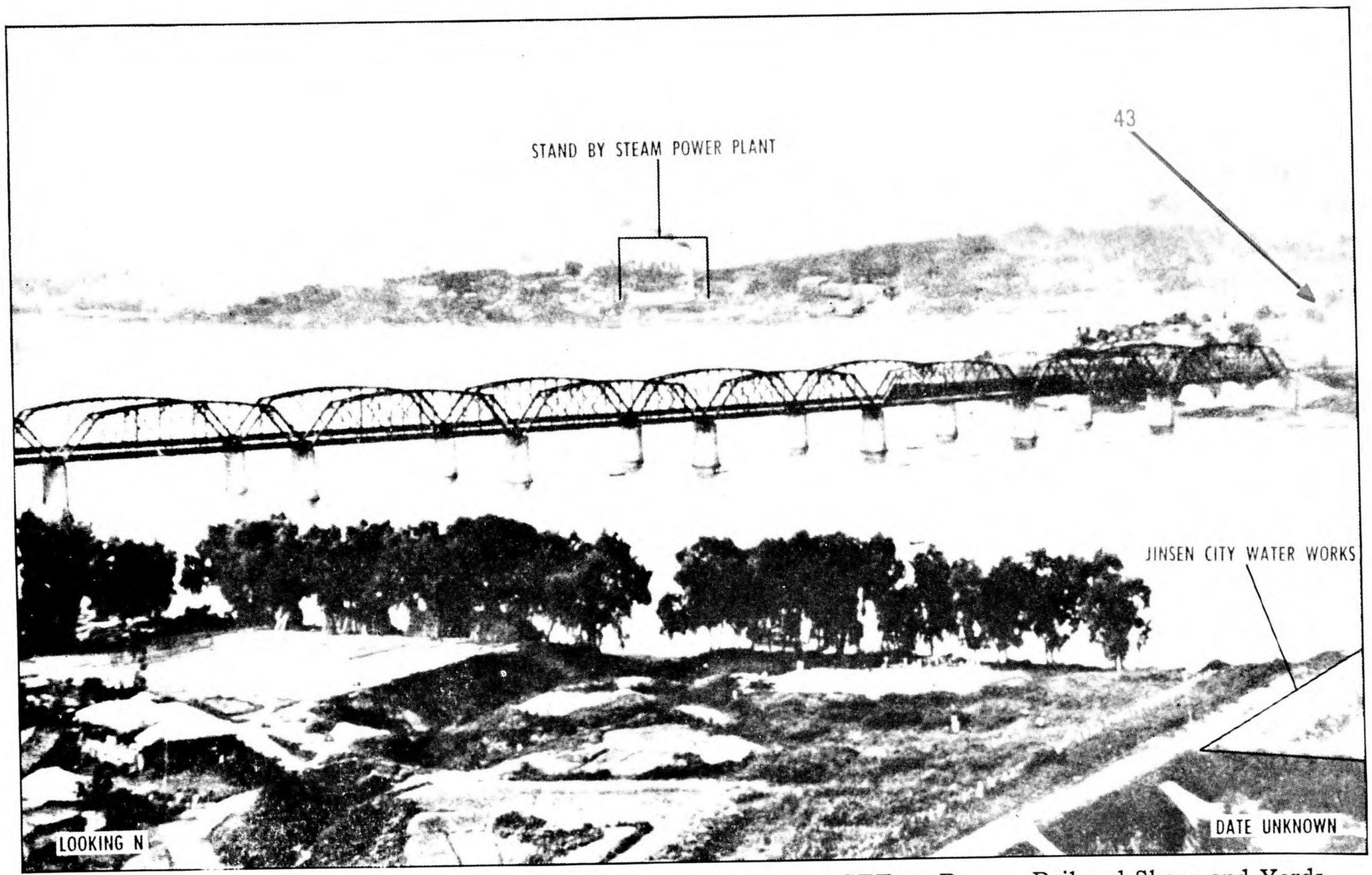


PHOTO 7— Keijo—TARGET 42 Han River Railroad Bridges. TARGET 43 Ryuzan Railroad Shops and Yards.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 SUMMARY (KEIJO-JINSEN REGION)

3632—16—Korea— 7-24-44—First Proof

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 SUMMARY (KEIJO-JINSEN REGION)

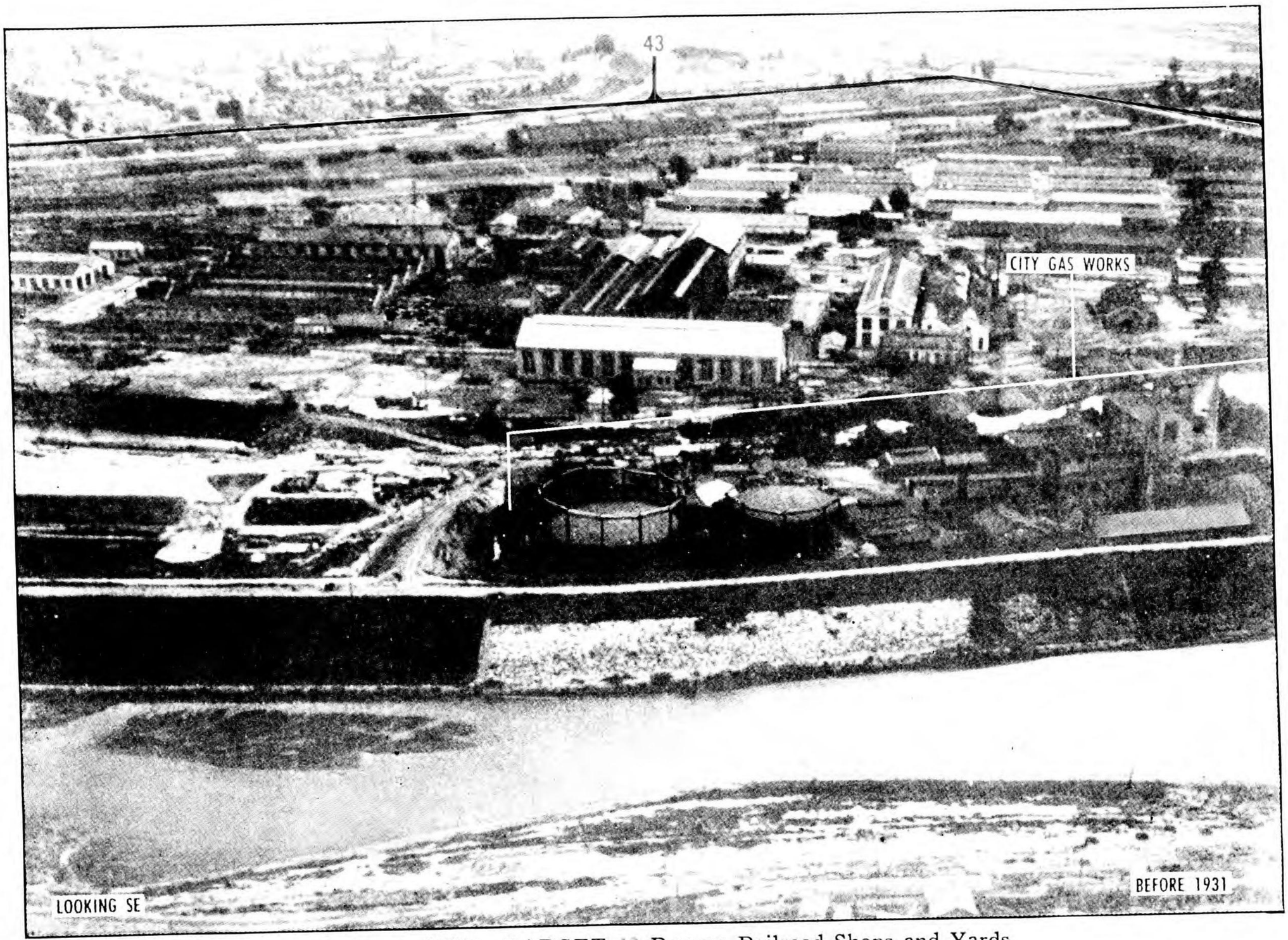


PHOTO 8—Keijo—TARGET 43 Ryuzan Railroad Shops and Yards.

TARGET 42

HAN RIVER RR BRIDGES

KEIJO

(TRANSPORTATION)

37° 31′ N 126° 57′ E (Approx) Two parallel single track bridges between Ryuzan and Eitoho carrying main Antung-Fusan line. Each has ten spans and is about 2000 ft long.

(See photos 7 and 9; maps on pages M-6, M-8 and M-10.)

TARGET 43

RYUZAN RR SHOPS & YARDS

KEIJO

(TRANSPORTATION)

37° 32′ N 126° 58′ E (Approx) Largest railway repair shops in Korea. Also build new rolling stock and other railway equipment. Since expansion in 1942, annual production believed to be about 25 locomotives, 2500 cars. Large freight yard serving southern industrial area of Keijo. Locomotive shed.

(See photos 7 and 8; maps on pages M-6, M-8, M-9 and M-10.)

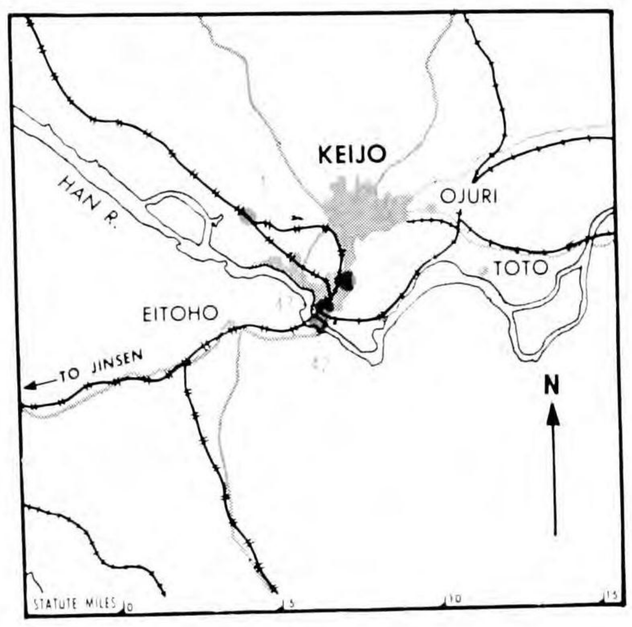


PHOTO 9—Keijo—TARGET 42 Han River Railroad Bridges.

TARGET 124

SUISHOKU FREIGHT YARDS

KEIJO

(TRANSPORTATION)

37° 35′ N 126° 54′ E (Approx) Large new classification yards of hump gravity type serving lines radiating out from Keijo to Heijo, Genzan, Fusan and Jinsen. 4 mi W of Keijo.

(See maps on pages M-6 and M-10.)

TARGET 210

RYUZAN MFG CO

KEIJO

(TRANSPORTATION)

37° 32′ N 126° 59′ E (Approx) Important manufacturer of freight cars and railway equipment. Also produces mining and engineering machinery, and military goods.

(See maps on pages M-6, M-8, M-9 and M-10.)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGETS 42, 43, 124, 210 (KEIJO-JINSEN REGION)

3632—17—Korea—7-24-44—First Proof

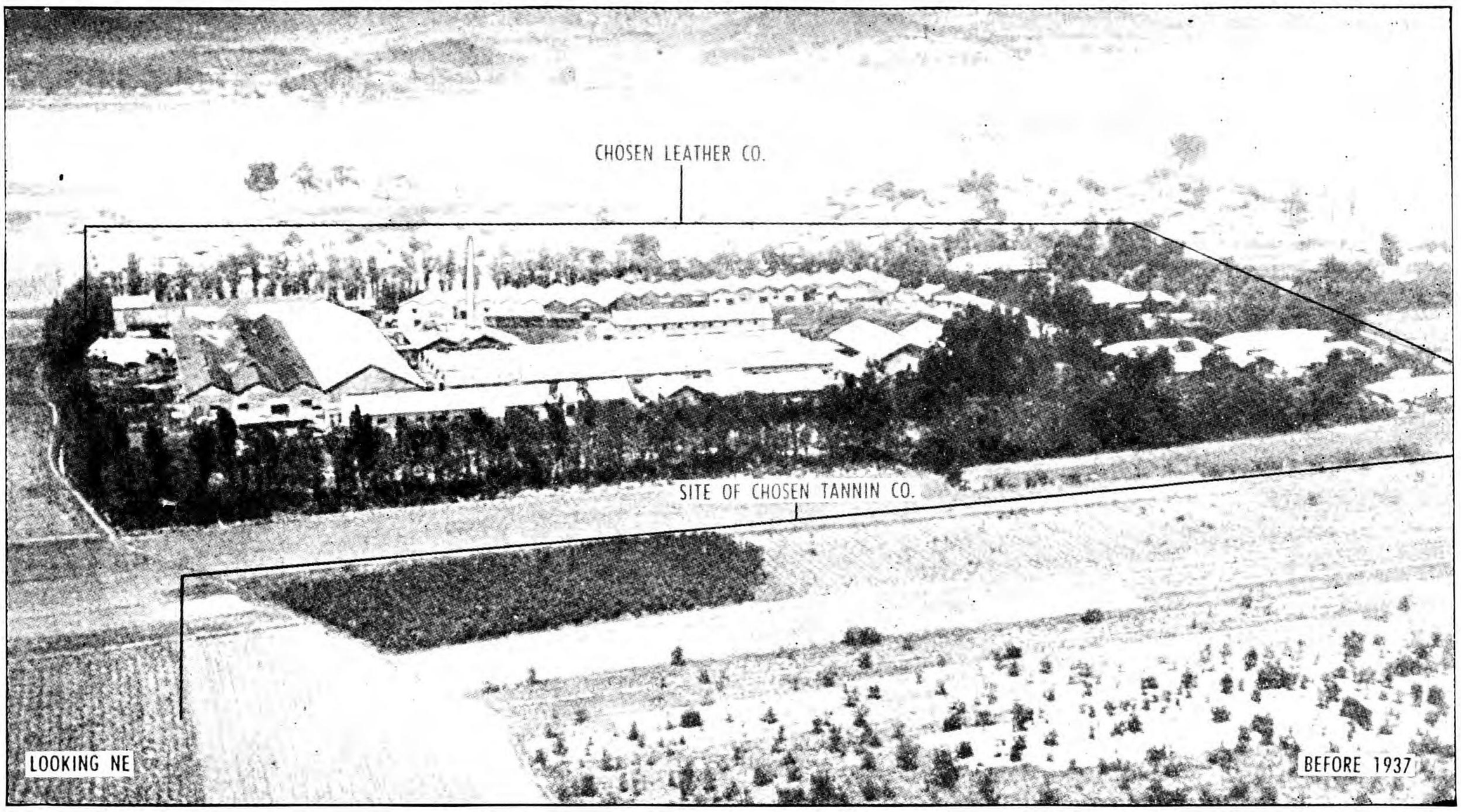


PHOTO 10— Eitoho—Chosen Leather Co. (Not listed as a target.)

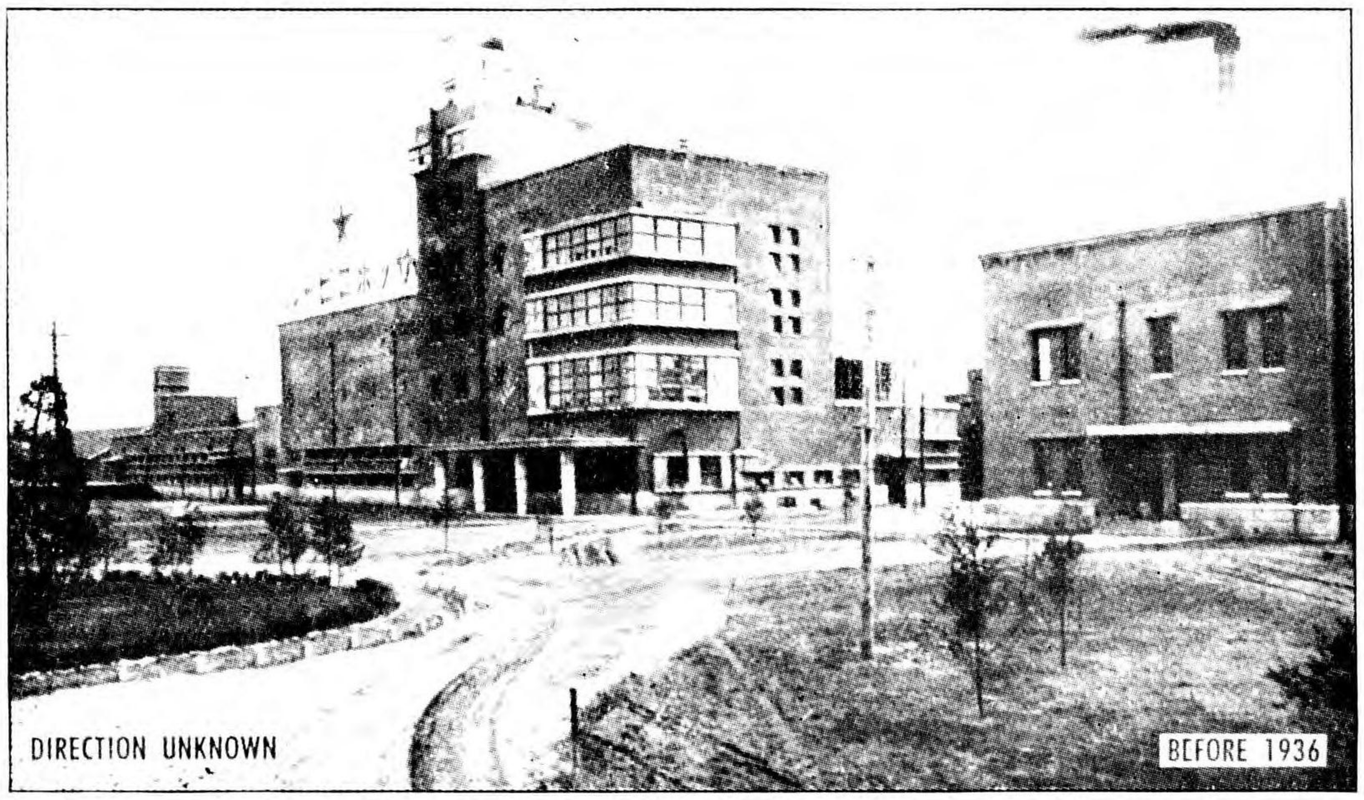


PHOTO 11— Eitoho—Chosen Brewery (Not listed as a target).

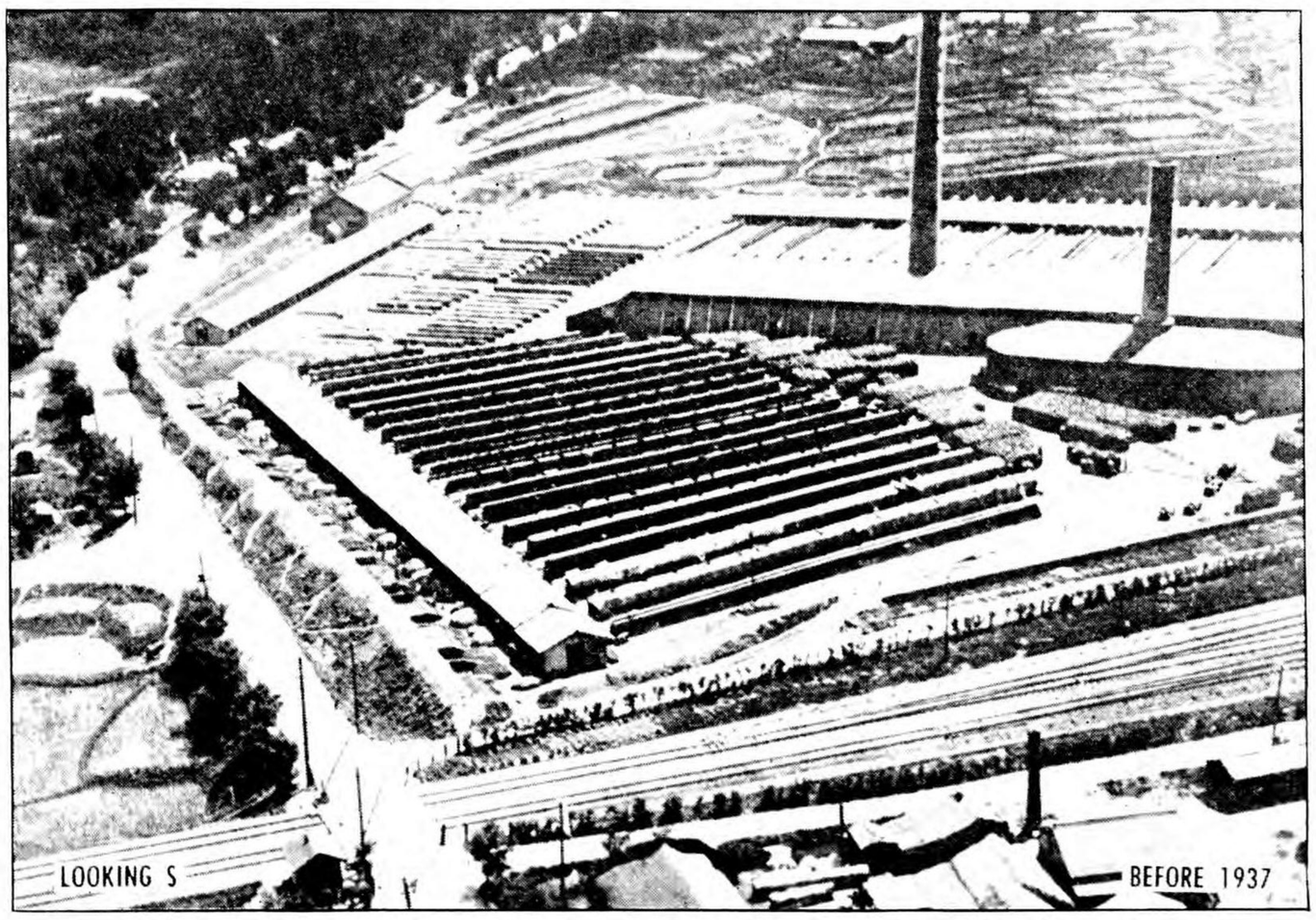


PHOTO 12—Eitoho—Pottery Works (Not listed as a target).

PHOTO 13— Jinsen—TARGET 45 Jinsen Harbor and Tidal Basin.

TARGET
45

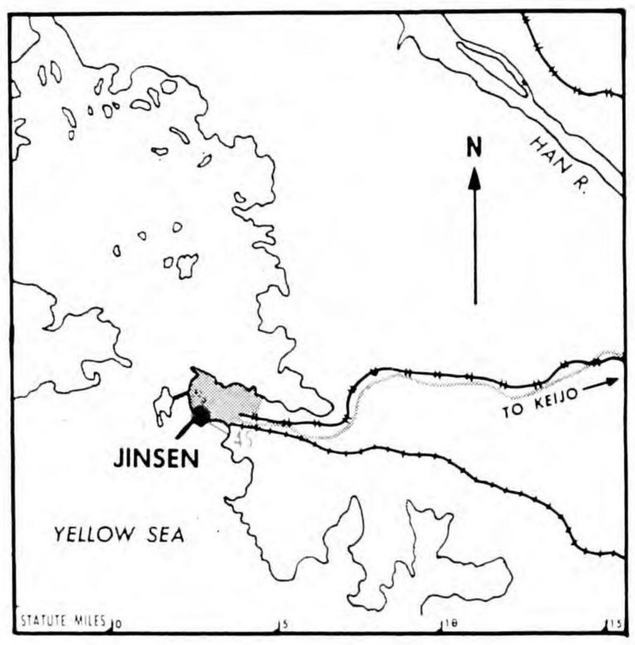
JINSEN HARBOR & TIDAL BASIN

JINSEN

(HARBOR FACILITIES)

37° 28′ N 126° 37′ E (Approx)—One of Korea's principal deepwater ports. Tidal basin and lock-gate completed in 1923 to adjust wharf facilities with 30 ft tide. Water area of basin is 1500 by 720 ft. 30 ton floating crane reported inside. Total of 3500 linear ft of wharfage paralleled on N side by RR spurs. Whses parallel RR along quay, N and NW of basin. Two breakwater-like training walls from deep water to lock-gate prevent silting of channel dredged across tidal flats. New basin, six times as large as old one, has been reported under construction.

(See photos 13, 14, 15 and 16; maps on pages M-6 and M-7.)



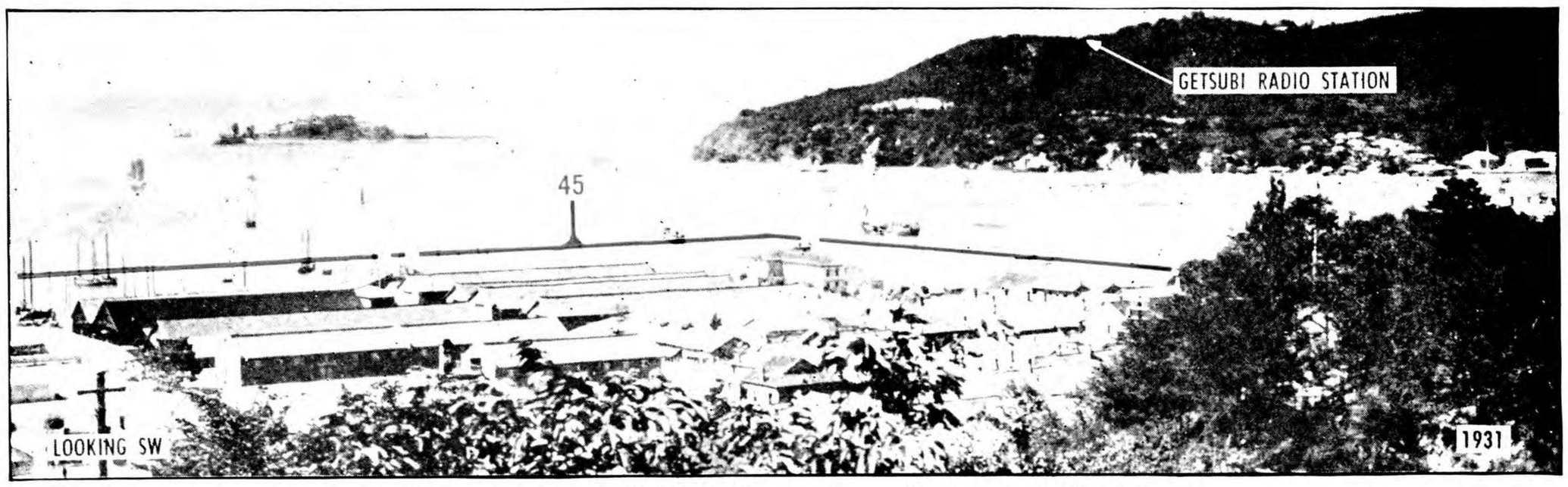


PHOTO 14— Jinsen—TARGET 45 Jinsen Harbor and Tidal Basin.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 45 (KEIJO-JINSEN REGION)

3632—19—Korea—7-24-44—First Proof

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PHOTO 15—Jinsen—TARGET 45 Jinsen Harbor and Tidal Basin.

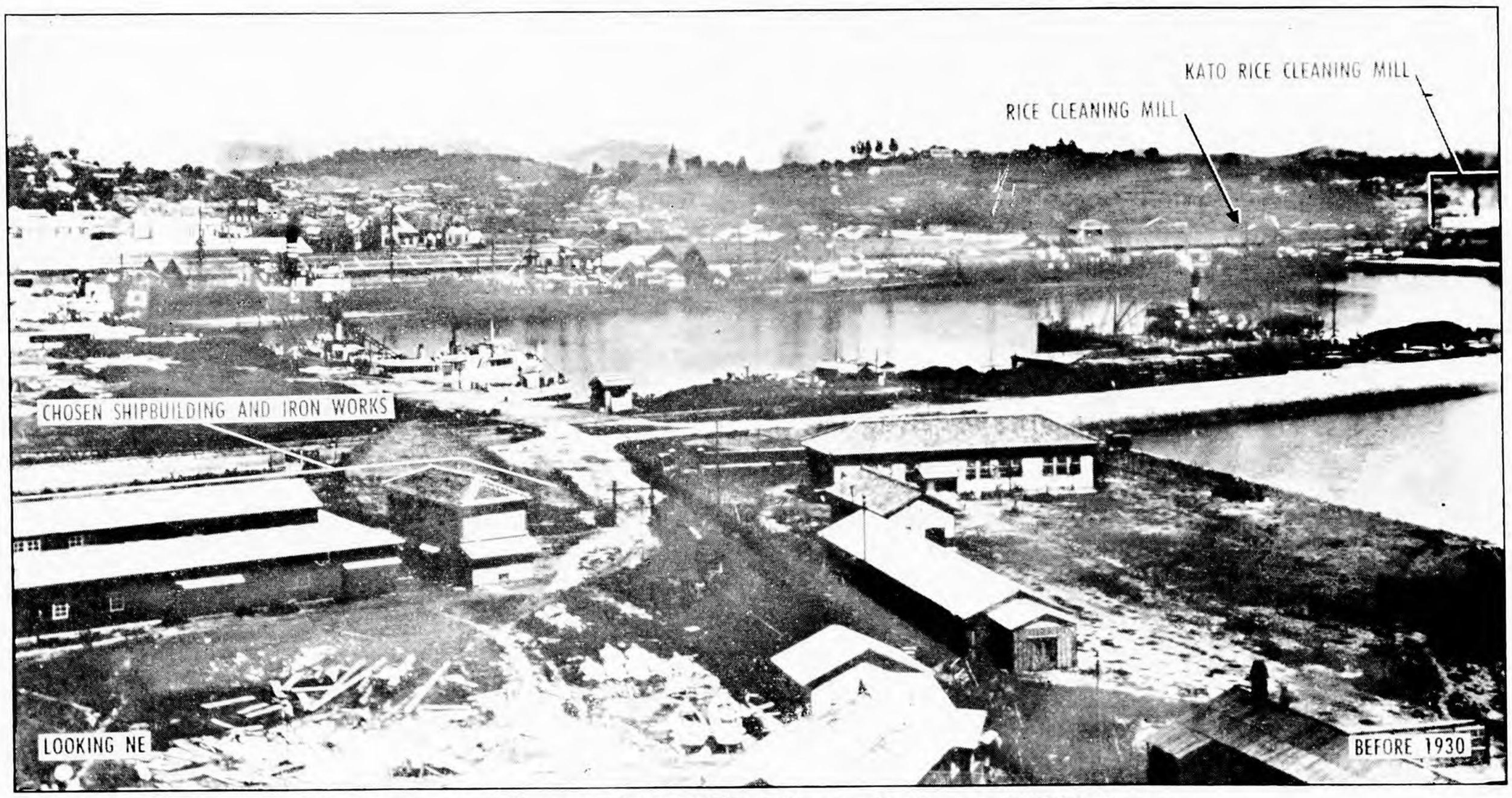

PHOTO 16—Jinsen—TARGET 45 Jinsen Harbor and Tidal Basin.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 45 (KEIJO-JINSEN REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 45 (KEIJO-JINSEN REGION)

3632—20—Korea—7-24-44—First Proof

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KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 45 (KEIJO-JINSEN REGION)

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HEIJO-CHINNAMPO REGION

KOREA AREAS, Nos. 84.1, 2, 3, 4, 5, 6, 7, 8

INDEX OF TARGETS BY NUMBER, CLASSIFICATION AND NAME

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74	Heijo Shunting Yards	24
91	Daido River RR Bridges	23

Summary and Evaluation of Heijo-Chinnampo Region

Heijo, the second largest city in Korea, with a population of about 280,000, is the army arsenal center for Korea and one of the two major arsenal centers on the Mainland. Heijo Arsenal **TARGET 61** approaches the Mukden Arsenal in the production of small arms and ammunition but does not produce heavy ordnance. It controls munitions and explosives manufacture in Korea and much of the small industry in Heijo. The Showa Aircraft Factory **TARGET 65**, assembling aircraft and manufacturing parts, and the air section of the Arsenal, producing parts, are believed to be the center of the limited Korea aircraft production.

The mainline railroad from Fusan enters Heijo from the south via two long bridges **TARGET 91** spanning the Daido River. There are large freight yards and one of the three largest Korean repair shops **TARGET 73** near the station. Extensive new classification yards **TARGET 74** are being developed north of the city to handle traffic with Manchuria over the mainline and over the single tracked line via Mampochin. The yards also handle traffic of the port of Chinnampo, 25 miles to the southwest, and the Japan Iron Works **TARGET 66** at Kenjiho via a spur leaving the main line south of the city.

Other installations not listed as targets, including a 10,000 KW stand-by power plant, are spotted on map on page **M-11.**

Chinnampo, the principal west coast Korean port, is located on the north bank of the Daido River estuary 20 miles within the entrance. Seaward beyond the entrance, great mudflats, drying at low tide and showing small islets at high tide, extend for some 20 miles. The estuary itself for 30 miles consists of projecting points with the indentations between, drying at low tide. The Daido River is a mile wide at Chinnampo and vessels of any draft can reach an extensive anchorage via a deep but winding channel through the tidal flats.

The harbor **TARGET 76** is an artificial basin open to the south, and provides some 4000 feet of berthage with parallel railroad spurs and freight sheds. The basin is reported to be partly dredged to take 10,000 ton vessels. A coal handling wharf **TARGET 77** one half mile east of the basin is equipped with mechanical handling equipment with a coaling capacity of 400 tons per hour. Before the war Chinnampo exported substantial tonnages of coal barged down the Daido from local mines, and rice, for which there is extensive warehousing in the port area.

There are two industrial installations at Chinnampo of major importance to the Japanese war economy. The Chosen Riken Metals plant **TARGET 67**, accounting for three percent and eight percent of Inner Zone aluminum and magnesium respectively, lies on open reclaimed land at the southwest end of the city. A smelter **TARGET 68** of the Japan Mining Co., located on a peninsula at the northeast end of Chinnampo, produces an estimated 20% of Inner Zone lead, 4% of the copper, and 15% of the low grade zinc.

The older and smaller of the two Korean plants of Japan Iron Works is located at Kenjiho on the Daido River ten miles east of Chinnampo. This plant **TARGET 66** is estimated to produce 400,000 of the 1,000,000 metric tons of Korean pig iron, and most of the Korean open hearth steel, about 240,000 metric tons. High grade ores are mined locally; coking coal is brought in from North China. Ships of 20 foot draft can reach the plant, but must lighter. There is a small basin with mechanical coal handling equipment.

There have been unconfirmed reports of a new aircraft plant near Kenjiho utilizing the light metals output of the Chosen Riken Metals plant at Chinnampo.

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3632—21—Korea—7-24-44—First Proof

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 INDEX AND SUMMARY (HEIJO-CHINNAMPO REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 INDEX AND SUMMARY (HEIJO-CHINNAMPO REGION)

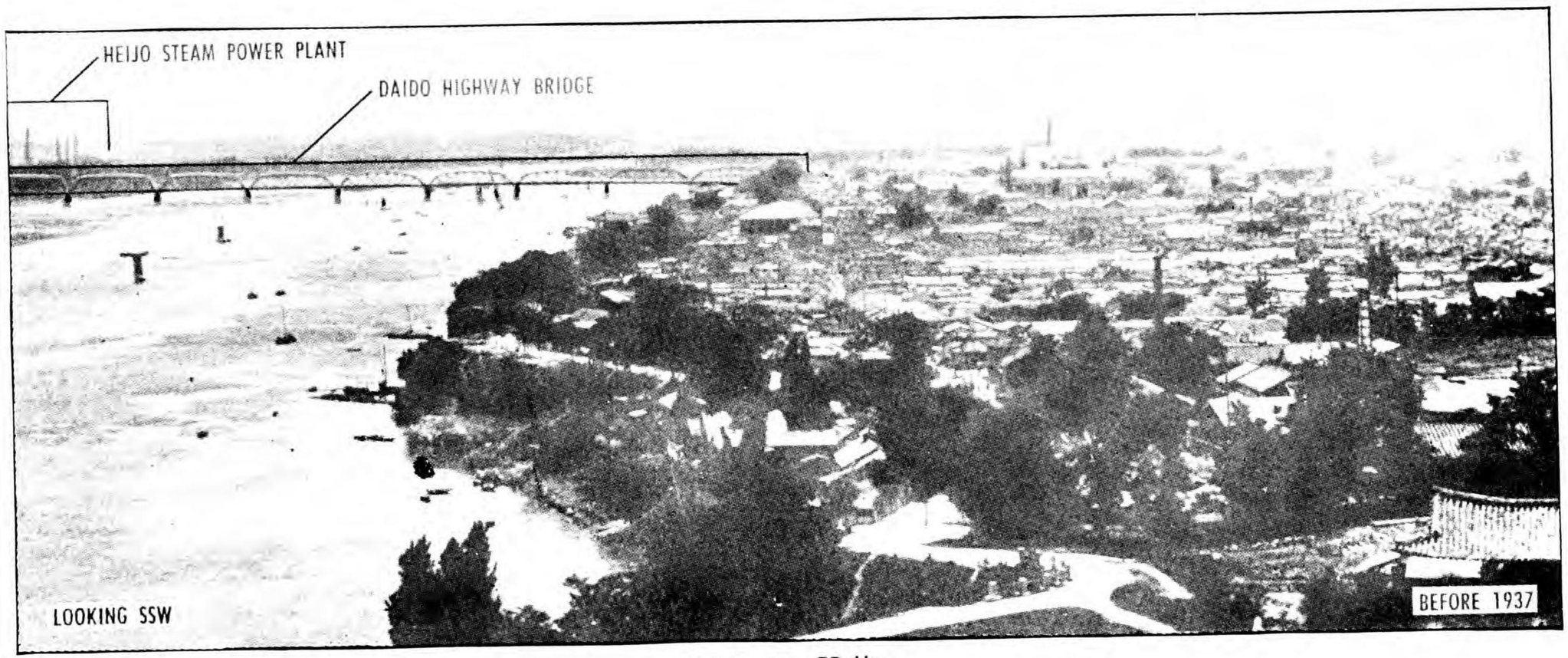
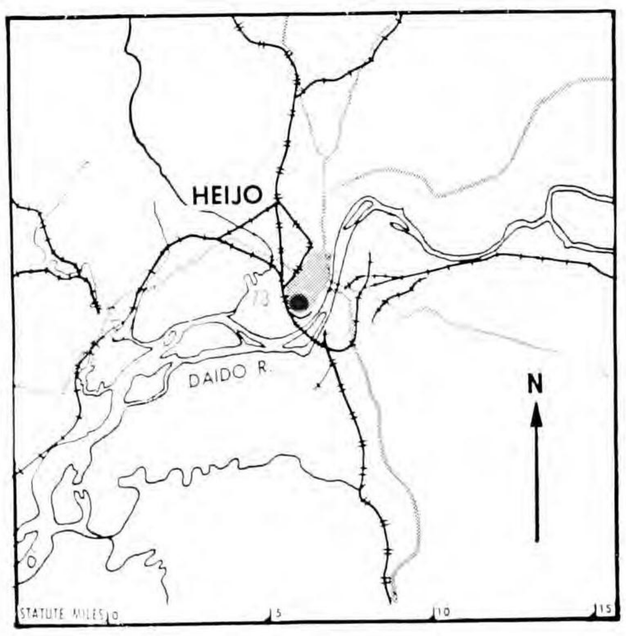


PHOTO 18—Heijo.



TARGET 73

HEIJO RR SHOPS & YARDS

HEIJO

(TRANSPORTATION)

39° 00′ N 125° 44′ E (Approx)—One of three largest railway shops in Korea, principally for the repair of freight cars. Manufactures rolling stock and other railway equipment. Freight yards with whses, locomotive shed. Main station and Army Depot on W side of Yards. Repair shops are at S end of yards.

(See photo 17; maps on pages M-6 and M-11.)

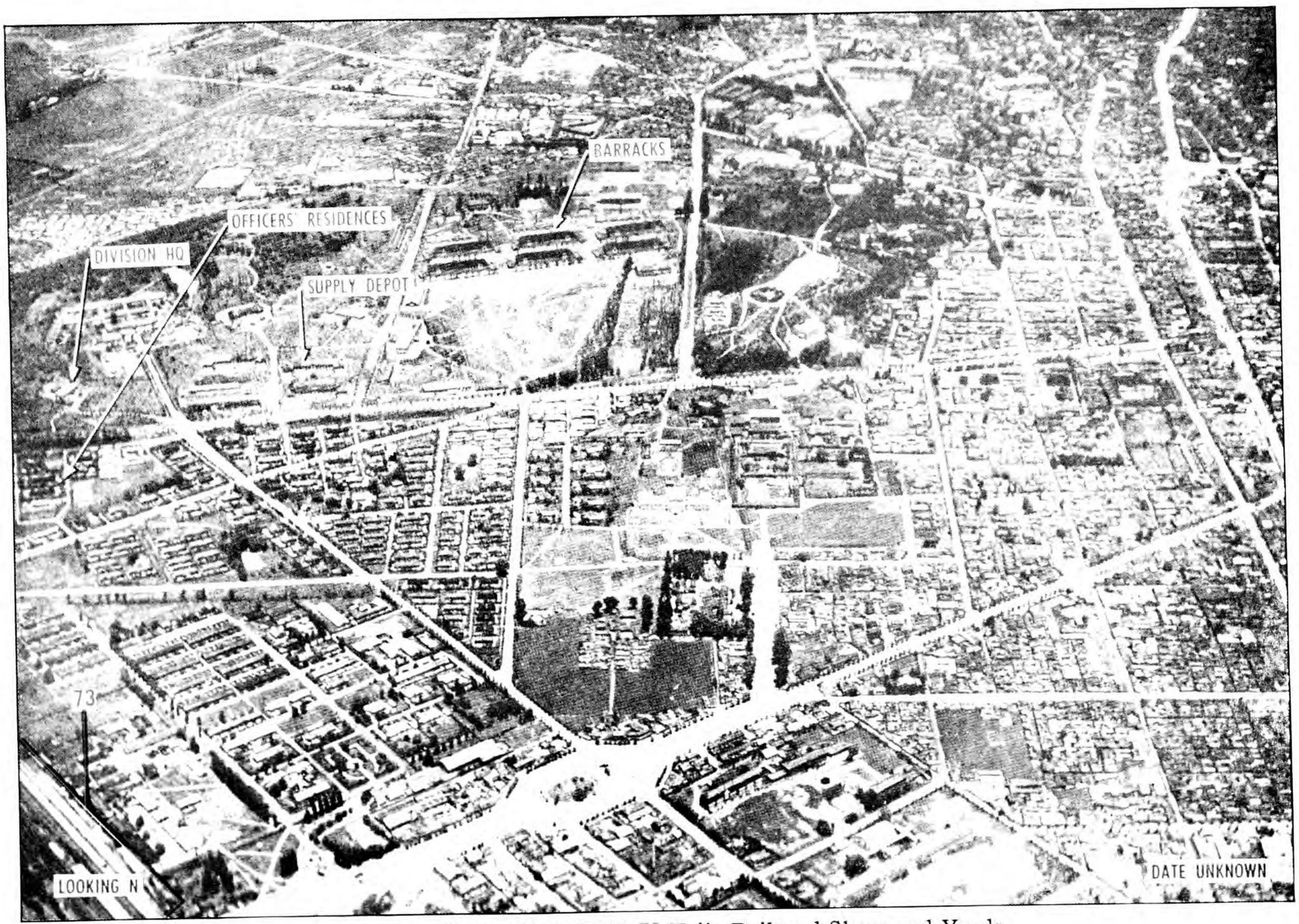


PHOTO 17—Heijo—TARGET 73 Heijo Railroad Shops and Yards.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 73 (HEIJO-CHINNAMPO REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 73 (HEIJO-CHINNAMPO REGION)

3632—22—Korea—7-24-44—First Proof

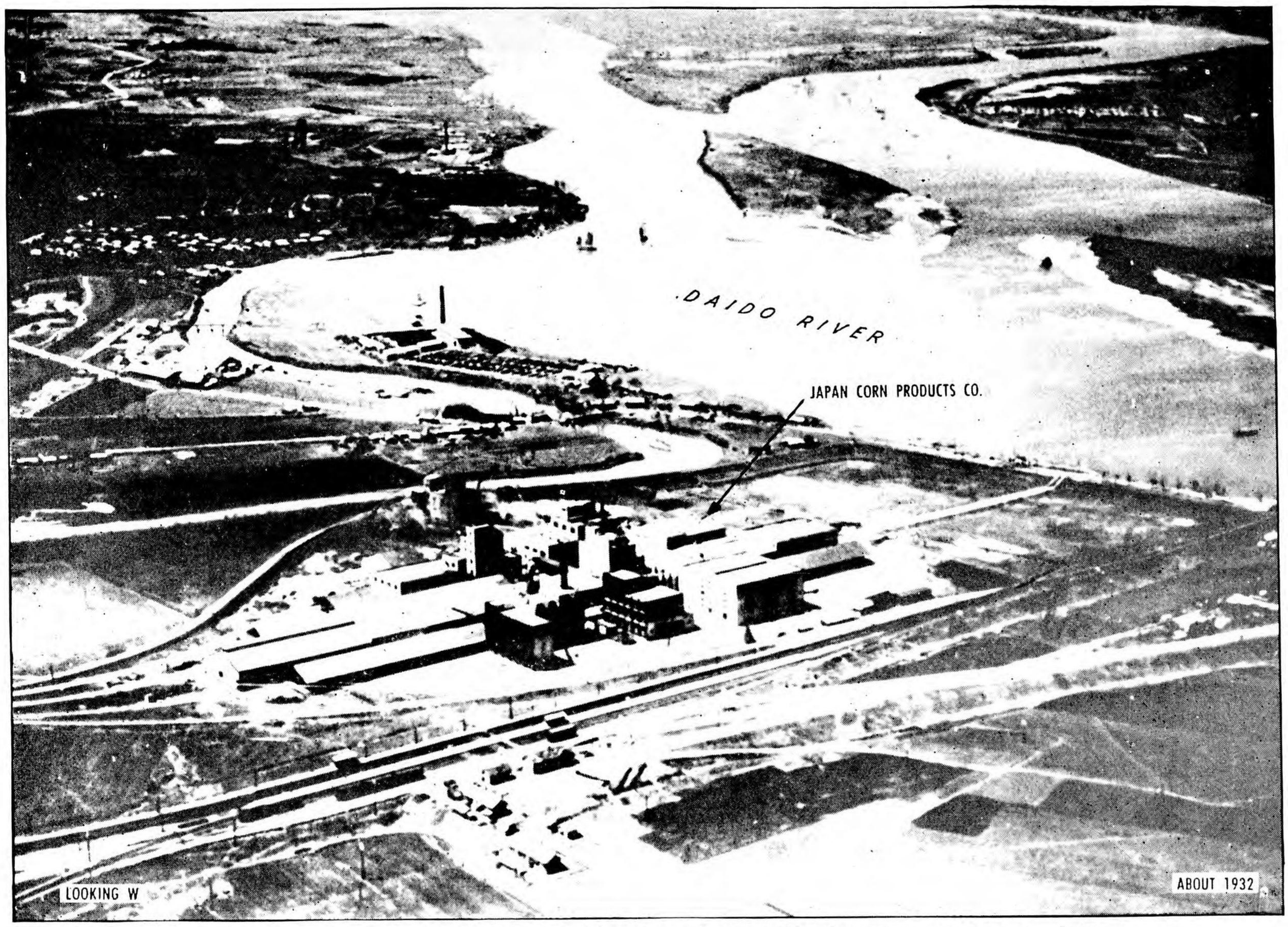


PHOTO 19—Heijo—TARGET 91 Daido River Railroad Bridges just off photo at right.

TARGET 91

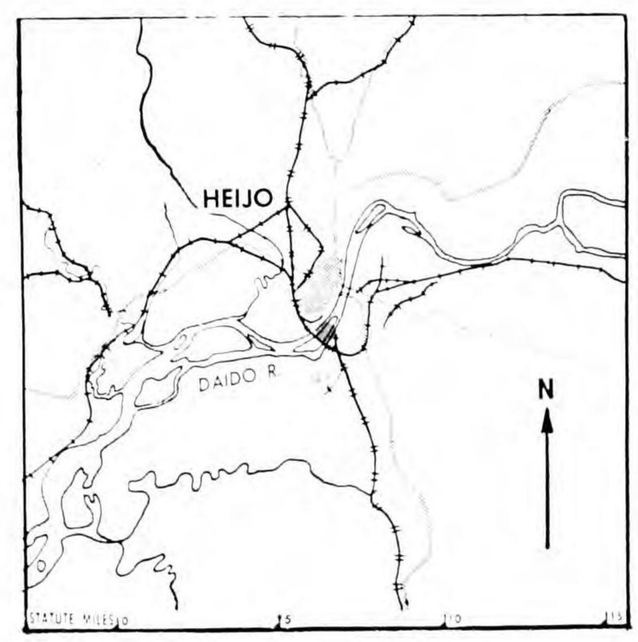
DAIDO RIVER RR BRIDGES

HEIJO

(TRANSPORTATION)

38° 59′ N 125° 45′ E (Approx)—Two single track bridges carrying main Antung-Fusan line S from Heijo via Yokaku Is. N bridge nine spans, 1440 ft long; S bridge ten spans, 1500 ft long. Parallel bridge may not be finished.

(See photos 19 and 20; maps on pages M-6 and M-11.)



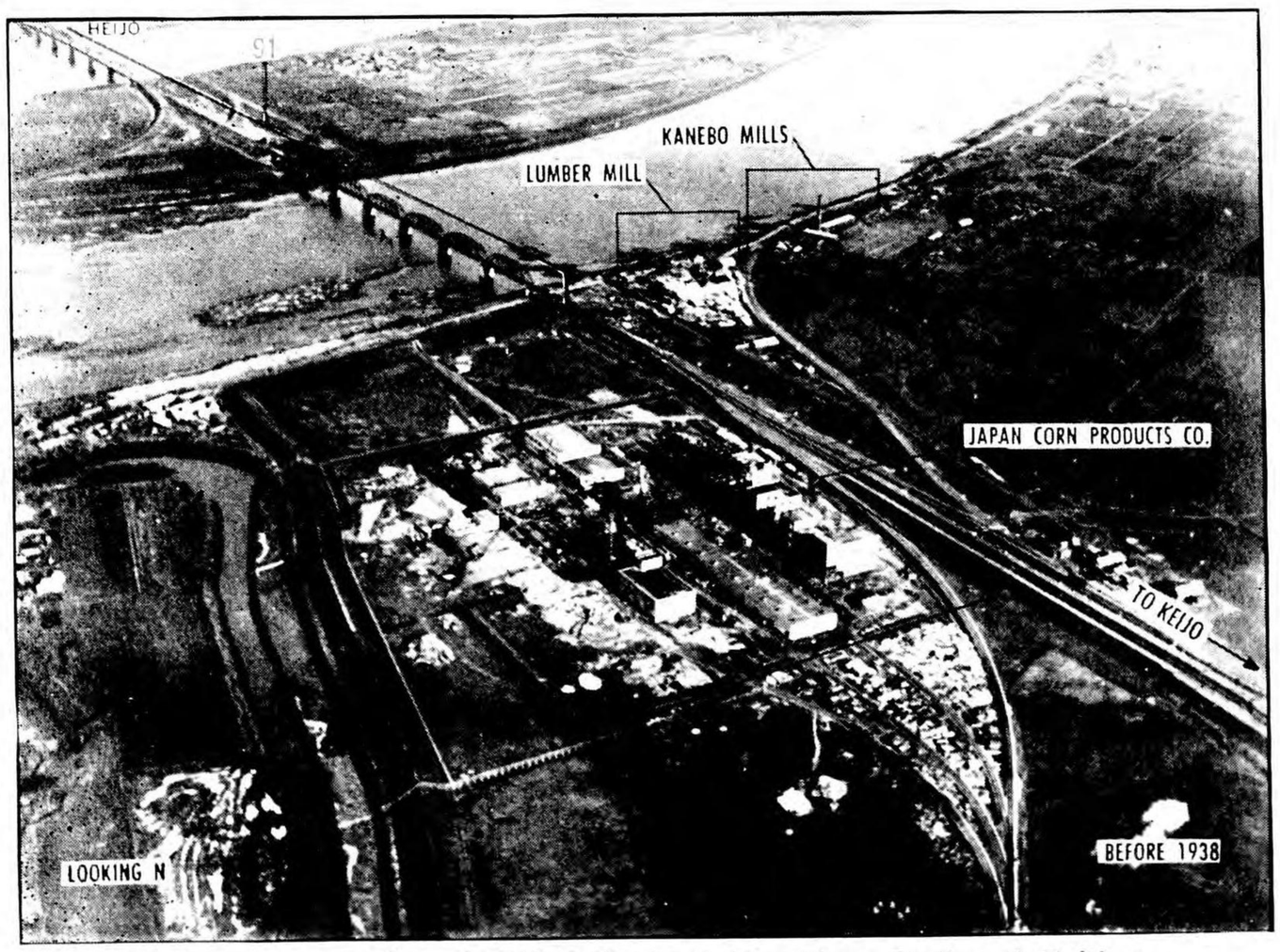


PHOTO 20—Heijo—TARGET 91 Daido River Railroad Bridges.

3632—23—Korea—7-24-44—First Proof

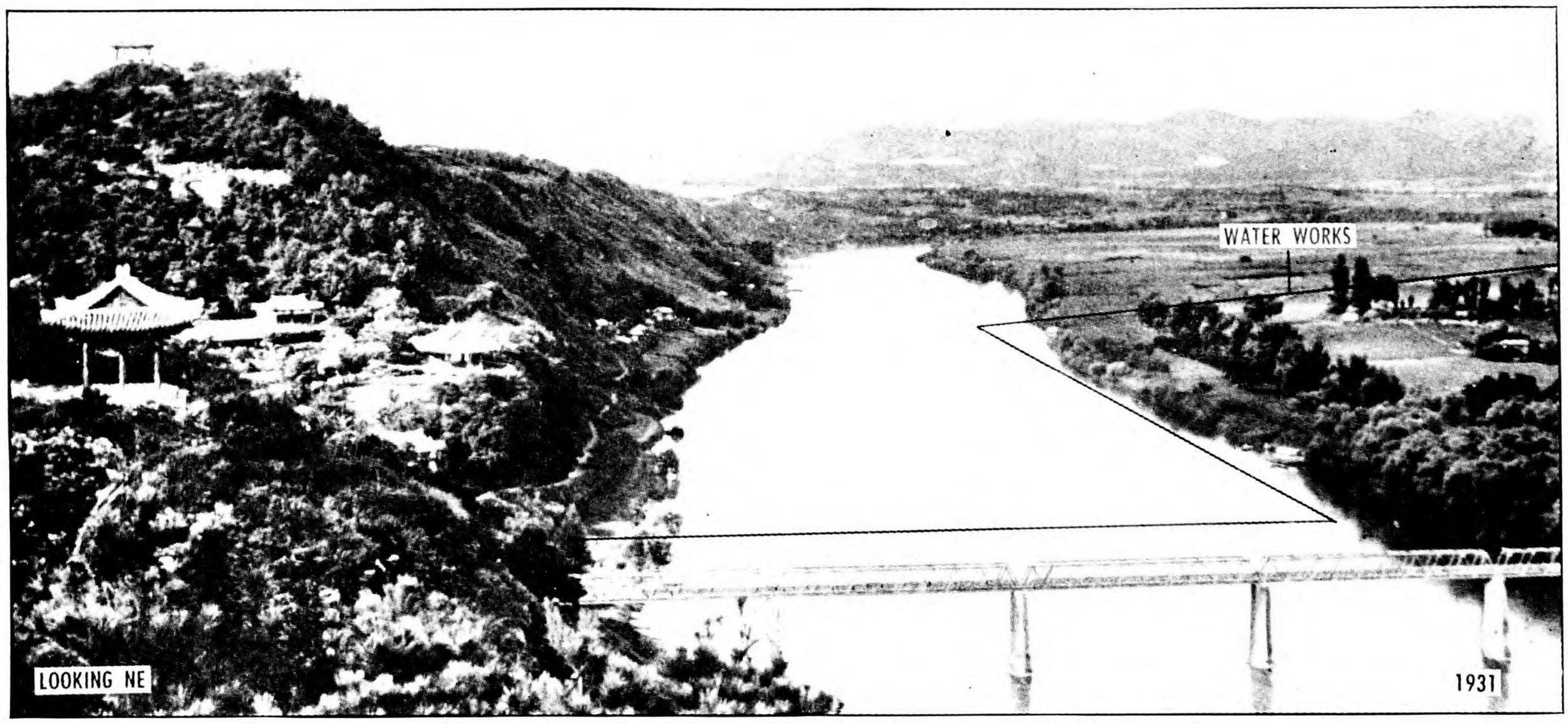


PHOTO 21—Heijo—City Water Works and Viaduct (Not listed as a target).

TARGET 61

HEIJO ARMY ARSENAL

HEIJO

(ARMS—MUNITIONS)

39° 00′ N 125° 44′ E (Approx)—Army arsenal center for Korea. Cne of two major arsenals on Mainland. Production of rifles, automatic weapons, ammunition, artillery shells, hand grenades, bombs and mines close to that of Mukden Arsenal in Manchuria. Also manufactures transport and artillery vehicles, military tools and equipment; but not heavy ordnance. Has own shell loading plant, supplied by many small machine shops throughout Heijo. Recent plant expansion to E and SE to the Daido River reported. Many small wooden whses constructed. Testing grounds in area W and SW. Arsenal reported to control all Korean explosives and munitions plants including Chosen Nitrogen Fertilizer Co at Konan (TARGET 1).

(See maps on pages M-6 and M-11.)

TARGET 74

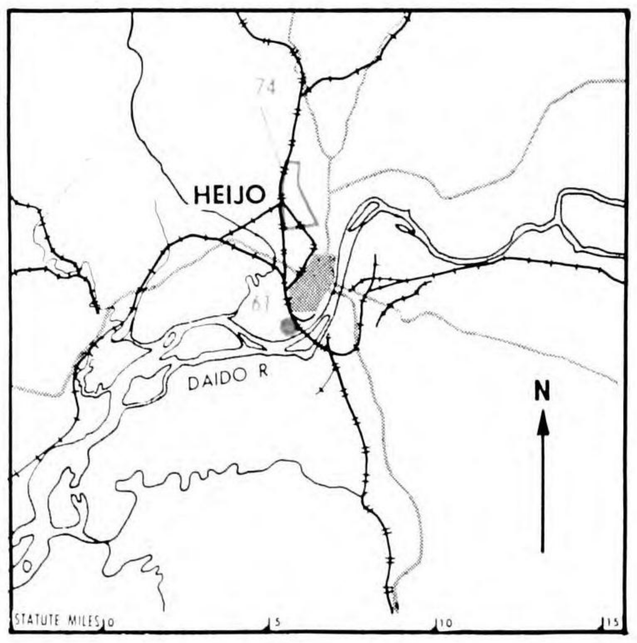
HEIJO SHUNTING YARDS

HEIJO

(TRANSPORTATION)

39° 03′ N 125° 44′ E (Approx)—One of principal classification yards in Korea. Handles traffic to the port of Chinnampo, to the Kenjiho steel industry and over the Antung and Mampochin lines to Manchuria which diverge at Saiho, N of the yards. New, may still be under construction.

(See maps on pages M-6 and M-11.)



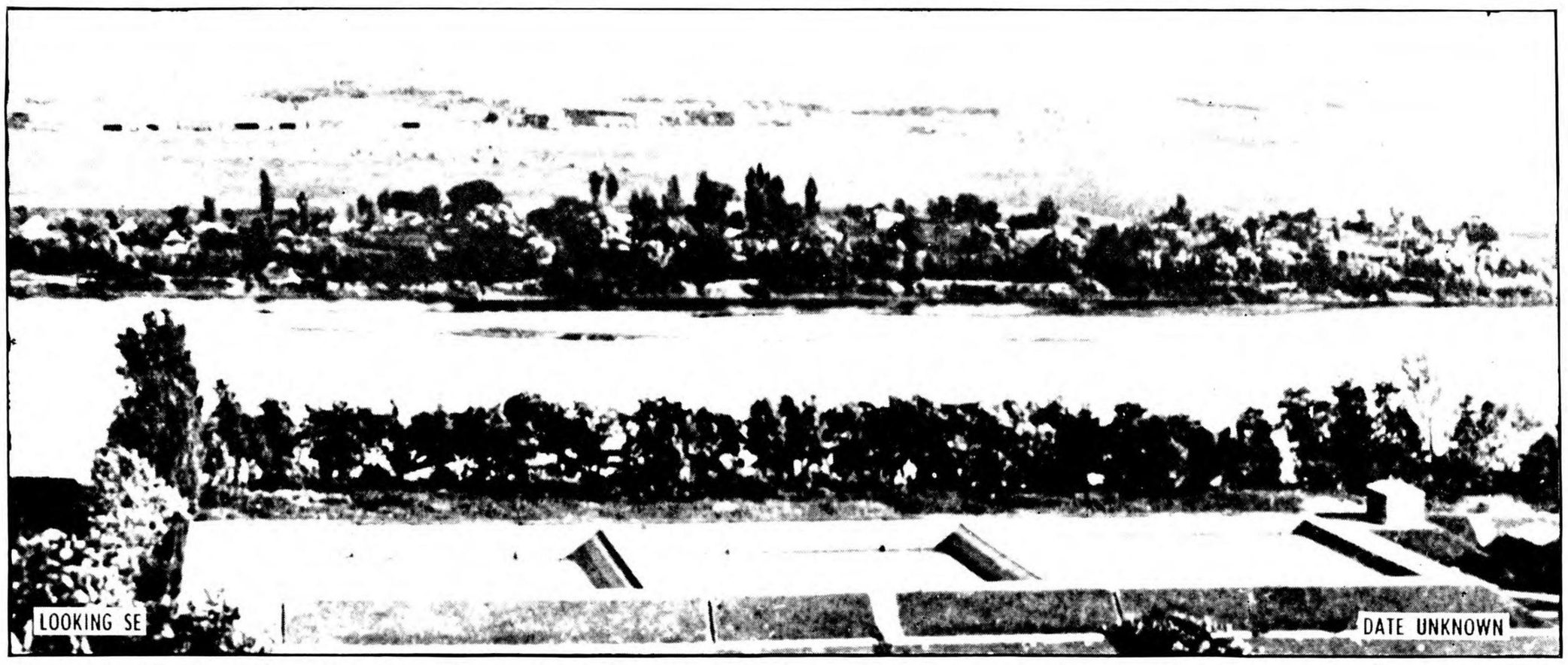


PHOTO 22—Heijo—View of Heijo Airport from City Water Works. Air Arsenal believed to be in center background. (Not listed as a target.)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGETS 61, 74 (HEIJO-CHINNAMPO REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGETS 61, 74 (HEIJO-CHINNAMPO REGION)

3632—24 Korea 7-24-44—First Proof

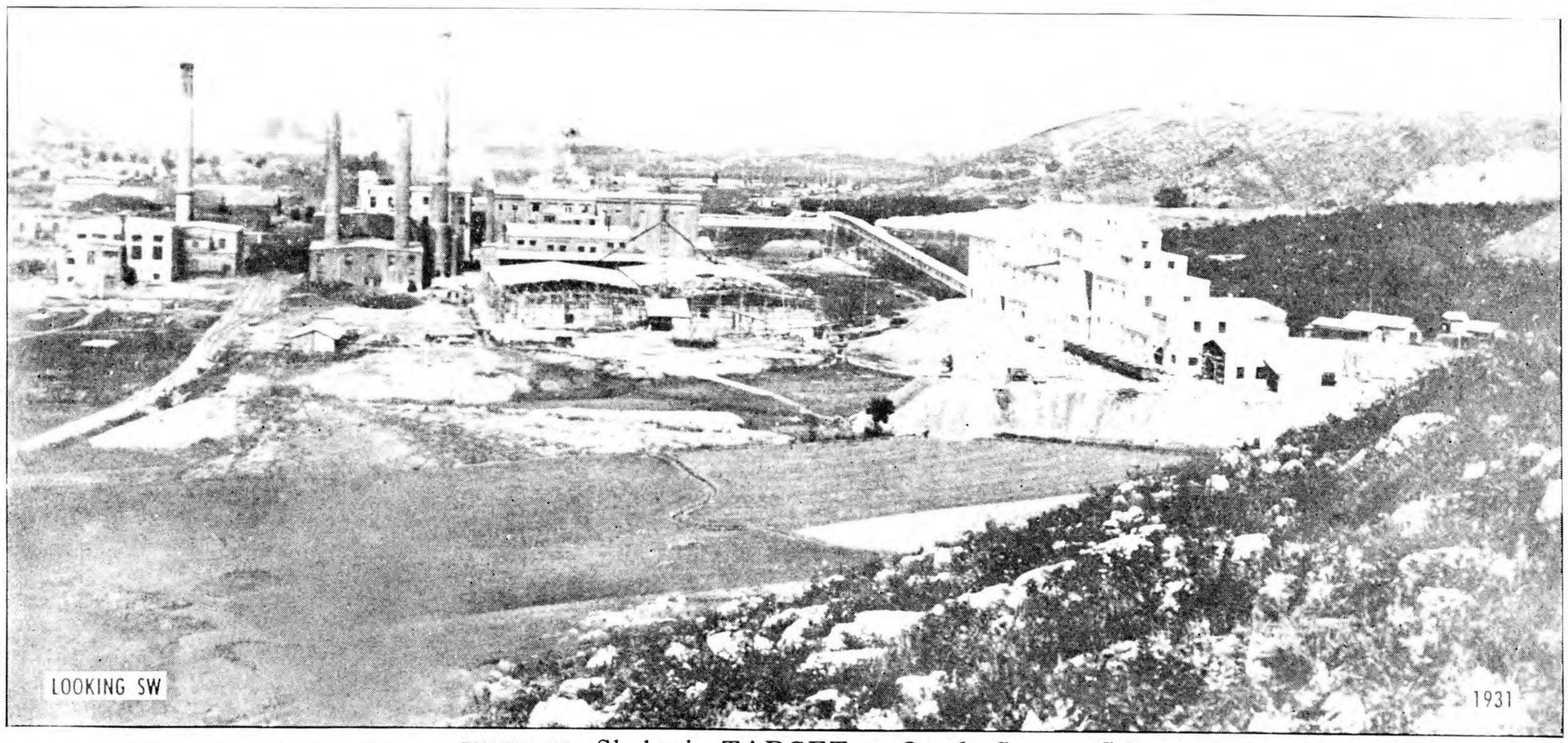
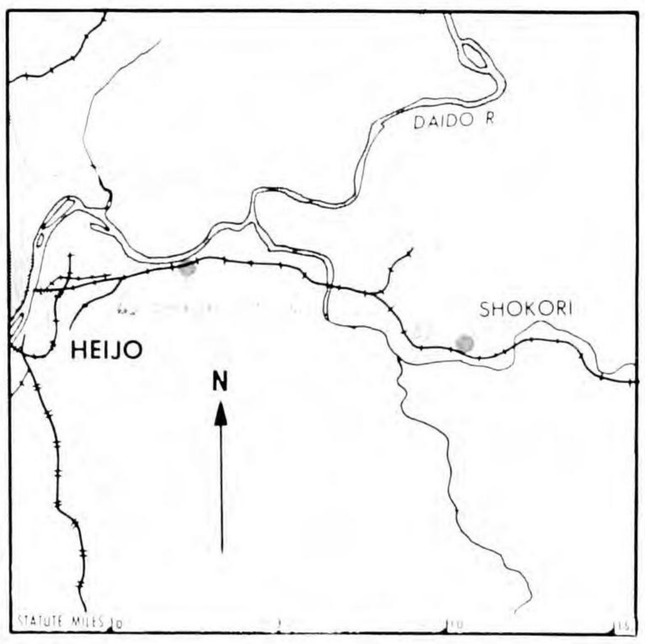
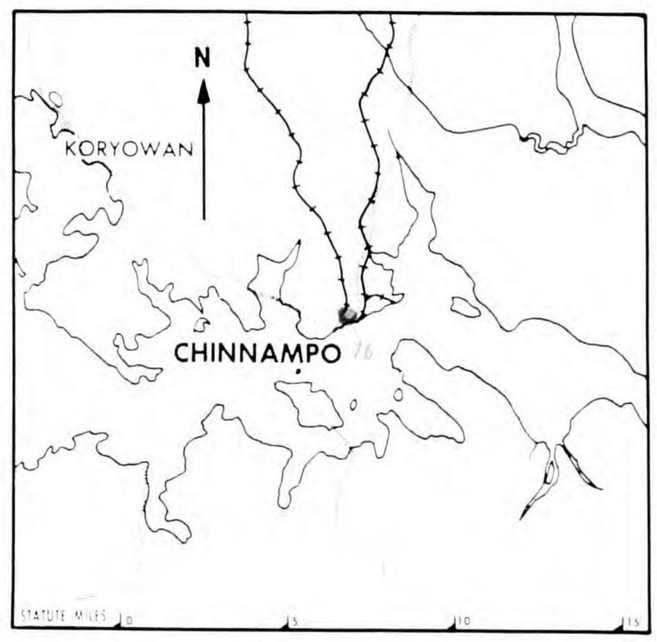


PHOTO 23—Shokori—TARGET 82 Onoda Cement Co.





TARGET 76

CHINNAMPO HARBOR

CHINNAMPO

(HARBOR FACILITIES)

38° 43′ N 125° 24′ E (Approx) Largest and best equipped harbor on west coast. Port for Heijo. 20 mi up from entrance of Daido R. Artificial basin open to the S with 4000 ft of berthage with varying depths. Reported dredged to take 10,000 ton vessels. Parallel RR spurs and freight sheds. Three traveling cranes. Extensive deep-water anchorage off basin in mile-wide river. Rice whses around harbor. Port has been most important rice storage and shipping point in Korea. Has also shipped heavy tonnages of coal and ore barged down river.

(See photos 24, 25 and 26; maps on pages M-6 and M-12.)

TARGET 65

SHOWA AIRCRAFT FACTORY

(Showa Hikoki Kogyo KK)

MIRIN (E of Heijo)

(AIRCRAFT)

39° 01′ N 125° 51′ E (Approx) Reported assembling aircraft, mfg parts, expanded since 1940. Several dispersed, single-storied, flat-roofed bldgs. Exact location not known.

(See maps on pages M-6 and M-11.)

TARGET 82

ONODA CEMENT CO

(Onoda Cement KK)

SHOKORI

(E of Heijo)

(CEMENT)

38° 59′ N 125° 59′ E (Approx) 1938 cap 256,000 metric tons. Own steam power plant with estimated cap of 10,000 KW.

(See photo 23; map on page M-6.)

PHOTO 24—Chinnampo—TARGET 76 Chinnampo Harbor.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGETS 65, 76, 82 (HEIJO-CHINNAMPO REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGETS 65, 76, 82 (HEIJO-CHINNAMPO REGION)

3632—25—Korea—7-24-44—First Proof

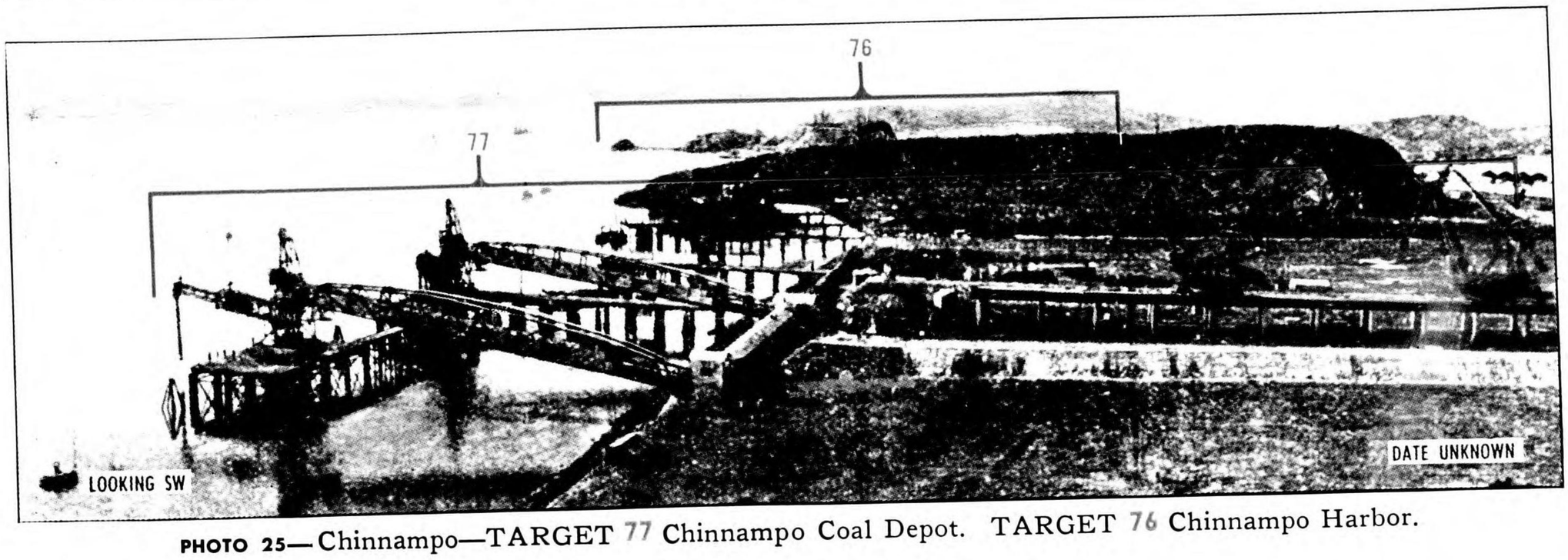
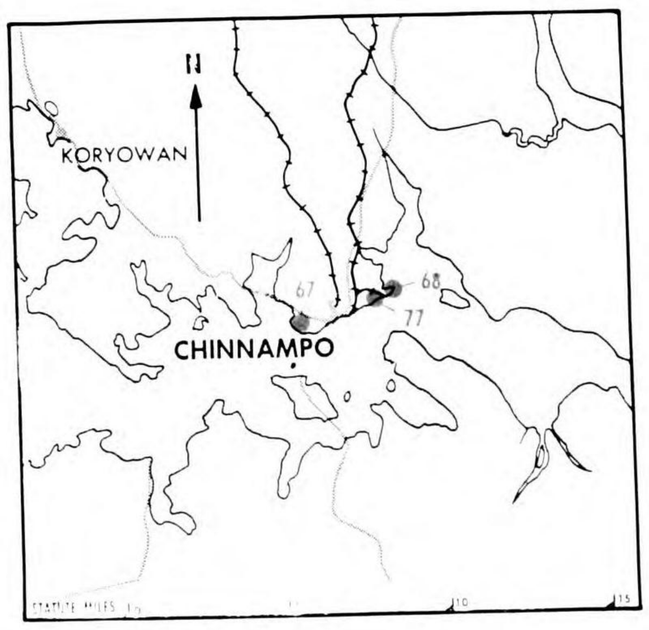


PHOTO 25—Chinnampo—TARGET 77 Chinnampo Coal Depot. TARGET 76 Chinnampo Harbor.

PHOTO 26—Chinnampo—TARGET 76 Chinnampo Harbor.



TARGET 77

CHINNAMPO COAL DEPOT

CHINNAMPO

(HARBOR FACILITIES)

38° 43′ N 125° 25′ E (Approx)—Largest coal depot in Korea. Has one coal pier, two mechanical loaders, 400 tons per hour, 190 ft apart on the waterfront. There is a travelling crane in the storage area.

(See photo 25; maps on pages M-6 and M-12.)

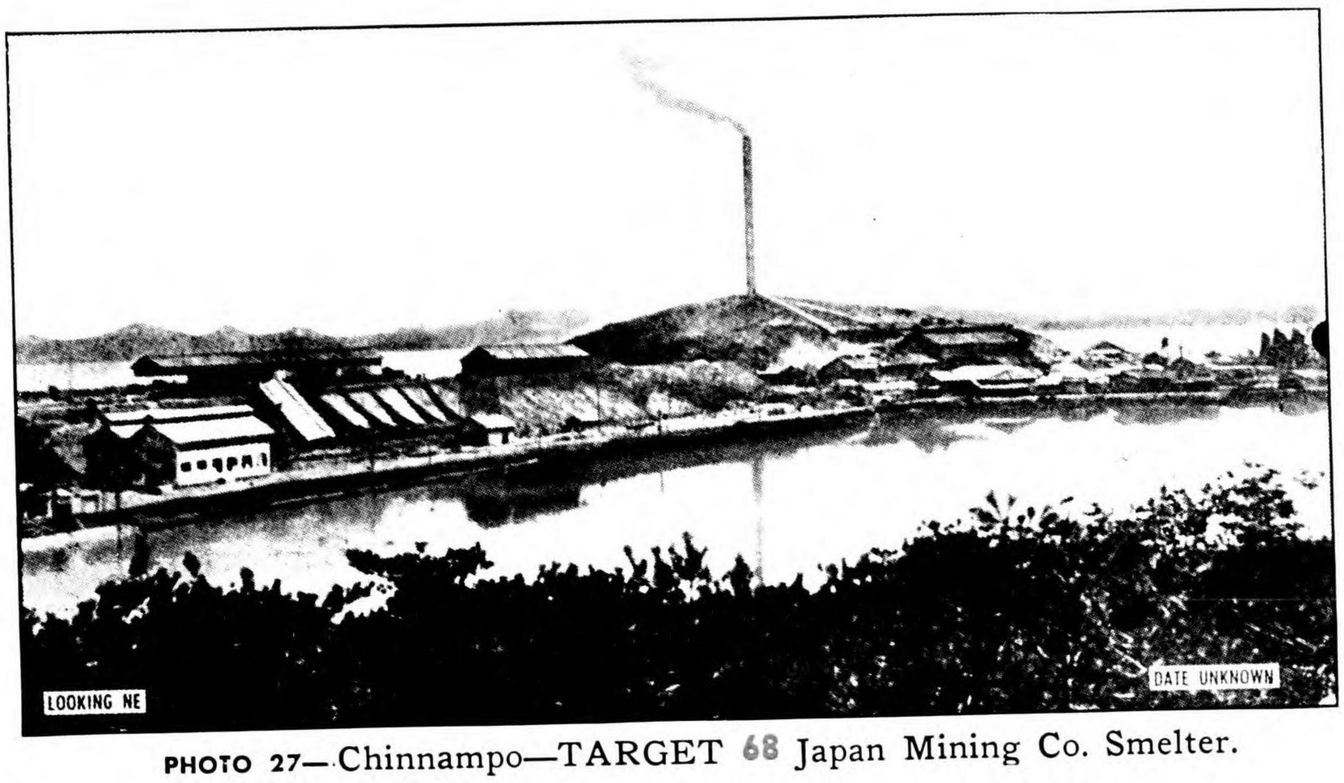


PHOTO 27—Chinnampo—TARGET 68 Japan Mining Co. Smelter.

TARGET 68

JAPAN MINING CO SMELTER

(Nippon Kogyo KK)

CHINNAMPO

(NON-FERROUS METALS)

38° 44′ N 125° 26′ E (Approx)—Estimated 1943 cap: 12,000 metric tons of lead, approx 20% of Inner Zone cap; 6000 metric tons of copper, approx 4% of Inner Zone cap: 12,000 metric tons of low grade zinc, approx 15% of Inner Zone cap. Chosen Nissan Chemical Co plant within the compound had estimated 1940 production of 50,000 metric tons of ammonium sulphate and 100,000 tons of superphosphates. Compound at NE end of Chinnampo on irregularly-shaped peninsula extending into tidal flats which dry at low tide. Zinc plant on reclaimed land adjoining. RR spur connects with Chinnampo station. Smelter has 600 ft chimney, highest in world. Workers totalled (pre-war) about 6000.

(See photo 27; maps on pages M-6 and M-12.)

TARGET 67

CHOSEN RIKEN METALS CO

(Chosen Riken Kinzoku KK)

CHINNAMPO

(NON-FERROUS METALS)

38° 43′ N 125° 23′ E (Approx)—Second largest aluminum and magnesium plant in Korea. Estimated 1943 cap: 6000 metric tons of aluminum, approx 3% of Inner Zone cap; 1000 metric tons of magnesium, approx 8% of Inner Zone cap. Magnesium produced by electrolysis of brine. Salt supplied from Government salt fields at Koryo Bay. Heavy electric power requirements supplied by Suiho hydro-electric plant on Yalu River in Manchuria. Planned pig iron production of 70,000-100,000 metric tons, using two sets of rotary kilns. Plant ferro-concrete, located at SW end of city on open reclaimed land extending into tidal flats which dry at low tide.

(See maps on pages M-6 and M-12.)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGETS 67, 68, 77 (HEIJO-CHINNAMPO REGION)

3632—26—Korea—7-24-44—First Proof

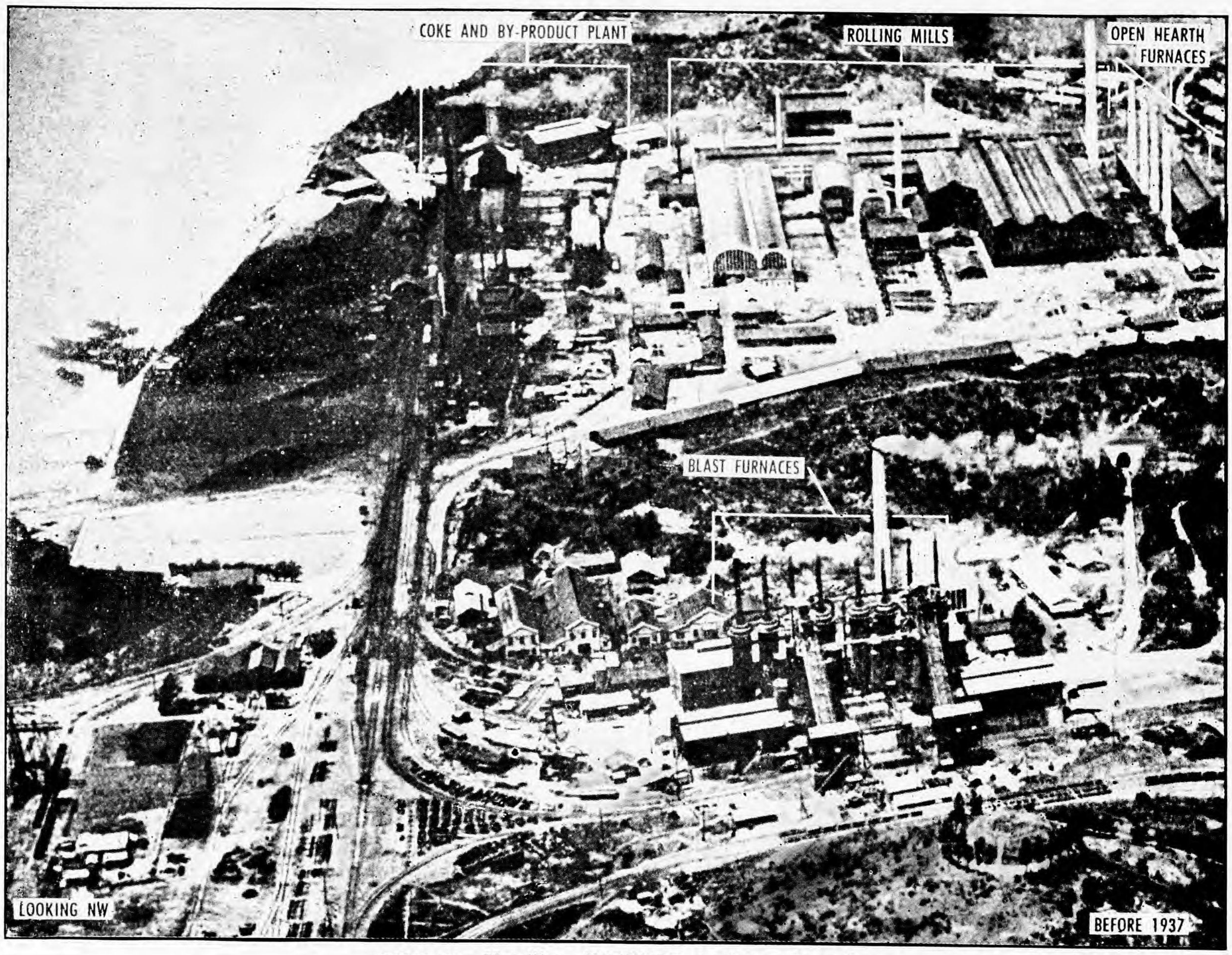
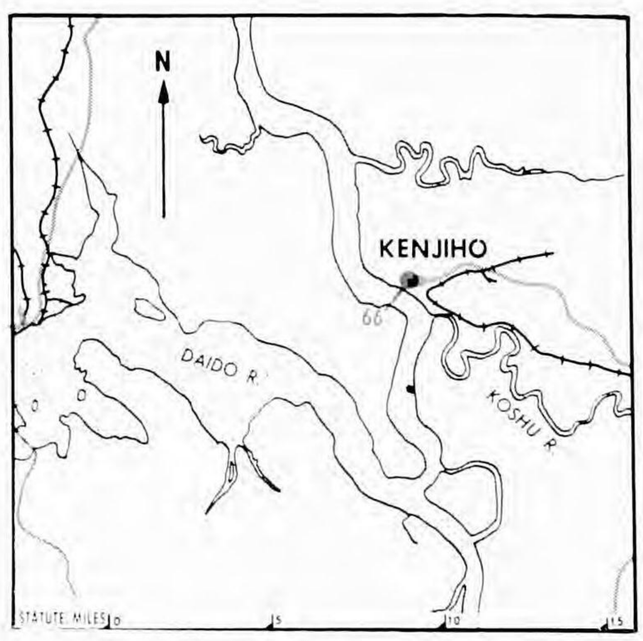


PHOTO 28—Kenjiho—TARGET 66 Japan Iron Co.



TARGET
66 JAPAN IRON WORKS (KENJIHO)

(Nippon Seitetsu KK)

KENJIHO

(IRON AND STEEL)

38° 44′ N 125° 37′ E (Approx)—Older plant of Co. Reported Korea's largest steel plant, second largest pig iron production. Estimated percentages of total Japanese Empire production; pig iron, 3%; steel ingot, 2%; rolled products, 2%; coke, 4%. Equipment and total annual caps: four blast furnaces, 400,000 metric tons of pig iron; open-hearth furnaces, 240,000 metric tons of steel; rolling mills, 175,000 metric tons of shapes and plates. Plant reported to have five batteries (total 180 ovens) of by-product coke ovens with total annual carbonizing cap of about 670,000 metric tons of coal (yield about 470,000 tons of coke). Ammonium sulphate and other coke oven by-products.

(See photos 28, 29, 30, 31, 32 and 33; maps on pages M-6 and M-10.)

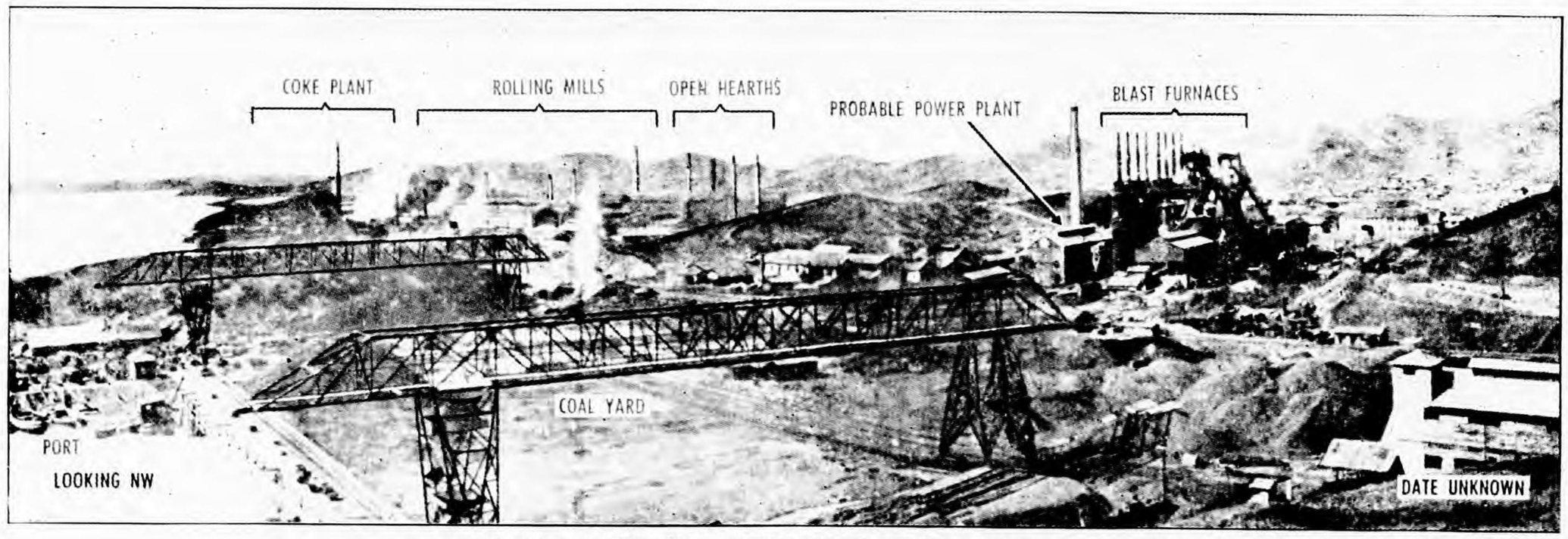


PHOTO 29—Kenjiho—TARGET 66 Japan Iron Co.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 66 (HEIJO-CHINNAMPO REGION)
KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 66 (HEIJO-CHINNAMPO REGION)

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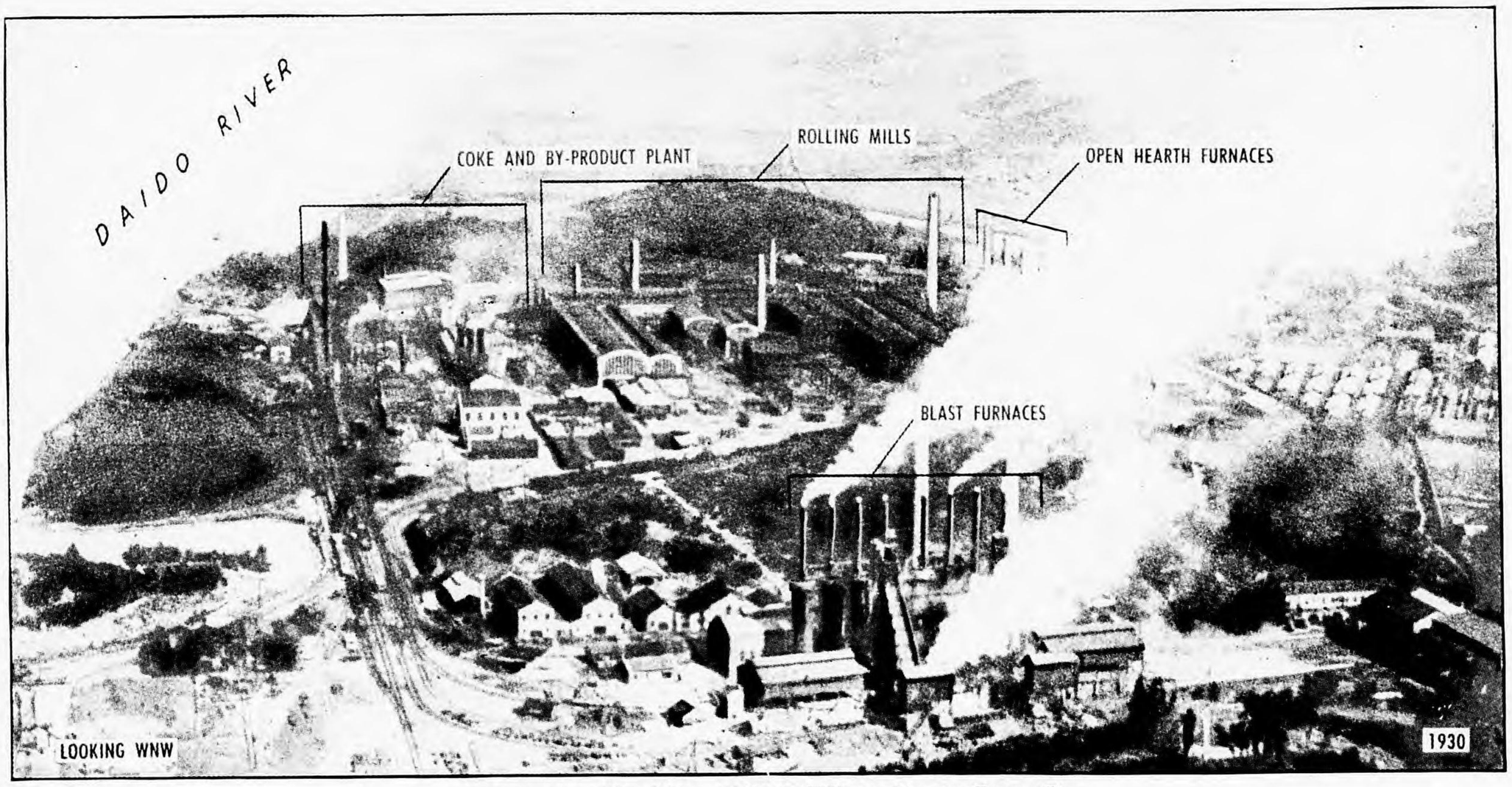

PHOTO 30—Kenjiho—TARGET 66 Japan Iron Co.

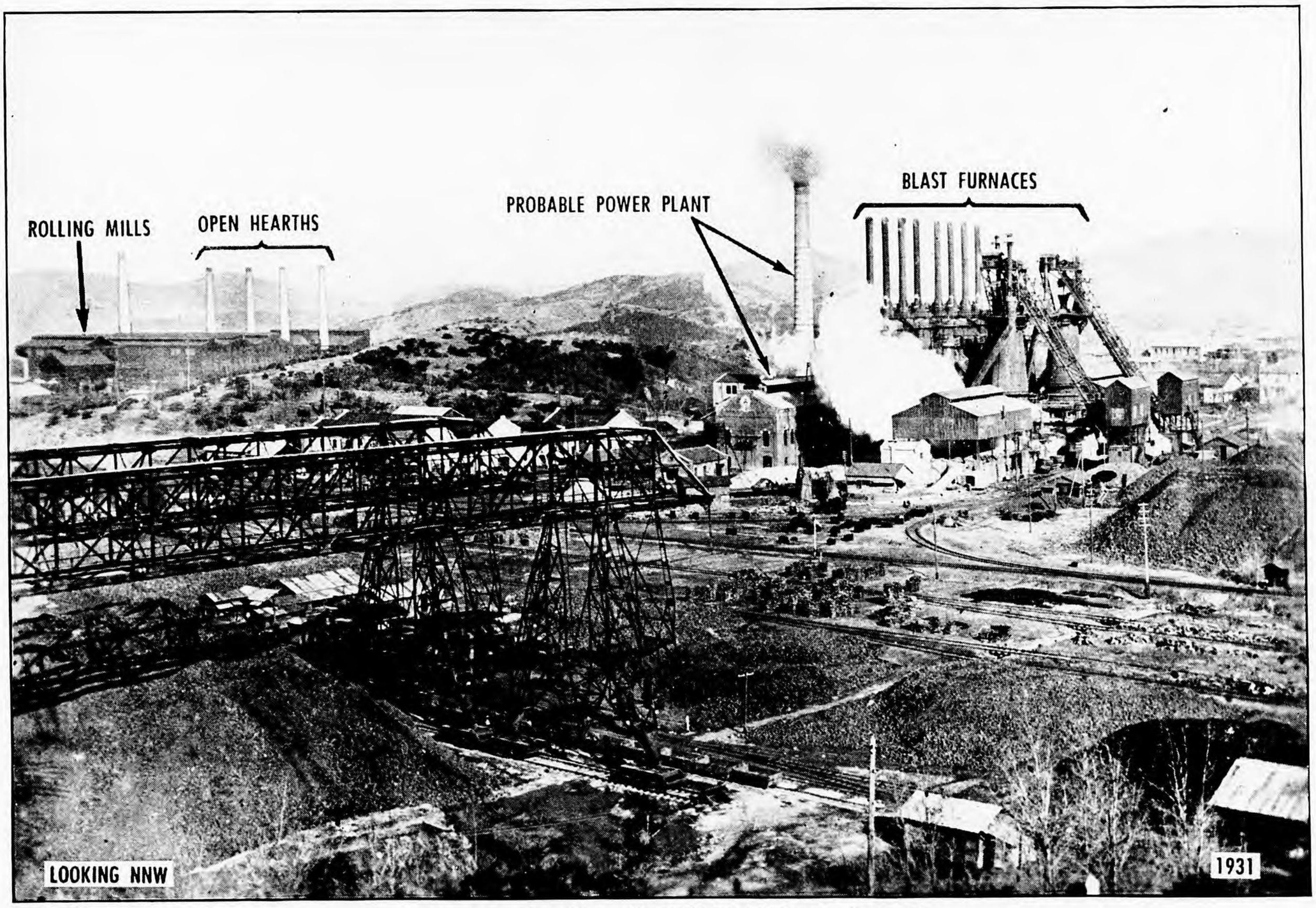

PHOTO 31—Kenjiho—TARGET 66 Japan Iron Co.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 66 (HEIJO-CHINNAMPO REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 66 (HEIJO-CHINNAMPO REGION)

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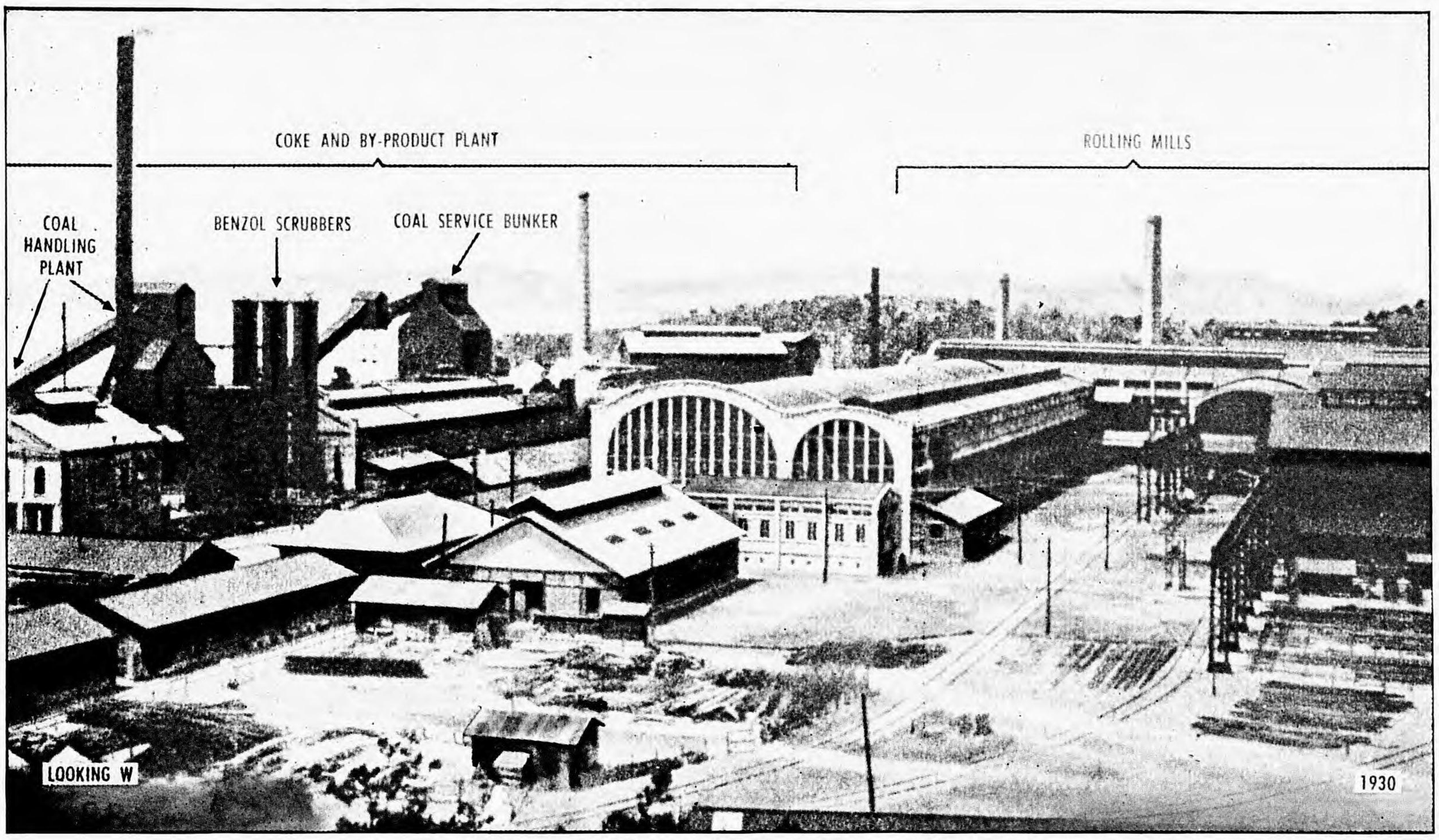

PHOTO 32—Kenjiho—TARGET 66 Japan Iron Co.

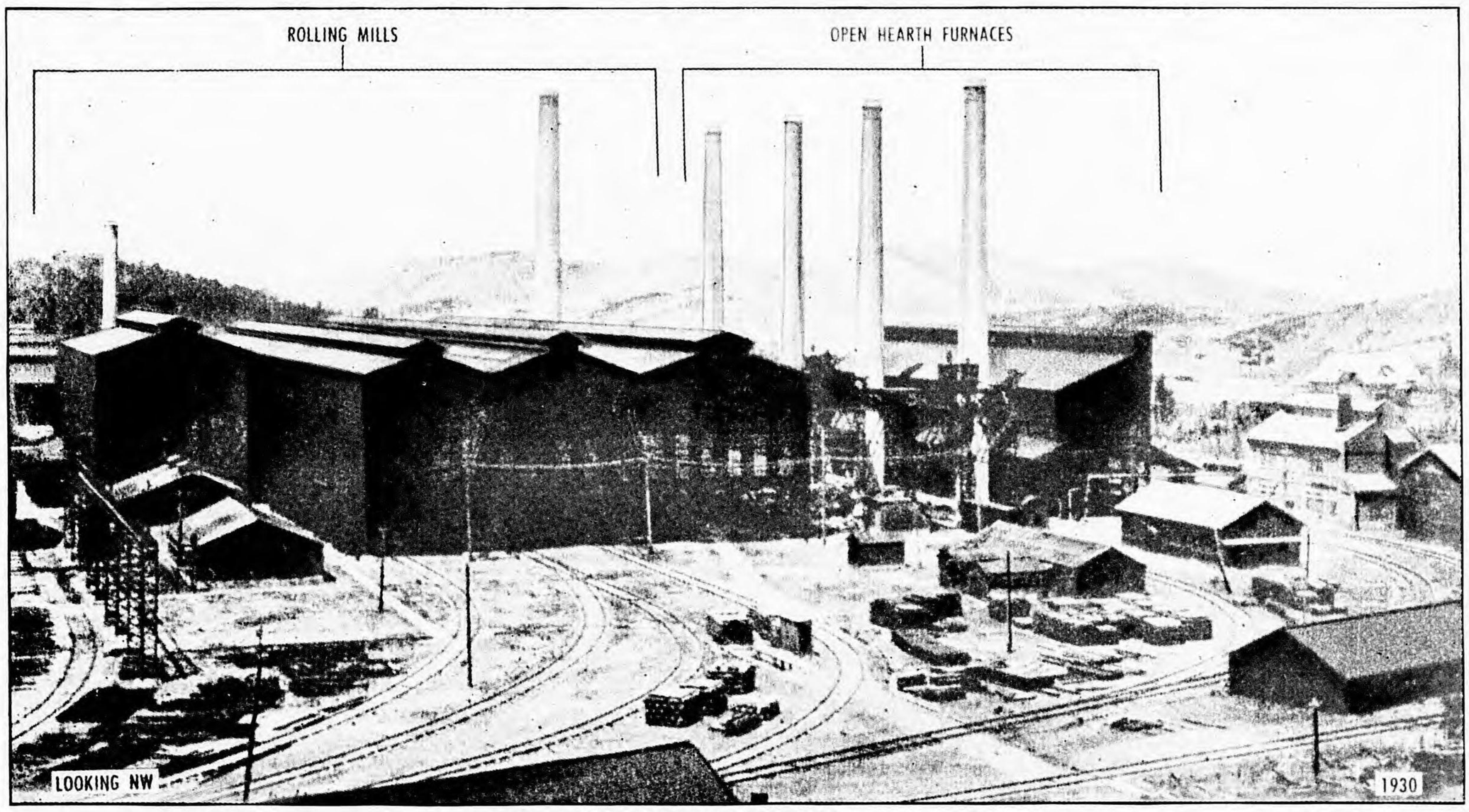

PHOTO 33—Kenjiho—TARGET 66 Japan Iron Co.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 66 (HEIJO-CHINNAMPO REGION)

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KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 66 (HEIJO-CHINNAMPO REGION)

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Air Objective Folder
KONAN REGION
KOREA AREAS, Nos. 84.1, 2, 3, 4, 5, 6, 7, 8

INDEX OF TARGETS BY NUMBER, CLASSIFICATION AND NAME

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Summary and Evaluation of Konan Region

The Konan region is the Far East's most extensive integrated development of basic chemical plants, light metals production and hydro-electric power.

The main plant of Chosen Nitrogen Fertilizer Co **TARGET 1** is the largest producer of basic war chemicals in the Japanese Empire. It includes the second largest Japanese magnesium plant, and produces aluminum, alumina, electric steel and a small amount of lead and copper. Nearby subsidiary plants produce explosives, carbide, chlorine, and fertilizers.

Reports indicate substantial expansion around Konan both in additional capacity and in new plants for new products. While these reports cannot be verified, the proximity to sufficient hydro-electric power and the established Japanese policy of developing basic industries on the Asiatic Mainland indicate that the relative importance of this plant has increased. Information on products manufactured, and plant layout and construction to about 1937 is detailed and accurate and most of the data of this type is as of this date. Estimates of capacities for 1944 have usually been made. It is known that aluminum and alumina plants were installed prior to 1940 at the locations approximately indicated on Map on page M-14. The capacities of both are estimated to have been doubled since 1940, but it is not known whether the additional capacity was installed at the old plant or at a new site. There are unconfirmed reports of aluminum production at Motomiya (Hongu), west of Konan.

The nitrogen fixation plant has nearly double the capacity of any other Japanese plant for producing nitrogen, which can be used for either fertilizer or explosives. The nitric acid plant may be the largest in the Empire. Before the war, this plant was the Empire's second largest producer of glycerine, wartime requirements for which have probably led to expansion. Sulphuric acid capacity is possibly the largest in the Far East but is lessened in importance because most of the output is chamber process acid suitable for fertilizer but not for explosives. Production of fertilizer, both nitrogen and phosphate, is by far the largest under Japanese control. The plant site also includes a number of smaller units for the production of derivatives and special products.

An estimated production of 3000 metric tons of magnesium from Korean magnesite ores represents approximately 25% of total Japanese capacity. The units for producing alumina from Korean shales and ingot aluminum account for an estimated 6% of total Empire capacity of both alumina and aluminum; the company makes its own electrodes and special synthetic cryolite. There may be aluminum rolling and extrusion capacity. There is substantial production of sponge iron and special steel. Some copper and lead is refined.

The whole Konan plant is in a compact compound about 1¼ miles long and less than half a mile wide. It is very modern, well laid out and quite similar to comparable plants in the United States and Europe. Most of the employees live in adjacent company-owned brick and concrete barracks.

The Chosen Nitrogen Explosives Factory **TARGET 2,** about two miles west of the main Konan plant, was one of the largest pre-war manufacturers of industrial explosives, including dynamite, ammonium nitrate, nitroglycerine and detonators. Expansion was planned in 1940.

The Motomiya Chemical Plant **TARGET 3** is the largest chlorine and electrolytic caustic soda plant in the Far East. This plant also produces substantial amounts of carbide, calcium cyanamide fertilizer and soybean cake fertilizer. It is possible that the small coke oven battery attributed to the main Konan plant **TARGET 1** is located at Motomiya.

The chemical center at Konan lies on the Korean east coast railroad and is adequately served by spurs. The new and extensive harbor constructed for the use of the plant is included in the area of **TARGET 1.** It includes a pier about 2600 feet long of reclaimed land type which handles large ships alongside. It has several warehouses, railroad spurs and modern equipment including travelling cranes and belt conveyor loaders. There is additional wharf space on an 1800 foot quay.

The chemical plants at Konan are estimated to re-

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 INDEX AND SUMMARY (KONAN REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 INDEX AND SUMMARY (KONAN REGION)

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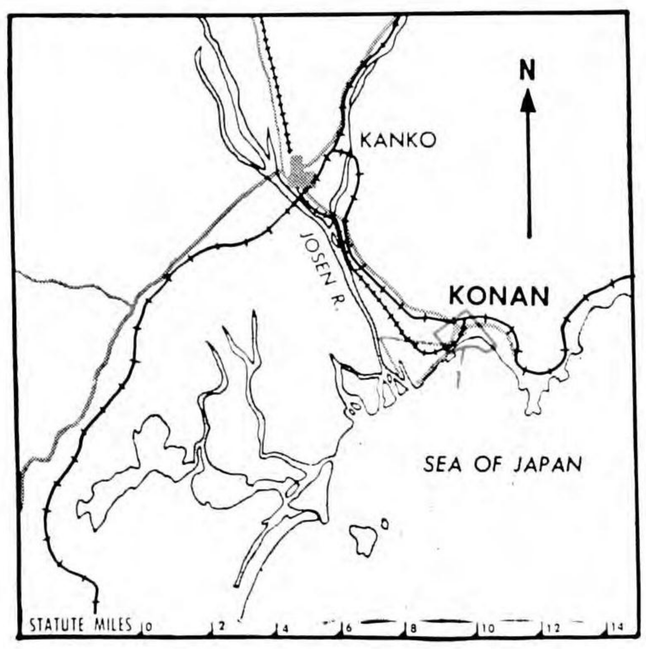
quire around 400,000 KW of electric power. This is obtained primarily from two hydro-electric developments less than 40 miles north. In this region, the main Korean mountain chain rises abruptly from the Japan Sea coast and slopes gradually westward to the Yalu River boundary between Korea and Manchuria. Dams on the northward-flowing Fusen and Choshin branches of the Yalu River create large storage reservoirs permitting year round generation of more than 500,000 KW. Tunnels carry the water south from each reservoir through the mountain divide to utilize precipitous slopes in the Josen River basin, which drains southward into the Japan Sea at Konan. (See Map on page M-12.)

Water from each reservoir operates four successive plants but the No. 1 plant of each project is the key unit. The Fusen Hydro-electric Plant No. 1 **TARGET 8** represents two-thirds, and the Choshin Hydro-Electric Plant No. 1 **TARGET 4** about one half, of the total capacity generated in each development. Both plants have horizontal turbo-generators operating under high pressures, with all vital equipment above floor level and subject to indirect damage as well as direct hits. While automatic valves located above the penstocks would prevent extended flooding, considerable damage from the column of water in the extremely long penstocks is indicated should turbine casings or penstocks be ruptured. In case of heavy damage to turbines or penstocks, downstream plants would be out of operation until repairs were completed, since there is no alternative means of bringing water to them. Except for Choshin Hydro-Electric Plant No. 2 **TARGET 5**, none of the six downstream plants connected with these two projects represent a sufficient percentage of the aggregate capacity available to Konan to be listed as targets.

The Fusen-Choshin projects are only two of the principal segments in the North Korea Power Network (See Summary and Evaluation, Electric Power). High-tension lines from similar developments utilizing the Kyosen River to the northeast, and the lower Choshin River to the northwest connect with the Fusen-Choshin circuits to Konan at the Kiroku switching station and at the Choshin Hydro-Electric Plant No. 1. (See Maps on pages M-3, and M-12). From Choshin No. 2, circuits carry surplus power southwest to the Heijo-Chinnampo and Keijo-Jinsen industrial districts, which are also tied in with the Suiho Hydro-Electric Plant on the Yalu River and smelter plants on the Kitakan River.



TARGET 1

CHOSEN NITROGEN FERTILIZER CO

(Chosen Chisso Hiryo KK)

KONAN

(CHEMICALS; NON-FERROUS METALS)

39° 50′ N 127° 38′ E (Approx)—Largest heavy chemical plant in Japanese Empire. Also large production of ingot aluminum, alumina, and magnesium. Estimated cap for principal products:

Nitrogen Fixation: 90,000 metric tons of nitrogen per year (ammonia); nearly double cap of any other plant in Empire. Large increase planned, but no reliable intelligence as to the extent to which plans carried out.

Nitric Acid: Pre-war production about 15,000 tons; cap 75,000 tons; may be largest in Empire.

Glycerine: 2000 tons per year (pre-war). Second largest producer in Empire before war and probably now expanded. Glycerine made in hard oil and soap section of plant.

Sulphuric Acid: Cap about 420,000 tons per year. One of the very large, if not largest, sulphuric acid plants in Far East. Large cap low grade acid; some high grade.

Fertilizer: Cap 500,000 tons per year of ammonium sulfate and very large quantities of phosphate fertilizers. Production will depend on extent to which nitrogen is used in products other than fertilizer.

Miscellaneous Chemicals: Substantial amounts of hydrochloric acid, hard oils(oleomargarine)and soap; small soda ash and coke production (one small coke oven battery); many derivitives of the basic chemicals listed above.

Magnesium: Second largest plant in Empire. Estimated 1943 cap 3000 metric tons from local magnesite ores, accounting for approx 25% of Japanese cap.

Alumina and Aluminum: Estimated 1943 cap; alumina 24,000 metric tons from local shales; aluminum 12,000 metric tons. Electrode factory near aluminum plant. Rolling and extrusion mill reported.

Copper and Lead: Small copper smelter and electrolytic refining plant. Small lead smelter.

All bldgs believed to be of modern construction, some reinforced concrete, others sheet metal over steel frame; construction approximates U. S. and European standards.

No well defined critical point in plant. Heavy general attack probably necessary to insure neutralization. Transformer station may serve whole area and can be damaged. Coke ovens (not located) are not critical in this plant. Steam plant necessary to production of a number of chemicals.

Target area includes pier about 2600 ft long, 300 ft wide, of reclaimed land type. Handles large vessels alongside. Mechanical loading equipment; RR spurs. Additional wharf space on 1800 ft quay.

(See photo 34 and photos on pages M-14 and M-15; maps on pages M-13 and M-14.)

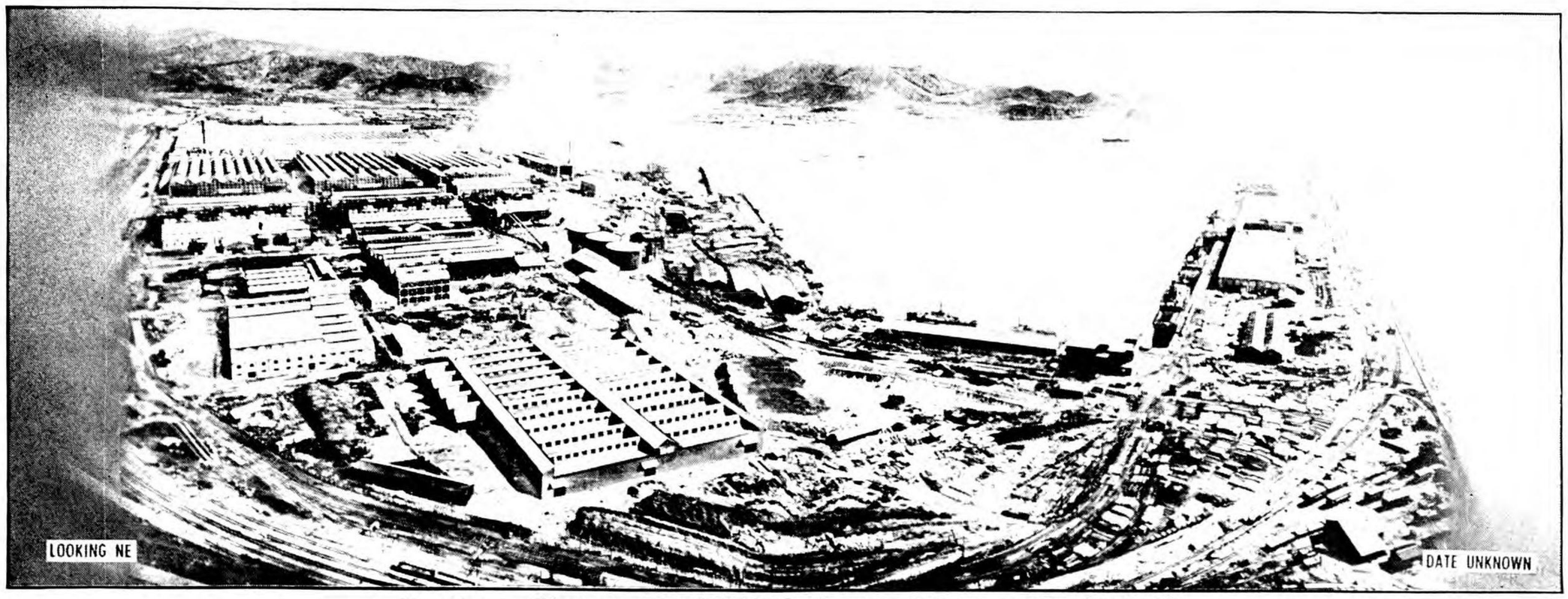


PHOTO 34—Konan—TARGET 1 Chosen Nitrogen Fertilizer Co.

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KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 1 (KONAN REGION)

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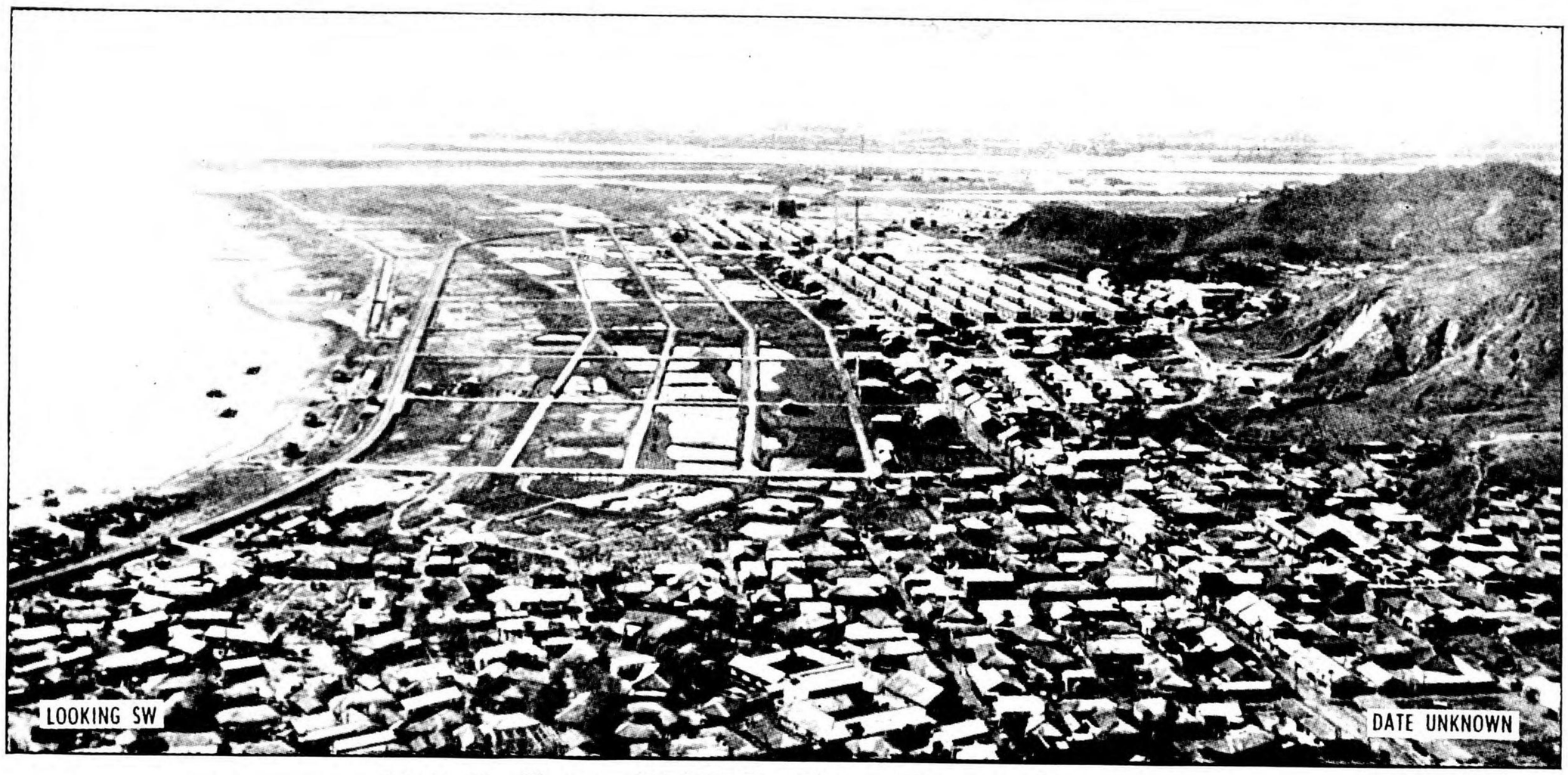


PHOTO 35—Konan—TARGET 2 Chosen Nitrogen Explosives Co.

TARGET 2

CHOSEN NITROGEN EXPLOSIVES FACTORY

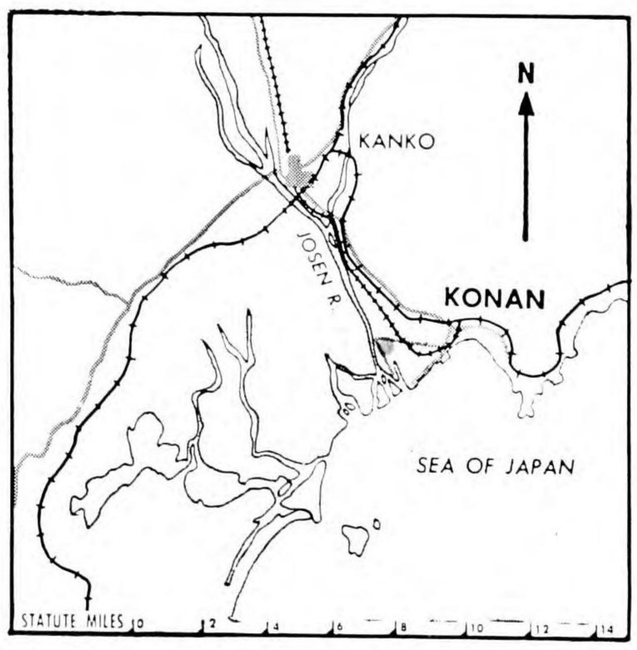
(Chosen Chisso Kwayaku KK)

KONAN

(ARMS—MUNITIONS)

39° 49′ N 127° 35′ E (Approx)—One of the largest pre-war manufacturer of industrial explosives in Korea. Expansion planned 1940. Now mfg industrial explosives, high explosives, detonators, etc. Modern plant. Storage revetments NW of factory.

(See photos 35 and 36; map on page M-13.)



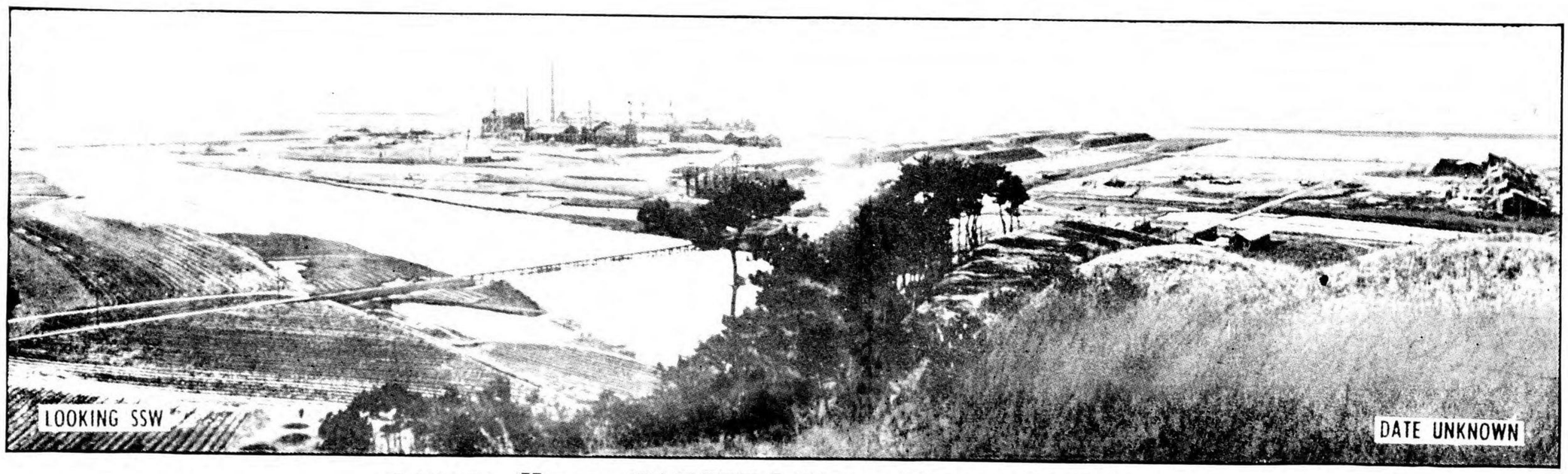


PHOTO 36—Konan—TARGET 2 Chosen Nitrogen Explosives Co.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 2 (KONAN REGION)

3632—32—Korea—7-24-44—First Proof

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 2 (KONAN REGION)

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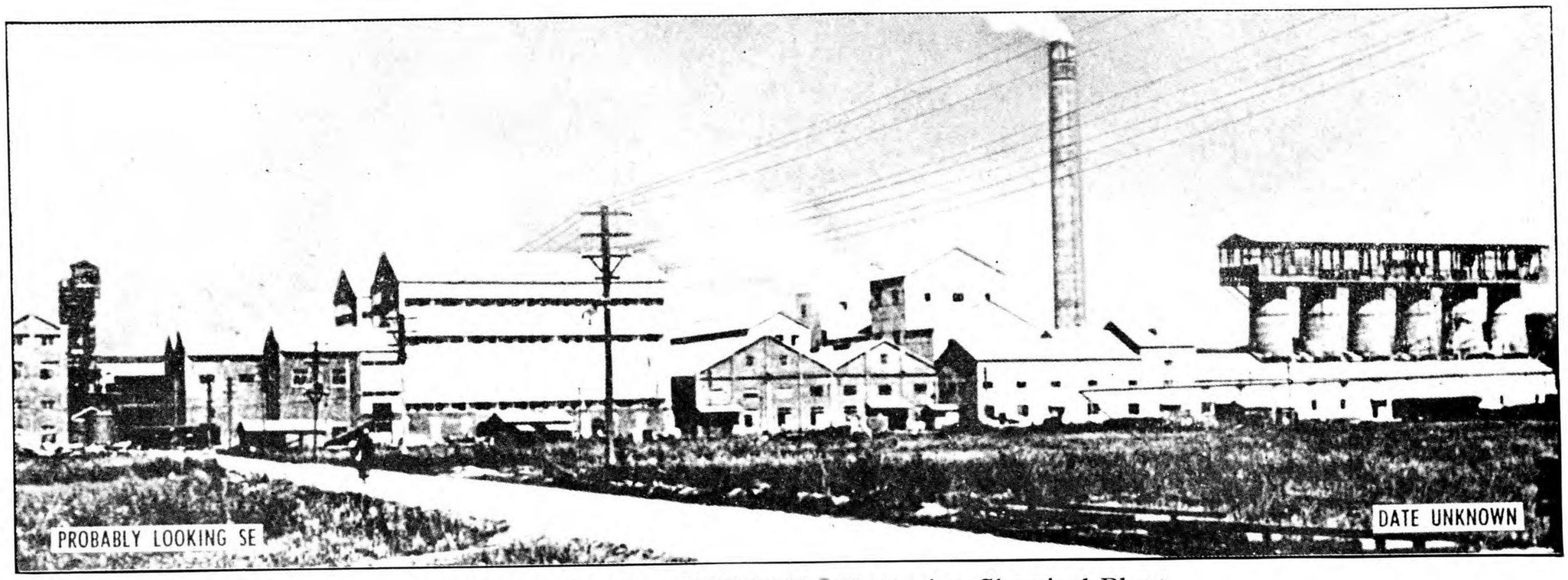


PHOTO 37—Konan—TARGET 3 Motomiya Chemical Plant.

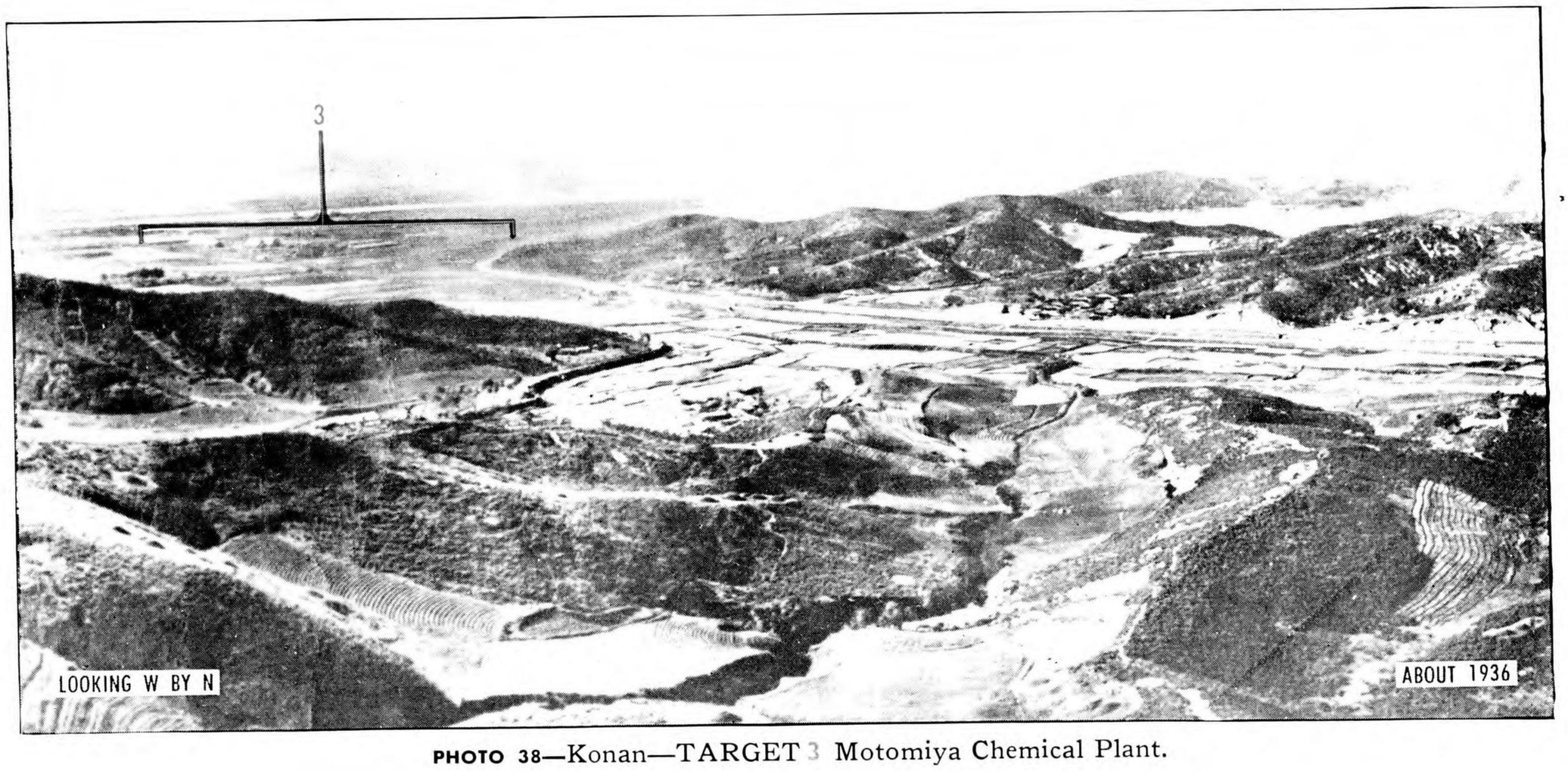
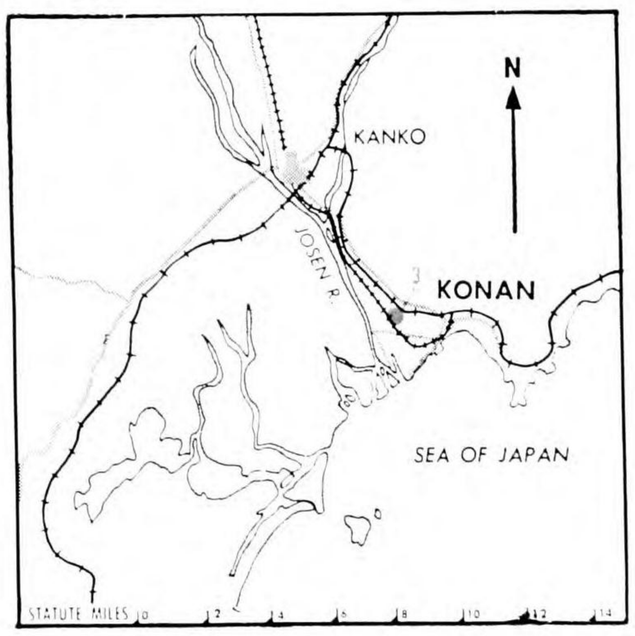


PHOTO 38—Konan—TARGET 3 Motomiya Chemical Plant.



TARGET 3

MOTOMIYA CHEMICAL PLANT

(Chosen Chisso Hiryo KK)

KONAN

(CHEMICALS)

39° 51′ N 127° 35′ E (Approx)—Largest chlorine and electrolytic caustic soda plant under Japanese control. In addition has cap 50,000 metric tons per year carbide, small calcium carbide fertilizer cap, substantial soya bean cake fertilizer output. Small coke oven battery reported at Konan may be at this plant.

(See photos 37 and 38; map on page M-13.)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 3 (KONAN REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 3 (KONAN REGION)

3032—33—Korea 7-24-44—First Proof

PHOTO 39—Choshin River Reservoir and Dam (Not listed as a target).

TARGET 5

CHOSHIN HYDRO-ELECTRIC PLANT No. 2

(ELECTRIC POWER)

40° 10′ N 127° 19′ E (Approx)—Installed cap 100,000 KW. Four penstocks. Four vertical turbo-generators. Switch-gear and tie-in with N Korea network directly NW of plant. Location approximate.

(See maps on pages M-3 and M-12.)

TARGET 4

CHOSHIN HYDRO-ELECTRIC PLANT No. 1

(ELECTRIC POWER)

40° 13′ N 127° 18′ E (Approx)—Key plant in Choshin power development. Installed cap 144,000 KW with additional 36,000 KW unit scheduled in 1939. 4-5 penstocks lead 4700 ft SSW to concrete power house measuring approx 300 by 85 ft. 4-5 horizontal turbo-generators. Transformer yard directly SW of power house. Power lines lead 35 mi S to Konan. Water led by tunnel to three successive hydro plants downstream with cap of 100,000, 42,000 and 28,000 KW respectively. Location approximate.

(See photos 40 and 41; maps on pages M-3 and M-12.)

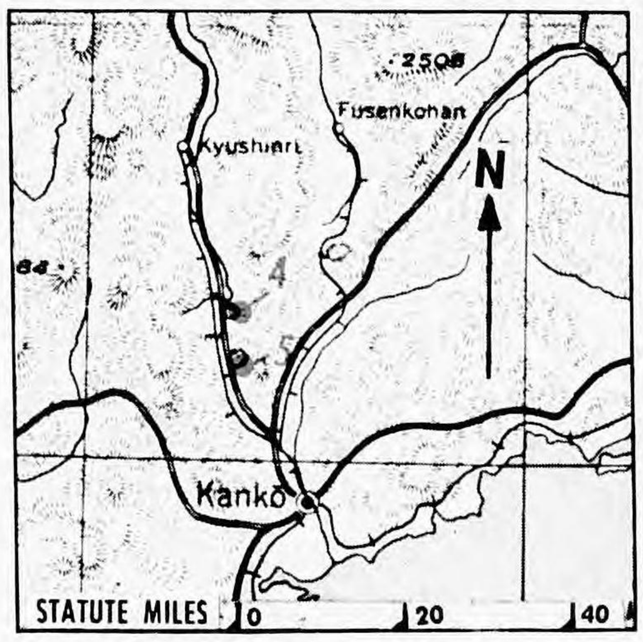


PHOTO 40—TARGET 4 Choshin Hydro-electric Plant No. 1.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGETS 4, 5 (KONAN REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGETS 4, 5 (KONAN REGION)

3632—34—Korea—7-24-44—First Proof

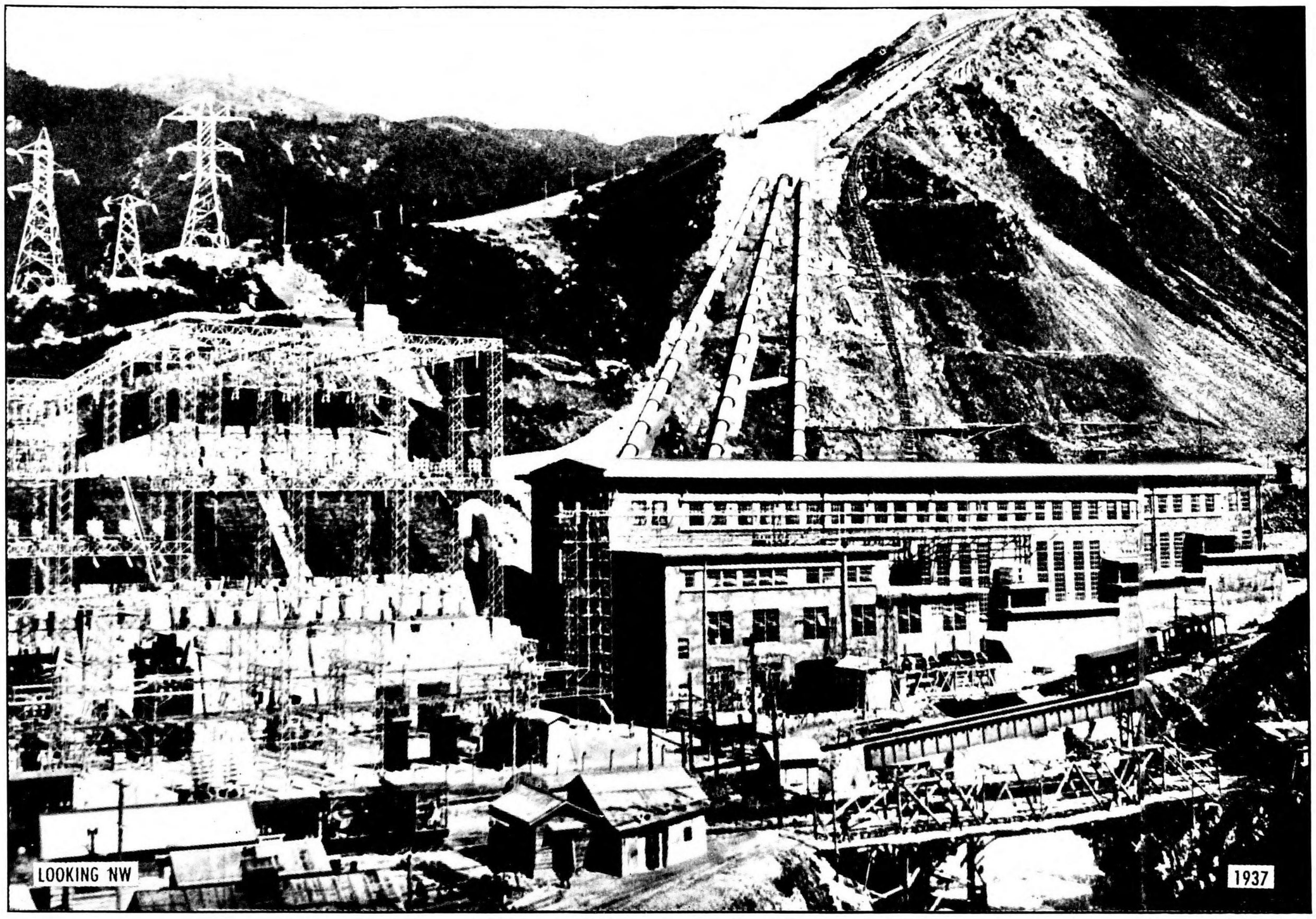


PHOTO 41—TARGET 4 Choshin Hydro-electric Plant No. 1.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 4 (KONAN REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 4 (KONAN REGION)

3632—35—Korea—7-24-44—First Proof

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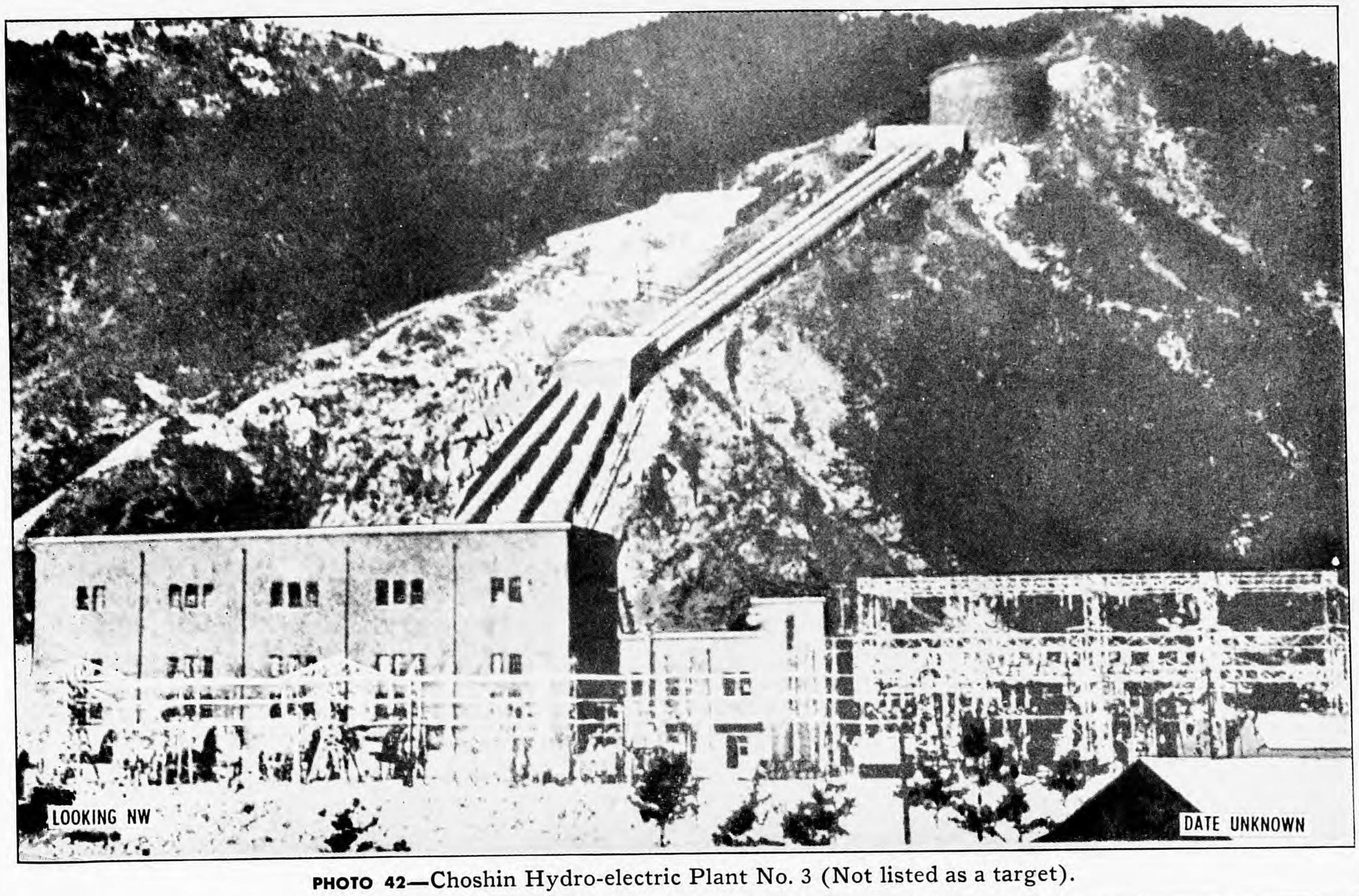

PHOTO 42—Choshin Hydro-electric Plant No. 3 (Not listed as a target).

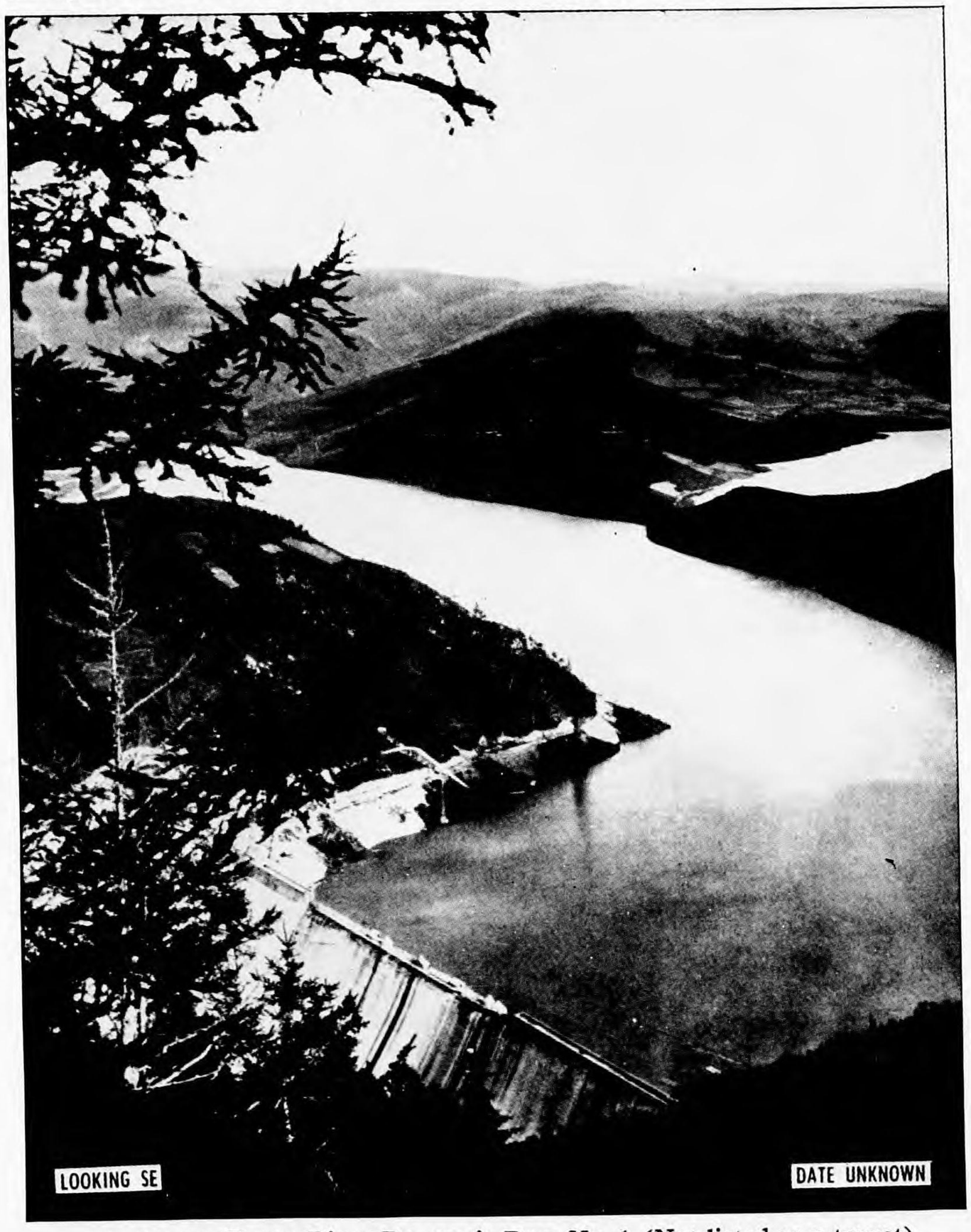

PHOTO 43—Fusen River Reservoir Dam No. 1 (Not listed as a target).

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KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 GENERAL PHOTOS (KONAN REGION)

3632—36—Korea—7-24-44—First Proof

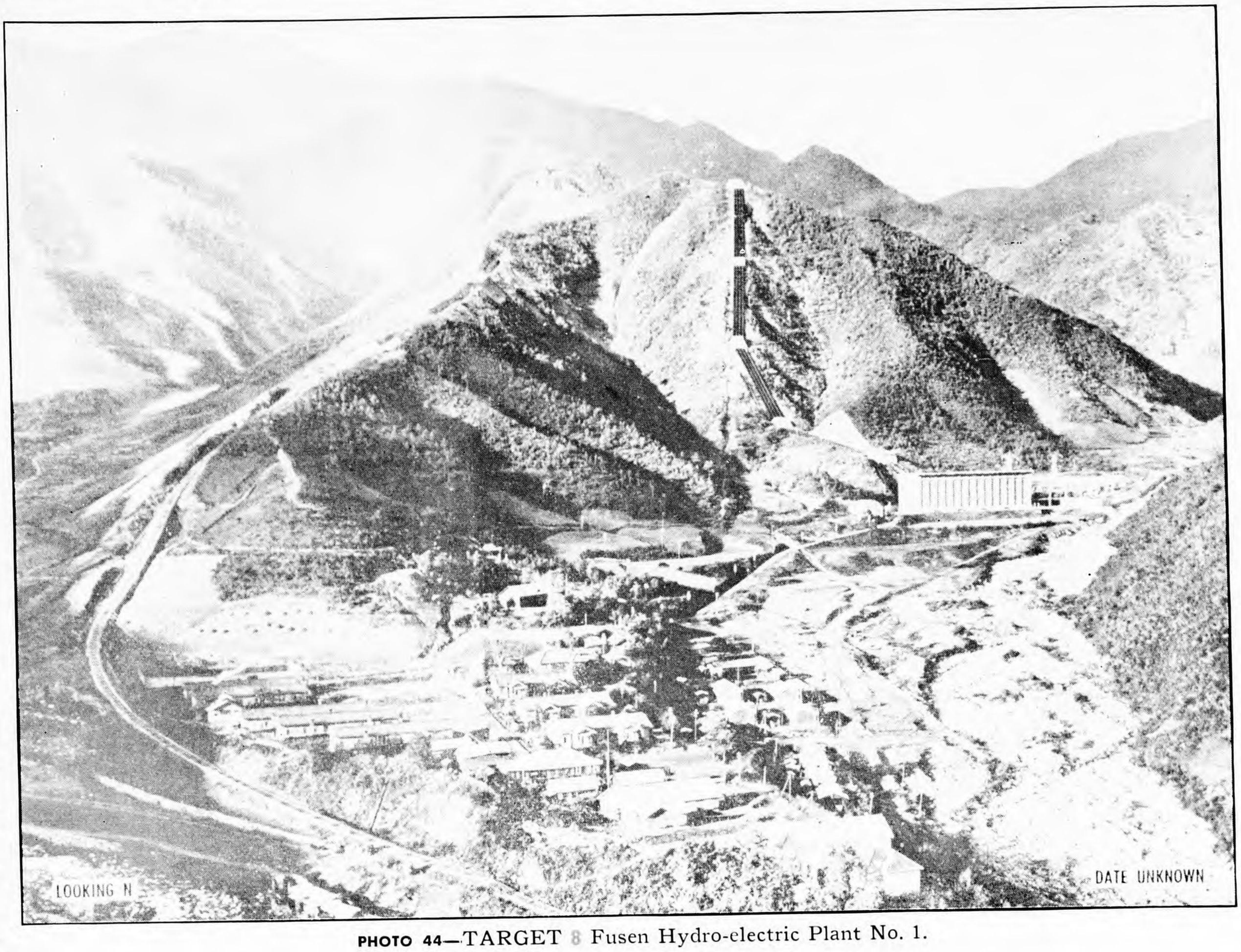
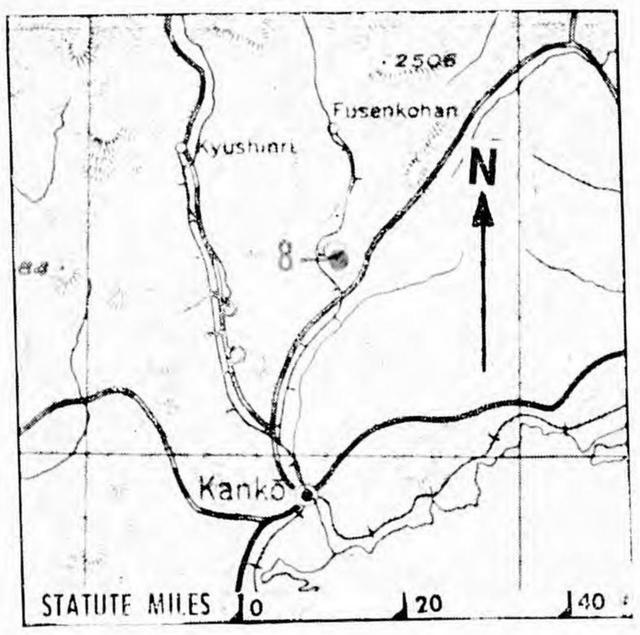


PHOTO 44—TARGET 8 Fusen Hydro-electric Plant No. 1.



TARGET 8

FUSEN HYDRO-ELECTRIC PLANT No. 1

(ELECTRIC POWER)

40° 21′ N 127° 34′ E (Approx) Key plant in Fusen power development. Installed cap 128,000 KW. Four exposed penstocks lead 8700 ft SE to concrete power house measuring approx 250 by 80 ft. Four horizontal turbo-generators. Transformer yard directly E. Power lines lead 35 mi S via Kiroku switching station to Konan. Water led by tunnel to three successive hydro plants downstream, with total cap of 72,000 KW. Location approximate.

(See photos 44 and 45; maps on pages M-3 and M-12.)

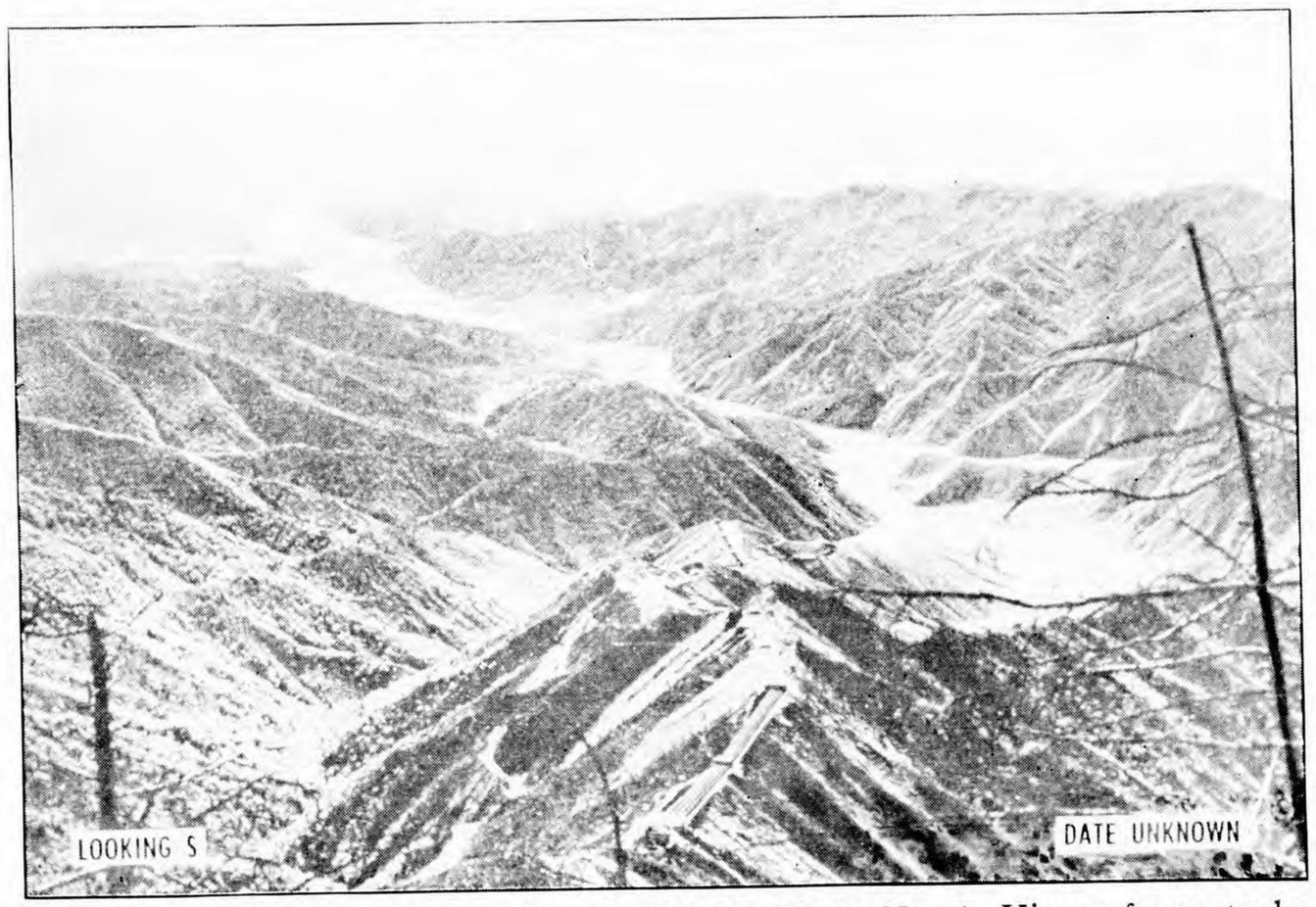


PHOTO 45—TARGET 8 Fusen Hydro-electric Plant No. 1. View of penstocks leading to plant, right center.

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 8 (KONAN REGION)

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 TARGET 8 (KONAN REGION)

3632—37—Korea—7-24-44—First Proof

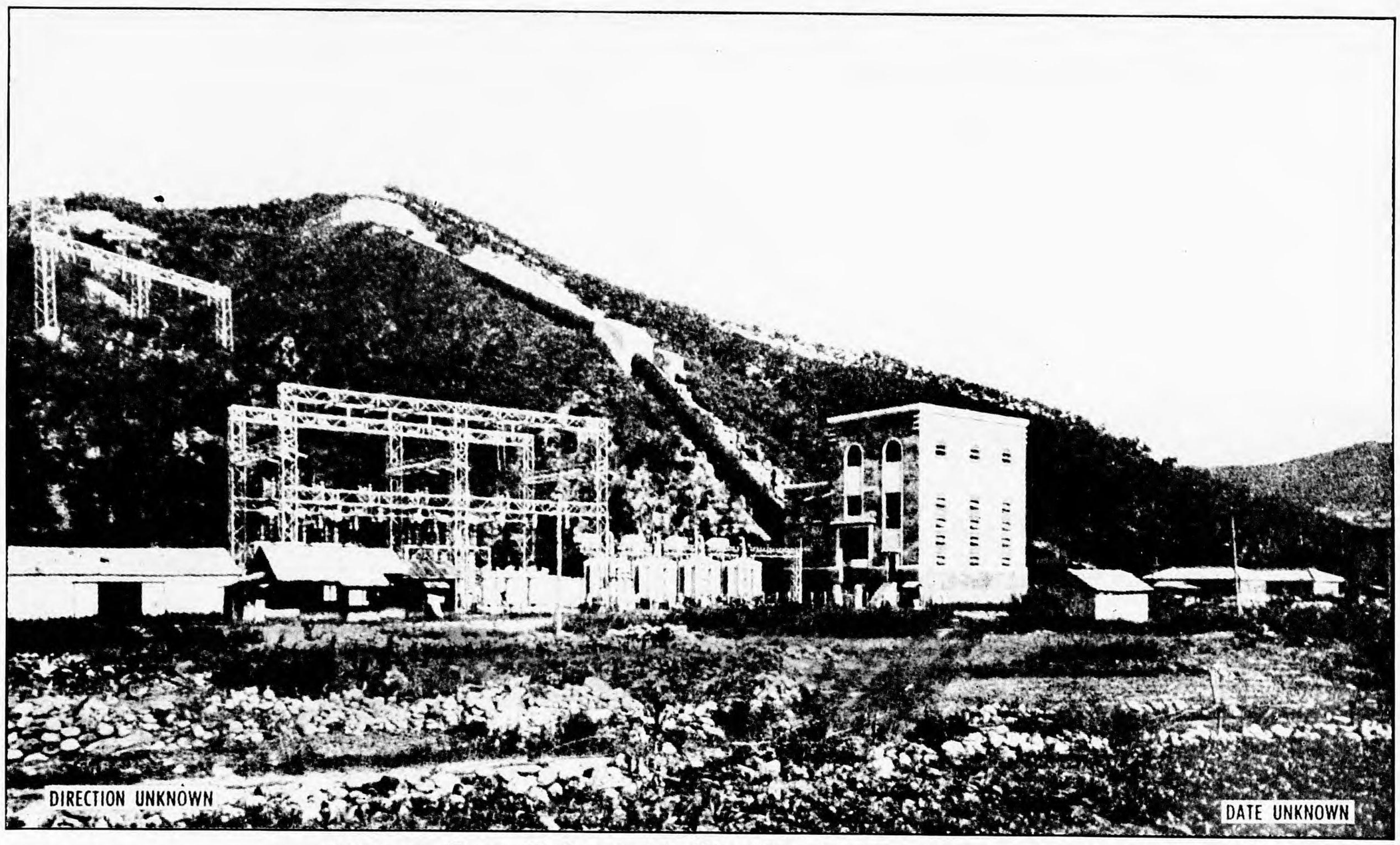


PHOTO 46—Fusen Hydro-electric Plant No. 3 (Not listed as a target).

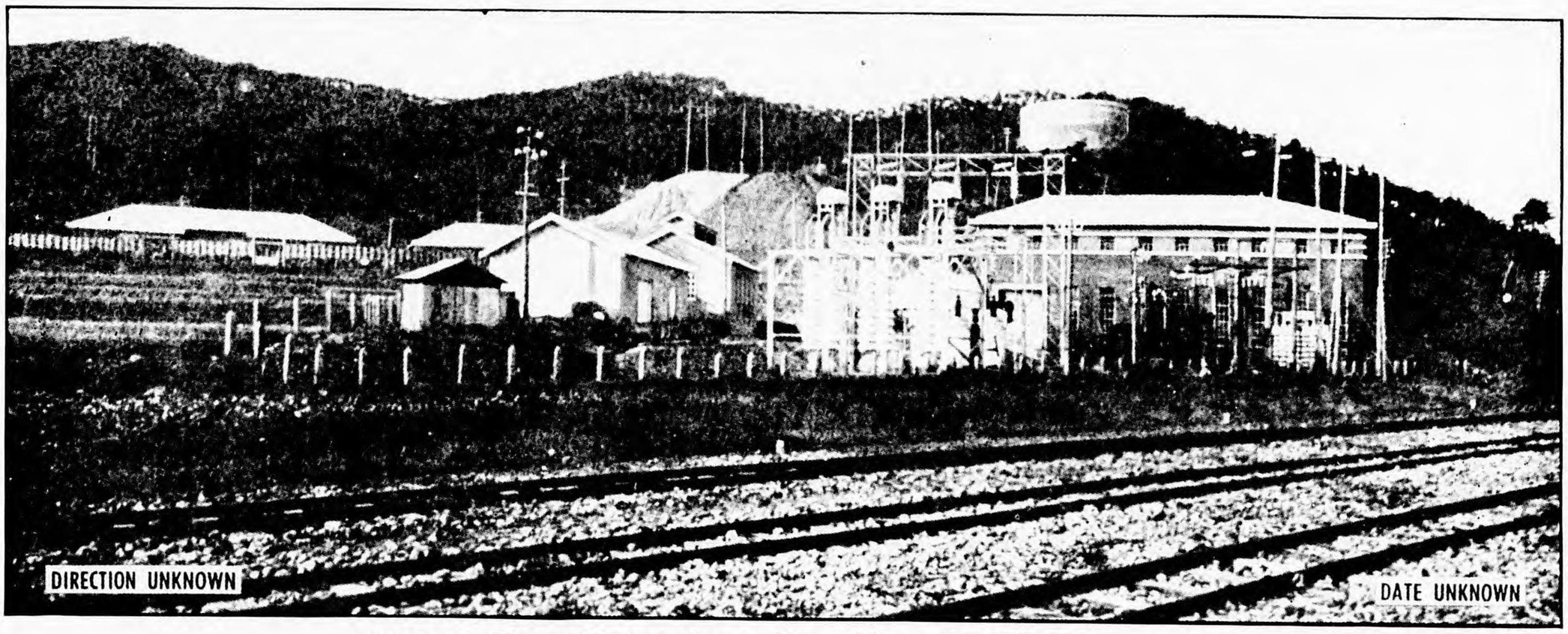


PHOTO 47— Fusen Hydro-electric Plant No. 4 (Not listed as a target).

KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 GENERAL PHOTOS (KONAN REGION)
KOREA AREAS NOS. 84.1, 2, 3, 4, 5, 6, 7, 8 GENERAL PHOTOS (KONAN REGION)

3632—38—Korea—7-24-44—First Proof