

CHINA JOURNAL OF SCIENCE & ARTS

美術
雜誌



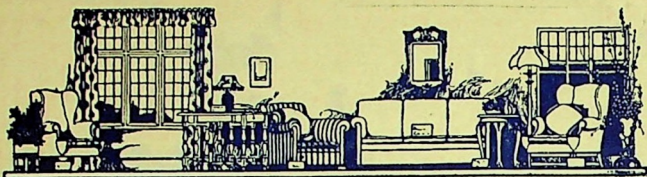
中國
科學

PRICE \$2.00 MEX.

Vol. IV.

JUNE 1926

NO. 6



ARTS & CRAFTS FURNITURE

IS RECOGNISED BY ITS DESIGN AND
FINISH, RENOWNED FOR ITS WORKMAN-
SHIP AND APPRECIATED ON PRICE

ARTS & CRAFTS, LTD.

(INCORPORATED IN HONGKONG)

FURNISHERS AND DECORATORS

Joyous Motherhood

To watch Baby's development, the gradual growth of his intelligence and his interest in those who care for him—this is a source of joy and pride to the happy mother. The first essential for health, physical and mental, is correct feeding. This is assured by adopting the

Allenburys'
Progressive System of Infant Feeding

which provides a graduated series of foods especially adapted to Baby's needs throughout every stage of development.

MILK FOOD No. 1 MILK FOOD No. 2 MALTED FOOD No. 3

Birth to 3 months

3 to 6 months

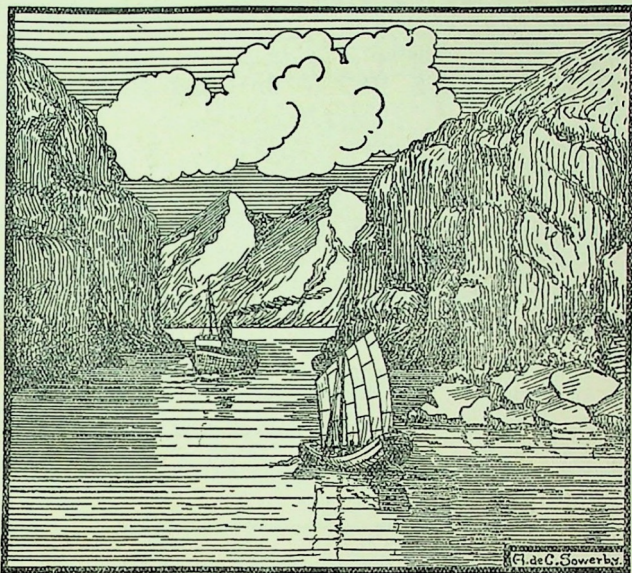
6 months and onwards

WRITE for a free copy of the 'Allenburys' book on Infant Feeding and Management and a sample of food. Please state the age of your Baby.

Allen & Hanburys Ltd., 40 CANTON ROAD, SHANGHAI.

059-Ch21/26/4-6

"YANGTZE GORGES"



"Where the Dragons are Born"

THE YANGTZE IS CHINA

The meaning of China, its greatness, its romance, its magic and its age can only be appreciated and understood by voyaging on the upper reaches of its mightiest waterway.

THE YANGTZE RAPID S.S. CO.

(Fed. Inc., U.S.A.)

offers A Daily Service the Year Round.

Our seven steamers provide the utmost in Comfort—Safety—Speed from Ichang through the Gorges to the foot-hills of Tibet.

Be Original!—See the Real China!—An unrivalled Panorama!

Bookings
through

MANN & HOYT, INC.

12 The Bund
Tel. C. 522

FETTÉ PEKING RUGS

FROM

THE FAMOUS FETTÉ LOOMS, PEKING

Oriental Handwork combined with Colour Harmony and Distinctive Designs adapted by Foreign Artists to satisfy Western Ideals of Beauty and Utility.

RUGS ON EXHIBITION AND SALE

10 NANKING ROAD

MARGARET J. NEAVY,

Shanghai Representative.

DeVilbiss Spray-painting System

The spray system is used for painting houses; factory, school, office, store and other building exteriors and interiors—with plaster, stucco, concrete, brick or wood surfaces; railway car bodies, trucks and stencils, locomotives and bridges; ships; structural iron, and like work. The same high degree of speed, uniformity and economy is obtained as in spray-finishing furniture, automobiles and hundreds of other similar manufactured products.

Lead and oil and ready mixed house paints, oxide paints, shingle stains, mill white and flat wall paints, calcimines, varnishes, enamels, graphite and asphaltum paints and other like materials are sprayed to equal advantage.

A sale of De Vilbiss equipment is not complete until the outfit is put into working order and your painters taught how to use it. This is part of the service rendered by our agent where there is one. However, making the installation is a simple matter and can be taken care of by the men in the plant, with the aid of directions and plans furnished with each outfit. The knack or swing of handling the DeVilbiss Spray Gun can be easily and quickly acquired—the average workman becoming proficient in all its uses within a short time.

The De Vilbiss Spray-painting System offers complete equipment for every painting requirement.

For estimates or demonstrations apply to the Sole Agents:

HARVIE, COOKE & CO.,

135 SZECHUEN ROAD, SHANGHAI

NOVELTIES

ART CURIOS

SILK KIMONOS

村上洋行

美術品商

南京路二號

The principal
Art Curio
and
Novelty Store
In Shanghai

PRICES RANGING FROM
A few Cents
to
Thousands of Dollars.

TOYO
MURAKAMI

26B KIANGSE ROAD
CORNER EZRA ROAD, SHANGHAI

PHONE C 2319

ORIENTAL
DESIGNERS 24

A
GREAT
TRAVELLER

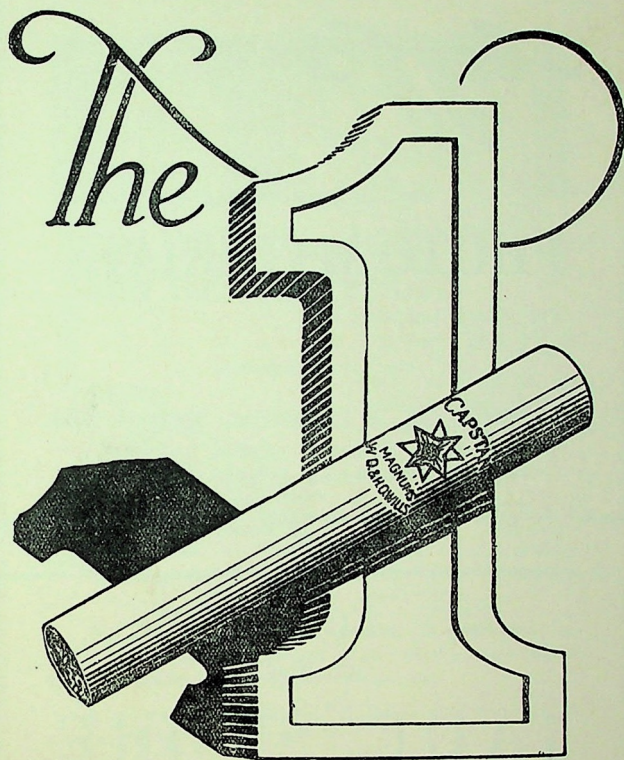
is the hosiery we produce. PAGODA is now worn throughout the
whole of the Far East.

CHINA COTTON & SILK WORKS, LTD.

Messrs. ILBERT & CO., LTD.,

SHANGHAI,

General Managers.



Cigarette

This advertisement is issued by the British-American Tobacco Co., (China) Ltd. MB-122

Agfa

the Standard Brand of reliable

PHOTO-MATERIALS

for every purpose

UNITED DYES & CHEMICAL WORKS LTD.

SHANGHAI, TIENTSIN, CANTON, HANKOW,
PEKING, NEWCHWANG, MUKDEN, TSINANFU

BUY YOUR JADE

AT THE

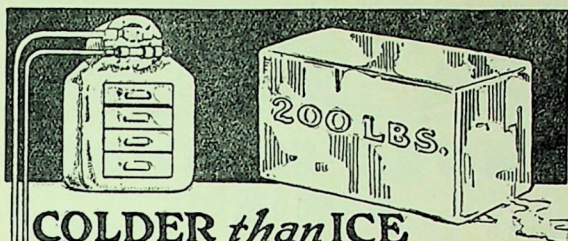
JADE STORE

A LARGE SELECTION OF
ANTIQUE AND
MODERN JADE
ORNAMENTS AND
JEWELLERY

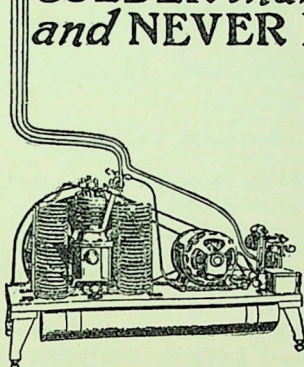
12A, NANKING ROAD

'Phone C. 3237

SHANGHAI



COLDER *than* ICE and NEVER MELTS



FRIGIDAIRE

frees you from all ice worries and assures you an *extremely cold*, sweet and wholesome refrigeration at all times.

FRIGIDAIRE is automatic. You simply turn on the electric current and forget your ice troubles.

FRIGIDAIRE can be installed in your old ice chest—or we can supply you a new chest, imported or made locally to fit your specifications.

You can pay for FRIGIDAIRE as you use it, over a reasonable period of months.

A GENERAL MOTORS PRODUCT

Frigidaire

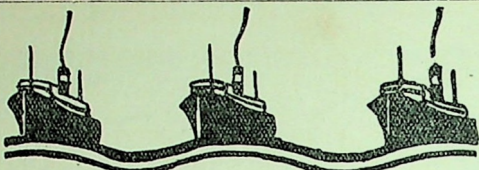
Economical Electric Refrigeration

ROSCOE L. HAMBLETON, INC.,

3 CANTON ROAD

SHANGHAI

Cable Address: "ROVIRTON"



HUGO STINNES LINIEN

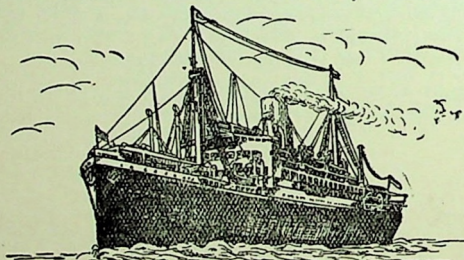
Passenger and Freight Service
to

Naples, Rotterdam and Hamburg

Agents in China :

SHANGHAI :	} Hugo Stinnes Linien, Ostasien Fahrt	
HANKOW :		
TSINGTAO :		} Behn, Meyer China Co., Ltd., m. b.H.
TIENTSIN :		
HONGKONG :	} Reuter, Bröckelmann & Co.	
CANTON :		

NORDDEUTSCHER LLOYD, BREMEN



Fast and Regular Freight and Passenger Service

Between

KOBE, YOKOHAMA, DAIREN, TSINGTAO, SHANGHAI, HONGKONG,
MANILA, SINGAPORE, BELAWAN, COLOMBO, PORT-SAID,

and

GENOA, MARSEILLES, ROTTERDAM, HAMBURG, BREMEN.

Five passenger-boats of 9500 Gr. Reg. tons each:

S/S "DERFFLINGER," S/S "SAARBRUECKEN," S/S "TRIER,"
S/S "COBLENZ," M/S "FULDA"

Accommodation for 100 Cabin passengers and 140 middle class:

Connection to all parts of
the world. Through-book-
ings to U.S.A.
Phones C. 7207-10

MELCHERS & CO.,

19-20 Kiukiang Road, Shanghai.

General Agents for the Far East.



**HAMBURG-AMERIKA LINIE
HAMBURG**

REGULAR FREIGHT AND PASSENGER
SERVICE FROM HAMBURG TO:

- NORTH AMERICA - NEW YORK, HALIFAX, BOSTON,
PHILADELPHIA, BALTIMORE,
NORFOLK, WEST COAST.
- CENTRAL AMERICA CUBA, MEXICO, VENEZUELA,
COLUMBIA AND EAST COAST.
- SOUTH AMERICA - COLUMBIA, ECUADOR, PERU,
CHILI, LA PLATA, BRAZIL.
- EAST ASIA - - - INDIA, PHILIPPINES, CHINA,
AND JAPAN.
- AFRICA - - - - LIBERIA AND WEST COAST.
- LEVANTE - - - - MEDITERRANEAN PORTS.
- NORTH SEA - - - CUXHAVEN, HELGOLAND AND
WESTERLAND.
- BALTIC SEA - - - STETTIN, RIGA.
- EMDEN-RHEIN - - - DORTMUND, ETC.
- AIR SERVICE - - - BERLIN-AMSTERDAM-LONDON.

For further information, apply to

HAMBURG-AMERIKA LINIE

2 Canton Road Filiale Shanghai 'Phone C. 2097-2098

**P. & O., British India, (Apcar Line) and Eastern
and Australian Lines**

(Companies Incorporated in England)

Total Tonnage 1,400,000

Peninsular & Oriental Fortnightly Direct Royal Mail Steamers
(Under Contract with H. M. Government)

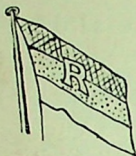
- "P. & O." (Fortnightly Service)—To Hongkong, Singapore, Penang,
Colombo, Bombay, Aden, Port Said, Marseilles, Suez, Gibraltar
and London.
- "P. & O." (Fortnightly Service)—To Moji, Kobe and Yokohama.
- "P. & O." (Frequent Service)—To Hongkong, Singapore, Penang,
Colombo and Bombay.
- "British India" APCAR LINE (Japan Line)—To Moji, Kobe and
Yokohama.
- "British India" APCAR LINE (Indian Line)—To Singapore, Penang,
Calcutta from Japan or Hongkong.
- "E. & A."—From Yokohama, Kobe, Moji or Hongkong to Manila,
Sandakan, Timor, Thursday Island, Cairns, Townsville, Brisbane,
Sydney and Melbourne.

For Freight and Passage by above Steamship Lines apply to

**MACKINNON MACKENZIE & COMPANY
HONGKONG AND SHANGHAI**

Cable Address: { "P. & O." "PENINSULAR"
"B. I." & Apcar "MACKINNONS"
"E. & A." "AMATREP" Shanghai.
"PERTAMA" Hongkong.

RICKMERS



GERMAN MAIL LINE
TO THE
FAR EAST
FAST AND REGULAR
FREIGHT SERVICE

from
HAMBURG AND ANTWERP

(as required also Bremen and Rotterdam)

Agents

Manila	...	...	...	MENZI & Co.
Hongkong	...	...	...	CARL BÖDIKER & Co.
Hankow	...	...	...	H. SOBBE
Tsingtau	...	...	...	P. VALDER & Co.
Tientsin	...	...	...	M. BOEDDINGHAUS
Dairen	...	...	...	C. HOLSTEIN & Co.
Kobe	...	...	...	C. HOLSTEIN & Co.
Yokohama	...	...	...	C. HOLSTEIN & Co.
Vladivostok	...	...	...	KUNST & ALBERS

For further information apply to

6 The Bund
Shanghai

RICKMERS LINE, m.b. H. *Cable Address:*
Zweigniederlassung Shanghai "RICKMERS"
General—Agents for the Far East Shanghai

ANNOUNCEMENT

THE CHINA JOURNAL OF
SCIENCE & ARTS
TITLE PAGE & INDEX
(FREE)

of Volume III (1925) of
the above Journal NOW
READY: also

SPECIAL
COVER
FOR BINDING
Price \$2.00 Mex.

Order now from our Office

8 MUSEUM ROAD,
SHANGHAI

W. G. PITCAIRN

MARINE SURVEYOR
Upper Yangtze River Consultant
Ichang and Chungking

Telegrams: "CAIRN"

Agent for:

J. HASTIE & CO., LTD.,
Greenock.
MACTAGGART, SCOTT
& CO., LTD., Edinburgh.

Salvage Pumps, Diving Apparatus,
Hydraulic Jacks and Equipment,
always ready at short notice.

**EISLER, REEVES AND
MURPHY, Inc.**

**Marine, Cargo and Engineer
Surveyors and Naval Architects**

3 Canton Road, Shanghai, China.

Cable Address: "RECORD"

*Codes: Bentley's, Western Union
and Scott's 10th Ed.*

**Largest controllers of Cotton,
Seeds, Egg Products and
General Produce in China.**

*Exclusive Surveyors for the
following Classification
Societies:*

American Bureau of Shipping
British Corporation for the
Survey and Registry of
Shipping.

Registro Navale Italiano.

Teikoku Kaiji Kyokai

(Imperial Japanese Marine Corp.)

Germanischer Lloyd.

*Officially recommended Sur-
veyors and Adjusters to the:*

International Transport
Versicherungs-Verband

(International Union of Marine Insur.)

Settling Agents:

Allgemeine Versicherungs-
Gessellschaft PHENIX in
Wien.

Agents:

Societe Generale de Surveil-
lance, S. A., and its affiliated
Companies, with offices in all
principal cities of the world.

Surveyors to:

United States Salvage As-
sociation, Inc.

Toplis & Harding, Assessors
to Lloyd's Underwriters.

Local Underwriters, etc.

Hawaii



*Surf a while
when you are going home*

Brown diving boys in Honolulu harbor . . . lei-venders wreathing you in tropic flowers as you descend gang-plank to melodies of the Hawaiian Band. Why, you'd miss the thrill of a lifetime if you failed to visit this international crossroads!

It costs no extra steamer fare to arrange a stop-over of 2 weeks or longer. You'll enjoy the balmy days; invigorating sports, surfing, outrigger canoeing, golf. High class hotels, \$2.50 to \$10 Gold, per day; housekeeping cottages, rooms, etc.—American conveniences in a veritable "Paradise".

Tickets on many lines inter-changeable at Honolulu. Ask your nearest travel or steamship agent and book through him. For attractive brochure, write TODAY—

HAWAII TOURIST BUREAU
Dept. 3, P. O. Box 296, Shanghai, China,
or 4321 Fort Street, Honolulu, T. H.,
U. S. A.

COAL TAR DYE-STUFFS
ACRIFLAVINE INDICATORS
BIOLOGICAL STAINS

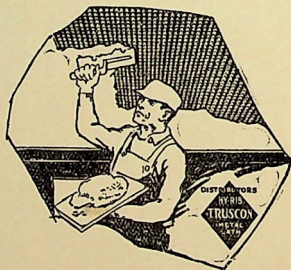
THE NATIONAL ANILINE AND
CHEMICAL CO. U.S.A.

NEW YORK

CHINA

14 CANTON ROAD, SHANGHAI

FIREPROOF,
SOUNDPROOF
ECONOMICAL
CEILINGS
can be produced by using
HYRIB OR
DIAMOND LATH



TRUSCON STEEL CO.

Manufacturers and Designing Engineers

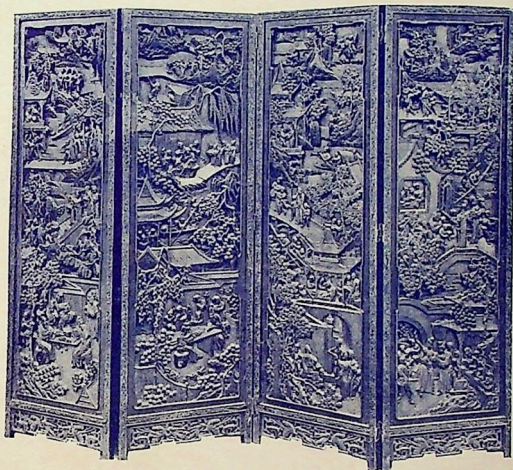
No. 3 CANTON ROAD, SHANGHAI

Telephones: Central 4779 and 4780

TAI LOONG & CO.

Manufacturers of

CARVED FURNITURE AND PICTURE FRAMES



Exquisite and Artistic Designs

Antique and Modern Carving

Lacquer and Chinese Redwood

from

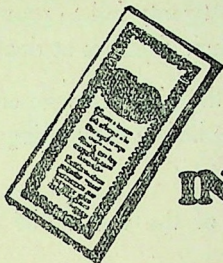
NINGPO, HANGCHOW, CHINKIANG, SHANGHAI

Nos. 1858-9 BUBBLING WELL ROAD, SHANGHAI

THE VALUE OF INSURANCE

IT is impossible for the individual to foretell or prevent the many serious hazards to which mankind is daily exposed, and against the effects of which it is highly important to provide. The function of Insurance in its numerous forms is to establish a medium, by the operation of which a vast aggregation of small sums is devoted to the protection of the individual and his interests. It brings into play the Law of Averages and applies it to the fullest advantage of the one seeking the protection it offers. No individual or firm, no matter how strong his or its position, can afford to go uninsured, since without the system of Insurance absolute security is impossible.

IF YOU HAD THE MONEY



LIFE INSURANCE

Mr. Married Man—have you enough insurance to protect your family, if something unexpected should happen to you ?

Mr. Single Man—are you buying insurance at the age when you can buy it to the best advantage ?

Mr. Parent—have you thought of providing for the education of your children through life insurance policies that will pay out at the time they will go to college ?

Miss or Mrs. Business Woman—have you provided insurance for the proper protection of your obligations ?

WEST COAST LIFE
INSURANCE COMPANY
SAN FRANCISCO - CALIFORNIA

W. R. RICE & CO.
General Agents

3 Canton Road
Shanghai

JUST A FEW INSURANCE FACTS

Nineteen out of every twenty fail to provide either for old age or for their families at death.

Ninety per cent. of the children who enter school at age six must stop before completing the eighth grade to go to work.

Thirty-five per cent. of the widows of the country are in want.

Life Insurance has decreased pauperism more than 33½% in thirty-five years.

Seven-eighths of all the money left by married men for their dependents is derived from life insurance.

For particulars of plan best suited for your requirements write the Shanghai Office.

MANUFACTURERS LIFE INSURANCE CO.

HEAD OFFICE TORONTO, CANADA

SHANGHAI OFFICE :

**343-5 Hongkong and Shanghai
Bank Building, Shanghai**

A. G. HEARNE,
District Manager.

SHANGHAI OFFICE
7 HANKOW ROAD
TEL. C. 807



TIENTSIN OFFICE
30 RUE COURBET
TEL. S. 2621

Special

Fire
Marine

Shanghai

Insurance

Motorcar
Loss of Profits
Housebreaking

Insurance

Opportunities

Burglary
Accident
Sickness

Office

Java Sea and Fire Insurance Co., Ltd.

Head Office: BATAVIA

ESTABLISHED 1861

FIRE, MARINE AND MOTOR CAR INSURANCE

Shanghai Branch Office: 3 Ezra Road

A. KOOYMAN, *General Manager*

Telephone Central 69 and 70

Tientsin Branch Office: 66 Rue du Baron Gros

J. A. WATTIE & CO., LTD.

(INCORPORATED UNDER THE COMPANIES ORDINANCES, HONGKONG)

Financial, General and Commission Agents

Head Office :

10 CANTON ROAD, SHANGHAI

(also at London and Sourabaya)

Secretaries or General Managers for :

Alma Estates, Limited
New Amherst Rubber Estate, Limited
Anglo-Dutch (Java) Plantations, Limited
Anglo-Java Estates, Limited
Batu Anam (Johore) Rubber Estates, Limited
Bukit Toh Alang Rubber Estate, Limited
Chemor United Rubber Company, Limited
Chempedak Rubber and Gambier Estate, Limited
Cheng Rubber Estates, Limited
Java Consolidated Rubber and Coffee Estates, Limited
Kali Glidik Coffee Estates, Limited
Kroewoek Java Plantations, Limited
Repah Rubber and Tapioca Estate, Limited
Semambu Rubber Estate, Limited
Senawang Rubber Estates Company (1921), Limited
Shanghai Building and Investment Company, Limited
Shanghai Klebang Rubber Estate, Limited
Shanghai Malay Rubber Estates, Limited
Shanghai Seremban Rubber Estates, Limited
Tebong Rubber Estate, Limited
Ziangbe Rubber Company, Limited

Agents for :

The Scottish Union & National Insurance Co.

The Gresham Fire and Accident Insurance Society, Ltd.

CUMINE & CO., LTD.

7 NINGPO ROAD

LAND ESTATE

AND

INSURANCE AGENTS

Agents:—

**CANTON INSURANCE OFFICE
LIMITED**

A. R. BURKILL & SONS,

2 CANTON ROAD, SHANGHAI

Secretaries and/or General Managers

The Shanghai Kedah Plantations, Limited,
The Padang Rubber Company, Limited,
The Bute Plantations (1913) Limited,
The Tanah Merah Estates (1916) Limited,
The Kota Bahroe Rubber Estates (1921) Limited,
The Dominion Rubber Company, Limited,
The Sungei Duri Rubber Estate, Limited,
The Shanghai Pahang Rubber Estates, Limited,
The Consolidated Rubber Estates (1914) Limited.



N. LAZARUS
QUALIFIED OPTICIAN

17 NANKING ROAD,
 SHANGHAI

Phone Central 6626

Refractionist :

R. V. MEYER
 F. I. O. London, Eng.

FREEMAN OF THE CITY OF LONDON

BANQUE BELGE POUR L'ETRANGER
 SOCIÉTÉ ANONYME
 (Affiliated to the Société Générale
 de Belgique)

CAPITAL (subscribed) Frs.	100,000,000
(paid up) - - - -	75,000,000
RESERVES - - - - -	32,000,000

HEAD OFFICE: BRUSSELS
 Branches:

LONDON, PARIS, NEW YORK, COLOGNE,
 BUCAREST, BRAILA, CONSTANTINOPLE,
 CAIRO, ALEXANDRIA, PEKING, SHANG-
 HAI, TIENSIN, HANKOV.

Allied Banks:

WIENER BANK-VEREIN, VIENNA, with
 Branches in AUSTRIA, HUNGARY, ITALY
 (TYROL), RUMANIA, and YUGO-SLAVIA.
 ALLGEMEINER BOEHMISCHER BANK-
 VEREIN, PRAGUE, with Branches in
 CZECHO-SLOVAKIA.

SOCIÉTÉ GÉNÉRALE DE BANQUE EN
 POLOCNE, WARSAW, with Branches in
 POLAND.

BANCO INTERNACIONAL DE IN-
 DUSTRIA Y COMERCIO, MADRID, with
 Branches in SPAIN and MOROCCO.

BANQUE FRANCO-BELGE DE BULGARIE,
 Soc. An., SOFIA and ROUSTCHOUK,
 with affiliations in PLOVDIV (PHILIP-
 POLIS) and BOURGAS.

BANQUE DU PAYS DE BOSNIE-HERCE-
 GOVINE, SERAJEVO, with Branches in
 YUGO-SLAVIA.

PEKING AND TIENSIN TIMES

(Established 1894)

The leading daily newspaper of Northern
 China, British Owned and British Edited.

Entirely independent in its views and
 criticisms, the "Peking and Tientsin Times"
 is by far the most influential newspaper in the
 district.

Proprietor :

TIENSIN PRESS, LTD.

VICTORIA ROAD

TIENSIN, NORTH CHINA



Miss Blanche

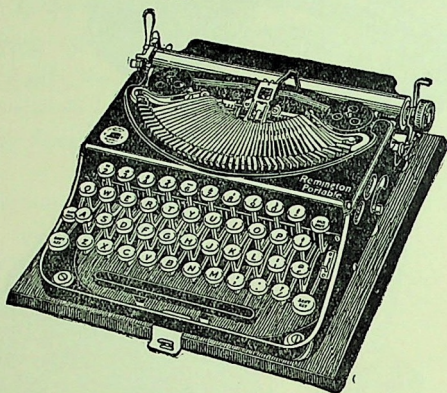
VIRGINIA

CIGARETTES

Sole Distributors for China :

HOLLAND CIGARETTE COMPANY, SHANGHAI

IMPROVED MODEL REMINGTON PORTABLE Typewriter



The Lightest and Most Compact Standard Keyboard Portable Typewriter on the market, yet it weighs only $11\frac{1}{2}$ lbs and is only 4 inches high.

Beside the regular keyboard, we can supply, without additional charge, machines with the following keyboards.

Chemical	Medical	Literary
Mathematical	Engineering	Scientific
Danish	Italian	Portuguese
French	Greek	Russian
German	Norwegian	Swedish
	Polish	

MUSTARD & COMPANY LTD.

22 MUSEUM ROAD

HONGKONG
CANTON

HANKOW
TIENTSIN

MOUKDEN
HARBIN

Dealers Everywhere



CALDBECK, MACGREGOR & CO., LTD.

(Incorporated under the Companies' Ordinances of Hongkong)

Wine and Spirit Merchants Since 1864

4 FOOCHOW ROAD

SHANGHAI

“The Connoisseur Comes to Caldbeck's”

General Managers for

THE AQUARIUS CO.

Manufacturers of

Sparkling **TABLE WATERS** and Silent Water
with **PURE DISTILLED WATER** only

“Every Drop Distilled”

THE SIGN



OF PURITY

BOOKS ON CHINA

Anderson: English Teaching Efficiency in China.....	\$3.00
Baker: "T'ai Shan," An Account of the Sacred Eastern Peak of China	3.00
Barkman: Peking and Other Poems	2.00
Bau: Modern Democracy in China	2.00
Bryan: An Outline of Chinese Civil Law	2.00
Chiang: A Study of Chinese Principles of Education.....	1.50
Chuang: Tendencies Towards a Democratic System of Education in China	1.50
Fletcher: Gems of Chinese Verse	2.00
Fletcher: More Gems of Chinese Poetry.....	2.00
The Four Books with English Translations and Notes ..	1.50
Fung: A Comparative Study of Life Ideals	1.80
Hayes: The Chinese Dragon..	1.20
Ho: Love and Duty	1.60
Hodgkins: China in the Family of Nations	3.00
Hsia: Studies in Chinese Diplomatic History	8.00
Leung: The Lone Swan.....	2.00
Lester: Poems to Wu.....	2.00
MacNair: China's New Nationalism and Other Essays, Trade Edition, \$2.50, Student's Edition	1.50
MacNair: The Chinese Abroad.	3.00
MacNair: Modern Chinese History—Selected Readings ..	8.00
The Outline Standards of the New System Curriculum	0.50
Pitman: Dragon Lure, a Romance of Peking.....	4.00
Remer: Readings in Economics for China	5.00
Remer: The Foreign Trade of China	4.00
Sen: Ancient Chinese Fables	0.35
Shirokogoroff: Process of Physical Growth among the Chinese, Volume I, Chekiang and Kiangsu.....	6.00
Sokolosky: American University Club of China Lectures, 1921-1922	0.90
Tao: Bulletins on Chinese Education, 1923	1.80
Tao and Chen: Education in China, 1924	0.70
Terman: The Efficiency of Elementary Schools in China.....	1.50
Twiss: Science and Education in China	2.40
Yen: The Mass Education Movement in China.....	0.50
Yin: Reconstruction of Modern Educational Organizations in China	1.80

THE COMMERCIAL PRESS, LTD.
PUBLISHERS

SHANGHAI

CHINA

M-4

STANDARD OIL CO. OF NEW YORK



The Mark  of Quality

SOCONY PRODUCTS

Illuminating Oil	Lubricating Oils and Greases
Gasoline and Motor Spirits	Fuel Oil
Asphalts, Binders and Road Oils	Paraffine Wax and Candles
Lamps, Stoves and Heaters	

Branch Offices the World Over

INTERNATIONAL BANKING CORPORATION

Capital, Surplus and Undivided Profits
U.S. \$14,000,000

Owned by the National City Bank of New York.

Head Office:

60 Wall Street, New York

London Office:

36 Bishopsgate, E.C.

BRANCHES

Barcelona	Madrid
Batavia	Manila
Bombay	Osaka
Calcutta	Panama
Canton	Peking
Cebu	Rangoon
Colon	San Francisco
Dairen	Santo Domingo
Hankow	Shanghai
Harbin	Singapore
Hongkong	Tientsin
Kobe	Tokio

Yokohama

All kinds of Banking.

We are also able to offer our Customers the services of the Branches of the National City Bank of New York in the principal countries of Europe, South America and in the West Indies.

N. S. Marshall, *Manager.*

1A Klukiang Road, Shanghai.

OLVA

IS THE BEST SOAP FOR THE
COMPLEXION



It is the SUPREME blend of

Palm and Olive Oils

Sold everywhere

THE SCIENCE OF GOVERNMENT

	\$
FEDERATIONS AND UNIONS WITHIN THE BRITISH EMPIRE. By H. E. Egerton.	6.30
THE POLITICAL SYSTEM OF BRITISH INDIA. By E. A. Horne.	6.30
THE GOVERNMENT OF INDIA. By Sir Courtenay Ilbert.	8.40
IMPERIAL UNITY AND THE DOMINIONS. By A. B. Keith.	9.00
GREATER ROMÉ AND GREATER BRITAIN. By Sir C. P. Lucas.	3.00
THE ENGLISH-SPEAKING NATIONS. By G. W. Morris and L. S. Wood.	5.10
DOMINION HOME RULE IN PRACTICE. By A. B. Keith.	1.50
THE CONSTITUTION OF CANADA. By W. P. M. Kennedy.	15.00
THE CAUSES AND CHARACTER OF THE AMERICAN REVOLUTION. By H. E. Egerton.	5.10
THE DECLARATION OF INDEPENDENCE, 1776. Ed. by J. B. Scott.	2.70
THE COLONIAL BACKGROUND OF THE AMERICAN REVOLUTION. By C. M. Andrews.	6.90
THE DOMINION OF NEW ENGLAND. By V. F. Barnes.	9.60
THE CONSTITUTION OF THE UNITED STATES. By J. M. Beck.	7.50

OXFORD UNIVERSITY PRESS

Amen House, Warwick Square,
LONDON, E.C. 4

C445 Honan Road
Shanghai

HOFFMANN

Ball and Roller Bearings

are noiseless. This has been attained by long experience and careful checking of results, in the sustained endeavour to make these Bearings the best of their kind. Moreover, they are British in all that the term implies. Specify HOFFMANN Bearings, and you specify silent bearings, you also specify British Bearings and

BRITISH BEARINGS ARE BEST

RIELLEY, SIMMONS & MILNE
25 PEKING ROAD
SHANGHAI

THE CHINA JOURNAL

OF

SCIENCE & ARTS

Editors : ARTHUR DE C. SOWERBY, F.Z.S. Manager : CLARICE S. MOISE, B.A.
 JOHN C. FERGUSON, PH D. Secretary : NAN L. HORAN
 Assistant Editor : R. R. L. FERNBACH, M.D., D.Sc.

[ENTERED AT THE CHINESE POST OFFICE AS A NEWSPAPER]

VOL. IV

JUNE, 1926

No. 6

CONTENTS

	PAGE
SCIENCE AND ART IN SHANGHAI BY A. DE C. SOWERBY	255
THE TARTARS BY PROFESSOR WONG KUO-WEI	
TRANSLATED BY TA T. CHEN	257
QUAINT BIRTH CUSTOMS IN WEST CHINA BY W. H. HUDSPETH	268
A SHORT SKETCH OF THE CHINESE LIBRARY DEVELOPMENT	
BY JOHN C. B. KWEI	271
NOSTALGIA BY MAUD HUBBARD BROWN	274
EDITORIAL COMMENTS	275
REVIEWS	279
THE SALT INDUSTRY OF TZEIUTSING BY WALLACE CRAWFORD	281
TRAVEL AND EXPLORATION NOTES	290
AN AFTERNOON ON A CHINESE BROOK BY PERCIVAL LEA BIRCH	291
THE DEVELOPMENT OF GOLDFISH, <i>Carassius auratus</i> , AS AFFECTED	
BY BEING OUT OF WATER, IN DISTILLED WATER, AND IN	
SOLUTIONS OF ALCOHOL BY SHISAN C. CHEN	294
ADDITIONAL TREES AND SHRUBS OF ST. JOHN'S UNIVERSITY CAMPUS	
BY W. M. PORTERFIELD	304
DOG SHOW SUPPLEMENT FACING	306
SCIENTIFIC NOTES AND REVIEWS	307
SHOOTING AND FISHING NOTES	309
SOCIETIES AND INSTITUTIONS	312
EDUCATIONAL NOTES AND INTELLIGENCE	313
PUBLICATIONS RECEIVED	314

Contributions of a suitable nature are invited and all MMS. not accepted for publication will be returned.

Books for review should be sent to the Editor as early as possible.

The subscription for the year (twelve issues) is \$10.00, Shanghai currency or its equivalent. In the U.S.A. and Canada, Gold \$6.00; in Great Britain and Europe, 25/- Postage free.

Crossed cheques (Shanghai currency) or P. O. O. should be sent in payment of the annual subscription from Outports, Europe and America direct to the Manager.

Office : 8 Museum Road, Shanghai, China.

PRINTED BY THE NORTH-CHINA DAILY NEWS AND HERALD, LTD., FOR THE PROPRIETORS

[All Rights Reserved]

Classified Index of Advertisers

ART AND CURIO DEALERS :

Toyo Murakami III

BANKS :

Banque Belge Pour L'Étranger XX
 Hongkong and Shanghai Banking Corp. XXXIV
 International Banking Corporation XXIV

BOOKS, BOOKSELLERS AND AGEHTS, ETC. :

Associated Publishers ... Book mark
 Kelly & Walsh, Ltd. XXXVII
 Oxford University Press XXVI

CONFECTIONERS :

Bianchi's XXXIII

CHEMICAL IMPORTERS, CRUGGISTS, ETC. :

American Drug Co. ... Cover 3
 Brunner, Mond & Co. (China Ltd.) XLIII
 Carlowitz & Co. XXXIX
 Merck, E., Darmstadt XXXV

DYES AND CHEMICALS :

National Aniline and Chemical Co., Inc. XII

ELECTRICAL ENGINEERS AND CONTRACTORS :

Westinghouse Electric International Co. Cover 3

ENGINEERS, MACHINERY MERCHANTS, SHIP-BUILDERS, ETC. :

Hambleton, Inc., Roscoe L. (Frigidaire) VII
 Koppel Industrial Car and Equipment Co. XXXVIII
 Rielley, Simmons and Milne XXVI
 Truscon Steel Co. XII

FOOD PRODUCTS :

Allenburys' Milk Food ... Cover 2
 Dairy Farm, Ice and Cold Storage Col, Ltd. (Daisy Brand Butter) XLIV
 Getz Bros. & Co. (Klim—Powdered Milk) XLI
 Lactogen Cover 4
 McBain, George, Import Department (Kossolian Salts) XXVII
 Shanghai Ice & Cold Storage Co., Ltd. (Clover Butter) XL

FURNITURE MANUFACTURERS :

Arts & Crafts, Ltd. ... Cover 2
 Tai Loong & Co. XIII

IMPORTERS AND EXPORTERS, ETC. :

Carlowitz & Co. XXXII
 Crittall Manufacturing Co., Ltd. (Crittall Metal Windows) XXXIII
 Ekman Foreign Agencies... XXXVIII
 Jardine, Matheson & Co., Ltd. XXXI
 Mustard & Co., Ltd. (Typewriters) XXX
 Stromwall Trading Co., Ltd. XXXVIII

INSURANCE COMPANIES :

Blom & Van Der Aa (Java Sea and Fire Insurance Co.) XVII
 Cumine & Co., Ltd. XIX
 Manufacturers Life Ins. Co. XVI
 Shanghai Insurance Office... XVII
 Wattie & Co., Ltd., J. A... XVIII
 West Coast Life Insurance Co. XV

JEWELLERS :

Jade Store Co., The VI
 Tuck Chang & Co.... .. XXX

MARINE SURVEYORS :

Eisler, Reeves and Murphy XI
 W. G. Pitcairn X

MERCHANTS AND COMMISSION AGENTS :

A. R. Burkill & Sons XIX
 Harvie, Cooke & Co. (De Vilbiss Sprays) II

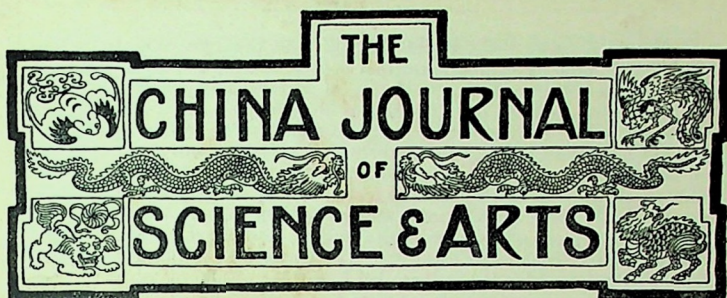
(Continued on next page).

Classified Index of Advertisers (Contd.)

OIL COMPANIES :		STEAMSHIP AND RAIL-	
Asiatic Petroleum Co.		WAY COMPANIES :	
(North China), Ltd. ...	XLII	Hamburg-Amerika Linie...	IX
Standard Oil Co., of New		Hugo Stinnes Linien ...	VIII
York	XXIV	Jardine, Matheson & Co.,	
		Ltd.	XXXI
OPTICAL GOODS, ETC. :		Mann & Hoyt, Inc. ...	I
Carlowitz (Zeiss)	XXXIX	MacKinnon Mackenzie &	
Lazarus, N.	XX	Co.	IX
		Messageries Maritimes ...	XLIV
PERIODICALS :		Norddeutscher Lloyd, Bre-	
Discovery	XXXIII	men	VIII
		Rickmers Linie, m.h.H. ...	X
PHOTOGRAPHY :			
United Dyos and Chemical		TOBACCO :	
Works (Agfa Photo-		British-American Tobacco	
graphic Supplies) ...	VI	Co. (China) Ltd. (Cap-	
		stan Cigarettes) ...	V
PUBLISHERS, PRINTERS,		Holland Cigarette Co. ...	XXI
NEWSPAPERS, ETC. :		Liggett & Myers Tobacco	
Commercial Press, Ltd. ...	XXIV	Co. (Chesterfield Cigar-	
North-China Daily News &		ettes)	XLII
Herald, Ltd.	XXXVI		
Oriental Press	XXXIX	TRANSPORTATION :	
Oxford University Press ...	XXVI	Aronovsky, D. G. M. ...	XXX
Tientsin Press, Ltd. ...	XX	Marden & Co., Ltd., G. E.	Cover 3
RUBBER GOODS :			
Dunlop Rubber Co. (China)		TRAVEL AGENCIES :	
Ltd.	XXIX	American Express ...	XXVII
		Hawaii Tourist Bureau	XI
RUGS :			
Fettè Peking Rugs ...	II	TYPEWRITERS :	
		Mustard & Co., Ltd. (Re-	
SILKS, LACES & SHAWLS :		mington)	XXII
China Cotton and Silk			
Works, Ltd., The ...	IV	WINE MERCHANTS :	
Laou Kiu Luen & Co. ...	XLI	Caldbeck, Macgregor & Co.,	
		Ltd.	XXIII
SOAP MANUFACTURERS		Union Brewery, Shanghai	
& MERCHANTS :		(U. B. Beer)	XXXV
China Soap Co., Ltd. (Olva			
Soap)	XXV		

Readers of "The China Journal of Science and Arts" are specially requested to make enquiries of the above firms when contemplating making purchases of articles or commodities mentioned in the advertisements, and, if possible, to purchase from our advertisers.

Advertisers, Journal and Readers form a circle of mutual interdependence and co-operation. Do not break the circle.



THE
CHINA JOURNAL
OF
SCIENCE & ARTS

VOL. IV

JUNE 1926

No. 6

SCIENCE AND ART IN SHANGHAI

BY

ARTHUR DE C. SOWERBY

One of the complaints foreign residents in China are in the habit of levelling at the life out here is that there is a marked paucity of anything catering to the intellectual and æsthetic sides of our natures. By this we do not mean to suggest that there is no intellectual life at all in the Far East, or that there are not many European and American residents who somehow manage to make life tolerable by developing their own intellectual and æsthetic interests. We have our literary and social guilds, our amateur dramatic clubs, our musical circles and our scientific societies, not to mention our private avocations; but these, supported by the few, must inevitably prove inadequate to the needs of such communities as have sprung up in the treaty ports, especially the larger ones. Their continued existence generally depends upon the enthusiasm and activities of a few ardent spirits: they are frequently "one man shows" and so have no stability or endurance.

Where in the homelands such amenities of life as the arts are well looked after by large and enthusiastic committees in every town, and art galleries, museums, libraries and orchestras are taken care of financially by the municipal authorities or the national government itself, here in China it is difficult to find enthusiastic workers for the communities' welfare to serve on committees, while municipalities, where they exist, look askance at spending money upon such non-remunerative things as art, literature and science.

Shanghai is by far the largest treaty port in China. Her foreign population has now reached considerable proportions: but how is she served in regard to the amenities of life under discussion?

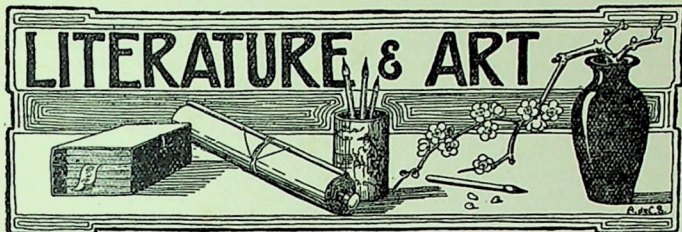
Almost her sole claim to intellectuality is that she maintains the largest and most expensive municipal orchestra in the world. Outside that she has nothing worth considering of an intellectual nature to offer her residents. The plastic arts are entirely neglected except for the efforts of a few members of private societies. The sciences have no place in the councils of the elected rulers, anything in this line being left to private enterprise. Drama is catered to by private societies and clubs, and the same applies, to a considerable extent, to literature. It is a remarkable thing that a community such as Shanghai should thus intellectually place all its eggs in one basket, and we often wonder how it came about—who engineered it. We also have a strong feeling that the distribution of funds thus entailed is unfair: and it seems to us that only two alternative courses are open to those responsible for the direction of municipal affairs, and they are either (1) to allocate funds equal to those spent on the band to other intellectual activities and objects or (2), if it is felt that this would involve the community in two great an expenditure, then to cut down the size and costs of the orchestra and spend the money thus saved on ministering to intellectual needs other than music.

The former course would be a great step forward: the latter a short step forward, and one preparatory to a longer one as the intellectual life of the community became stirred into renewed activity. To let matters remain as they are suggests stagnation, the worst of all evils.

Shanghai, as a community, is rich enough to establish art galleries, museums and libraries second to none in the world, and still maintain its splendid orchestra.

We are glad to see that the demand for such institutions is becoming increasingly insistent. Since the holding of the third annual spring art exhibition of The China Society of Science and Arts, of which this Journal is the official organ, the demand for a permanent art centre for Shanghai has been voiced in all the leading papers of Shanghai. Those responsible for the exhibition could tell a tale of difficulty and discouragement that would make any self-respecting community blush with shame. Yet one stroke of the pen on the part of the Council could make easy the paths of those who are struggling to introduce into Shanghai the intellectual and aesthetic life the community so sorely needs.

We have advocated the erection and endowment by the Council of an institution that shall form the centre of all intellectual life in Shanghai ever since this Journal and the Society it represents came into being, but unless the community will arouse itself to back the demand there is little chance of this desirable object being attained.



THE TARTARS

BY

PROFESSOR WONG KUO-WEI (王國維),
(*Tsing Hua Research Institute, Peking.*)

TRANSLATED BY TA T. CHEN, PH. D. (陳達),
(*Instructor in Tsing Hua College, Peking.*)

INTRODUCTION.

In the history of the later T'ang and early Sung Dynasties, the Tartars had some intercourse with China. But the name "Tartars" (韃靼) was suddenly left out of the official histories of the Liao (遼) and Chin (金) periods. The main purpose of this paper is an inquiry into the status of the Tartars in the Liao and Chin Dynasties. The nature of this inquiry may be summarized in seeking answers to the following questions:

- 1.—Who were the Tartars? Were the Tartars and the Mongols the same people?
- 2.—Were there Tartars during the Liao and Chin periods? If so, where did they live and did they have intercourse with China?
- 3.—Since the term "Tartars" was eliminated in the official documents of these two periods, under what other tribal names were their relations with China recorded? What kinds of corroborative evidence can be introduced for their identification?
- 4.—Why did the official historians try to leave out the term "Tartars" in the history of the Liao and Chin dynasties?

I.—THE TARTARS IN THE LATTER PART OF THE T'ANG DYNASTY.

The name "Tartars" (韃靼) appeared for the first time in Chinese History in the latter part of the T'ang Dynasty. Instances of references to the Tartars are as follows: In book 5 of the "Collected Essays" by Li Tê-yü (李德裕) it was stated that in an imperial decree to a high official of the Uigurs, named Wu-mu-ssü (嚠沒斯), the following statement appears at the end: "I trust that you and your subordinates,

name Tartars appeared only once in the Liao Annals and was never mentioned in the Chin Annals. Where were the Tartars during the Liao-Chin period of about 300 years? In the unofficial publications of this period, the writers occasionally discussed the activities of this tribe. Why, then, did the official historian try to avoid the tribal name Tartars in the dynastic histories?

II.—THE COUNTRY OF TSU P'U (阻卜).

A careful study of the Liao and Chin Annals has revealed the fact that certain tribes known as the Tsu P'u (阻卜) of these periods probably corresponded to the Tartars of the earlier dynasties. There seems ample evidence to prove this assertion. The chief character of the body of evidence hereinafter introduced is an attempt to identify the Tsu P'u tribes with the Tartars. Thus, in the "Record of Shên Tsung," the Liao Annals, it was said that "in the first moon of the third year of K'ai T'ai 開泰 (1014) the Tartars besieged Chên Chow (鎮州). But because the place was well defended, the invaders soon withdrew." In the "Biography of Hsiao T'u-yü (蕭圖玉)" a somewhat more detailed account appears as follows: "During the reign of K'ai T'ai (1012-1020), the country of Tsu P'u again revolted and besieged T'u-yü at K'o Tun city (可敦城). It was a vigorous attack. By using the bow and arrow, T'u-yü's soldiers defeated them, whereupon the enemy fled to Wo-lu-to city (窩魯朵)." The Chin Annals also stated that the military post of Tsen Chow was stationed at the ancient city K'o Tun, so the above accounts, though appearing in two independent works, really referred to the same event, as they agreed both in the time and nature of the event. But in one work the name "Tartars" was mentioned, and in another "Tsu P'u." Again in the "Table of the Tributary nations," the Liao Annals, it was said that "in the third moon of the fifth year of K'ai T'ai (1014) the tribe of Tsu P'u revolted and that its chief, named K'uei K'o (魁可), later submitted himself to the imperial court." The same matter was mentioned in the "Record of Shên Tsung," but the chief who later submitted himself was not the K'uei K'o of Tsu P'u, but the K'uei K'o of Tang-gan. In these two cases the terms Tsu P'u and Tang-gan were used interchangeably, just as the terms Tartars and Tang-gan were used interchangeably as above shown. Is it not likely, then, that the Tsu P'u tribes of the Liao period were probably the Tartars of the T'ang Dynasty?

Much direct evidence to show the identity between the Tartars and the Tsu P'u was given in the Chin Annals. In the "Biography of Chin Ku Ch'ing Ch'ên" (夾谷清臣) it was stated that "for the revolt of Tsu P'u the Emperor blamed the official Ch'ing Ch'ên and appointed Hsiang (襄) to take his position." Also in the "Biography of Hsiang" the following detailed account appears: "Hsiang began to fortify Lin Huang (臨潢) Meantime the Emperor confidentially ordered his army to advance. One wing took the easterly course and Hsiang himself took the westerly course. The eastern wing came to the Lung Chü River 龍駒河 (now the Kerulen River) and was surrounded by the Tsu

together with A-po-wu (阿波兀), and also the tribes of Hei-chü-tzü (黑車子) and Tartars are enjoying good health." In book 8 of the same work, a letter was written for Liu Mien (劉沔) to another official of the Uigurs, named Chieh-yü-ch'ieh-ssü (頡于伽思), saying that on the day when T'a-pu-ho-tsu (踏布合祖), Kirghiz's envoy, started on his journey, his country moved to Ho-lo-ch'uan (合羅川), the old home of the Uigurs, and to occupy the territory of five tribes including An-hsi (安西), Pei-t'ing (北庭) and Tartars. This event transpired in the year 842 or 843. In 868 the Tartars followed the leadership of Chu-hsieh-ch'ih-hsin (朱邪赤心) to subjugate P'ang-hsün (龐助), and in 882 they followed Li K'o-yung (李克用) to subdue Huang Ts'ao (黃巢). On both occasions they rendered helpful assistance. In subsequent years, during the Later T'ang (923-936) and Later Han (948-950) Dynasties, the Tartars continued to pay tribute to China, as shown in the Annals of the Later Five Dynasties, especially in the "Biography of the Tartars." During the reign of Sung T'ai Tsung (976-997), Wang Yen-tê (王延德) was sent as a royal envoy to the Kingdom of Kao Ch'ang (高昌), and on his return he reported that he had passed nine tribes of the Tartars.

In addition, there were other tribes which lived to the north of China and which were perhaps racially related to the Tartars. In some instances, the historical documents recorded their ethnic affinity, cultural resemblance or territorial propinquity with the Tartars. Thus, according to the annals of the Later Five Dynasties, the Tartars were ethnically akin to the Moho (𪚩鞑) who were probably remote progenitors of the Tartars. The Annals also mention a certain tribal chief in the person of Chê Wên T'ung (折文通) who also appeared three times in the Ts'ê-fu-yüan-kuei (冊府元龜). The significant fact to note is that each time his name is mentioned, he is associated with a different tribe. At one place he was called the Chê Wên T'ung of the Western River Tribe, at another the Chê Wên T'ung of the Tartars, and at still another place, the Chê Wên T'ung of the Tang-gan 黨項. (黨項 is usually pronounced "Tang-hsiang" in the Mandarin, but "Tang-gan" is believed to be nearer the ancient pronunciation.) From this it appears that the Tartars and the Tang-gan were probably racially related to each other. The Annals also stated that one branch of the Moho who were scattered around the Yin Shan region called themselves the Tartars. In Wang Yen-te's account of the nine tribes of the Tartars, all lived in the north-west of Hsia Chow (at the present time Ning-hsia) and as far as Harni. This agrees essentially with the distribution of the Western River Tribe mentioned in the Ts'ê-fu-yüan-kuei above referred to. The Tartars had some tribal cognomens which were similar to those of the Uigurs, such as Tarakan (達干), and had other titles which were like those of the Kitans, such as Hsiang-wên (相溫). Wang Yen-tê also told us that "the Kitans were shepherds of the Uigurs, and that the Tartars were their cowherdsmen. When the Uigurs moved to Kan-chow in Kansu, the Kitans and Tartars struggled between themselves for supremacy." It was clear that towards the close of the T'ang Dynasty, the Tartars were strong enough to compete with the Kitans for tribal leadership. But later the

P'u tribes. For three days all communication was cut off and the besieged urgently asked for help. . . . Hsiang beat drums and advanced . . . at day break the army was near the enemy's camps and made a sudden attack. The besieged also broke out and joined the imperial army. As a result the enemy retreated to the Wa-li-cha River (斡里扎河) leaving tents and cattle behind. Hsiang also ordered Wan-ching An-kuo 完顏安國 (完顏 is here pronounced "Wan-ching" which is believed to be an approximation to the Nu-chen dialect.) to pursue the enemy, resulting in the breaking up of the latter army. In the midst of heavy rain, about 70 to 80 per cent. of the enemy soldiers died of extreme cold. The chief was taken prisoner and the conquerors inscribed their victory on the rocks of the Chiu-fêng-shan (九峰山). Now in the "Confidential History of the Yüan Dynasty," in book 4, it was also recorded that because the chief of T'a-t'a-erh (塔塔兒), named Mich-ku-chên-hsieh-wu-liéh-t'u (蒙古眞薛兀勒圖), failed to obey imperial orders, the Chin court ordered Wang Ching 王京 to subdue him. The army went as far as the Wa-li-cha River and captured the chief." Wang Ching was really the same as Wang-ching (完顏), slightly differing in pronunciation. A similar account appears both in the "Expeditions of Sheng Wu" and "Record of T'ai Tsu" of the Yüan Annals. The chief difference in these accounts is that in the Chin Annals the name Tsu P'u was mentioned, whereas in the Confidential History the name T'a-t'a-erh was mentioned. These two terms were here used interchangeably just as the terms "Tartars" (in the Record of Shen Tsung) and Tsu P'u (in Biography of Hsiao T'u-yü) were so used in the Liao Annals.

III.—THE TWO DIVISIONS OF THE TARTARS.

In the T'ang Dynasty one branch of the Tartars was under the control of the chief Wu-mu-ssu of the Uigurs, as above indicated. When Wu-mu-ssu declared allegiance to China, the Tartars must have come with him. They lived around the Yin Shan mountains, on the western side of the Yellow River and in the northwest of Ling Chow (靈州) and Hsia Chow (夏州). This tribe was mentioned by Wang Yen-te and also in the Annals of the Later Five Dynasties as above shown. Another branch of the Tartars came under the rule of Kirghiz, after the latter had occupied the ancient home of the Uigurs. They lived quite far from the boundary of China and little was known about them, except in book 24 of Méng Hsi Pi T'an (夢溪筆談) by Shên Kua (沈括), a description was given of a tribe "living in the Ulan mountain ranges west of the Kara-muren (喀喇木倫) River," a tributary of the Liao River. The tribesmen were said to be "vigorous and were in the habit of eating raw meat. Cooking was unknown to them." "This tribe," continued the author, "was bounded on the north by the Hei-shui-hu 黑水胡 (now identified with the Hei-shui-mo-ho 黑水靺鞨) and on the south by the Tartars." Because this branch of the Tartars lived in the far north, they had little intercourse with China during the T'ang Dynasty. As to the tribe above described, it resembles the tribe Mang-ku-tzu (冒骨子) as far as living habits are concerned, as mentioned in the Sung-mo-chi-

wên (松漠紀聞). Judging by its northern limits, it also agrees with the Mêng-wu-shih-wei (蒙兀室韋) in the old T'ang Shu and the Shih-wei-mêng-wa (室韋蒙瓦) of the new T'ang Shu. In all probability this is a Mongol tribe.

IV.—THE HOME OF THE TSU P'U AND THEIR INTERCOURSE WITH CHINA.

From the above it is evident that the country of the Tartars was quite extensive in area. In the "Record of Officials" of the Liao Annals, it was reported that "among the tributary nations in the north was the country of Tsu P'u which had quite a large territory, for under its jurisdiction were four Ta-wang-fu (大王府) and three Chieh-tu-shih-sü (節度使司). Its relations with the Liao were frequent and complicated." In the Table of Tributary Nations alone were recorded 96 occasions on which the Tsu P'u either paid tribute to or revolted against the imperial Liao. Of course this does not include the points of contact they had with China as given in the sections on the "Records" and "Biographies" of the Annals. Envoys from Tsu P'u came to China rather frequently. They came sometimes once in several years, sometimes several times in a year, sometimes even twice in a month. When the envoys came at short intervals, it must have been due to the fact that each tribe independently sent its emissary to the Chinese court.

As to the pasturage of the Tsu P'u, the "Biography of Hsiao-han-chia-nu (蕭韓家奴) gives a succinct summary as follows: "The Tsu P'u dated back for considerable time. Formerly they lived as far north as the Lü-chü River 臚胸河 (now the Kerulen River) and as far south as the boundary of China. They were a scattered lot of people, having no internal organizations. They were plundering hither and thither, and when Liao T'ai Tsu sent an expeditionary force as far as the Gobi in the west, the Tsu P'u tribes submitted themselves. With them were also the people of Hsi Yü (西域). Later the imperial court moved some tribes nearer to the national borders and divided the Tsu P'u into three divisions. They had neither forts nor garrisons, but for several generations the Tsu P'u have never revolted." From the above account it seems clear that the northern boundary of the Tsu P'u reached the Kerulen River. As to its western boundary the Liao Annals (Imperial Record of T'ai Tsu) give a brief description as follows: "In 924 (in the ninth moon) the imperial army was stationed at the old Uigur city and on a certain day the order to attack the Tsu P'u was given." Thus a branch of the Tsu P'u tribes appeared to have lived west of the old Uigur city which is now identified as Kara Balgasun (合刺八剌合孫), a small town on the west bank of the Orkhon River (鄂爾昆河), or a short distance to the northwest of Erdeni Tso (額爾德尼昭), Outer Mongolia. Again, in the "Biography of Hsiao Hui" (蕭惠) it was stated that "when the western Tsu P'u rebelled, Nieh Lu-ku (涅魯古) was ordered to suppress them. He met the enemy at K'o Tun city on the east of the Orkhon River." During the Liao Dynasty, then, the western Tsu P'u lived around the Orkhon River which was about the Kingdom of the Uigurs during the T'ang Dynasty.

In addition, the territory of the Tsu P'u tribes is fairly definitely stated in the Chin Annals. The "Biography of Tsung Hao" (宗浩) gives the following description: "The tribesmen of Kuang-chi-la (廣吉刺) are crafty and have coerced other tribes to move inside the Great Wall. Tsung Hao has suggested to the imperial court to attack them in late spring when their horses are weakening. Meantime, the Tsu P'u tribes have also revolted. However, the powerful Hsiang (襄), who after discussing this matter with officials in Peking, has concluded that it would be more advantageous to the Chin court to leave Kuang-chi-la alone, as this would give the Tsu P'u tribes something to worry about in their east." From this it may reasonably be inferred that territorially, the Tsu P'u tribes lived west of the Kuang-chi-la tribe. Further evidence is found in the Yüan Annals and also in the Confidential History of the Yüan Dynasty. In the former, in the "Biography of T'ê-hsieh-shan" (特薛禪) it is said that the tribe Hung-chi-la 弘吉刺 (previously known as Kuang-chi-la) and others lived at the Er-ku-nai River (額爾古納河) In the latter it is stated the tribe Hung-chi-la and others lived at the region where the Kalka River (喀爾喀河) entered Bor nor (貝爾湖) This indicates that the home of the Tsu P'u was situated west of the two rivers—the Er-ku-nai and the Kalka. Further, in the Chin Annals, in the "Biography of Hsiang," mention was made of an official named Hêng (衡) who was ordered to lead an army to take a westerly course to attack the Tsu P'u tribes while Hsiang himself was to start from the city of Lin Huang. Thus, south of the Kerulen River was also found pasture land of the Tsu P'u tribes.

V.—THE T'A-T'A-ERH (塔塔兒).

When we come to study the early Mongol period and particularly before the establishment of the Dynasty we find that another name was used to describe the Tsu P'u tribes. This new name was T'a-t'a-erh. The evidence is briefly as follows: The Confidential History mentions two tribes of the T'a-t'a-erh who were reported to have lived near the Urson River (烏爾順河) which connects Kulun Nor (呼倫湖) in the north and Bor Nor in the south. The document also reports four tribes of the T'a-t'a-erh who lived in the west of the Kerulen River, within the territory of Uchumucin (烏珠穆沁) under the Silingol League (錫林郭勒盟). These tribes were all neighbours to the Hung-chi-la tribe of the Er-ku-nai River and the Kalka River. The same report mentions another tribe of T'a-t'a-erh who lived in the neighbourhood of the Kerulen River. Near them was also a tribe of Hung-chi-la. It may be concluded then that the T'a-t'a-erh occupied almost the same territory as the Tsu P'u tribes of the Chin Period.

For generations, the T'a-t'a-erh were hostile to the Mongols. Khan An-pa-hai (俺巴孩) was captured by the T'a-t'a-erh and sent to the Chin court. Yeh-su-kai (也速該), father of T'ai Tsu of the Mongol Dynasty, was also poisoned by them. Therefore the emperor T'ai Tsu willingly helped the Chin court to kill Mieh-ku-chen-hsieh-wu-lieh-t'u,

a famous chief of the T'a-t'a-erh. Later, when the Mongols conquered four tribes of the T'a-t'a-erh, they massacred all the males of the T'a-t'a-erh, including their children. Although some Mongols seemed to have the blood of the T'a-t'a-erh in their veins, as indicated by such surnames as T'o-t'o-li-t'ai (脫脫里台), Ta-ta-erh (達達兒), Ta-ta-li-tai (答答里帶), and Ta-Ta-tai (答答帶), they were all assimilated by the Mongols. At the beginning of the Mongol Dynasty, there were virtually no full-blooded T'a-t'a-erh surviving.

VI.—PROBABLE REASONS WHY THE TERM "TARTARS" WAS OMITTED
IN THE LIAO AND CHIN ANNALS.

Up to this point two general questions will perhaps suggest themselves: (1) How did the Tartars of the T'ang Dynasty become known as the Tsu P'u of the Liao and Chin periods? (2) How was the term Tsu P'u originated? Since in Chinese history there is no term which sounds or looks like Tsu P'u, it appears extremely difficult to trace its origin. In fact, in intimating suggestions on this point, the writer may appear to be arbitrary and dogmatic. With the limited scope of evidence he now has, he makes bold to suggest that the term Tsu P'u is probably the inverted position of the Chinese characters 鞑靼. He also surmises that this is probably an intentional distortion on the part of the official historian of the Mongol Dynasty. Briefly his reasons are as follows: As above stated, in the unofficial publications of the Liao and Chin periods the writers occasionally mentioned the Tartar tribes, but in the official publications no reference was made to them. It must be borne in mind that the official annals of the Sung, Liao and Chin dynasties were compiled and edited in the Mongol Dynasty. The official editors probably omitted the reference to the Tartars for two special reasons: (1) The Mongols were not Tartars, but the people of the Chin (Han Jên—漢人) and the Chinese (Nan Jên—南人) called them Tartars, which they resented. For the relations between the Tartars and the people of the Liao-Chin period were generally humiliating to the Tartars. What was recorded in the history of these periods was either the revolt of the Tartars, or tribute-paying by the Tartars. Since the Chinese mistook the Mongols for Tartars, they might think that the forebears of the Mongols were subjected to the Liao and Chin courts and were occasionally humiliated by them: and the Chinese might thus despise the Mongols, even though they ruled over them. Secondly, during the reign of Shun Ti (1333-1367), when the annals of the Sung, Liao and Chin were being edited, the prowess of the Mongol Dynasty already had reached a low level, and the Government might want to preserve its false dignity by omitting references to dynastic humiliations. Let us now proceed to the evidence of the case. In the Hui-chu-ch'ien-lu (揮塵前錄) written by Wang Ming-ch'ing (王明清) of the Later Sung Dynasty, there is an account of "a trip to Kao Ch'ang" which is reproduced almost word for word in the Biography of Kao Ch'ang of the Sung Annals. But a careful comparison of the original and the reproduction reveals the fact that in the latter there are six omissions of short passages, each containing the

term "Tartars." Again in the Wang Liao Lu 亡遼錄 (quoted in Vol. 21 of the Pei-mêng-hui-pien—北盟會編) it was stated "that in 1124, T'ien Tsu (天祚), the last emperor of the Liao Dynasty, secured help from Ta-shih-lin-ya (大石林牙), the Tartars and Mao-ko-shih (毛割石) near the Yin Shan region and wanted to re-take Yen Chow (燕州) and Yün Chow (雲州) as he thought he was favoured by Providence in so doing. But Ta-shih-lin-ya strongly persuaded him not to take this step. . . ." The same appeared in appendix II of the Tung-tu-shih-lüh (東都事畧). It was also recorded in the Imperial Record of the Liao Annals and agreed with the other two accounts above referred to, excepting that the term "Tartars" was omitted. Another piece of evidence may be introduced. The Sung-mo-chi-wên reported that Yü-tu (余都) and his son, under the pretense of going on a hunting trip, fled to the Kingdom of Hsia. The people of Hsia asked them about the number of soldiers they had brought with them. They answered that they had only two or three hundred, whereupon they were refused admission. Yü-tu and his son went to the Tartars. "The chief of the Tartars pretended to welcome them and gave them a feast. Secretly he gave orders to attack them. Yü-tu and his son were both killed." This was also recorded in the Liao Annals and was probably taken from the Chi-wên as the latter was an earlier work. But in the Liao Annals the incident concerning the Tartars was omitted. Again, in the "Biography of Traitors" in the Chin Annals, the treason of Yü-tu and his son was reported, as was their murder. But the account failed to show by whom they were murdered. From the above instances it would seem reasonable to infer that the omission of the term "Tartars" in the official histories of the Liao and Chin periods was intentional.

As regards the probable steps whereby the Chinese characters 韃靼 were finally changed into 阻卜, the following may be suggested. In the records of the T'ang Dynasty the characters 達怛 appeared first. Later they were changed into 達韃. But not until the Later Sung Dynasty did one find the term 韃韃 in the historical publications, suspecting that the radical 草 was wrongly added to 達. In the historical sources from which the Liao and Chin Annals drew much material, the terms 韃韃 or 達怛 were occasionally used. They might be inverted to assume the form of 韃韃 or 怛達 which looked somewhat like 阻韃, and 阻韃 frequently appeared in the official annals of the Liao and Chin Dynasties. Now, if the hypothesis of intentional omission is at all tenable, it would require little imagination to say that 阻韃 might really be simplified into 阻卜 so as to distort absolutely the traditional name of the tribe in order to enable the historian not to mention the Tartars in the official histories. As a result, in the whole work of the Liao Annals the name 達旦 appears only once in the Imperial Record of Shên Tsung. Aside from this there is the expression Pai-ta-ta-hsiang-wên-ch'uang-ku-erh 白韃韃相温床古兒 (ch'uang-ku-erh, the chief of the white Tartars) which appears in the Imperial Record of T'ien Tsu. The historian did not try to avoid the name "White Tartars" because they were not related to the Mongols by blood.

The case of intentional omission may be strengthened by introducing an analogous case in the Chin Annals. Originally there were ten places of the military posts under Hsiang-wên (相溫) in the northwest and southwest. But in both the Gazetteer (地理志) and Record of War (兵志) there were only nine places. The Gazetteer mentioned the I-tien-chiu (移典糺) and omitted the Mêng-ku-chiu (萌骨糺); the Record of War mentioned the Meng-ku-chiu and omitted the I-tien-chiu. As a matter of fact both should be included in each work. The Meng-ku-chiu (Mongol chiu) was omitted because the Mongols had once been the mercenary army under the Chin Dynasty, and that event was considered humiliating by the Mongols.

VII.—ETHNIC AFFINITY BETWEEN THE TARTARS AND THE WHITE TARTARS, AND THEIR LACK OF BLOOD RELATIONSHIPS WITH THE MONGOLS.

The people of the Chin and the Sung Dynasties called the Mongols "Tartars," but this was erroneous. In the Mongol version of the Confidential History of the Mongol Dynasty, the Mongols themselves never adopted this name. Since the Ming Dynasty the term "Tartars" has become the proper name for the Mongols, and the "Biography of the Tartars" in the Ming Annals is really the "Biography of the Mongols."

In the Mêng-ta-pei-lu (蒙鞞備錄), by Mêng Kung (孟珙), the Tartars were divided into three branches, namely Pai-ta-ta (白鞞鞞), Hei-ta-ta (黑鞞鞞), and Shêng-ta-ta (生鞞鞞)—White Tartars, Black Tartars and Uncivilized Tartars. The White Tartars were the Wang-ku tribe (汪古部), the Black Tartars were the Mongols: and the activities of the Uncivilized Tartars were once recorded in the reign of Ming Tsung (明宗), the T'ang Dynasty. The Mongols were sometimes known as the Black Tartars, which indicated that they were not real Tartars. For instance, the Mongols called western Liao "Black Kitan," in contradistinction to the Kitan of the Liao period. They also called the Kitan army "Black Army" in contradistinction to the Mongol army. Similarly the people of the Chin called the T'ang-kua (唐括) tribes "Black Tribes," in contradistinction to the white tribes of the Wan-ching-p'ei-man (完顏裴滿) family. Consequently, the term "Black Tartars" seemed to imply that they did not spring directly from the Tartars.

As for the racial affinity between the White Tartars and the Wang-ku tribe, it is probable that both are ethnically related to the Tartars of the earlier periods. As above indicated the Tsu P'u tribes of the Liao and Chin Dynasties lived in the same regions as the T'a-t'a-erh of the early Mongol Dynasty, both being in the northeast of Mongolia. Again there are the Shui-ta-ta (水鞞鞞), Water Tartars, in Liao Tung. So in the Annals of the Later Five Dynasties, the Tartars were called the descendants of the Moho. As above shown, one branch of the Tartars in the Yin Shan region had much intercourse with the Ugurs in the north, Toba (拓拔) in the south and Tang-gan in the west. It is probable that these Tartars became a mixed race between the Moho in the east and Tang-gan in the west. There are also indications that the Wang-ku tribe was composed of half-breeds. In the Mongol Annals it was stated in the biography

of A-la-wu-ssü-t'i-chi-fu-li (阿刺兀思剔吉忽里) that the Wang-ku tribe descended from the Sha-t'o-yen-mên tribes (沙陀雁門), as towards the end of the T'ang Dynasty the Tartars, Sha-t'o (沙陀), T'ui-hun (退渾), and Tang-gan tribes mingled in the north and west of Chên Wu (振武), now Kuei-hua, and therefore there must be considerable racial admixture amongst them.

The Mêng-ta-pei-lu (蒙鞞備錄) also mentioned the fact that Chang Tsung (章宗) of the Chin period built a new wall to the north of Tsin Chow and stationed a T'ang-ku-chiu (唐古紮) as its garrison. Therefore what was known to the Mongols as Wang-ku was known to the Chin period as T'ang-ku, but they could not mean the same tribe, as the change of sound from Wang to T'ang was too unlikely. It must be that in the Wang-ku tribe there were people of the T'ang-ku origin. On the other hand, T'ang-ku and Tang-gan were similar in sound and probably denoted the same tribe.

It may also be added that the term "Wang-ku" practically means mixed race. In the chapter on "Province of Tenduc" in Marco Polo's Travels, King George was, according to western researches, said to be King Ko-li-chi-ssü (關里吉思) of the Kingdom of Kao T'ang (高唐). Although the narrative does not state that the King is a member of the Wang-ku tribe, it says that under him are a class of men known as the Argons. According to Cordier, who edits Yule's edition of the Travels, the Argons are a mixed people, the mixture being from the native Buddhists and the Mohammedans who came from the west. But the writer of this paper thinks that Argon is a sound slightly varied from Wang-ku, both applying to the tribe. Argon also means half-breed, but the racial admixture is not between Buddhists and Mohammedans, but between the Moho from the east and Sha-t'o and T'ang-ku from the west.

The distribution of the Wang-ku tribe was very much the same as one division of the Tartars who lived near the Yin Shan region. In addition, the term "White Tartars," as above shown, has a certain connotation: so there seems reason to believe that the Wang-ku were descended from the Tartars. However, it must be pointed out that the evidence for this contention is far less convincing than in the case of Tsu-P'u and T'a-t'a-erh as already described.

CONCLUSION

To reiterate the main problems of this short paper and to state them in slightly different terms, it may be pointed out, by way of summary, that, in Chinese usage, the term Tartars has reference to certain specific tribes in several historic periods. In the later T'ang and early Sung Dynasties, the tribesmen bearing the name Tartars were living in the neighbourhood of the Yin Shan ranges. They alone had some intercourse with China. Their kinsmen whose home was quite far north from their own, were little known to the Chinese then. After the downfall of the T'ang Dynasty, there elapsed a period of about 300 years popularly known as the Liao and Chin Dynasties, which were in part contemporaneous with the Sung Dynasty. During this period the name Tartars

was not mentioned in the official histories, but certain tribes known as the Tsu P'u approximately occupied the ancient home of the Tartars. The Tsu P'u tribes were scattered over a quite extensive area. They were found near the Orkhon River in the west, the Kerulen River in the north, the Kulun Nor region in the northeast, the tributaries of the Liao River in the east and the Yin Shan ranges in the south. In this extensive area, other tribes also lived among the Tartars. At the beginning of the Mongol Dynasty, however, the tribes living approximately in the same region were not known as the Tsu P'u but as the T'a-t'a-erh. Therefore the Tartars, the Tsu P'u, and the T'a-t'a-erh made their homes more or less in the same territory at different historic periods. As to the question why the name Tartars was omitted in the official histories of the Liao and Chin Dynasties, no positive evidence is yet forthcoming. The writer merely suggests that this is probably a case of intentional omission on the part of the official historians of the Mongol Dynasty. They might be tempted to do this chiefly because the Mongols were not Tartars, but they were thus called by the Chinese. This the Mongols resented. Their resentment was due mainly to the fact that the Tartars had had some humiliating relations with the Liao and Chin courts, whereas the intercourse between the Mongols and the Liao Dynasty was quite insignificant; and not until the Chin Dynasty, did their relations with China grow in importance. Besides the Mongols were rulers of the Chinese and must preserve the dignity of a sovereign people. It is probable, then, that the omission of the term "Tartars" in the Liao and Chin Annals was intentional and calculated.

SILENT NATURE

Soundless as chariots on the snow,
The saplings in the forest grow
To trees of mighty girth,
Each nightly star in silence burns
And each day in silence turns
The axle of the earth
The silent frost, with mighty hand,
Fetters the rivers and the land
With universal chain;
And smitten by the silent sun,
The chain is loosed, the rivers run,
The lands are free again.

THOMAS T. LYNCH.

QUAINT BIRTH CUSTOMS IN WEST CHINA

BY

W. H. HUDSPETH, M.A. (CANTAB)

Among the Miao in Yunnan and Kweichow, there still persist some unique birth customs which are of intense interest to students of Anthropology. There is probably no family of the human race of which so little is accurately known as the Miao and other non-Chinese races of South-west China. A traveller may spend many months with these people and be hospitably received by them : but it is necessary to move amongst the Miao some years and to study them sympathetically before they will speak of tribal practises. In this they are like all primitive peoples throughout the world. I here cull from my note-book observations on quaint birth customs, which I have made during the past ten years.

The Miao in common with most Eastern people intensely desire children, and childless women are despised. Such women eat a mountain herb to ensure their having a child, and in many cases this is effective. A native doctor whom I know well has cured many women who came to him from two, three and even four days journey away. Once I heard of a childless wife being sent away by her husband to consort with another man until she should find herself with child. This expedient is not unknown amongst the Chinese.

During pregnancy, a mother does not observe any rules as to diet and behaviour ; but after the birth, she is secluded and regarded as unclean. The mother's seclusion is for two or three days only, as there is too much work to be done on the farm to allow of her resting longer, but for a whole month she eats her food apart from the other members of the family. I have known many instances where a woman has given birth to a babe one day and on the following day has attended to her work in the fields. In Miao families, the mother is the cook ; and it is part of her work to carry all water needed for daily usages. During this month, however, some other person cooks the food and brings the water. The mother's food, which at this time is slightly better than usual, is placed in a separate pan from that used by the family, while the basin and wooden spoon which she uses are inviolable. They are not to be used or even touched by any other person. During the days of seclusion, it would be a crime for the mother to go into any neighbour's house ; and, should she go next door or to any house to borrow anything, she must stand at the door. Under no circumstances is she to cross the threshold. At this time, too, a strict diet is observed ; and no pickles, fruit or anything sour is eaten. When her month is completed, the mother washes her clothes and all the vessels she has used, whereupon her disablement is at an end and she is permitted again to be a normal member of society. It is very much feared that any

QUAINT BIRTH CUSTOMS IN WEST CHINA

infracton of these ceremonies would result in the person transgressing being struck by lightning.

A strange dread attaches to the mother's milk. It is commonly believed that, should a drop of the milk accidentally come into contact with food given to the cattle, they will be struck by lightning.

There is little distinction made between the coming of boys and girls. Both are welcome. In this matter the Miao are very different from the Chinese, though a remarkable case amongst the Chinese has come to my notice. A Chinese woman working in the fields gave birth to a baby girl. Fearing her husband would not want the child, she went home leaving the infant in the field. In the evening her husband came in, and, noticing his wife's condition, he asked where the babe was. She explained that the child was a girl and that she had left her in the field. "Girl or boy, I want my child," said the husband. The babe was brought and is now a big girl.

If twins be born (though happily this is rare) the mother is greatly frightened. Should one of the twins die, a rough dummy of the dead child is fashioned and a pretence is made that the child is still living, as it is believed that though there are two persons, there is only one life. When the twins marry, whether the twins be two boys, two girls, or a boy and a girl, it is indispensable that both marry on the same day.

It is commonly believed that there is a sympathetic union between a newly-born child, the after-birth and the umbilical cord. The fortunes of the individual for good or evil are supposed to be bound up with the after-birth and umbilical cord, so that if these are properly treated the child will be prosperous, whereas if they be injured, he will suffer accordingly. If they be thrown away the child will die. In the case of a boy, the after-birth and cord are buried at the base of the central pillar of the house; while in the case of a girl they are buried under any one of the side pillars. When the babe is young, the water in which he is washed is emptied over the place where the after-birth and cord are buried. If, when the child is older, the umbilicus is sore, it is bathed and the water emptied over where the after-birth and cord are buried. When a child dies, the wizard often divines that it is because the after-birth and umbilical cord have not been properly treated.

Little ceremony attaches to the naming of the infant. The mother's parents are the people who give the name to the first child. To girls the name of some flower is given, while boys are given some such name as "The-Guest-has-come" or "The boy-of-good-features-has-come."

A quaint belief centres round the crying of babes which are being nursed. The child's crying is said to be due to the attacks of a small ghost called the "Ah-shae." It would appear that a very long time ago an unmarried girl gave birth to a babe. This is not uncommon amongst Miao. The young mother strangled the child which now in the land of shades is ever hungry, and, seeing mothers nurse their children, the small ghost wants the milk and comes to snatch it, thus causing young babes to cry. The "Ah-shae" does not trouble the mother, it worries the child. Happily, wizards can capture this ghost; and when the crying becomes troublesome, the assistance of a wizard is sought. He

heats pork fat in a pan until it is intensely hot. Pouring this into a basin that he holds in one hand, and taking a lighted resinous stick in his other hand, he drinks and spits out the heated fat around the house, and after some time succeeds in driving the "Ah-shae" into a small gourd which he has brought for the purpose. Once the small ghost is in the gourd, the wizard corks it and takes it away from the house. Afterwards he stands in some concealed place near a road, and, when a woman carrying a babe is passing, he lets out the small ghost, which goes after the unsuspecting travellers. A cross, marked with soot on the forehead of a child, is very effective in keeping away this undesirable ghost.

Frequently an elaborate ceremony attaches to the first cutting of the child's hair. When the mother wishes to take the child out of doors for the first time, she snips off a little of the babe's hair, which she places in one of the side walls of the house. It is said that this prevents the babe from catching cold, and ensures that the child will not be afraid of thunder. A woman who has had difficulty in rearing children, however, consults a wizard about the first hair cutting ceremony, and he insists that a maternal uncle must officiate at the ceremony. Under these circumstances, the hair is not cut until the child is three years old: and then it is not clipped, but is shaved. The usual procedure is for the maternal uncle to buy the razor and to present the child with a cap, a kind of loose blouse, a pair of trousers and a pair of shoes. For the occasion two pigs are slaughtered, one for the child whose head is being shaved. It is generally only for boys that so great an expense is incurred. A hind leg of this pig is given to the uncle. A second pig is killed for the uncle's reception and he is presented with a half of this. Before commencing the rite, the uncle places a cord, which he has made of wool and hemp, around the child's neck saying "Pluto with a chain of iron cannot bind you. I bind you with this cord of wool, May you live a thousand years and may your hair grow whiter and whiter."

EUROPEAN MOTIFS IN CHINESE ART

My dear SOWERBY,

Reading *The China Journal of Science & Arts* last night. I came across—"European Motifs in Chinese Art" on page No. 208 in the May issue.

Among my collection of Chinese brasses.—I have a pony—which, to my mind, shows a distinct foreign influence in the making and I shall be glad to place it at your disposal if you are interested.

Yours sincerely,

W. J. N. DYER.

We hope to give in our next issue a picture of Mr. Dyer's horse, which has an interesting history, and, except for one other specimen, appears to be unique.—Ed.

A SHORT SKETCH OF THE CHINESE LIBRARY DEVELOPMENT

BY

JOHN C. B. KWEI

Confucius and Lao-tze have clearly told us in their writings that the most ancient mode of recording thought was done by knotted cords. This mnemo-technical method of remembering data of various kinds seemed to have been common all over the globe among the peoples of a primitive civilization. The necessary pre-requisites for library development are writing, pen, ink and paper. The invention of Chinese writing in the proper sense of the words is credited to Tsang Hsieh, who is said to have lived in the 28th century B.C. Old fables represent him as a person of four eyes and possessing the face of a dragon. He accomplished the written characters by imitating the foot-prints of birds. Mung Tien, a general in the third century B.C., is commonly said to be the inventor of the writing brush of hair. Ink was discovered by Wei Tan, who lived in the 4th century A.D. He made ink out of lamp black and mixed it in a mortar with a solution of gum or gluten. The manufacture of paper from the inner bark of trees, ends of hemp, old rags and fishing nets was first carried out by Tsai Lun, the chief eunuch under the Emperor Ho-ti of the Han Dynasty (89-105 A.D.).

China is one of the cradles of ancient civilization in the world and her history is largely a record of despots and despotism. For the sake of convenience, we may divide the Chinese library development into three periods:—(1) The time before Confucius; (2) The time of and after Confucius up to the formation of the Chinese Republic; and (3) The conditions after the inauguration of the Republic to the present day.

Chinese historians generally regard the basin of the Yellow River as the cradle of the Chinese people, and state that their ancestors were nomads, who some five or six thousand years ago migrated from the north-western part of Asia and finally settled in what is now the province of Shensi. From the time before Confucius was born in 551 B.C., many inventions have been recorded, like the compass, the boat, the cart, the bow, the arrow, bamboo and musical instruments, the calendar, weights and measures, and, the most important of all, writing. There can be little doubt of the existence of many written documents on bamboo tablets, but most of them have been lost, leaving no name and scarcely a trace behind. We may regard this period as preparatory to the present book making and collection.

The age of Confucius and downwards witnessed a succession of distinguished writers, famous for their theories and the freedom of their utterances, like Lao-tze, Mencius, Mih-tze, Sun-tze, and others. It is fortunate that most of their writings have come down to us, though not in their original forms. The practice of forming a national collection

of books under the supervision of the government did not make any headway, till 25 A.D. This act was prompted by the extinction of all the records of the past, excepting only works on medicine, divination and agriculture, during the Chin dynasty. With a view to governing the people for ever and ever with ease and leisure, the first emperor of the Chin Dynasty wished to keep the intelligence of his subjects as low as possible. In order to do this effectively, he boldly ordered the burning of all existing books, with the exceptions mentioned above, and the burying alive of all the literati. In the long run, this dynasty came out shorter than usual, and the succeeding dynasty, Han, in order to see that the court ceremonies and music were carried out in the proper order, according to the standards of the former dynasties, made every effort to gather the relics of the past, which were found in the walls of the houses, in caves in the mountains and even in the beds of rivers. What these sources failed to reproduce, old men came forward to supply from their well-stored memories, and thus were kept alive the torches which had been lit by the genius of bygone writers. Furthermore, officers were appointed to examine the classics, works on divination, medicine, the art of war and others. As soon as the task was finished, Lew Heang was officially appointed to take charge of this collection. He even tried to arrange it, index it and make a digest of its contents. It is reported that there were 3,123 sections on the classics, 2,705 on philosophy, 1,318 on poetry, 790 on military matters, 2,528 on mathematics, and 868 on medicine. Nearly every succeeding dynasty since the Han has imitated this practice of forming national collections of the native literature, which certainly has added much to the advancement of the nation in mental culture. The driving force of all this is the veneration of the old, more than anything else. As time went on, many new inventions have accelerated the increase of books, such as cheaper and better paper, and printing. Fung Tao is usually regarded by the Chinese as the inventor of printing, and holds much the same place in Chinese history that Gutenberg holds in that of Europe. From his day, printing became a fine art. The books of the Sung Dynasty have never been surpassed in skill of printing. On the other hand, toward the end of each dynasty, books belonging to the national collection have been more or less burnt, or lost, because of chaotic conditions.

The early part of the eighth century, Tang Dynasty, has marked a flourishing period for library development under the monarchical rule. The number of works described in the official record of the national library amounted to 53,951 books; besides which there was a collection of 28,469 recent books. The thing which may interest all Chinese librarians is that the classification which was then used has been followed with very little modification to the present day. The four main divisions are Classics, History, Philosophy and Miscellanies.

In the Ming Dynasty, about the fourteenth century, Emperor Yung-leh determined to signalize his veneration of the past by the publication of an encyclopedia. Two thousand persons were ordered to carry out the work and at the end of four years they were able to report to the emperor the completion of their labours, which were represented by an

A SHORT SKETCH OF THE CHINESE LIBRARY DEVELOPMENT

encyclopedia in 22,937 volumes. But for some reason, they were not printed.

Three centuries later, Kang-hsi, the second emperor of the Manchu Dynasty, conceived the idea of renewing Yung-leh's project, and, like that emperor, he appointed a commission to give effect to his design. The work was colossal. It was required that they should extract from every work of authority all passages bearing on the following six general categories: (1) The Heaven; (2) The Earth; (3) Mankind; (4) Inanimate Nature; (5) Philosophy; and (6) Political Economy. For forty years the commissioners toiled. In the meantime he retired; and his son had been upon the throne already five years, when the weary commissioners were able to write "Finis" on the last page of the 5,020th volume of the Tu Hsu Chi Cheng (Complete Collection of Ancient and Modern Literature, with illustrations). Tradition asserts that only a hundred copies of this work were printed, all being distributed as imperial presents among the princes of the blood and the highest officials in the empire. The most famous Chinese dictionary, Kang-hsi Chihiden, was also accomplished under the same emperor.

About twelve years after the death of Kang-hsi, Chien-lung, one of the very wisest emperors, came to the throne. By his order, every known work of antiquity, as well as everything in print from the pen of well-known authors or poets, was collected, revised and reprinted at the expense of the government. The entire collection, comprising six thousand volumes, was issued under the title of Shih Ku Chuan Shu, or "The Complete Set of the Four Libraries." "The Libraries" here mentioned, were the "Libraries of classics, history, philosophy and miscellanies," into which the whole work is divided. Chi Yue was the editor-in-chief of this whole work and he had made a synopsis of each book for the information of his studious master. At present this synopsis is issued in separate volumes and can be considered as a key to the vast masses of Chinese books. In this connexion mention must be made of the Commercial Press, Shanghai, which has made satisfactory arrangements with the government to print the whole original set, at as low a cost as possible. Before long we may have the chance to possess one copy ourselves.

So far we have seen that the soul of library development under the absolute monarchy was the emperor, and the background of forming national collections was more respect of the old, than diffusing knowledge among the general public. Only persons of nobility and classical education were able to have free access to the library. But this did not last indefinitely. In 1910, a year before the Chinese Revolution, a library with the purpose of serving rich and poor, old and young, educated and uneducated came into existence. This is the Boone Library, Wuchung. In 1914, this library introduced travelling libraries into China, and in 1920, a library school, as a part of the library, was also opened. With reference to the attitude taken by the Central Government toward the library movement, on April 11, 1915, the Ministry of Education promulgated eleven regulations which emphasize the promotion, organization and administration of libraries. But on account of political and

economic reasons, the results are not very remarkable. Socially speaking, the people have begun to realize the importance of libraries. Funds to erect libraries have been donated by altruistic persons, though these are few in number. The most important evidence of this new spirit is the gift of about five hundred thousand dollars by ex-Tuchun Chi Hsieh-yuan to the library of the South-Eastern University, Nanking, in memory of his father. During the past few years, local library associations have sprung up like mushrooms. On June 2, 1925, the National Library Association was formally inaugurated in Peking. Its main purpose is to accelerate the Chinese Library Movement. With this in view, a library monthly bulletin has already been started. A library quarterly is now under consideration and preparation. Notwithstanding the good impression I have mentioned in regard to the conditions after the Republic, it cannot be denied that an enormous amount of work remains to be done. What China needs is not the exact copying of what other nations have achieved in the library work. She has a mission of her own and something different and unique to contribute, though one realizes that long years must pass before real success can be achieved.

NOSTALGIA

BY

MAUD HUBBARD BROWN.

When I was young, I never saw a mountain,
When I was young, I never saw the sea,
 And that was why I used to dream
 How those two splendid things might seem,
And could not rest, and came away,
To far-off, ancient, famed Cathay.

But O, the fields of golden rod,
And O, the tasseled corn!
 And was it I, who used to view
Such splendid things with scorn?

And O, the piquant Aprils,
And O, the summer's green!
 And did I barter beauty, held,
For loveliness, unseen?

Now I have climbed the serried hills of China,
And I have sailed her tossed-up yellow seas,
 But O, the prairies, where there grow
 The white primroses, row on row,
And far off vistas, where the rain
Marches across the purple plain!

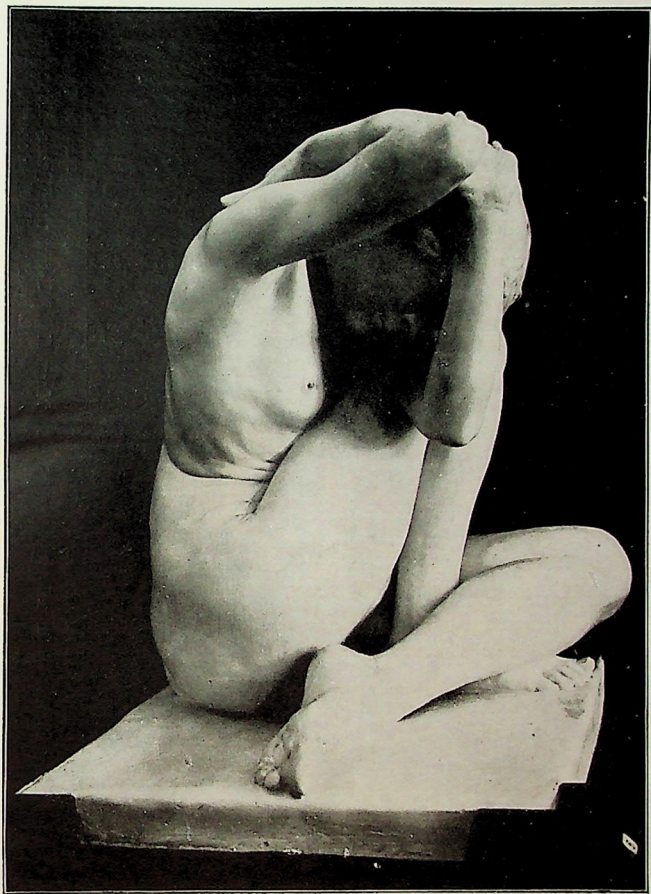
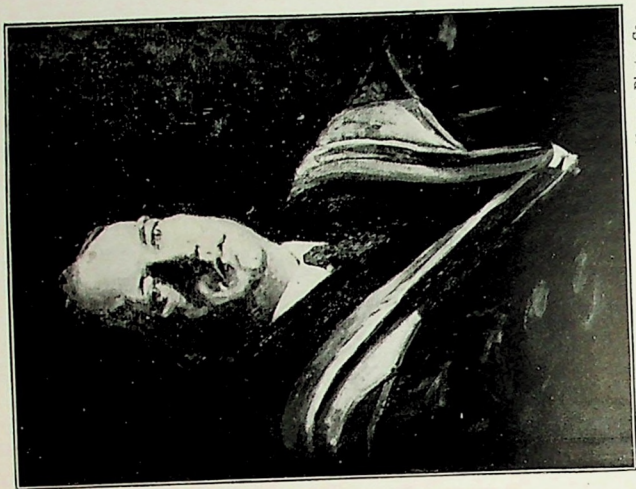


Photo by Young Photo Co.

"THE WOMAN."

This Beautiful Statue by W. W. Wagstaff was Exhibited in the Royal Academy. It formed one of the chief attractions at the recent Art Exhibition held in Shanghai.



Photos by Young Photo Co.

Portrait of Dr. Harley McNair. From the Oil
Painting by Mrs. S. P. Clement.



Study of a Baluki. From the Oil Painting by
Mrs. Vera Deas.



Boy's Head. From the Study by Mrs. R. Cecil Robertson.

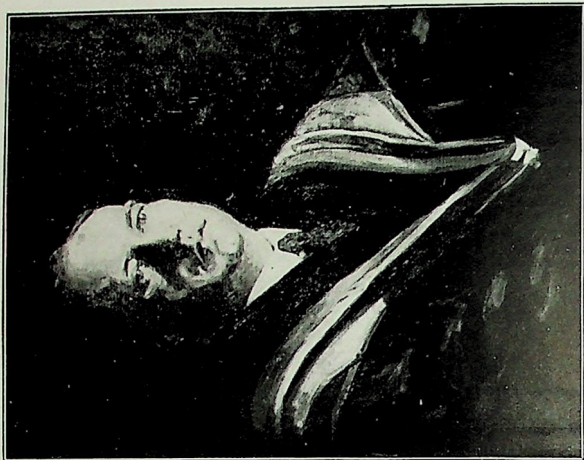


Photos by Young Photo Co.

"Eyes that Smoulder." From the Pastel Study by Ralph Rowntree.



Study of a Baluki. From the Oil Painting by
Mrs. Vera Deas.



Photos by Young Photo Co.

Portrait of Dr. Harley McNair. From the Oil
Painting by Mrs. S. P. Clement.



Boy's Head. From the Study by Mrs. R.
Cecil Robertson.



Photos by Young Photo Co.
"Eyes that Smoulder." From the Pastel
Study by Ralph Rowntree.



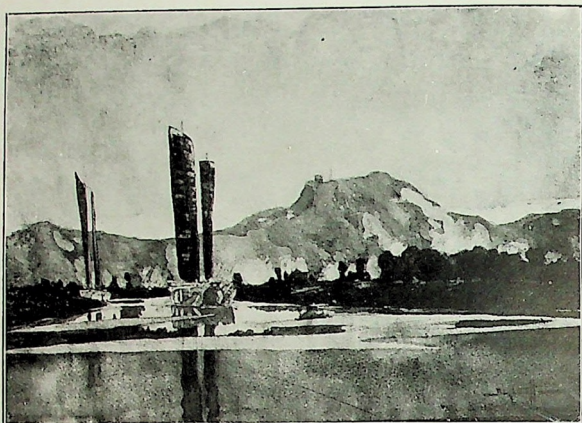
"Chinese Children." From the Water-colour Study by Elizabeth Otis Dunn.



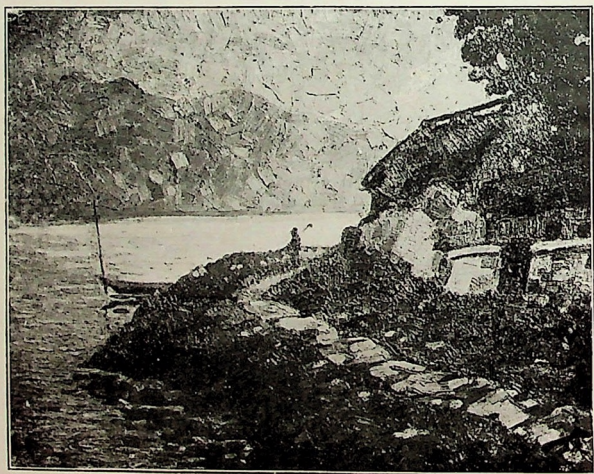
Photos by Young Photo Co.
"Goolie with Umbrella." From the Water-colour Study by Mrs. R. Cecil Robertson.



Two fine examples of the work of Mr. Coldmoon Y. S. Tao, a young Chinese Artist, who is trying to combine the Soul of Chinese Art with the body of European Art.



"Dawn at Soochow." From the Water-colour Painting
by B. Krenoff.



Photos by Young Photo Co.

"The River Bank." From the Oil Painting by Fong Tse Ching.

EDITORIAL COMMENTS

LI LUNG-MIEN

THEORY VERSUS FACTS

Agnes E. Meyer has written a book on Chinese Painting, as reflected in the thought and art of Li Lung-mien, which was published by Duffield and Co., New York, late in 1923. This large volume of nearly 250 pages attempts to picture according to the author, "the swaying of the Chinese pendulum between customs and creation, the story of human conventions destroying humanity, the tragic inevitability of which is softened by the thought that tradition, as in the case of China, often makes us great before it slays us." The author explains that she chose Li Lung-mien for her theme because she "found that, bound up in one Chinese artist's life and interests, were those of all his predecessors and all who came after him. Of its own accord the story spread out until it touched the first dim years of Chinese history and illumined some of the very things that China feels and thinks to-day." She claims further that Chinese art "has an especial value for us at present. In spite of all our scientific discoveries, the lessons of actuality have not yet been incorporated in our scheme of human behaviour. The romantic, the philosophic and the speculatively religious patterns established by our scholastic ancestry still hold us firmly in their grasp. Chinese life, on the other hand, was founded upon a highly developed understanding of the universe which, though lost at times, was ever recaptured and reinvigorated by later teachers who saw the value of that early wisdom." Mrs. Meyer has her own theory of life also. "It is in the conquest of our temporary truths that all such manifestations as religion, science, art and philosophy are born. They are the records of the growth of the human spirit and they are valuable to posterity only as they continue to contribute to that growth. To this extent they are interesting, as indications of the life quest; but woe to those people who would put them above the quest itself! Woe to those who would live by dogmatic systems of philosophy or religion or art rather than keep their attention tenaciously fixed upon the natural sources of such achievements! Those are the innumerable souls who prefer theory to fact." Temporary truths, life quest, woe to dogmatism in religion, philosophy or art—these are the catchwords of the viewpoint of the authoress. I think that I know what is meant by "dogmatism in religion, philosophy or art" and am fully prepared to join in unqualified denunciation of it; but I am not sure that I comprehend the meaning of the other two phrases—temporary truths and life quest. This does not perturb me, however, for I have read this book to find out the author's opinion of the place of Li Lung-mien in the pictorial art of China and not to become familiar with her philosophy of life.

It is the facts of Li Lung-mien's record as a painter that lure me, and, in reading the Preface, I find that it confirms the statement of the preliminary announcement concerning the inclusion of "the entire catalogue of Li Lung-mien." These were of such interest to me that I subscribed and sent a cheque of U.S. \$10 for the book, but when it reached me I found a "Note to the Second Edition" in which it was stated that "the catalogue of Li Lung-mien's paintings and the bibliography have been omitted from this edition." Further inquiry elicited the fact that the edition de luxe, selling for \$100, is considered the first edition and that the deleted edition sent to me is the second.

Mrs. Meyer considers her subject under three heads: (1) The philosophical background of Li Lung-mien; (2) His intellectual life; (3) His art. The philosophical background is in reality a discussion of the "Three Religions," San Chiao, of China, a loose term which originated in the time of the Three Kingdoms. Confucianism

is rightly considered to be a restatement of the ancient wisdom of China. The author considers Chinese art to be Confucian both in its origin and its development; it expresses a racial rather than an individual point of view. It makes a conscious effort to preserve the ideals and traditions of the nation. The second chapter, which treats of Li's intellectual life, may be summarized in a paragraph.

"The interaction of these traditions in Chinese pictorial art may be with accuracy compared to the structure of a piece of woven material. Confucianism is the woof which acts as basis and framework of the whole. Without the strong organization of the Confucian state and its creation of comparatively peaceful conditions that made production possible; without the deliberate encouragement of art carried on by the emperors, or the careful preservation of art products, both ancient and modern, in imperial galleries and academies; above all things, without the Confucian insistence upon continuity of subjects and techniques, Chinese art could scarcely have existed at all, would certainly never have developed so broadly or so magnificently, and would inevitably have perished in the numerous destructive conflicts, or by the natural deterioration of time and accident. Through this Confucian woof runs in and out the warp of Taoism, lending an endless variety of pattern and colour, a richness of imagination, of gayety and humor, in short, much of what is fascinating, charming in this most beautiful of cultural fabrics. Through their constant reiteration of nature's importance, through their frequent re-inspiration by unbroken contact with the peace and splendor of nature's domain, through their preservation of the scholar's ancient independence of thought, they kept their art a living one, expressive of themselves, developing as they developed, glorious and free as long as they were, becoming a mechanical reiteration only when the flaming inspiration of their Taoist fathers had been quenched. Then the pattern-giving warp wore thin and the woof stood out lifeless and unadorned. In the most beautiful moments of this tapestry were noticeable some strands of precisely the same weave but of different hue that lent a note of interesting novelty, exotic in quality and attractive through that very strangeness; that was the influence of Buddhism. These strands contributed delightfully to the variety of the fabric. Were they removed, a considerable gap would make itself felt; but to the fundamental structure they added no necessary element, and the pattern even without them would have been of transcendent beauty."

These two chapters are Mrs. Meyer's interpretation of the religion, philosophy and art of China previous to the time of Li Lung-mien. On the whole her views will be generally accepted as sound, though her terminology as well as her casual references reveal a lack of familiarity with the "broad learning" to which she refers in the Preface. A few instances may be cited. On page 118 reference is made to "The Brownish-Red Wall" which, of course, is Ch'ih Pi (赤壁), the hill on the side of the river where the great naval battle was fought in which Ts'ao was defeated by Chou Yu and Liu Pei. This famous site is referred to as "a certain hill near the Yangtze." It is as familiar to young Chinese students as Trafalgar or Thermopylae to ours. On page 105, in a description of the "Poetical Gathering in the Western Garden," reference is made to the "pretty girl who is one of the handmaidens in Wang Chin-ch'ing's household." Any one familiar with Wang Chin-ch'ing, brother-in-law of the two Su's, knows that the translation should have been "two handsome women" and that by these were meant Wang's two famous concubines Yün Ying (雲英) and Ch'un Ying (春英). On page 101, footnote 3, there is a reference to "the K'un-wu Knife." This should be "a knife or tool from K'un-wu," K'un-wu being the name of a hill from which a superior type of iron was obtained. On page 50 it is said that the term "Chü-shih" (居士) is of Buddhist origin, although on a preceding page the authoress took pains to dispute the statement "that the withdrawal from community life in the third cent. B.C. is proof positive of an early Buddhist influence in China." The term "Chü-shih" (居士) is used in the Book of Rites, Li Chi, and refers solely to "withdrawal from Community life." On page 103 there is mentioned a "Ma-t'i stone" as if it were some variety of stone; whereas ma-t'i (馬蹄) refers only to the shape, viz. that of a horse's hoof, small at the top and larger at the bottom. These are all trifling instances but they are sufficient to serve as a warning to the increasing number of persons who undertake translation of books dealing with special topics before having acquired a sufficient foundation in general literature. To all such

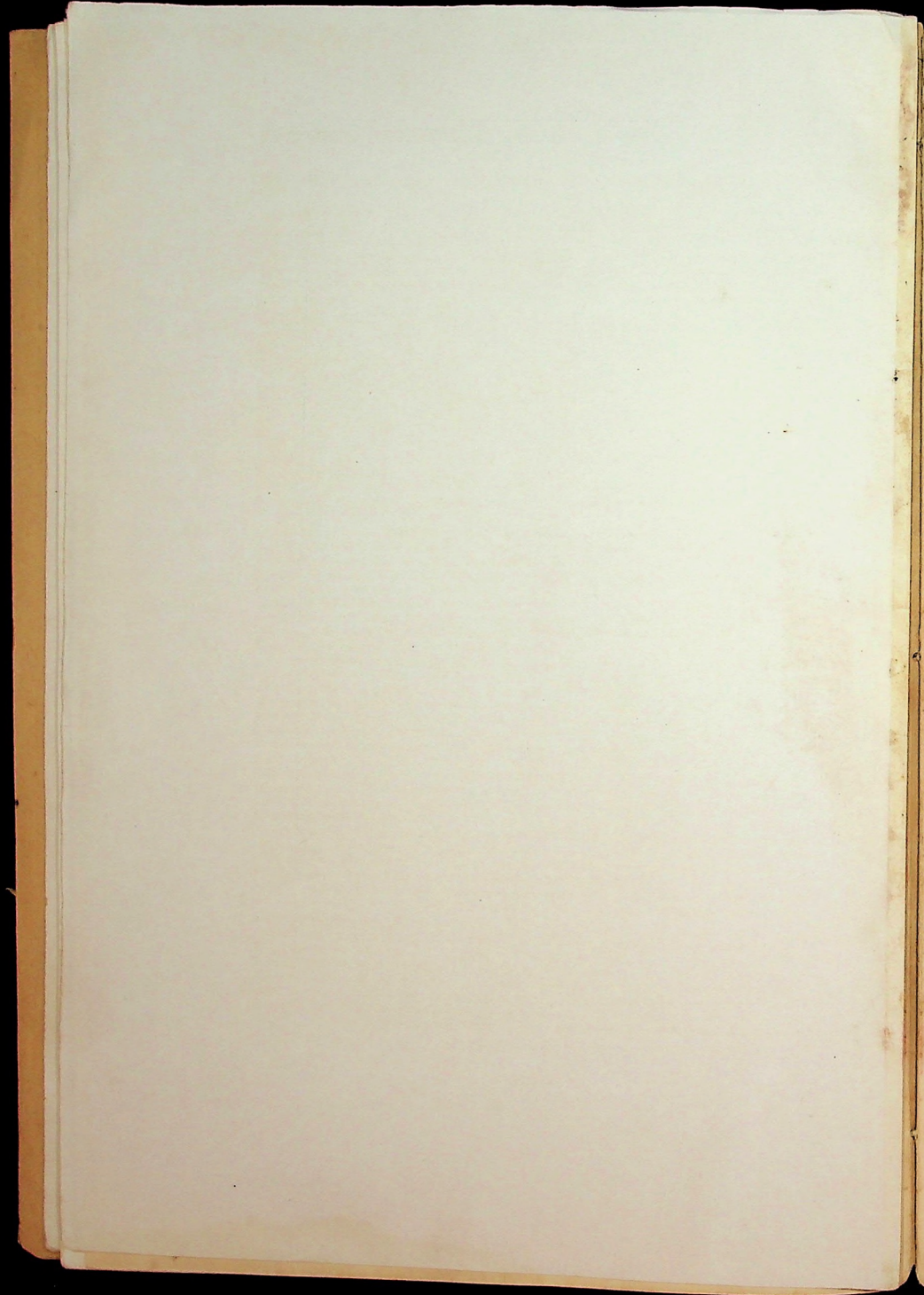
瑞應經云淨飯王嚴駕抱太子謁大自在天神廟時諸神
像志起禮拜太子是父王驚歎曰我子於天神中更尊勝

宜字天中天



Specimen of the Writing of Li Lung-mien
from the Scroll of Wu Tao-tzu entitled
"The Presentation of Buddha"

送子天王圖



EDITORIAL COMMENTS

there are pitfalls in almost every paragraph, and from these even the aid of able young Chinese translators cannot save them.

The art of Li Lung-mien occupies only 74 of the 243 pages of this volume and this, it must be remembered, is the central theme. I must confess that without the catalogue and the bibliography, the facts of Li Lung-mien's art seem to have too little consideration in comparison with Mrs. Meyer's theories concerning the philosophy, religion, and art of China. But here one must remember that the title of the book is not Li Lung-mien but Chinese Painting as reflected in the thought and art of Li Lung-mien.

The twelve illustrations are taken from four paintings—"Laotzu Delivering the Tao Te Ching," "The Lotus Club," "An Album of Lohans," and a "Hunting Scene." They are beautifully reproduced and give the reader a good idea of the greatness of the art of this superb painter. At the same time these four paintings, even if they are admitted to be genuine specimens of the work of Li Lung-mien, can scarcely be considered to be the paintings which Chinese critics have praised as the best and most representative of those which have been preserved. None of these paintings is mentioned in the Hsüan Ho Collection, nor is any one of them included in the collection of Chao Meng-fu. "The Lotus Club" is first mentioned in the Ch'ing Ho as included in the collection of the famous Ming dynasty statesman, Yen Sung, and in this same collection there was a Lohan picture but no Lohan Album. I am not sure what picture is meant by the "Hunting Scene" but presume that it is Fei Ch'ü Hsi Shu (飛鷹習射) which is first mentioned in the collection of Chao Meng-fu. As far as I know the first reference to the painting "Laotzu Delivering the Tao Te Ching" is made in Shih Pai Chai Shu Hua Lu (十百齋書畫錄), written in the early part of the late Manchu dynasty, and the first mention of a Lohan album is in the Ch'ien Lung collection. These facts are not noted for the purpose of casting any doubt upon the genuineness of these four paintings, about which I do not feel free to express an opinion, but only to point out that they are not specimens which have been regarded as typical of Li's work or influential in the development of Chinese painting. Among the "Four Beautiful Objects"—*ssu mei chü* (四美具)—the Emperor Ch'ien Lung in his annotation on the Nü Shih Chen of Ku K'ai-chih notes three paintings by Li Lung-mien, viz. "A River (or streams) in Shu" (蜀江, 蜀川), "The Nine Songs" (九歌), and "The Hsiao and Hsiang" (瀟湘); but of these three only one, "The Nine Songs," is included in the Hsüan Ho collection. This also is the only one mentioned by Chang Ch'ou, the best critic of the Ming dynasty, in his Ch'ing Ho. The earliest critiques of the Manchu dynasty, such as the Ta Kuan Lu, T'ieh Wang Shan Hu, Keng-tzu Hsiao Hsia Lu and Shih Ku T'ang, all refer to it. This painting is in the Government Museum, Peking, and must be considered to hold the premier place among the surviving specimens of Li's work. Next in importance must be placed the "Hsiao Hsiang" (瀟湘), "The River in Shu" (蜀江), "The Five Horses" (五馬), "The Five Hundred Disciples" (五百塵真), and "The Drunken Priest" (醉僧). By the use of the word "importance," I refer not solely to the artistic merit of the paintings, which is a matter always of personal choice, but to their influence upon later artists and thus upon the subsequent development of the art of painting in China. Whatever may be the estimate by any foreign writer as to the relative merits of Chinese paintings or Chinese artists, the only standard which can be considered fixed and unalterable is the consensus of Chinese critics. Our aim, as foreigners, in studying Chinese pictorial art should always be to discover this standard. It need not control our own preferences as collectors, but it must be the criterion as to whether or not our opinions are correct.

I should like to discuss more fully this chapter on Li's art, but am handicapped by not having a First Edition which contains the Catalogue, Category and Bibliography. As a whole the book is not easy to analyze. It contains many valuable translations, it discusses Chinese civilization sympathetically, and it gives a good composite view of the essential elements which entered into the growth of a good Chinese painter. Its greatest usefulness is in giving to the English reading public the views of Chinese writers; while its chief weakness is the inability of the authoress to estimate these views at their true value in their actual perspective.

J. C. F.

THE ART EXHIBITION IN SHANGHAI

Owing to the fact that this exhibition was held the last week in April, the following report was necessarily too late for the May issue, but we feel that interest in the exhibition has been sufficiently keen to justify its inclusion here.

Taking it on the whole, it may be said that the work exhibited was of a higher average standard than that shown in the two previous exhibitions, but, on the other hand, there were fewer outstandingly interesting pieces. A good many of the exhibits were merely studies, while many more were portraits. Some of the latter were excellent. Outstanding in this class of work were two oil paintings by Mrs. V. Deas, showing the head and shoulders of a Baluki and a Kurdish Coolie, respectively. The same artist's oil painting of a Chinese temple front was remarkably good. Mrs. J. E. Denham's water-colours of Chinese junks, done during her recent visit to Foochow, were very good and were much admired. The freshness of the colours and the interesting compositions and subjects of this artist render her works particularly pleasing. There is less of the mere study and more of the finished picture about them. Victor Podgoursky's work was represented by but a few pieces, though these were fully up to his usual standard. Indeed, it was a great pity that this talented artist did not send in more of his work. Mr. P. P. Stoopin sent in a number of small oil paintings and charcoal sketches showing analysis of colour and form, but we were disappointed with this artist's exhibits as compared with those of last year. We understand, however, that both he and Mr. Podgoursky have done a lot of interior decoration work during the past year, as well as teaching at the Shanghai College of Fine Arts, and so have had but little spare time.

Mrs. C. J. Ferguson had two good portraits in the exhibition, while Mrs. Elizabeth Dunn's work was well represented by crayon and pastel portraits and a series of delightful studies in colour of Chinese children. As an interpreter of Chinese child life this artist is unbeaten. There are a clearness, precision and definiteness about her work that place her in the front rank of local artists. Turning to the work of the members of the Art Departments of the British Women's Association and the American Women's Club, we would like to point out, without meaning any offence, that their work, while extremely good, shows a considerable sameness. The reason for this is not clear, unless it be that these artists are in the habit of working in groups, using the same models, or painting the same landscapes, and that by their close association they are approximating each other in style and technique. If the artists of these groups would do less of the "study" work and branch out along individual lines on the creation of finished "pictures," we feel sure that they would greatly increase the interest of their work. Amongst this group of artists the studies of Mrs. R. C. Robertson, mainly of natives, were specially worthy of note, as also were the courtyard and temple exteriors of Mrs. R. J. Roberts and Mrs. S. P. Clements' portrait in oils of Dr. Harley McNair. We were a little disappointed with Mrs. Mary F. Swan's group of water colours this year, but she is to be congratulated on the success of her oil painting of a group of Chinese temples. Again, Mrs. Swan has been busy with interior decorating work and has had little time for other painting.

Mr. Ralph Rowntree was represented in the exhibition by a set of pastel studies, which, while showing careful work and a mastery of materials, leave us with a feeling that it is a pity that an artist who can do such good work as the Chinese coolie's head, exhibited last year, and the Sikh's head in the present exhibition, should spend his time on what to us appears trifling by comparison. We do not wish to suggest that the work shown was bad, but that the artist is capable of so much better and more serious work.

An artist whose work is new to Shanghai, and which is not to be overlooked, is Mr. Mstislav Stehirovsky. A set of exquisite decorative panels or plaques—we hardly know what to call them—showing work of minute detail and very fine drawing introduce this artist to us. His works would make excellent illustrations for a book like the Arabian Nights or the Rubayat. We understand that some of it is designed for reproduction in cloisonné work.

Mr. George T. Squires exhibited some very pleasing water-colour landscapes, while Mrs. Squires showed two well executed designs for tapestry, as well as some

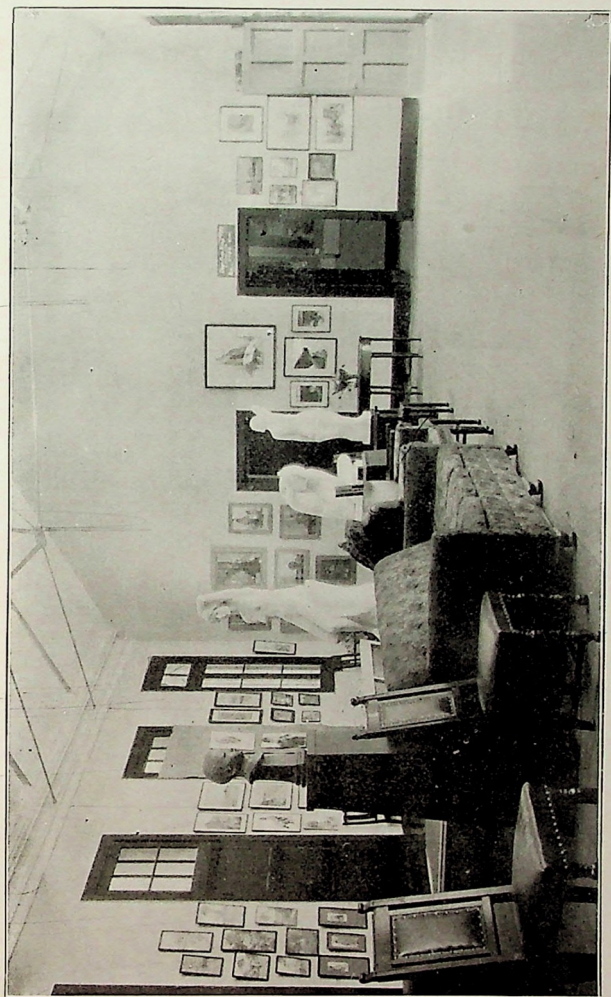
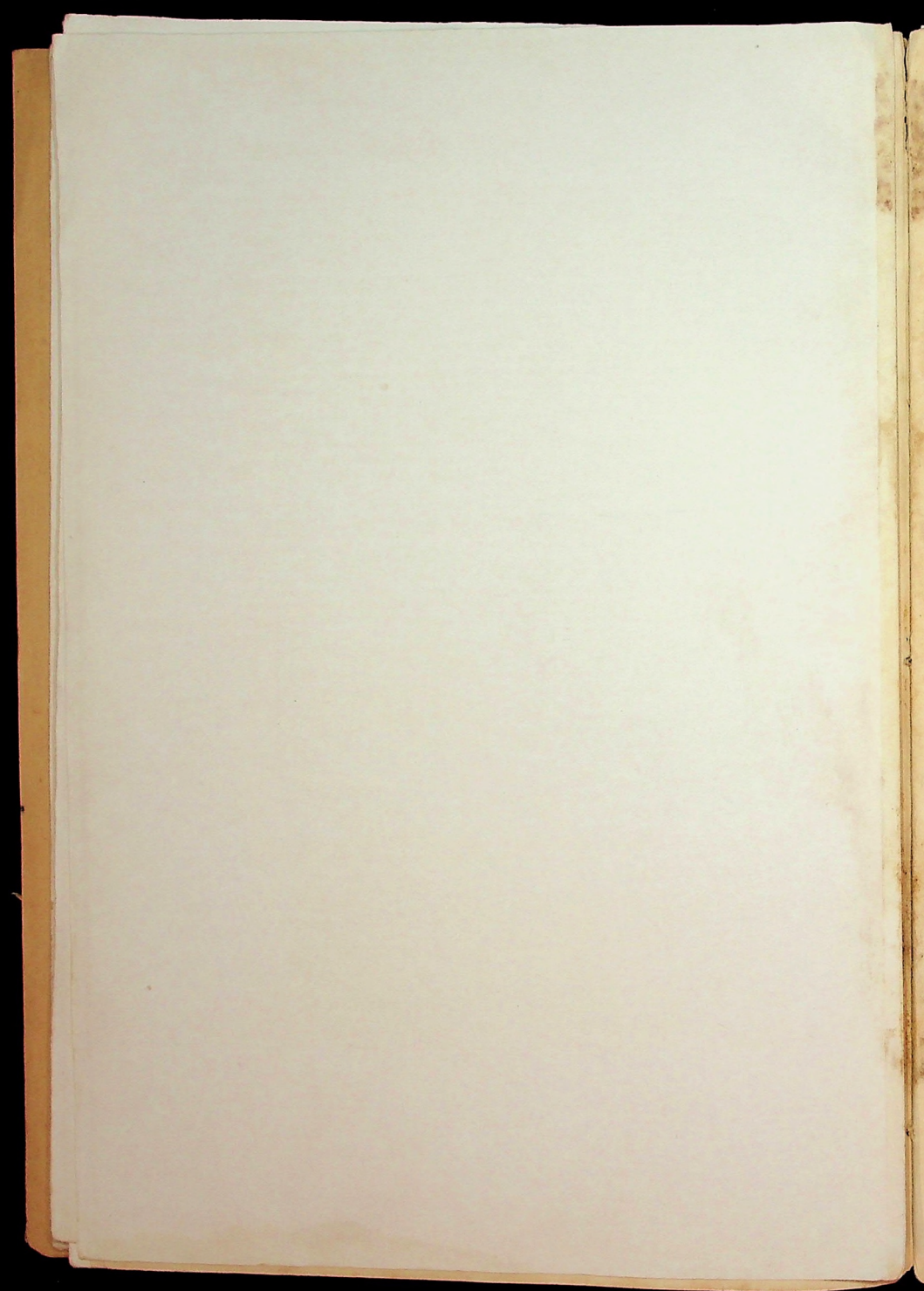


Photo by P. P. Stoopin

The Water-Colour Paintings and Sculpture Room at the Annual Spring Art Exhibition of the China Society of Science and Arts, held at the Old British Post Office Building in Shanghai during the last week in April.



EDITORIAL COMMENTS

water-colour studies. Mr. Fong Tse Ching's oil paintings of landscapes were extremely good. His style is impressionistic but effective, and his technique all that is to be desired. Mr. Stone Pan showed two charming water colours of bamboo groves; while Mr. D. H. Porterfield's water colours of St. John's Chapel, interior, and St. Mary's Chapel, exterior, are the best things he has yet shown.

An interesting series of exhibits were some 26 scrolls painted by Mr. Coldmoon Y. S. Tao, whose ambition is to combine Chinese and Western painting and so create a new school. His idea is to get the spirit and motifs of the Chinese masters into pictures in which the methods and technique are European. The result, while interesting, is what might be expected, namely a mixture, which we fear can please the critics of neither Western nor Chinese art. Mr. Tao shows wonderful ability and it seems a pity that he should spend his time trying to accomplish the impossible.

The artists of the Shanghai College of Fine Arts, who had some 50 exhibits in rooms set aside for them, showed how well the Chinese can master the principles and materials of Western art.

Mr. W. W. Wagstaff's sculptures were much admired, especially the one called "The Woman," which, we understand, was exhibited in the Royal Academy in London.

As previously stated, the rooms were lent to the Society for the purposes of the exhibition, while Messrs. Arts and Crafts very kindly supplied the furnishings and the Public Works Department of the Municipal Council the plants which decorated the premises.

THE TOWN TRAVELLER: This is a clever little weekly that has been started recently in Shanghai by Dr. Rene Fernbach. We have received copies from the first issue, which appeared early in April, and may be said to have attained instant success amongst those who took the trouble to read it. The articles contained in the pages of *The Town Traveller*, besides maintaining a high literary standard, deal with topics of vital interest to the Shanghai community as well as to China and the world at large. For instance, such questions of the day as the Spending of the British Boxer Indemnity Fund; Popular Conceptions of Medicine; the Best Rubber Shares and Why" are ably discussed. A very useful item is a weekly list of changes of personnel in firms in Shanghai, as well as changes of addresses, which information is given under the heading "The Shanghai Directory."

But the weekly is by no means entirely devoted to such serious subjects. On the contrary it is full of humour of a particularly pungent kind. Space does not permit of a detailed review of the contents of this lively publication, but we tender our congratulations to Dr. Fernbach for having created something quite new to China, and something which China should appreciate.

A. DE C. S.

REVIEWS

OUR MINDS AND THEIR BODIES, by John Laird, Regius Professor of Moral Philosophy in the University of Aberdeen. London, 1925. Oxford University Press, Humphrey Milford. Price 2/6 nett.

It is difficult to decide if Professor Laird is a protagonist of psycho-analytical concepts as these are usually outlined to the layman, or, on the other hand, if he is a serious student of the more recent medical hypotheses concerning the connexion between mental and physical life processes.

His thesis is that there is such a connexion, and he advances many valid arguments in its support. Had he been content to confine himself to any one of the several angles from which he approaches his subject, his contentions would be much clearer. He chooses, however, to deal first with the "Attitude of Common Sense," then to submit the "Evidence of the Sciences, from the Psychological Aspect and from the Bodily Side." He follows these with the tabulation of numerous hypotheses concerning the connexion between mind and body, and devotes one-half of his treatise to "Metaphysical Speculations" entailing such factors as Materialism

THE CHINA JOURNAL OF SCIENCE & ARTS

and Mechanism, Animism, Neutral Monism, Mind-Energy (on M. Bergson's Theory), Idealistic Theories, Parallelism and Philosophical Dualism.

It is, all in all, a scholarly exposition; and that it should stress the psychological rather than the physical is to be expected of a professor of moral philosophy. It is evident, on the other hand, that the author has devoted considerable study to the medical phases involved. Like most laymen, however, he seems to have failed to grasp the true significance of these, or else has purposely subordinated them to the psychological, with which he is better acquainted. To-day, the exposition of psychology differs so materially from that of twenty or thirty years ago, that no writer on the subject, who hopes to carry conviction, can longer ignore either psycho-analytical or medical concepts in their true relation to pure psychology.

Although this work is one of a series of "The World's Manuals," and as such would seem to be intended for the average reader, the latter will find it very difficult at times to follow the learned author. Professor Laird, in presenting the most important arguments in support of the correlation of mind and matter, has unfortunately attempted too much in too little space. To do justice to so interesting a thesis, several volumes are required. The result is that many of the points that he would elucidate are anything but clear. Nevertheless, to those who are as interested as the author in establishing the correlation mentioned, this little book will prove highly edifying.

A COMPARATIVE STUDY OF LIFE IDEALS, by Dr. Yu-lan Fung, The Commercial Press, Ltd., Shanghai, 1925, Price \$1.80.

The learned young Doctor of Philosophy of Columbia University—for the brief autobiography which he appends to his treatise informs us that he is but thirty-one years of age—has written a noteworthy book in more than one respect. The reader is first of all impressed with his command of the English language, so essential to the exposition of a subject so abstruse as the author has chosen.

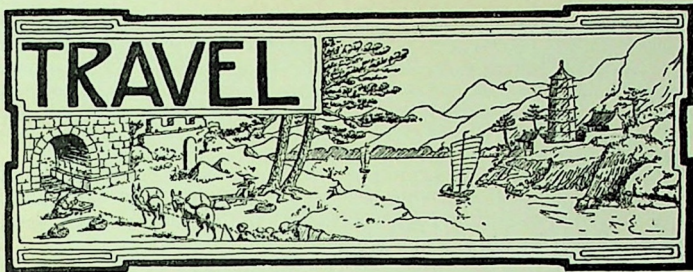
Written at Kaieng, Honan, in 1923, the author has been at pains to assay certain systems of philosophy and to compare those of the West with those of the East. To quote from his preface: "All who philosophize have their visions and at the same time their blindnesses. Their vision makes known to them certain aspects of reality, but at the same time excludes other aspects. It is exactly their vision that causes them to be blind. In the present work I am going to tell people facts as I see them. I do not pretend that I am not blind. But how far I am blind is a question for the critics to answer, rather than for the author of the work."

It is quite evident that he is not blind, since he betrays more than superficial understanding of the systems which he compares, and makes clear, as he has undertaken to do, "the similarity of human nature, the uniformity of human experience, the common problems that have faced all humanity and the common methods of solving these problems."

There are, to be sure, certain passages in which he betrays the failing of most writers on philosophy or psychology, that is to say, the employment of vague expressions. Thus, in discussing Nihilism according to Schopenhauer and dealing with his conception of a lost paradise, the author points out that Buddhism found for it a better term, viz., the "Real Suchness," and goes on to explain that "Real" signifies that it is not nothing; "Suchness," that it is simply such. "If one insists on asking what is that Suchness, Buddhism can answer only negatively."

One wonders whether in later life Dr. Yu-lan Fung will not see fit to modify certain of his present interpretations. These are characterized by the cock-sureness of one who is less than half-way along life's path, and it is to be observed that he is still within that decade of his existence wherein conclusions formed to-day are abandoned to-morrow. It would appear that from the age of forty onward, one's impressions become more permanent and one's inferences more accurate. Despite these truisms, the author is to be congratulated upon his erudition and more particularly for giving us a book embodying much of the philosophy of the Chinese classicists, which he makes the more interesting in the light of modern and Western ethics. His book reminds us once more that there is very little new under the sun, and that the great principles and ideals enunciated to-day are, in the main, those enunciated in a by-gone era and once more served up to us with slightly different dressing.

R.R.L.F.



THE SALT INDUSTRY OF TZELIUTSING

BY

WALLACE CRAWFORD, M.D., D.P.H.

(Continued from Page 229)

V

THE BRINE.

The brine raised from the wells may be divided into three kinds; at least that is the classification locally. Black, yellow and white are the different grades, which are valued according to their colour. Black brine is the best variety and produces the greatest quantity of salt per catty of brine. White is the thinnest brine raised and boiled.

As the brine is raised to the surface in the pipe, it is emptied into a tub at the side of the well and run to a vat some thirty feet away, where it is allowed to settle. From this vat it is necessary to raise the brine to a height sufficient to permit it to run to the boiling pans. In case the pans are at the same well, which is often the case, the task of transporting the brine is easy. If, on the other hand, the brine must be transported any great distance, it must be raised sufficiently high to allow it to gravitate in the conducting pipes to the boiling pans.

The unit of measure for brine is the "tan," which weighs three hundred and sixty catties. In a "tan" of brine there are three hundred and sixty "wan." The quality of the salt is gauged by the amount which can be boiled out of a "wan" of brine. This varies, the highest being three and six tenths ounces. This quantity is boiled from the brine which is the heaviest and richest in crude salt. Even a one ounce brine will be boiled, especially if the gas is handy and the output of brine is not strong. It often happens, however, that the brines are mixed together and the merchant risks the results. An average well will produce enough brine to supply ten boiling pans steadily.

It is just possible that the fringe of the industries within this industry has hardly been touched. That there are by-products is self-

evident. As one stands at the edge of a well, and watches the brine pipe emerge from the bowels of the earth, one gets smells of various vapours. At some wells Sulphuretted Hydrogen is very evident, and at others obnoxious odours are strong. A visitor to the wells one day stood too close to the mouth of one, and, as the brine was being discharged from the pipe, the gases that escaped were strong enough to overcome him temporarily. He had to be carried home.

When the brine is boiling, one gets the same variety of odours, and to some people the smell of the brine boiling rooms is peculiarly nauseating.

Saltpetre is a common by-product of the industry, though it has not been manufactured here.

Some three years ago, samples of all the salt procurable hereabouts were bottled and sent to Peking, ostensibly as samples for the Chief Inspectorate. It developed later that experts had analyzed these and found that there were at least twenty one by-products yielded by the salt. In addition to these, there must be other chemicals in the skimmings of the boiling pans.

One cannot but think that some day the products at present discarded will be of greater value to the world than is the salt produced. This awaits the confirmation of chemists and laboratory experts.

VI

TRANSPORTATION OF THE BRINE.

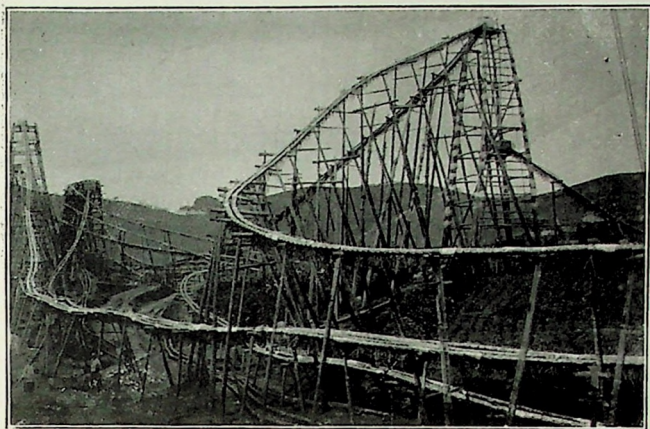
The brine is emptied from the brine pipe into tubs at the well mouth. From here it is run by gravity into vats. From these vats it is carried in three ways.

- (1) BY GRAVITY
- (2) BY COOLIE
- (3) BY BOAT

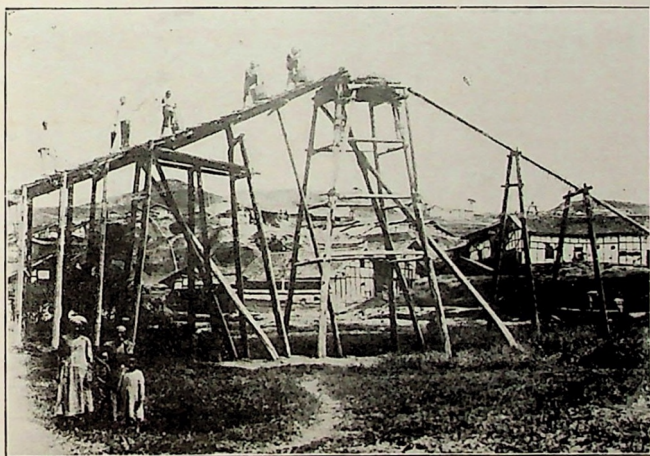
If the salt well happens to have gas in connexion with the well, the process of getting the brine to the boiling pans is simple, coolies being called to carry, or "tiao" it up to the pans, which are always above the well mouth. But this is not always the case. It more often happens that the brine has to be transported miles from the well where it was raised.

If the method of gravity is to be employed, a small house is elevated on poles and two men are placed in it with a tread mill to draw the brine up to a small tub in the centre of the house. The brine thus raised to this tub is allowed to flow by gravity as far as it will, when it is again raised and let run to another level. This method is used in places to carry the brine for miles over hills, in some instances the distance exceeding ten miles. Thus a special business is created, that of transporting the brine; and special companies undertake this business. It becomes the second division of the industry, the business being known as "gien."

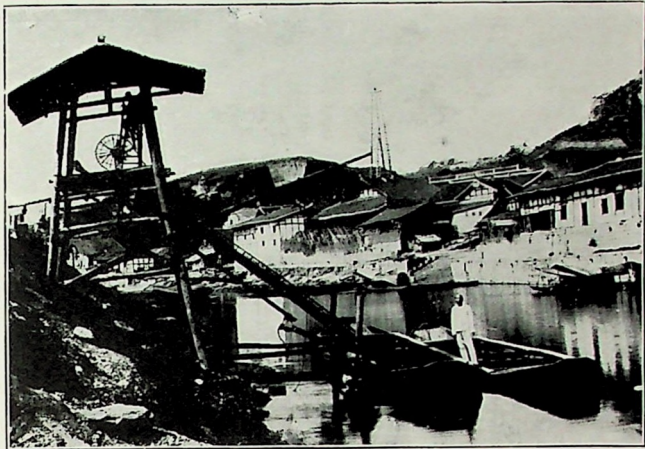
To carry the brine over the country, bamboo pipes of about six inches in diameter are used. As these would not stand the sun and wind, they must be specially prepared by being wound with bamboo strips, which are so applied to the pipes that they overlap. The binding is tightened



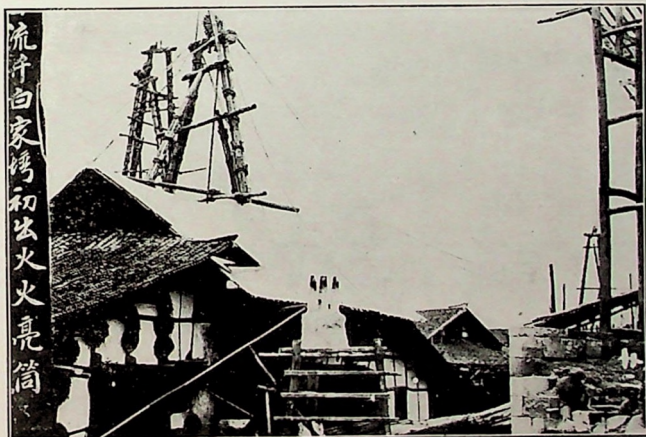
Five Lines of Bamboo Pipes which Conduct the Brine to the Boiling Pans.



Coolies Carrying Brine up the Trestle Work to the Nests into which it is Poured and allowed to Run to the Boiling Pans.
The Bamboo Pipe-line leads off to the right.



Arriving at the Boiling Pans, Treadmills are used to Draw the Brine, by Man Power, up to the Pans. A man can be seen working a treadmill and drawing the brine up to the level of pans.



Dividing the Gas. The white object on the platform has five pipes at the top, like chimneys, by which the gas is divided, subsequently being conducted to the pans by separate pipes.

THE SALT INDUSTRY OF TZELIUTSING

by bamboo wedges driven tightly between the pipe and the binding strips. If the conduits must go underground, they are subjected to a heavy coat of lime and wood-oil cement, which when dried is impervious to the weather and will endure for six or seven years, which is twice the life of the pipe when simply bound. The conduits are joined by telescoping the pipes one into another, and cementing them with the wood-oil-lime cement.

Where great heights are to be scaled, derricks with stout houses on the tops are erected, and mules are utilized to raise the brine, instead of tread mills. The brine then gravitates as before to the base of the next derrick, where it is raised another twenty feet or so, and so on over the ridge.

The second method of conducting the brine is by coolie carriage or "tiaing" it in buckets. There used to be a way of paying for this work, by so much per step, but it is paid now by the load of three hundred and sixty catties, called a "tan." I do not know of any coolie carrying this much at one time, but there are some who will carry almost three hundred catties for short distances. These human horses have immense pails suspended from each end of a carrying pole. They do not carry in the usual way, but with the carrying pole squarely across both shoulders, and upon the pad of fat and muscle which they have developed across the top of the shoulder blades. These coolies begin carrying when quite young, and develop exceptional powers of endurance.

Often the methods of conduit and coolie are combined, and the coolie carries the brine to a tub, out of which it runs into conduit tubes to be carried away to the boiling pans. Hundreds and hundreds of coolies are occupied in this trade, and as many as a dozen conduit pipes may be seen lying together in places where they near the boiling pans.

In the third method, where streams are available, boats are used to convey the brine to the boiling pans. The brine is run out of the well tub, into the vats and then into the boats, which are huge, flat-bottomed affairs made specially for carrying brine. When full, they are towed or poled to the boiling pans, and the brine raised by treadmills to the vats beside the boiling pans, there to await running into the pans. This method is not extensively employed as the streams available are few. In some places the three methods may be used to convey the brine to the boiling pans.

Throughout the carriage of the brine, it is wonderful to see the care with which it is handled and the very small amounts which are lost. If a conduit by chance is injured so that it leaks, this is immediately reported, and repairers are at once despatched to the spot. There always seems to be any number of coolies with pails to catch the escaping brine, and they are recompensed for each pail they return to the owner.

VII

BOILING THE BRINE.

Boiling the brine is carried out in two ways, boiling by gas and boiling by coal fires.

Where coal is utilized for the boiling, a tunnel is dug, about five feet deep and four feet wide. From each side of this are dug the fire holes, and over the fires are located the boiling pans. There is no superstructure, the pan being simply set up on five iron rods, and the open space between the pan and the hole closed by surrounding the pan with flat slabs of sun-dried mud. This is then plastered and the boiling pan is ready for the brine. The coal fire is started: and, as there is no chimney, the smoke escapes as best it can all around the rim of the pan and out through the stoking hole or any other crack or crevice that it can find. It will be seen that in this way it is impossible to produce the fine white salt, such as is boiled down over gas fires. The coal-boiled salt is black with soot and dirt and debris. It is not skimmed and the product is much inferior to the gas-boiled. This product called "pa" or rock salt is chiefly exported, there being consumers who prefer it to the crystal or "wha" salt.

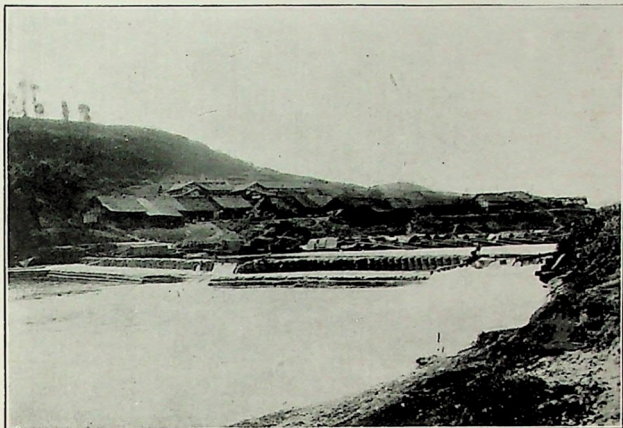
In the manufacture of the rock salt, old and broken pans are used, as they can be riveted together with crude iron rivets and clamps, and the crevices cemented with a solution of lime and brick clay. This cement apparently does not interfere with the quality of the salt produced. For the crystal salt only perfect pans are used.

The boiling pans are of crude cast iron about five feet in diameter and much like a great saucer. They weigh about twelve hundred catties, are extremely clumsy and very brittle, not a few being cracked in transportation. They are manufactured at a place called Chechiang, just above Chungking and are brought by boat to the market here. There is crude iron ore hereabouts, but the merchants claim the product will not stand the strain, so they must purchase these in a much more distant market. A pan laid down at the boiling house costs \$110. The life of a pan is indefinite, and is shortened only by the carelessness of the attendants. If the brine is allowed to dry unduly and the pan become overheated, it naturally cracks and is then useless for crystal salt. With proper care the pans last for years.

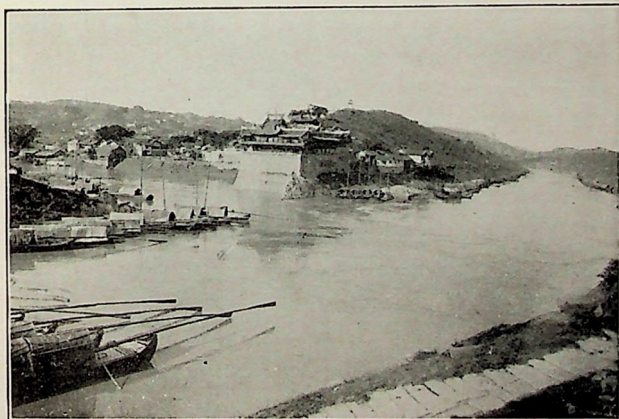
Boiling goes on twenty-four hours a day and three hundred and sixty five days in the year, the New Year's holidays being taken in shifts, as the gas must be utilized.

When gas is struck in a well, it is allowed to flow out by a side exit to a place where iron tubes have been erected. Here it is lighted and allowed to burn at will day and night. The iron tubes are multiplied until through each flows a quantity of gas sufficient to keep a fire under one pan. If the well is a big one there will be a great flare in the sky until the pans are set in place and the gas used to advantage.

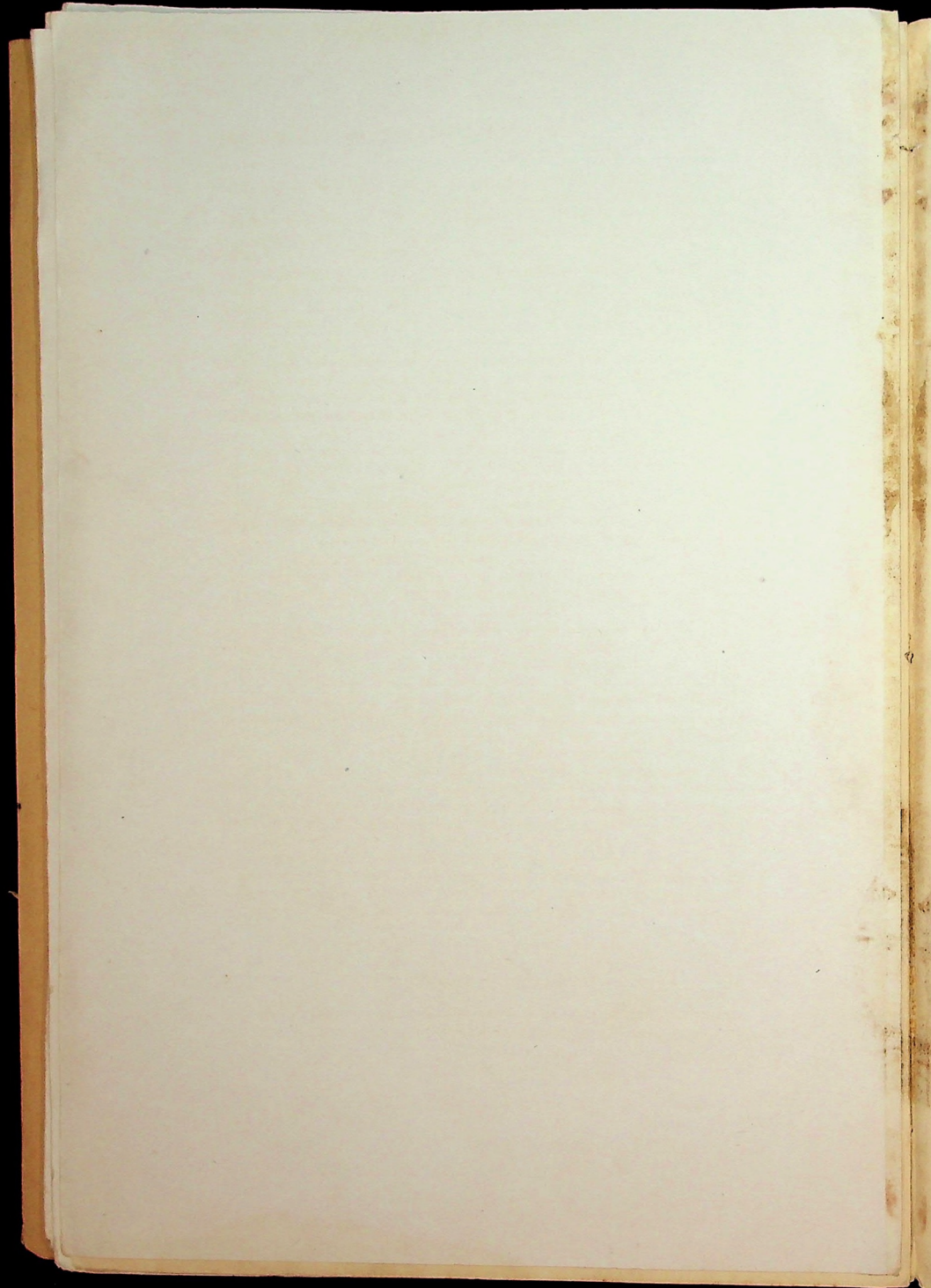
The laying of the pans for gas fires is not the same as that for coal. The pans for gas fires are arranged in a straight line, with the tunnel immediately under the centre of the boiling pan. Each pan is elevated a little above its fellow, the row running up hill to give the gas opportunity to flow the full length of the tunnel, it being lighter than air. As many as forty and even fifty pans may be put in a row. The rows of pans are parallel, with a path between each pair. Here and there are vents for the extra gas if there should be any. The gas that comes out of these vents



Often Temporary Dams are made by Filling Salt Bags with Sand. The Runway for the Boats is to the Right. During High Water the Dam is Washed Away.



The River at High Water. There are immense numbers of boats, about 5,000, on this stretch of river extending about 120 li.



THE SALT INDUSTRY OF TZELIUTSING

is also kept burning, but is put to no use save to light pipes for the men. This is a great waste of good gas and heat.

As the brine crystallizes, it is dipped into settling baskets of bamboo, and allowed to drip. The drippings are caught in a stone trough below and reboiled. The fires under the pans are practically never put out, and as soon as one pan of salt is crystallized, more brine is run into the pan and the process repeated. Gas fires will crystallize a pan of salt in about twenty four hours, while the coal fires take some three days. For exportation, there is less wastage with the rock salt than with the crystallized product.

It is estimated that there are some five thousand brine wells in the district and some three thousand gas boiling pans. If one wishes to rent out his gas, he can demand and receive a rental of sixty taels per annum for each fire, the expense of putting the pans in place and maintaining the place being the tenant's.

To insure the better crystallization of the salt, bean-curd water is poured into the pans with the brine. This is made in the usual way with the soya bean, soaked in water and turned out with a stone mill. About two gallons of the bean-curd water is added to each pan of brine. The result is a much better quality of crystal, though what difference it makes to the palatability of the salt, I cannot say.

In other parts of China the sun-drying process is utilized, but nowhere in West China is this method employed. The condition of the atmosphere is such as to preclude this method, and the rains are too uncertain.

This chapter should not be closed without a note on the great waste of the gas. It has been asserted, and I think it is correct, that there is more gas wasted in Tzeliutsing in one year than would be required to supply the demand, under proper supervision, for ten years.

As the gas cannot be piped down hill, owing to the pipes not being sufficiently strong to withstand the pressure, each works must be erected to accommodate the flow of gas; that is to say, it must be erected on higher ground than the well from which the gas is escaping. Each successive pan must be higher than its neighbour, as it is placed in the row, away from the well. Now if iron or metal piping were used, it would reduce the distance of piping the brine, and the gas could be controlled, and conserved. Where it is necessary to pipe the brine, the iron pipes would be cheaper in the long run, even if the initial outlay were higher.

Again, if gas reservoirs were installed and each consumer were compelled to use a gasometer, the cost would be less than at present; and a great many more patrons could use a more constant gas supply, which would do more and better work. This in itself would be a big business for anyone.

VIII

TRANSPORTATION.

Salt exportation may be divided into two classes, the "Piao" or retail salt and the "Yin" or wholesale salt.

Virtually the only way in which retail salt is sent out of the district is by carrying-coolie. This method is so common that it need not be enlarged upon here. But the exportation of the wholesale salt is such a big question that it demands our careful attention, as it is in this that one of the biggest channels for foreign business lies. With the betterment of travelling conditions, missionary effort will also be expedited.

When the boiling process is completed the salt is placed in bamboo baskets made especially for the purpose, weighed, sealed and lashed for carriage. This work is all done by experts, who can make as much as a string of cash per day at the work. The crystal salt bundle or bale averages about two hundred catties in weight, while the rock salt only one hundred and sixty.

After bundling, the salt is carried into the Government storehouses, from which it is released upon permit. It is then loaded into small boats, which take it to the junks, which, in turn, convey it to the outport, Ten Gin Guan. Two men will carry these bags to the boats. They, also, can earn as much as a string of cash per day at the work. The boats congregate at the Government weighing depot, where the packing is inspected, and about ten per cent. of it carried to the scales. If this portion proves correct in weight, the release permits mentioned above are exchanged for discharge permits, upon payment of the salt tax. The junks are then free to discharge their cargo at Ten Gin Guan.

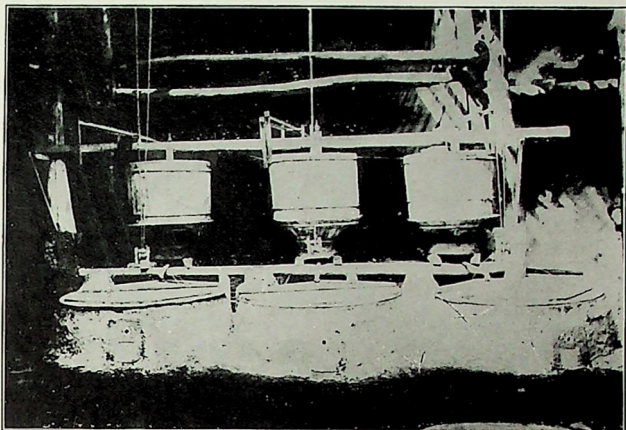
Retail salt is not baled in the same way, but is carried openly to the Government release offices, of which there are some eight in various localities. The salt is cut in forty, eighty and one hundred and twenty catty weights. Thus, any peddler may take a quantity suitable to his strength. When he purchases a load of salt, he is given a release ticket, after paying his tax. This is stamped at the door, and viséd at certain offices on the main roads from Tzelutsing.

These offices are known as checking offices, and tend to restrict the carriage of illicit salt. The majority of the peddlars carry one hundred and twenty catties, and sell it in small quantities along the road. Some of these men do a four or five days' journey with their wares.

In some parts mules are used to carry the rock salt to the river-bank. During low water, there is a considerable trade in this way from Kungchin, the falls in the river being too high to permit the boats to pass over, thus necessitating a portage of about fifteen *li* to the Government weighing scales.

The average export from the weighman's yards here is seven "tsai" or cargoes of salt per day. Cargoes of salt are made up as follows. Fifty bags of salt make a "chang" of crystal salt, and nine "chang" make a cargo. Of the rock salt, it takes twelve "chang" to make a cargo, as the bags or bales are lighter. From here to the nearest port, where the regular cargo boats can come, is about one hundred and forty *li* by river, but not more than ninety by land.

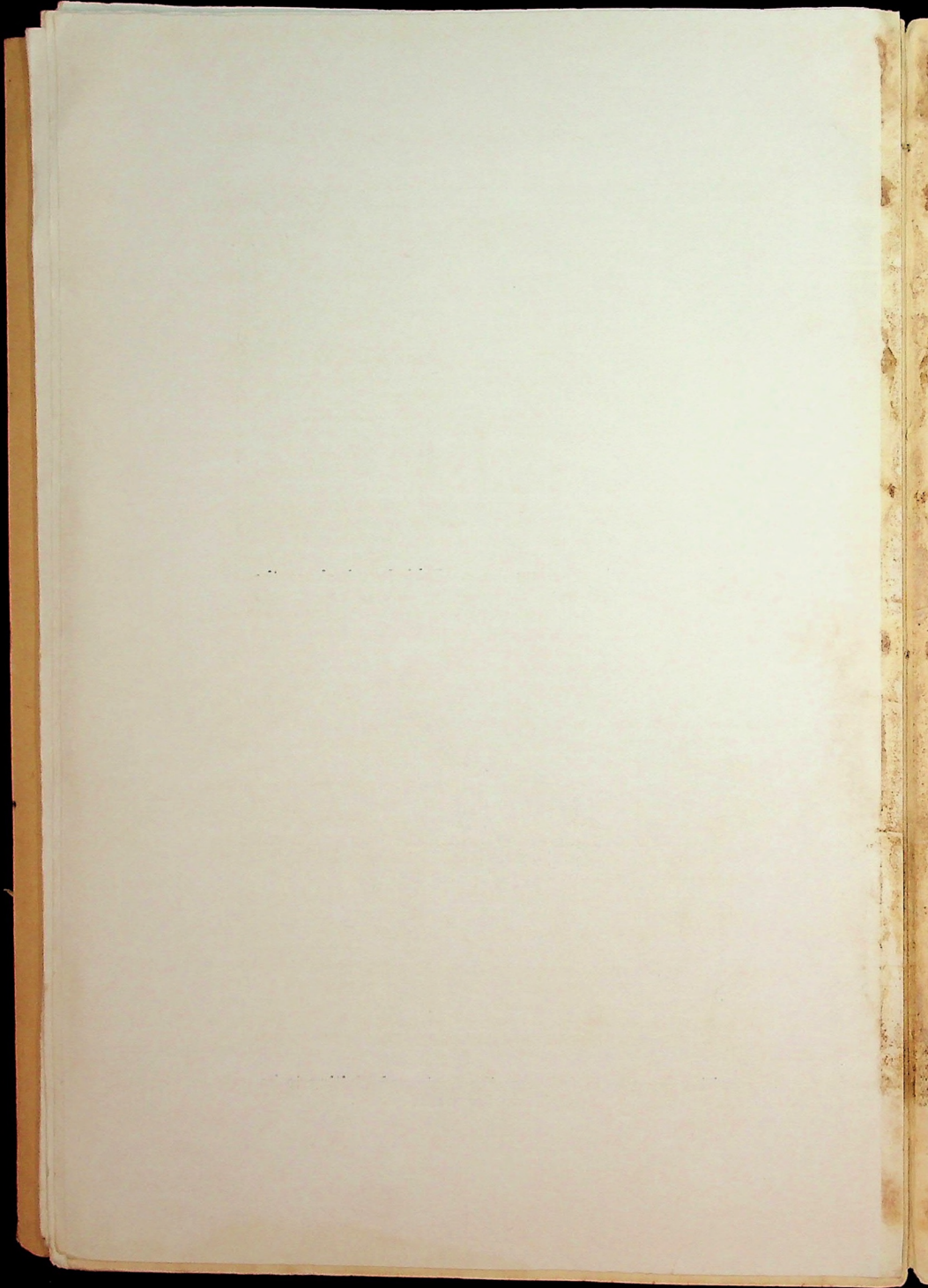
It would seem as if the transportation of the wholesale salt had passed into the hands of a monopoly over this stretch of river. The price per cargo is at present taels one hundred and ten. There are some five thousand boats on the run, and three or four cargoes are carried by them,



Three Gas-heated Boiling Pans. Behind and above the pans are reservoirs for the brine waiting to be run into the pans.



Boiling Pans Unloaded from the Boats and Waiting to be Carried to the Wells.



THE SALT INDUSTRY OF TZELIUTSING

on an average, yearly. It takes five of the boats to carry a cargo of salt to the junks at Ten Gin Guan. One cannot but think that the volume of business done on the river could be efficiently handled by thirty per cent. of the shipping that now chokes it. If the boats now between here and the port were placed end to end, they would more than bridge the entire distance. The monopoly, however, keeps them on the river and keeps up the price for exporting the salt.

The transporters association of the city are and have been anxious to find a better way than the present one for exporting the salt to Ten Gin Guan. They have approached the Federal Government, and through the local Government Salt Revenue Office, have held conferences with the interested parties. An agreement was reached whereby the transporters were to put up one half the expense of a railroad to Ten Gin Guan, while the government took responsibility for the other half, the transporters paying the Government a consideration for the loan. The project would have gone through had not political upheavals interfered, and the usual Chinese difficulty of "paying the piper" arisen. When the Yunnanese and the Szechwanese began hostilities, the agreement was dropped. But these astute business men have not abandoned the idea, and will welcome any scheme which will assist in getting their salt to market more cheaply. The writer was a strong advocate of the steam line, and spoke well of the project on every occasion. Indeed, it is by far better than the present method, but one is not convinced that there is not even a better way.

Some three years ago an engineer was visiting Tzeliutsing, and we talked over the question of the road. This gentleman had not been over the road, but he had been in China ten years, and had some understanding of Chinese customs. He suggested to the writer that the idea of a motor road be considered. We then took this matter up and soon concluded that the easiest way to get a steam road through this part of the country would be to get a motor road first, prove its efficiency and economy, and then consider the steam road later.

Some of the arguments against the immediate installation of a steam road were as follows:—

(1) The Road Bed.—If a motor road were desired, the present roadway could be utilized, though it would be better if a new road were surveyed. But if it were necessary to construct a road independent of the present thoroughfare, and that were a steam road, a width of at least sixty feet would be required for the road bed, while thirty feet would answer for the motor road.

(2) Survey of Road.—This could be done away with if the present roadway were used as a motor road. It cannot be gainsaid, however, that a survey would be better; but one must remember that, here in remote Szechwan, any innovations which are to be introduced will be expedited if they can be brought in slowly and quietly. The matter of a survey brings up more than one question, such as graves, buildings, ancestral tablets, and *feng shui*. It is possible to use the present roadway, save possibly in two or three places where the grade might be found too heavy for the cars. The matter of a survey could be gone ahead with

later. As a matter of fact, one survey of this piece of roadway has been made by a Chinese engineer who studied engineering in Japan. It is said to be a very good survey, and, with a few changes, would be available.

Nearly a year ago, steps were taken and an engineer was brought in. It was found to the surprise of the local gentry that the engineer was a German, and they promptly proceeded to have the gentleman recalled. It is said that he surveyed three miles of road at a cost of seven thousand dollars. Just who put up this money is not stated.

(3) Diplomatic difficulties would be fewer with the motor road.

(4) Initial Capital.—In the case of a railway, the estimated budget would rise to one million and a half taels: a properly surveyed motor road, with fully qualified engineer and assistant employed for one year, fifty one-ton trucks, garages, repair shops, additional supplies for break-ages, etc., could be acquired for two hundred thousand taels. Without the survey, this sum would be materially reduced.

(5) Importation of Initial Equipment would be infinitely easier. The completed cars could be shipped by boat right to Ten Gin Guan, and be put in work at that end of the line.

If we began with a steam line, it would be almost impossible to haul the parts of engines, cars, rails, etc., up to Ten Gin Guan, except in the highest water. Even then, the cars and engines, would have to be sent up in pieces, and assembled. It would be much better if the steam road were begun at Luchow, the nearest port for steamers, which only come up here in high water.

(6) Prejudice of the people.—This point has been dealt with in "point 2" under "survey of the road"; but cannot be too much emphasized, as it will be an important factor in beginning a road of whatever character. If the motor road were begun first, it would not be as foreign a system as the steam road, as it would be more accessible and the people would take to it much more readily than to the smoky, ponderous engines.

(7) No steam road could be in operation here in less than two years. A motor road could be in use in six months.

(8) Ease of Projection of a Motor Road.—Just as soon as this were found to be more than an experiment, steps would be taken to extend it, and the same equipment would be enough to make a longer haul of the salt, or to carry other products. Branch roads could be run from it, and these tributaries extended without any interference with the main road or importation of foreign material, until more cars were required.

As soon as the scheme were seen to be a success, steps would be taken to extend the road to Luchow, where the big salt junks would then load, all the year round.

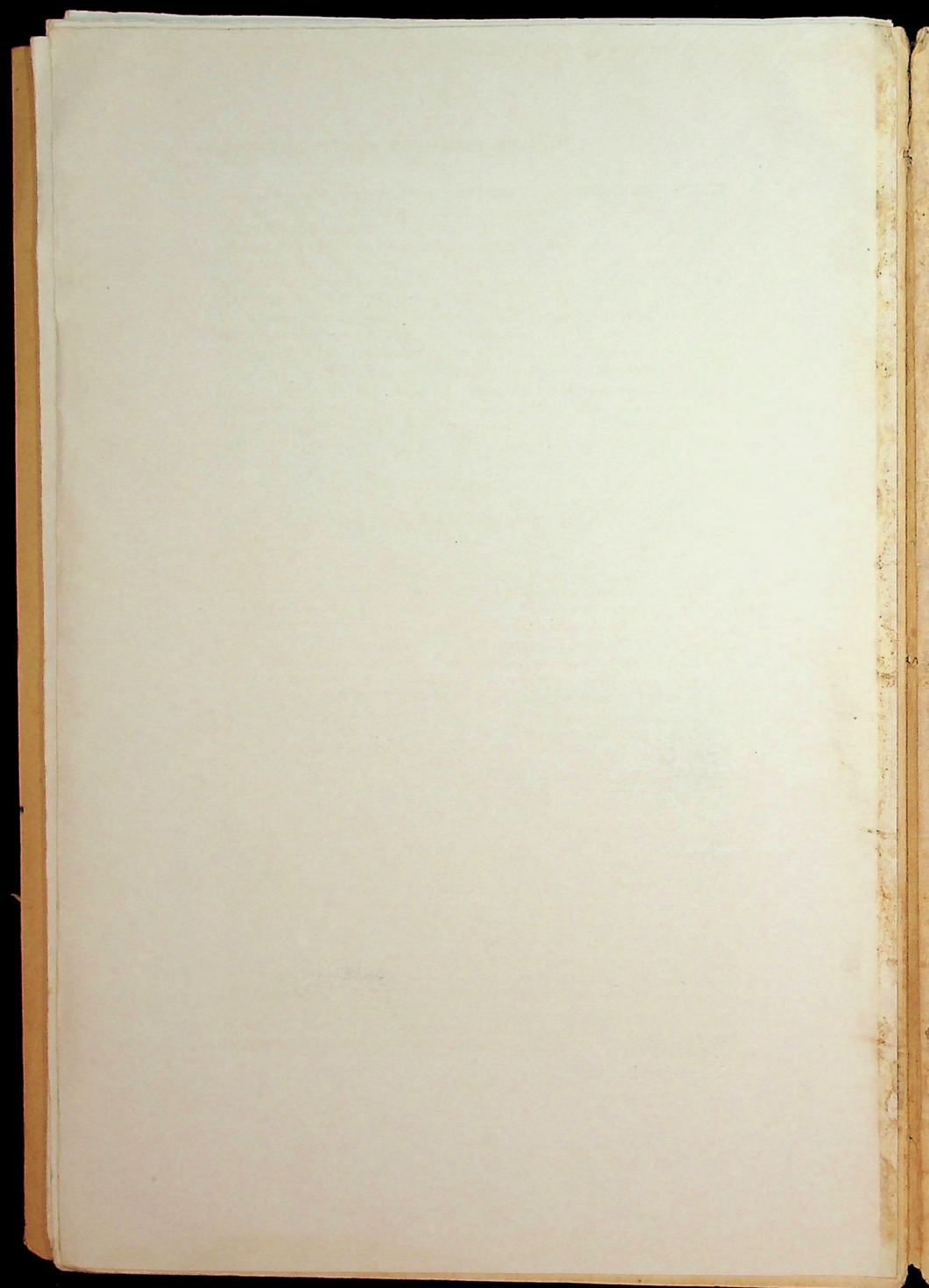
Because of the freight which would be brought back by the empty cars, it would soon be found necessary to extend the main roads from here to (a) Jungshien, from which city, paper, medicines, dyes, oil, and coal are constantly coming; (b) Wei Yuan, from which place come chiefly coal and paper, but there are other exports; (c) Suifu. This port is on the junc-



Pack Horses and Mules are used a great deal to carry the Salt to the River Front and also Inland for Retail Consumption.



Preparing Packs for the Animals at the Government Stores.



THE SALT INDUSTRY OF TZELIUTSING

tion of the Min and the Yangtze, but there would be a lot of trade to and from it with Tzeliutsing. There are other neighbouring cities, but the road could not be built so easily to reach them. Possibly one could include (d) Tzechow, from which place we get medicines, tobacco, bamboo, candy and sugar; and to which we send large quantities of retail salt.

The coal trade from Wei Yuan would in itself demand special cars and equipment for its trade. The passenger traffic between here and Ten Gin Guan, and the country seat of Fushun, each of which is said to be about twenty three English miles from here, would be almost sufficient to pay the return trips, and would grow tremendously when the people saw with what ease and speed the trip could be accomplished.

(9) Social opportunities afforded by such an innovation. One ventures to prophesy that such a road would be immensely popular with these rich merchants, the result being that many pleasure cars would be imported and other resultant pleasures introduced, one of the items most lacking in the place at present.

There would be also an opportunity for the missionary to do more itinerating work, with greater ease and efficiency.

One cannot close this chapter on the transportation of the salt without mentioning at least one of the drawbacks to any real advance in this line in West China. I speak of the soldiery, so called. The wide awake merchants know, to their sorrow, that any innovation in the shape of transportation introduced by them will be made use of by these vandals. If there were any idea in the minds of the soldiers of keeping the system in shape, it would not be so bad; but not only do the military ruin the system, but they abuse the men to whom it belongs for not keeping it in shape at their own expense, for them to use or abuse as the soldiers please. It will be easily seen, then, that no company would be willing to proceed with any scheme of transportation unless some guarantee could be given that it would not be seized by the soldiers and run to ruin by them, with no compensation for the owners.

We have heard rumours of a scheme originated by General Yang of the Second Army, to inaugurate a company composed of his own officers, who will forego their pay for several months, the money thus accruing to buy two ships for upper Yangtze service, install a road from Luchow, and handle the transportation of salt from Tzeliutsing to Luchow.

One cannot but hope that something may come of the aspirations of General Yang, as it is only through the Military that anything will be accomplished for some time to come in West China, they having all the power and controlling every project which is undertaken. And, until the merchants of Tzeliutsing can be assured of a stable civil government, or protection from the Federal Government, they are not going to "find" their money bags for any scheme, however rosy. It takes no stretch of imagination for those who have lived hereabouts for the last five years, to form a mental picture of what would happen to such a motor road, were it put in operation and the soldiers were to come along and "borrow" the use of it for a short time. Ruined cars, stagnant traffic, no salt moving, people angered against the innovation, and the whole wreck thrown back at the Transporters' Association, without so much as

by your leave or one word of thanks or thought of remuneration for the damage done to the system. It is virtually certain, however, that one of the first places where a new road, and in all probability a motor road, will be built is in Tzeliutsing, as soon as quiet is restored in this province.

Governor Liu Hsiang has been making plans for a long time now to open a motor road from Chungking to Chengtu. This road would not come nearer than one hundred and twenty *li*, at Luei Chang. If Governor Liu's road were promoted, a spur could be run down here, but it would not materially help out the situation in Tzeliutsing, as the main road for this place would be out to Ten Gin Guan, Tzeliutsing's natural port.

Salt can be manufactured to-day for about thirty cash per catty. Transportation is the biggest problem for the merchants, and it will be the first improvement they will undertake when order is restored in these parts: but nothing will be done as long as the soldiers dominate affairs as they do to-day.

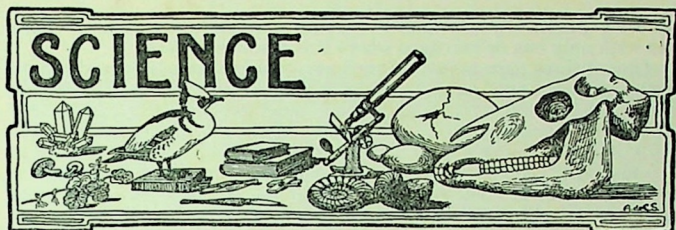
(To be continued).

TRAVEL AND EXPLORATION NOTES

EASTERN BHUTAN: One of the most indefatigable explorers of South-western China and neighbouring regions is Mr. L. Kingdon Ward, who at one time was a resident in Shanghai. His first exploration was when he joined the Duke of Bedford's Exploration of Eastern Asia and went with the late Mr. Malcolm P. Anderson and Dr. J. A. C. Smith, also well known in China, on a trip to the Tai-pei Shan region in South-western Shensi to collect biological specimens for the Natural History Museum, South Kensington. On this trip the famous golden takin (*Budorcas bedfordi*) was discovered. Always more of a botanist than a zoologist, Ward has since devoted his time to the exploration of Yunnan and neighbouring regions, giving special attention to the extraordinarily rich flora of that area, and contributing thereby in no small degree to our knowledge of its botany. The discovery of many new plants lies to his credit, as well as valuable data and observations upon the distribution of plant life and its relation to mountain range formation and other geological problems of the district explored.

Recently he has returned from yet one more expedition in this general region, this time in Bhutan, and some of his experiences have been published in the *Field* and other periodicals.

THE THIRD ASIATIC EXPEDITION: News is to hand that the advance camel caravan of the Third Asiatic Expedition of the American Museum of Natural History finally got under way from Kalgan on April 26. The military made several attempts to commandeer the camels, but these were safely escorted beyond the last barrier by a military escort secured through the American Consul. Owing, presumably, to the present disturbed state of the country between Peking and Kalgan, the warfare between the Kuominchun and the so-called Allied Armies having been carried beyond Peking in the direction of Kalgan, the main party of the Expedition at the time of writing has not left Peking. It is hoped, however, that the military situation may clear up sufficiently to allow the members of the Expedition, whose duties are to carry out the field work, and the fleet of motorcars to transport them across Mongolia, to get to Kalgan, whence they may start after the camel caravan. We can rest assured that if it is humanly possible the gallant band of scientists who form the Expedition and their energetic leader will make the start for their destination, namely Western Mongolia and Turkestan, before it is too late to accomplish anything this summer; but it is greatly to be regretted that present conditions have held them up so long.



AN AFTERNOON ON A CHINESE BROOK

BY

PERCIVAL LEA BIRCH

Towards the end of March, 1925, I enjoyed some very pleasant fly-fishing for orange-finned carp, rainbow carp, and knife fish. The scene of operations was usually the Shihlipoo Stream, three miles from Kiukiang, and near the motor road to the foot of the Kuling Hills. Let me describe a typical afternoon. After a long spell of wind and rain, the weather has changed, and there are signs of spring everywhere. The geese have left on their long flight to the Siberian tundras, and the evening hours no longer resound with the familiar gagging. Some of the duck tribe still remain: teal, mallard, and yellow-nib. In fact, a few of the latter stay through the summer and breed in the Yangtze Valley.

As it always seems to me much pleasanter to ramble by oneself, I carry my own thermos flask and sandwiches, and proceed to find a ricksha which soon gets me out to Shihlipoo Bridge. This old stone bridge, with its single humpbacked arch, always strikes me as one of the most satisfying bits of Chinese architecture I have ever met with. I therefore make no apology for appending a photograph. By it I cross to the other side of the stream, and put my rod together on the grass in front of the little joss house which stands hard by. I am using a light 9½ foot split bamboo trout rod by Hardy of Alnwick, a delightful tool for this light fishing. I have a three yard cast tapering from 1X to a 4X point, to which is attached a tiny hackle blue upright as tail fly, while there is a small Coch-y bonddhu for dropper. I mention these flies particularly, as they seem to be about as good as anything one can select. It is important to have them small, as the brook holds plenty of knife fish, some of them so small that they are only to be taken on diminutive hooks. The Shihlipoo Stream holds plenty of water this March afternoon; but it is crystal clear, as there has been no rain for several days.

Having got my tackle ready, I take a look at the water. Some little way below the bridge there is a weir of rough stones, so that the level of the water above is somewhat raised, and we have a long, still

pool with practically no current. There are numerous trees on both sides with only one or two gaps where it is possible to cast.

One of these gaps is just where I am standing, and, looking down on the clear water, I see four or five fair-sized fish sailing slowly along within easy range. A large patch of floating weed prevents my putting my fly ahead of them, so I have to wait for their return. After a time, back they come, the leader a nice carp of fully half a pound. I manage to drop my tail fly a couple of feet in front of his nose, and then draw it very slowly along. The carp takes it at once, and a startled plunge follows as I tighten on him. He is one of the slenderly built orange-finned variety, active fish which put up a good fight. Some careful manoeuvring follows to keep him clear of the large patches of floating weed, and then, having no net, I pull him ashore at a place where there is a conveniently gentle slope.

This is a good beginning, but it is tiresome having to miss much good water, on account of the closely growing trees. Half way down the pool, where casting is quite impossible, I can see many good fish moving. However, below the little weir of stones, there is another pool with a run into it. Here I can stand against a high bank on a ledge close to the water, thus making myself inconspicuous against the dark background. I at once become aware of more orange-finned carp feeding. There is a tree overhanging the pool twenty yards below where the ripples enter the still water. The branches hang so low that it is impossible to cast beneath them, and I have to take care not to throw too far and endanger my flies. As luck will have it, there is a monster right underneath, who comes up every now and then with a splash. The shade of the protecting tree is evidently his chosen sanctuary, and he stays persistently in this impregnable stronghold.

There are, however, others that are more adventurous, and cruise about the pool, sucking down a fly every now and then as they circle around. Whenever one of these sails up beyond the dangerous twigs, I put a fly over him, and after several attempts hook a lively six-ouncer. Two others soon follow, and then no more venture above the tree; I have established a scare and it is time to go elsewhere. Meanwhile the monster has gone on rising at intervals, and I hear his splash of derisive farewell as I walk away down stream. As I stroll along the little brook I find, every here and there, wide shallows at the tails of pools, where the knife fish are rising gaily. Soon I have added several of the silvery little fellows to the bag. Now a halt for tea suggests itself, and I sit down to my thermos and sandwiches beside a lovely clematis, with star-like flowers two and a half inches across. A sheltered corner and some sunny days have induced it to blossom thus early.

After tea, a short walk brings me to quite a different bit of water. The stream has broadened out and the banks have become lower, and devoid of trees. Here I find a rapid run which dashes into a long shallow pool. A curve in the shore causes a wide eddy, which, however, is nowhere deep. An up-wind breeze has driven a frothy scum up to the top of the pool, so that the whole of the quiet water about the eddy is spread over with an opaque skin. In this shallow water constant swirls

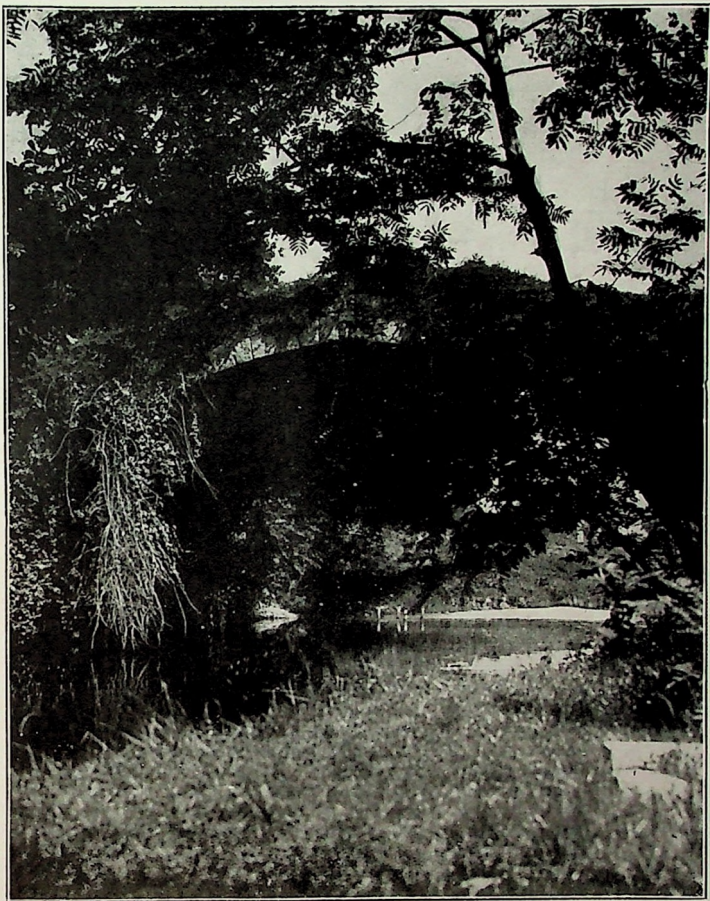
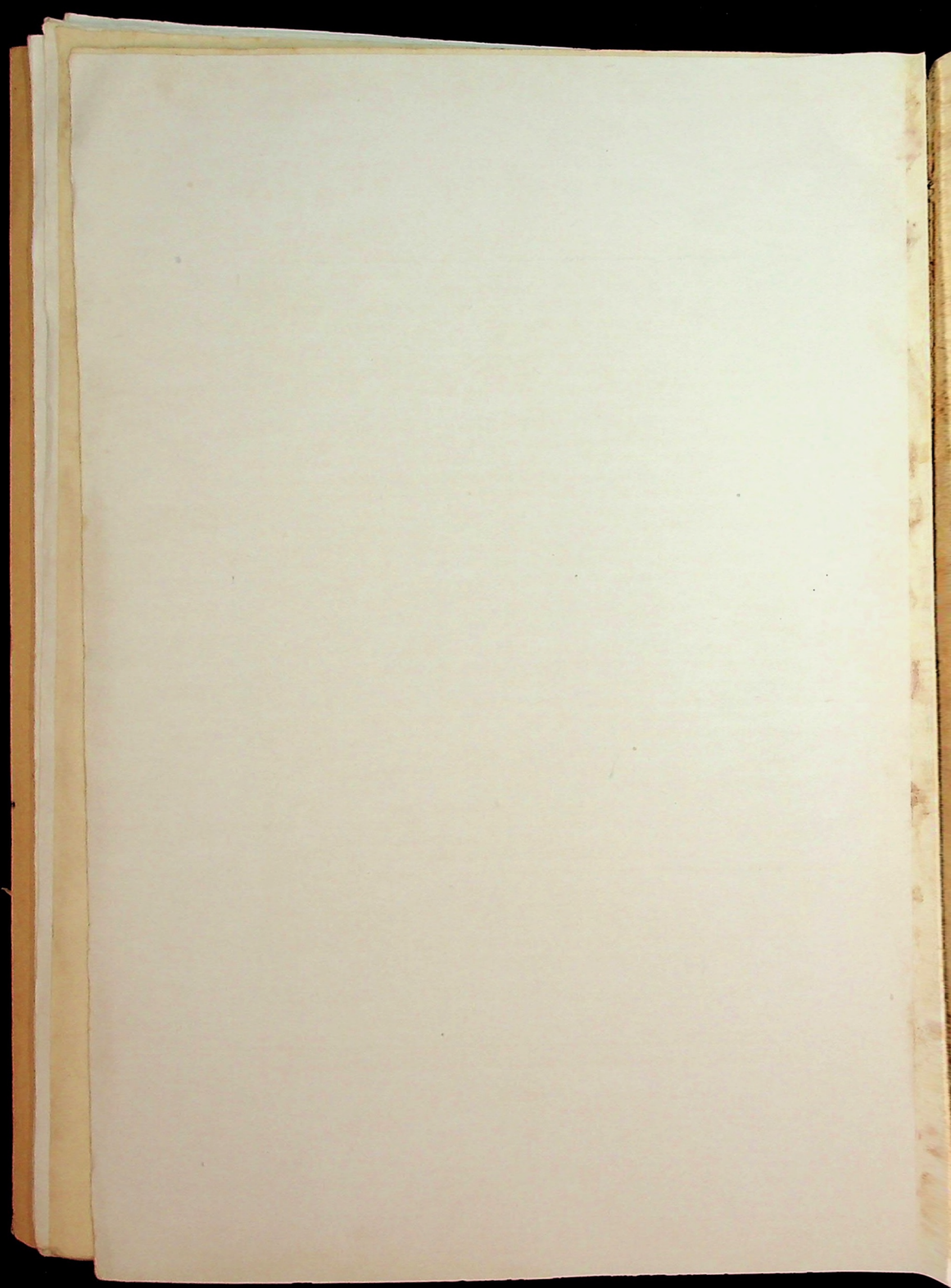


Photo by Major Percival Lea Birch.

The Shihlipoo Bridge, near Kiukiang.



AN AFTERNOON ON A CHINESE BROOK

and oily rises disclose the presence of a finny host. The fish themselves are, however, as invisible to the angler, as he, fortunately, is to them. The position of the circling carp is shown by their wakes, so I take up my place within easy range, and start dropping my flies just ahead of the moving tracks. Success comes quickly, and I find I have lighted on a shoal of feeding rainbow carp, under the most ideal conditions, in that we are mutually invisible, while the water is so shallow and clear that a small fly proves irresistibly attractive. I have added sixteen fish to the bag before the remainder take fright. Certainly they are not large, three to four ounces, but their graceful shapes and brilliant colouring make a handsome show.

I have never properly identified the slender silvery carp with orange fins.* These fish run such a pleasing size, rise in such satisfactory fashion, and fight so well, that they deserve a warm place in the affections of fly-fishers. They are by no means confined to running streams, but are just as numerous in lakes, where, however, they are less easy to catch, seeing that they only come on the rise a short time before sunset. In streams they always seem to keep to the big, quiet pools, where they circle round and round on regular beats, sucking down flies quietly, with very little disturbance of the water. Very many of them are $\frac{1}{2}$ lb. each, while I have taken them as heavy as $\frac{3}{4}$ lb. When hooked, they are very much more lively and powerful than English dace, which I look on as decidedly inferior fish to these Chinese representatives of the family.

As regards knife fish, I have found that most excellent sport is to be had with these silvery fellows among the weeds at the shallow edges of lakes. The culters often feed very freely in the small open spaces amid shallows covered with vegetation. They will then take the fly with great readiness. Moreover, I have found that it is in these spaces among the weeds that one hooks the finest specimens. The large shoals, so often seen cruising about open water, usually contain the smaller individuals. When shooting, I have constantly found small ponds near villages full of knife fish of quite a fair size. In these quiet pools, where the fish are undisturbed, and consequently bold, it is easy to do considerable execution with the fly. Where the weeds are very thick and the open spaces small, it is well to dispense with the bob fly, using only a single small hackle at the tail. When there is a dropper as well, the task of divesting the line of slimy green weed becomes unnecessarily irritating. Small murrel often take even the tiniest of flies: the thing is to pull them out quickly, before they bite through the fine gut. Little *Gan Yu*, of $\frac{1}{2}$ to $\frac{3}{4}$ lb., also take small flies at times, but their mouths are so bony and afford such poor hook-hold, that they frequently get rid of the fly before they can be pulled ashore.

* Possibly this is the red-finned culter, *Culter erythropterus*, Basilewsky.—ED.

THE DEVELOPMENT OF GOLDFISH,
CARASSIUS AURATUS,
AS AFFECTED BY BEING OUT OF WATER, IN DISTILLED
WATER, AND IN SOLUTIONS OF ALCOHOL.

BY
SHISAN C. CHEN.

The effects of physical and chemical conditions upon the development of *Fundulus heteroclitus* have been investigated by many American biologists. Morgan (1906) and Stockard (1907) found that the eggs of *Fundulus heteroclitus* may develop out of water in a moist chamber. Stockard (1906, 1910) found that the development of *Fundulus* eggs may take place in distilled water and that if they are put into a weak solution of alcohol, cyclopean eyes will be developed. The present investigation aims at finding out whether or not the development of goldfish is similarly affected by being out of water, in distilled water, and in weak solutions of alcohol.

The experiments mentioned in the following were made in the laboratory of the Department of Biology of the National Southeastern University during the spring of 1925.

MATERIAL.

I attempted to get artificially fertilized eggs for my experiments by the method of Berkhouse (1908). My attempt failed because it is very difficult to get a goldfish whose eggs or sperm flow out of the body in mature condition by application of pressure. In the present study, all the eggs were obtained by the natural method of spawning and fertilization.

Eggs of goldfish are sticky for a while immediately after leaving the body of the female fish; they stick to everything which they encounter. The common method of goldfish breeders is to let a goldfish deposit its eggs on a bunch of water plant, usually *Myriophyllum*. In my experiments, this method was adopted. After spawning, the bunch of *Myriophyllum*, together with the eggs attached to it, was taken out of the spawning aquarium and transferred to a large pan filled with water. In this pan the eggs were separated from the bunch by means of forceps, the separated eggs having only a very short branch of *Myriophyllum* attached to them. By this time the eggs were no longer sticky and were easy to handle.

There may be several thousands of eggs attached to a single bunch of *Myriophyllum*. In each experiment only the eggs detached from the one and the same bunch of *Myriophyllum* were used.

The spawning season of *Carassius auratus* in Nanking begins early in April and lasts till about the middle of June. The length of time in

THE DEVELOPMENT OF GOLDFISH

which the eggs are obtainable allowed the experiments to be repeated again and again.

EFFECTS OF BEING OUT OF WATER UPON DEVELOPMENT.

Following the method of Morgan (1906) and Stockard (1907), I conducted my first experiment on the development of goldfish as follows: In a Petri dish moist filter paper was packed around the edge, leaving a centre of about three centimeters in diameter free from the moist filter paper. Fertilized eggs were put in the centre of the dish. After the dish was covered, its interior was moist enough to prevent the loss of water from the eggs by evaporation.

In a moist chamber like that described above, Morgan and Stockard found that *Fundulus* eggs developed normally until many days after the hatching stage was reached. In the case of goldfish, however, the development was normal only during the first one or two days, after which the eggs in the Petri dish were flattened and no longer able to maintain their spherical form against the force of gravitation. When the control eggs in the tap water were hatching, those in the Petri dish became very flattened and distorted, although some of the flattened eggs were still living. After being supplied with water, some of the living flattened eggs hatched; the fishes thus hatched out were very abnormal and died after a few days. A repetition of this experiment yielded similar results.

After a few trials I found that with the following method the goldfish eggs may develop in a moist chamber without being pressed against the bottom of the glass dish by the force of gravitation: A specimen tube (one inch in diameter and four inches in height) was covered with a cork partially cut off to allow a free passage of air (Fig. 1). Within the tube there were two lumps of moist filter paper. One of the lumps was put near the bottom, the other near the top. Between the two lumps I put a branch of *Myriophyllum* on which some eggs were attached. The eggs were thus suspended in a moist chamber with neither the danger of excessive evaporation nor that of being flattened by the force of gravitation.

Using the method described above I investigated some details of the development of goldfish out of water with especial regard to the hatching and the rate of development. In this investigation I set up controls in similar specimen tubes with similar corks, but containing tap water instead of moist filter paper. These control tubes were maintained under similar conditions with regard to light, temperature, etc. as those of the tubes for the development out of water. The eggs were put into the tubes from three to five hours after fertilization. About ten eggs were put into each tube and from four to ten tubes were set up at each time in the investigation. The investigation was started for the first time on May 7 and repeated three times, on May 13, 17, and 31. The results of the first investigation and the repetitions agree in essential points and may be generally stated as follows:—

When the eggs in water were hatching, those out of water did not hatch. Among the latter, however, there might be a few eggs which

were in contact with water drops condensed on the *Myriophyllum*. Such eggs hatched as those in water, but the young fishes died soon after hatching unless they were immediately transferred into water. The unhatched eggs remained living from a few hours to about one day in the egg-membrane out of water and died afterwards.

If the eggs developing out of water were transferred into water one or two days before the time of the hatching of eggs in the control, they hatched from eight to twenty-four hours earlier than the hatching of the control eggs. The fishes thus hatched out may be as normal as those hatched in the control tubes: or a little premature, but soon becoming normal. If the eggs developing out of water were transferred into water at the time, or a few hours before the time, of the hatching of the control, they hatched within from one to fifteen minutes after the immersion into water. The fishes hatched out in this way were abnormal in body form, due probably to the shrinkage of the egg-membrane. The abnormality, however, disappeared gradually if the fishes remained in water for a few days. From a few hours to one day after the hatching period of the control, the eggs developing out of water might hatch in some cases, but not in others after, being immersed in water. The fishes hatched out at this time were crooked and abnormal, but lived up to eight days after the transfer into water.

Examinations and comparisons of the embryos developing out of water and in water, showed that the rate of development out of water was a little faster than that of the development in water. When the colour of the chromatophores of the embryo developing in water were light, those of the embryo developing out of water were darker. The beginning of the beating of the heart was earlier in the case of the embryos developing out of water than in those developing in water.

In one experiment, in order to make a more accurate study of the rate of development, I measured the body length from the tip of the snout to the posterior end of the caudal fin on a number of fishes. The measurements were made with an ocular micrometer under a binocular dissecting microscope. Some of the fishes measured had been out of water for some time during their early stages of development and returned into water later. Others were in water from the beginning of development. The data obtained from these measurements are in Table 1, page 303.

In Table 1 the average body length of the fishes whose early embryonic stages had been out of water from May 31 to June 2 is greater than that of the control at June 3. This indicates that the rate of development was faster in the eggs developing out of water than in those developing in water, probably on account of the greater rate of oxidation in the former than in the latter. But the fishes whose embryonic stages had been remaining out of water until June 3 were about as long as the control fishes. This shows that the growth of the embryos developing out of water was retarded some time before June 3, and if the embryos were returned into water before this time the growth would be continued as in the case of the embryos returned into water on June 2.

The above mentioned results differ in some respects from the development of *Fundulus* out of water. In *Fundulus* the hatching stage was

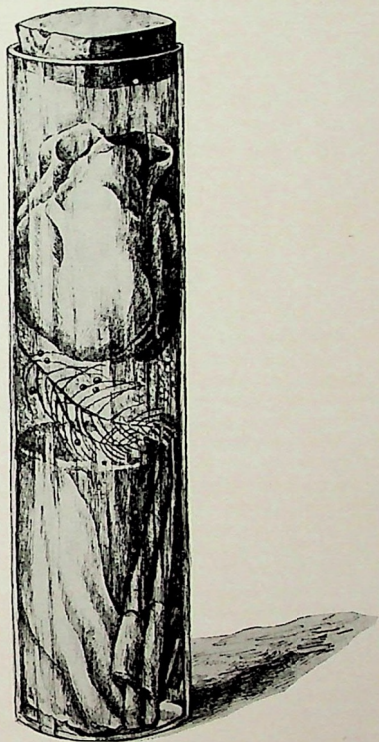
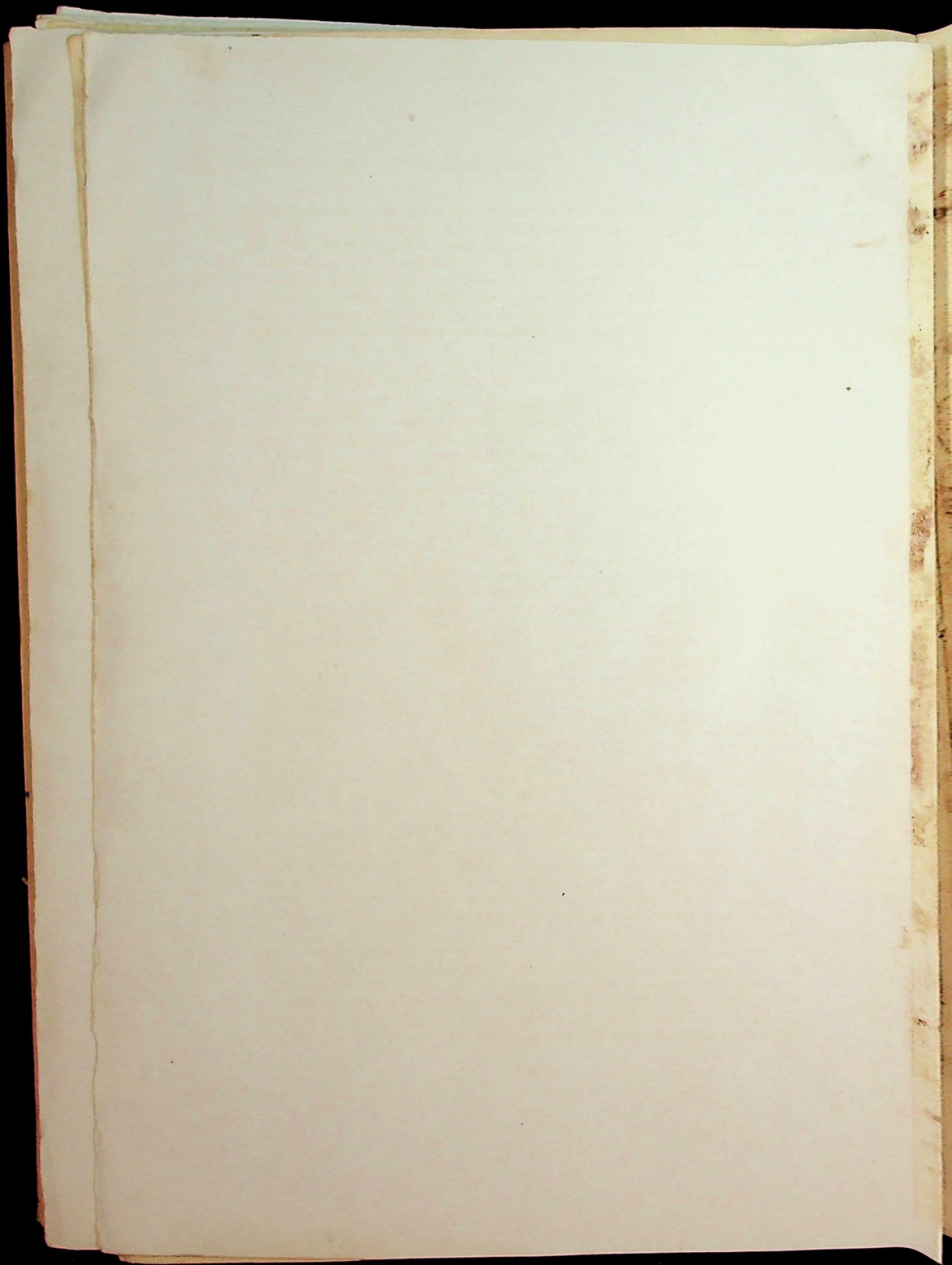


Fig. 1. A Moist Chamber for the
Development of Goldfish Eggs
out of Water.



THE DEVELOPMENT OF GOLDFISH

reached on the thirteenth day of development, but the eggs developing out of water may remain living and unhatched for thirty-three days. In goldfish, the embryos developing out of water cannot remain alive for more than one day after the hatching of the fishes in the control tube. In the case of *Fundulus*, Stockard (1907) found that the embryos out of water grow within the egg-membrane after the hatching stage is reached. But the data in Table I indicate that the growth of the goldfish embryos developing out of water was retarded some time before hatching.

EFFECTS OF DISTILLED WATER UPON DEVELOPMENT.

Stockard (1906) found that *Fundulus* eggs may develop in distilled water until the hatching stage is reached. Since a marine fish is able to develop in distilled water it was expected that the goldfish, being a fresh-water fish, would be similar in this respect. I started an experiment on May 4 to test this point. Unexpectedly, half of the eggs died after eight hours and all the eggs died after twelve hours in the distilled water, while the eggs in the tap water control were developing normally. This experiment was repeated on May 7 with similar results.

The next step of my work was to find out whether the death of the eggs was due to the lack or insufficiency of oxygen in it. On May 10 thirty newly fertilized eggs were put into each of the following preparation: (1) Ordinary tap water. (2) Tap water boiled for five minutes to drive out the dissolved oxygen and then cooled down to room temperature. (3) Distilled water aerated by pouring slowly from one tumbler into another for twenty times. (4) Distilled water boiled for five minutes to drive out the dissolved oxygen and then cooled down to room temperature. If the cause of the death of eggs in the distilled water were the lack of oxygen in it, the eggs put into the boiled tap water and boiled distilled water would die and those put into the ordinary tap water and aerated distilled water would survive. The result of this experiment, however, is against this hypothesis, for the majority of the eggs in the ordinary tap water and boiled tap water survived, while all those in the aerated distilled water and boiled distilled water died within a few days. Thus it was proved that the cause of the death of eggs in the distilled water was something other than the lack of oxygen in it.

Another hypothesis to explain the death of the eggs in the distilled water is that the eggs take up some mineral elements from the water during their development and they die in the distilled water because the latter contains nothing to support the development of the eggs. This hypothesis, however, is overthrown by the fact that the eggs are able to develop out of water where they cannot, of course, obtain any mineral element from their surroundings.

Probably death is due to the loss of some essential matter from the eggs into the distilled water. The following facts may be considered as evidence in support of this assumption. In my early experiments on the influence of distilled water, I observed that the death of the eggs in the distilled water was earlier in the dishes containing less eggs or more water than in those containing more eggs or less water. I started an experi-

ment on May 25 to confirm this observation. I put forty newly fertilized eggs into a large vessel containing 400 cc. of distilled water and another forty eggs from the same bunch of *Myriophyllum* into 40 cc. of distilled water. After the eggs had been six hours in the distilled water I found thirty-seven of them dead in 400 cc. of water and twenty-eight of them dead in 40 cc. of water. On the next morning all the eggs in the 400 cc. of distilled water died, while in the 40 cc. of distilled water six eggs remained living. One of these six eggs had lived until May 27 and died after that time before hatching. The above mentioned data show that the eggs died quicker in larger amounts of distilled water than in smaller amounts, probably because the loss of the essential substances from the eggs was faster in the former circumstances than in the latter.

Another fact supporting the hypothesis mentioned above is that the eggs which had been in distilled water for some time died earlier if they were transferred into a dish containing fresh distilled water. In one case repeated washing with distilled water caused the death of the eggs within one hour. On May 17 I put 50 eggs in 50 cc. of distilled water. In the next morning I found 30 dead eggs; 20 eggs remained living. From these 20 living eggs I transferred eight into a dish containing fresh distilled water. The other twelve living ones remained in the original distilled water. On the morning of May 19 I found all the eight eggs which had been transferred into fresh distilled water dead, while those in the original distilled water remained living, except one. Some of the eggs in the original distilled water were living until May 20. This result shows that the distilled water in contact with the developing eggs for some time is different from the fresh distilled water in regard to the ability for maintaining the life and development of the eggs, probably because the former contains some substance lost from the eggs and the presence of these substances reduces the rate of further loss of substances from the eggs developing in it.

I made several experiments to study the development of goldfish in tap water mixed with various proportions of distilled water. The first experiment was started on May 2. On this day five fertilized eggs were put into each of the specimen tubes containing the following mixtures of different proportions of distilled and tap water:—

No. 1 and No. 2.—Each containing 30 cc. of tap water.

No. 3 and No. 4.—Each containing 25 cc. of tap water and 5 cc. of distilled water.

No. 5 and No. 6.—Each containing 20 cc., of tap water and 10 cc. of distilled water.

No. 7 and No. 8.—Each containing 15 cc. of tap water and 15 cc. of distilled water.

No. 9 and No. 10.—Each containing 10 cc. of tap water and 20 cc. of distilled water.

No. 11 and No. 12.—Each containing 5 cc., of tap water and 25 cc. of distilled water.

No. 13 and No. 14.—Each containing 30 cc. of distilled water.

THE DEVELOPMENT OF GOLDFISH

With the exception of the Nos. 13 and 14 in which the eggs died before May 3, the eggs in all the other tubes hatched a few days later. The eggs in the mixtures of tap water and distilled water hatched one or two days earlier than those in the tap water. The fishes hatched out in Nos. 11 and 12 died two days after hatching, while those in Nos. 1 to 10 remained living.

Ordinarily the newly hatched fishes are unable to swim. Such fishes sink to the bottom of the vessel. After one or two days, however, the fishes gradually become free-swimming. In my experiment on the effects of distilled water mixed with tap water the fishes hatched in the tap water control behaved as usual, but those hatched in the mixed water remained unable to swim after so long as eight days after hatching.

The fishes hatched and grown in the Nos. 1 and 2 were normal in every respect: but those in Nos. 3 to 10 were abnormal in having smaller eyes in proportion to the body length, smaller or very small air-bladders, and fewer black chromatophores (Fig. 2). The greater the proportion of distilled water in the mixture, the more intense were the abnormal characters exhibited. I found all the ten fishes in each set of the tubes were similar in regard to their abnormal characters. In some fishes there were other abnormal characters such as tail turned upward, distended pericardium and body cavity, and thread-like heart, but these characters were not general. A few of them had normal sized air-bladders, but were floating near the surface of water and unable to swim freely.

The above-described experiment was repeated on May 17, 25, and 31. The experiment started on May 25 was conducted exactly as that started on May 2. In the experiment started on May 31, tumblers with Petri dishes as covers to prevent over-evaporation were used instead of the specimen tubes. Into the tumblers I put 30 eggs and 180 cc. of tap water, 60 cc. of tap water mixed with 120 cc. of distilled water, or 30 cc. of tap water mixed with 150 cc. of distilled water. The results of these two experiments agree with that of the experiment started on May 2.

The experiment started on May 17 was conducted as follows:— I put 54 eggs into each of the tumblers containing 60 cc. of tap water, 30 cc. of tap water mixed with 30 cc. of distilled water, and 20 cc. of tap water mixed with 40 cc. of distilled water, respectively. On May 25 I found that the fishes hatched out in all these tumblers were normal. The result of this experiment disagrees with that of the experiment started on May 2. This disagreement may be due to the fact that the volumes of mixed water used in the experiment started on May 17 were smaller in proportion to the number of eggs than the volumes of water used in the other experiments.

In order to compare the size of eye and the length of body of the fishes developed in the tap water and those of the fishes developed in the distilled water mixed with tap water, I made some measurements with an ocular micrometer under a binocular dissecting microscope, the results of which are in Table 2, page 303.

From the data in Table 2 we can see that the bodies were shorter and the eyes smaller in the case of the fishes hatched in the mixed water than in the case of the fishes hatched in the tap water. Based upon the

data in Table 2, I calculate the ratios of the diameter of the eye to the body length for the fishes in the mixed water as well as those in the tap water. The ratio for the fishes in the mixed water is .0682 on June 4 and .0695 on June 11, that for the fishes in the tap water is .0744 on June 4 and .0793 on June 11. These ratios show clearly that the eyes are smaller in proportion to the body length in the fishes hatched in the mixed water than in those hatched in the tap water. The data in Table 2 indicate also that the growth of eyes of the fishes hatched out in the mixed water did not cease after hatching. Hence, the smaller size of the eyes of fishes in the mixed water is due to the slower rate of growth of the eyes in comparison with the growth of the body length.

EFFECTS OF ALCOHOL UPON DEVELOPMENT.

In *Fundulus*, Stockard (1910) found that cyclopean eyes may be developed, not only in $MgCl_2$ solution, but also in alcohol solution, the effect of alcohol being supposed to be due to its anaesthetic property. The following experiments were made to find out whether the effect of alcohol upon goldfish is the same as upon *Fundulus*.

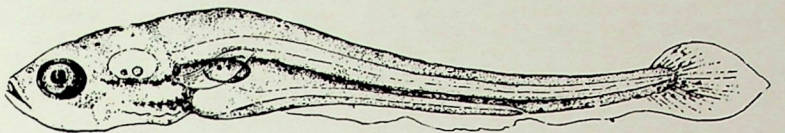
My first experiment was started on May 13. In this experiment about 35 newly-fertilized eggs were put into 20 cc. of each of the following solutions of alcohol in tap water: 10 per cent., 7 per cent., 5 per cent., 3 per cent., 1 per cent., 0.5 per cent., and 0.1 per cent. A control in tap water was started at the same time. After the eggs had been in the alcohol solutions for six hours a portion of them were taken out and transferred into tap water. Other eggs were transferred from the alcohol solutions into tap water after nine hours, twenty-eight hours, and forty-five hours. The results of the experiment are as follows:—

Eggs in the 10 per cent., 7 per cent., and 5 per cent., alcohol solutions died within five and half hours. Eggs in 3 per cent., 1 per cent., 0.5 per cent., and 0.1 per cent. alcohol solutions died before hatching.

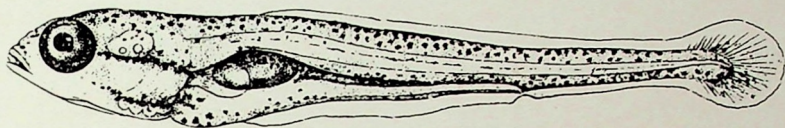
Eggs remained in the 3 per cent. alcohol solution for 6 to 28 hours and then transferred into the tap water died before hatching. Eggs remained in the 0.1 per cent. alcohol solution for 6 to 45 hours and then transferred into the tap water hatched, the fishes thus hatched being normal.

Eggs remained in the 1 per cent. alcohol solution for 6 or 19 hours and in the 0.5 per cent. alcohol solution for 6, 19, 28, or 45 hours and then transferred into the tap water hatched, the fishes thus hatched out being some normal and some abnormal. The abnormal characters were, however, not cyclopean eyes but distended pericardium and others to be described later.

On May 31, I repeated the experiment on the effect of alcohol. At this time I did not use the alcohol solutions of more than 1 per cent. in strength nor less than 0.1 per cent. The solutions used were all near to 0.5 per cent. because it was found in the previous experiment that this strength of alcohol effected the eggs without causing their death. Into



A.



B.

Fig. 2. (A) Fish developed in Tap Water mixed with Distilled Water. (B) Control. Both A and B were fertilized on May 31, hatched on June 3, and drawn on June 10.

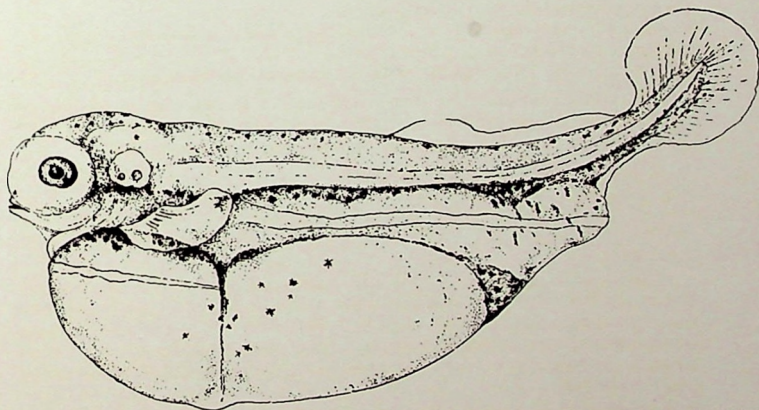
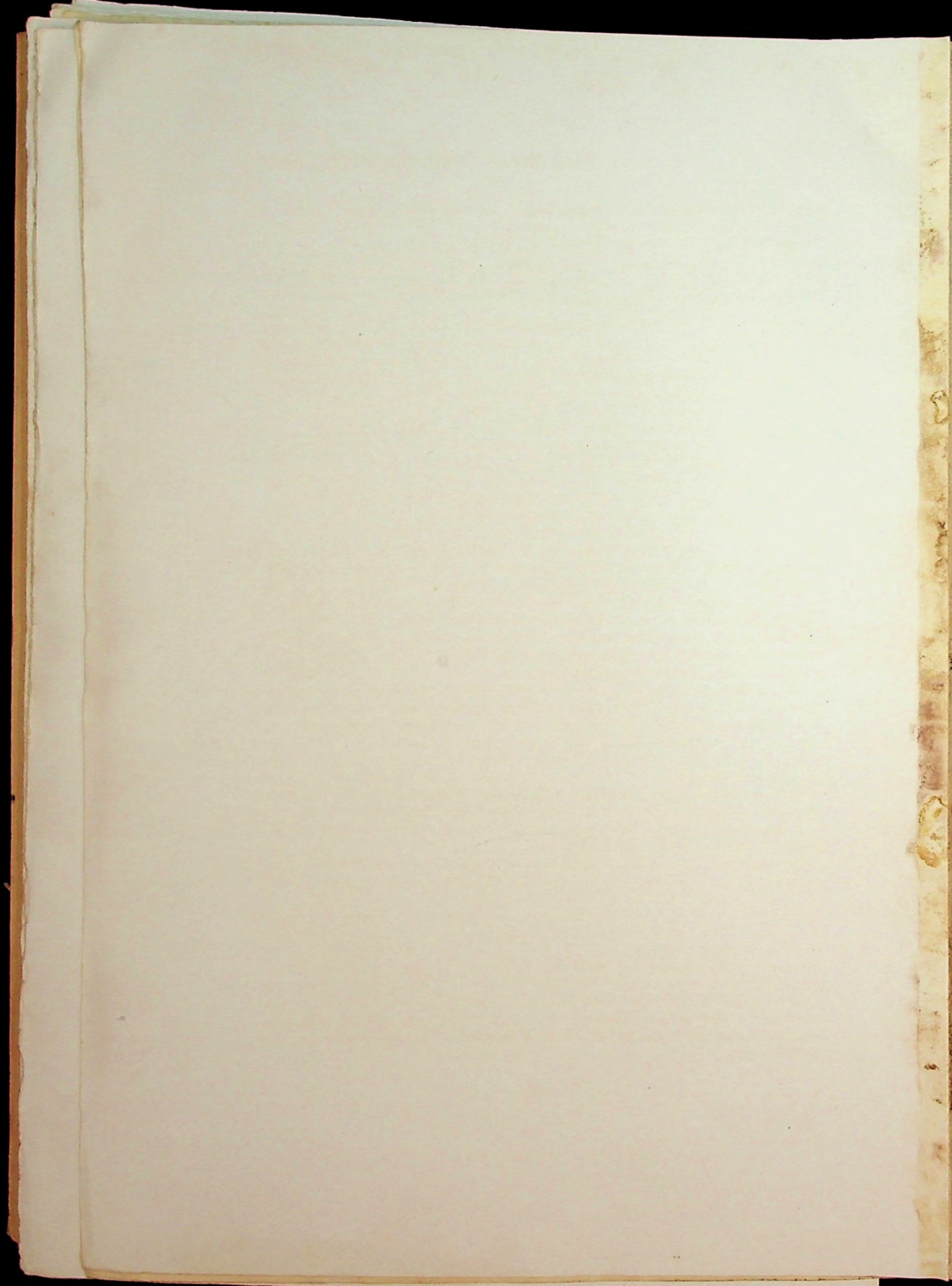


Fig. 3. Abnormal Fish developed from Embryo, which had been in 65% Alcohol Solution for 50 hours. Fertilized on May 31, hatched on June 4, drawn on June 10. For Control see Fig. 2. (B).



THE DEVELOPMENT OF GOLDFISH

each of the following alcohol solutions I introduced 50 eggs at the 8 to 16 cells stage :

Nos. 1 and 2.—200 cc. of .65 per cent. alcohol solution.

Nos. 3 and 4.—200 cc. of .50 per cent. alcohol solution.

Nos. 5 and 6.—200 cc. of .35 per cent. alcohol solution.

No. 7.—200 cc. of tap water.

After about 50 hours in these solutions the eggs in Nos. 1 to 6 were transferred into the tap water. The eggs in the No. 7 hatched on the afternoon of June 3 ; those in the Nos. 1 to 6 hatched in the afternoon of June 4, the hatching being delayed for one day by the temporary action of the alcohol. The death rate of the eggs exposed to the action of alcohol was great. I obtained only 18 abnormal fishes and 16 normal fishes in the Nos. 1 to 6 ; all the others in the Nos. 1 to 6 died before hatching.

I studied the abnormal fishes in detail on June 7 and found that all these fishes had the following abnormal characters in common : distended pericardium, thread-like heart, absence of or very slow circulation of blood, distended body cavity, and absence of or very small air-bladder. In many cases the tails bent downward or upward and the eyes were smaller and the black chromatophores fewer than those of the fishes of the control. In extreme cases the pericardium and the body cavity became so swelled that the fishes appeared like empty bladders. (Fig. 3) The extent of the swelling of pericardium increased with the age of the fish. A dissection of such a fish showed that the pericardium and body cavity were really empty. Notwithstanding the extreme abnormal form of these fishes, they had lived more than one week after hatching. I found no cyclopean eye in the embryos and fishes effected by alcohol during their early stages of development.

The disagreement of my result with that of Stockard may be explained as follows : The alcohol solutions used by Stockard were from 3 per cent. to 9 per cent. in strength. In my experiment eggs in 1 per cent. alcohol solution were killed within 28 hours and those in 3 per cent. solution were killed within 6 hours. Hence, I was compelled to use weaker solutions, viz. .65 per cent., .5 per cent., and .35 per cent. These solutions may be too weak to produce cyclopean eyes in the goldfish. Another interpretation of the disagreement of my result with that of Stockard is that the goldfish eggs do not respond to the action of alcohol in the same way as the *Fundulus* eggs.

Distended pericardium with thread-like heart and distended body cavity had been produced by Stockard (1907) in his study of the effects of KCl , $MnCl_2$, NH_4Cl mixed with $MnCl_2$ and $MgCl_2$, mixed with $NaCl$, respectively, upon the development of *Fundulus*. These abnormal characters had also been produced in *Fundulus*, by Regan (1915), who treated the eggs with butyric acid, alcohol, and KCN , respectively, and by Werber (1915) who treated *Fundulus* eggs with butyric acid and acetone. In my experiments on the effects of distilled water mixed with tap water I found a few fishes with similar abnormal characters. Hence, the swelling of the pericardium and the body cavity is a general abnormal character and not a specific effect of alcohol upon the development of the goldfish eggs.

SUMMARY.

1. A method for the development of goldfish eggs out of water has been devised. Eggs which had been out of water for some time during their early stages of development and then returned into water hatched earlier than those always remained in the water. If not returned into water, such eggs were unable to hatch and remained alive for only about one day after the hatching of the control. During the earlier stages of development the rate of development of the embryos developing out of water was faster than that of the embryos within water. But, during the later embryonic stages, the growth of the embryos out of water and within the egg-membranes was retarded and the fishes became gradually abnormal in body form.

2. Goldfish eggs developing in the distilled water died before hatching. The death was earlier in the eggs which remained in larger amount of distilled water in proportion to the number of eggs in it and in the eggs which, after being in distilled water for some time, were transferred into fresh distilled water. The probable cause of this death is the loss of some essential substances from the eggs into the surrounding water.

3. Goldfishes which developed and hatched in the mixture of tap water and distilled water were unable to swim freely and had smaller eyes, smaller air-bladders, and fewer black chromatophores in comparison with the fishes which developed and hatched in tap water.

4. Goldfish eggs developing in the solutions of alcohol, even as weak as 0.1 per cent., died before hatching. The effects of the temporary action of alcohol upon the development of goldfish eggs were the delay of hatching and the production of the distended pericardium, thread-like heart, absence of or very slow circulation of blood, distended body cavity, absence of or minute air-bladder, and very few black chromatophores. Cyclopean eyes were not found in my experiments on the effect of alcohol.

LITERATURE CITED.

- Berkhouse, J. R.—1908. Some experiments on the artificial expression and fertilization of goldfish. *Trans. Amer. Fish. Soc.*, 1908, pp. 142-144.
- Morgan, T. H.—1906. Experiments with frogs' eggs. *Biol. Bull.*, v. 11, pp. 71-92.
- Regan, F. P.—1915. A further study of the origin of blood vascular tissues in chemically treated teleost embryos, with especial reference to haematopoiesis in the anterior mesenchyme and in the heart. *Anat. Rec.* v. 10, No. 2, pp. 99-129.
- Stockard, C. R.—1906. The development of *Fundulus heteroclitus* in solutions of lithium chloride, with appendix on its development in fresh water. *Jour. Exp. Zool.*, v. 3, No. 1, pp. 99-120.
- Stockard, C. R.—1907. The influence of external factors, chemical and physical, on the development of *Fundulus heteroclitus*. *Jour. Exp. Zool.*, v. 4, No. 2, pp. 156-202.

THE DEVELOPMENT OF GOLDFISH

Stockard, C. R.—1910. The influence of alcohol and other anaesthetics on embryonic development. Amer. Jour. Anat. v. 10, No. 3, pp. 369-392.

Werber, E. I.—1915. Experimental studies aiming at the control of defective and monstrous development. A survey of recorded monstrosities with special attention to the ophthalmic defects. Anat. Rec. v. 9, No. 7, pp. 529-562.

TABLE 1.

Comparison of Fishes Whose Early Embryonic Stage had been Out of Water, with the Control.

	Date of Returning into Water	Date of Measurement	No. of Fishes Measured	Body Length in MM.			Remarks at the Time of Measurement
				Average	Maximum	Minimum	
Test. Out of water on May 31	June 2	June 3	15	5.161	5.356	4.499	Swimming
	June 3	June 3	15	4.670	4.928	4.071	Sinking
Control. Hatched on June 3		June 3	11	4.661	5.142	3.856	Sinking
		June 4	11	5.239	5.785	4.713	Swimming

TABLE 2.

Body Length and Diameter of Eye of Fishes Developed in Mixed Water and Fishes Developed in Tap Water.

Fishes	Date of Measurement	No. of Fishes Measured	Body Length in MM.			Diameter of Eye in Mm.		
			Average	Maximum	Minimum	Average	Maximum	Minimum
In 60 cc. of Tap Water mixed with 120 cc. of Dist. Water	June 4	5	4.499	4.713	4.285	.307	.333	.271
	June 11	5	5.570	5.999	5.142	.387	.458	.312
Control in Tap Water	June 4	5	5.485	5.785	5.142	.408	.437	.375
	June 11	5	6.256	6.427	5.785	.496	.542	.437

ADDITIONAL TREES AND SHRUBS OF
ST. JOHN'S UNIVERSITY CAMPUS

BY

W. M. PORTERFIELD.

In the first volume of *The China Journal of Science and Arts* (1923), the September number (No. 5), there appeared a preliminary list of the trees and shrubs of the St. John's University Campus. Mention was made of the fact that many of our species had not yet been finally identified. After a rather long time, however, in which there were many interruptions, we are at last ready to publish the promised list of additional trees and shrubs. With both local and outside assistance we gathered together all the outstanding trees and shrubs of which we were not sure and worked them out. For local assistance we are fortunate in having to thank one of our advanced students, N. Z. Tsiang, and for outside help, Prof. A. N. Steward of Nanking University. The total number of our different kinds of trees and shrubs is now 111.

PINACEAE 松杉科 (sung sha ko)

Chamaecyparis: *C. pisifera*, Sieb. and Zucc. 花柏 (hua beh). Sawara Cypress.

Juniperus: *J. formosana*, Hayata. 銀落松 (yin lo sung). Weeping Cedar.

FAGACEAE 殼斗科 (chiah dov ko)

Quercus: *Q. Fabri*, Hance 白反櫟 (beh fan lih). Scrub oak.

Q. variabilis, Blume. 花櫟 (hua lih). Chestnut oak.

MORACEAE 桑科 (sang ko)

Ficus: *F. Carica*, L. 無花果 (wu hua kou). Fig tree.

ROSACEAE 薔薇科 (chiang wei ko)

Kerria: *K. Japonica*, D.C., var. *flore-pleno* 通草 (tung tsao). Globe flower.

Pyracantha: *P. crenulata*, Roem 黃檜葉梅 (huang yü yeh mei). Fire thorn.

LEGUMINOSAE 荳科 (dou ko)

Albizzia: *A. Julibrissin*, Durazz. 合歡 (he huan), 絨花樹 (jung hua shu.) Albizzia.

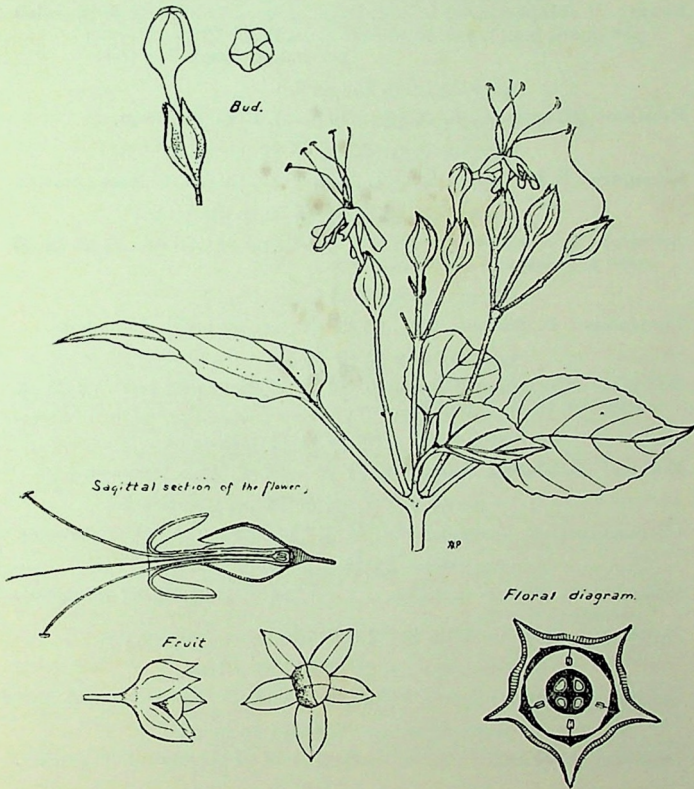
Amorpha: *A. fruticosa*, L. 假木藍 (gia muh lan). False Indigo.

Dalbergia: *D. hupeana*, Hance. 檀樹 (tian shu), 山槐 (shan huai)

山荆子 (shan kin dzi). Dalbergia

Erythrina: *E. Crista-galli*, L. 刺桐 (tsi tung). Common coral tree.

Sophora: *S. japonica*, L. 槐樹 (huai shu). Pagoda tree.



Clerodendron Fargesii, Dode
(In flower Shanghai, Oct 23)

EUPHORBIACEAE 大戟科 (da gih ko)

Alchornea : *A. trewoides*, Muell. 山麻杆 (shan ma kan). Alchornea.

BUXACEAE 黃楊科 (huang yang ko)

Buxus : *B. sempervirens*, L., var. *angustifolia*, Loud. 狹葉黃楊 (hsiah yeh huang yang). var. *rotundifolia*, Baill. 圓葉黃楊 (yuen yeh huang yang). Box tree.

MALVACEAE 錦科 (gin ko)

Hibiscus : *H. syriacus*, L. 木槿 (muh chin). Rose of Sharon.

ELAEAGNACEAE 胡頹子科 (hu tui dzi ko)

Elaeagnus : *E. ferruginea*, A. Rich. 胡頹子 (hu tui dzi). Chinese Oleaster.

CORNACEAE 山茱萸科 (shan dju yu ko)

Aucuba : *A. japonica*, Thunb. var. *variegata*, Dombroin. 桃葉珊瑚 (tao yeh shan hu). Gold dust tree.

OLEACEAE 木犀科 (muh si ko)

Fontanesia : *F. Fortunei*, Carr. 白荊木 (beh kin muh). Fontanesia.

LOGANIACEAE 馬錢科 (ma tsien ko)

Buddleia : *B. Lindleyana*, Ledeb. 密蒙花 (mi meng hua). 醉魚草 (tsuei yü tsao). Buddleia.

APOCYNACEAE 夾竹桃科 (giah chu tao ko)

Nerium : *N. odorum*, Soland. 夾竹桃 (giah chu tao). Oleander.

VERBENACEAE 馬鞭草科 (ma bien tsao ko)

Clerodendron : *C. Fargesii*, Dode. 臭老漢 (chow lao han). Clerodendron.

SOLANACEAE 茄科 (tsie ko)

Solanum : *S. Pseudo-capsicum*, L., var. *nana*, Hort. 假椒 (gia³giao). Jerusalem cherry.

Lycium : *L. chinense*, Mill. 枸杞 (kou chi). Matrimony vine.

BIGNONIACEAE 紫葳科 (dzi wei ko)

Campsis : *C. chinensis*, Voss. 龍角花 (lung kio hua). Chinese trumpet vine.

CAPRIFOLIACEAE 忍冬科 (ran tung ko)

Lonicera : *L. Maackii*, Maxim. 狗集穀 (kow tsi ko). Bush honeysuckle.

DOG SHOW SUPPLEMENT

THE FOURTH ANNUAL DOG SHOW

OF THE

CHINA KENNEL CLUB

The annual Dog Show of the China Kennel Club (Shanghai), which was held on Saturday, May 1, in a special enclosure erected on the Bund adjacent to the public gardens, was an unqualified success, the extreme popularity of this event being testified to by the gate receipts which totalled something like \$1,500, exclusive of 300 tickets issued to exhibitors. Thirty-five classes and 297 dogs were listed in the catalogue. Numerous post-entries taken at the opening of the show brought the total of dogs entered up to well over 300. Judging was conducted with dispatch, and, on the whole, to the satisfaction of exhibitors and the general public.

The championships of the show were awarded to Mr. F. W. Potter's Airedale "Tim" for dogs, and to Mr. N. W. Hickling's pointer "Daisy" for bitches. It was generally conceded that the pointers were the best class, though the Airedales were very good, as also were the Alsatians, the last being numerically the strongest. Considerable correspondence has taken place in the local papers over the question of judging the Airedales, but we feel that the criticism has not been altogether fair or well sustained by the facts of the case in question.

As regards the Alsatians it is interesting to note that winners of the three classes for those dogs this year were all sired by Mr. H. Schoenherr's "Klaus von Warnowtal," who won 1st prize in his class in the 1924 show, but has not competed since.

The general arrangements for benching and judging this year were excellent, but we cannot condemn too strongly the practice on the part of exhibitors of taking their dogs off the benches during the show and of wanting to take them away from the show before the stipulated time. Apart from the confusion that this causes, it is altogether unfair to the public who pay to see the show, and without whose support the show could not be held at all.

Special cups were given by the following :

E. T. Byrne, Esq., for Champion Dog.

A. P. Nazer, Esq., for Popular Selection.

R. N. Swann, Esq., for Best Irish Setter either Sex, and for Best Bitch.

H. Brian Bates, Esq., for Best Pointer Dog.

Mrs. H. Brian Bates, for Best Airedale Puppy.

THE CHINA JOURNAL OF SCIENCE & ARTS

Puppies—1. Mr. H. S. Swotting's dog, Shanghai Jock, 6 mos. 2. Mrs. N. W. Hickling's bitch, Sarah, 6 mos.

West Highland Terriers—1. Mr. C. S. Peacock's dog, Jack, 3 years. 2. Mr. C. S. Peacock's bitch, Botty, 2.6 years. 3. Mr. F. Reilly's bitch, Lassie, 1.6 years.

Pomeranians—1. Mrs. K. S. Sih's dog, Toy, 1.11 years. 2. Mrs. K. S. Sih's dog, Dragon, 1.8 years. 3. Mr. H. M. Cumine's dog, Prince Tony, 3 years. h.c. Miss Basto da Silva's dog, Bonzo, 2.6 years & Mrs. F. J. Brand's bitch, Twinkle, 4 years.

Chows—1. Mrs. F. Milner's dog, La-Fah, 10.6 years. 2. Mrs. E. Dumon's bitch, Shambah, 1.4 years. 3. Mrs. E. M. Manley's dog, Inky, 9 mos.

Puppies—1. Mrs. H. MacGregor's bitch, Patsy, 4 mos. 2. Mr. S. E. Clark's bitch, Ah-foo, 4 mos.

Pekinese (Dogs)—1. Mme. Wellington Koo's Tieh-Shi-Tze-erh, 1.2 years. 2. Mrs. R. M. C. Ruxton's Li Po, 5 years. 3. Miss D. Campbell's Sand White, 1.6 years. h.c. Mrs. Artelt's dog, 1.3 years.

(Bitches)—1. Mr. E. A. Silagi's Cheeky, 5 years. 2. Mrs. A. Morris' Pekie, 2 years. 3. Mrs. H. J. Collar's Justine, 1.6 years.

Japanese Spaniels—1. Mrs. N. H. Schregardus' bitch, Kikusan, 3 years.

Champion Dog—Mr. F. W. Potter's Airedale, Tim.

Champion Bitch—Mr. N. W. Hickling's Pointer, Daisy.

Best Exhibit (Popular vote)—Mr. R. F. Cave's Alsatian bitch, Lady Patricia.

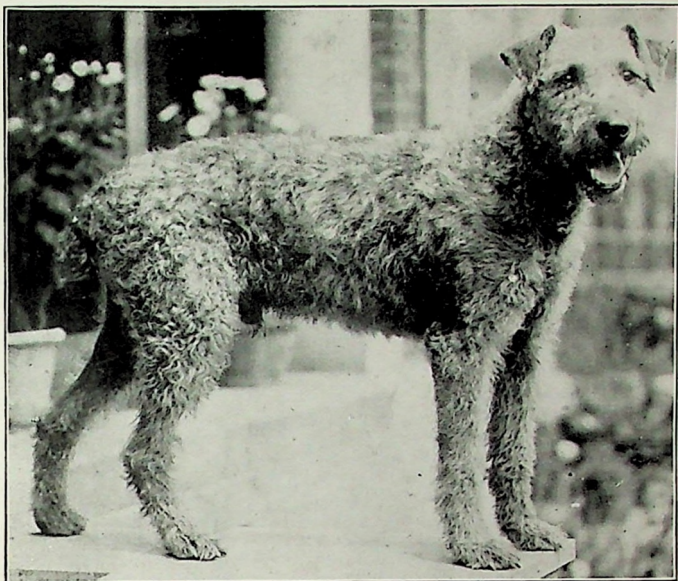


Photo by Ah Fong.

Mr. F. W. Potter's "Tim," 3 years: 1st Prize for Airedale Dogs, and Champion Dog of the Show.

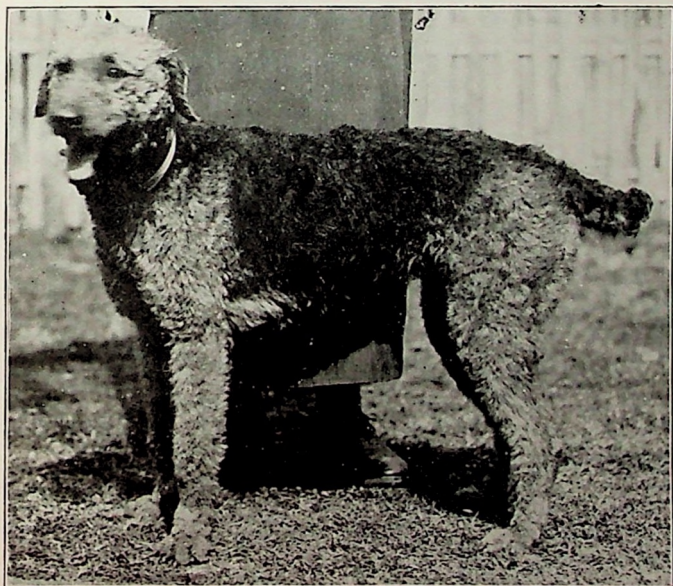


Photo by Young Photo Co.

Mr. A. L. Hearne's "Betty," 2 years: 1st Prize for Airedale Bitches.

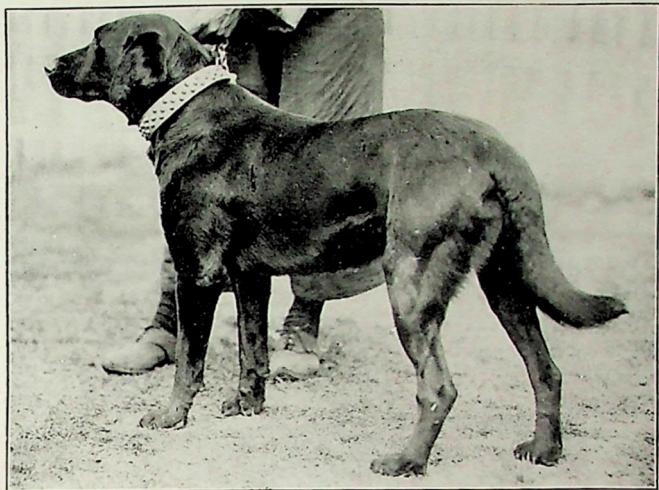


Mrs. O. L. Ilbert's "Patricia of Kiangsu," 1.9 years: 1st
Prize for Irish Setters.



Photos by Young Photo Co.

Mr. J. G. Adams' "Bessy," Gordon Setter Bitch, 6 years:
1st Prize for Setters other than Irish.

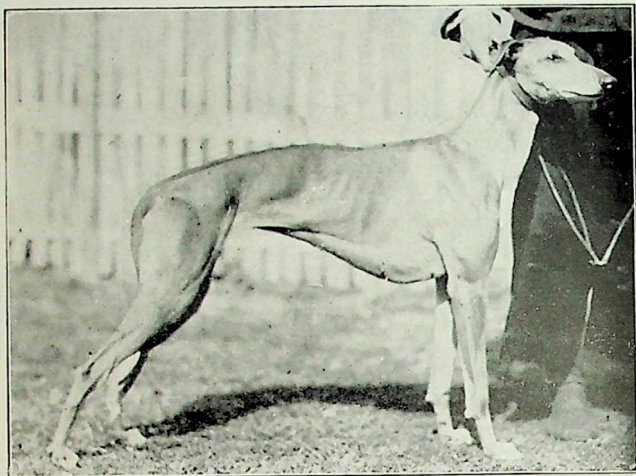


Mr. H. Brian Bates' Labrador Retriever Dog, "Drinkstone Rex," 3 years: 1st Prize for Retrievers.



Photos by Young Photo Co.

Mr. N. W. Hickling's Springer Spaniel, "Floss," 3 years:
1st Prize for Spaniel Bitches.



Mrs. Emile Essig's "Snaka," bitch, 3 years: 1st Prize
for Greyhounds.



Photos by Young Photo Co.

Mr. K. S. Sih's "Jewel," bitch, 3.6 years: 1st Prize
for Collies.

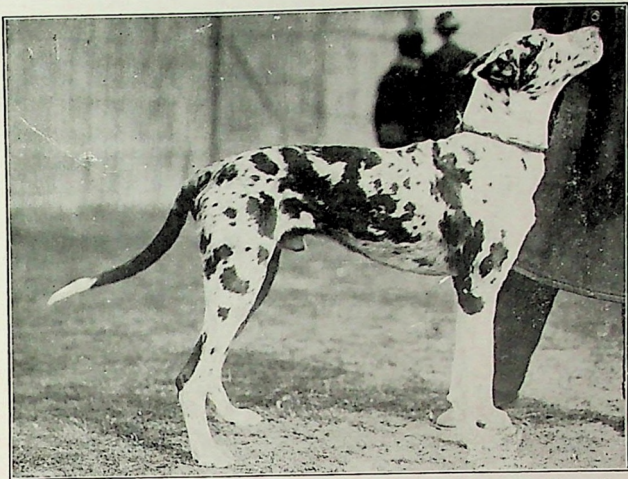


Photo by Young Photo Co.

Mrs. E. Kirkemo's "Fussen Flott," dog, 2 years:
1st Prize for Great Danes.

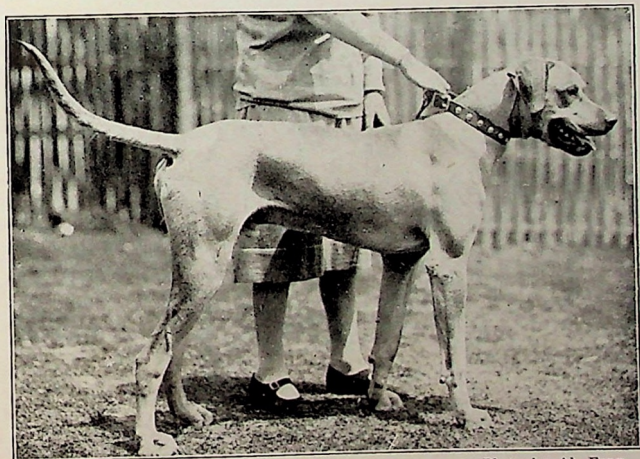
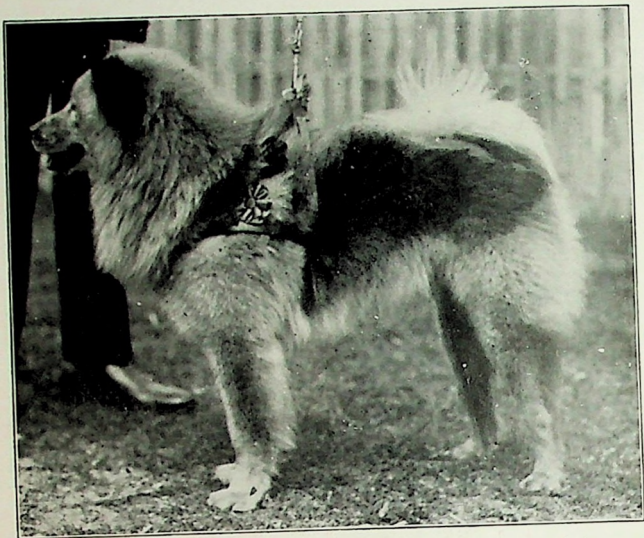


Photo by Ah Fong.

Mrs. Ellis Hayim's Mastiff-Dane "Sultan," dog, 1.4 years.
Highly commended in the Foreign Crossbred Class.



Mrs. F. Milner's "La-Fah," dog, 10.6 years: 1st
Prize for Chows.

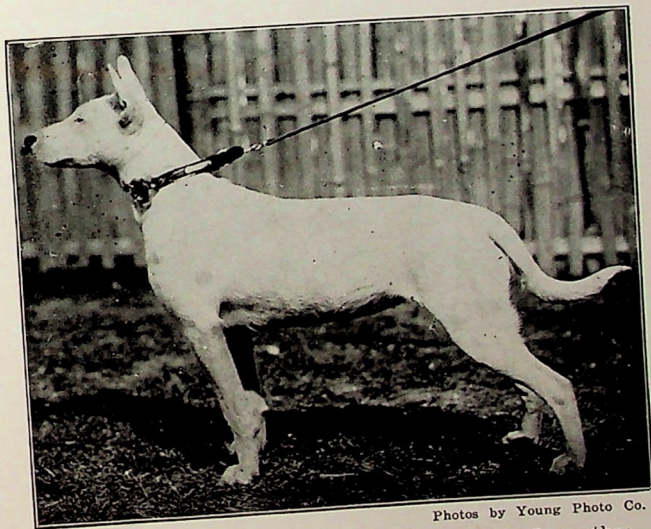


Photos by Young Photo Co.

Mr. A. J. Linge's "Paddy," bitch, 1.8 years: 1st Prize
for Wonks.



Miss G. G. Merecki's "Jinnie," bitch, 1.2 years: 1st Prize
for Wire Haired Terriers.



Photos by Young Photo Co.

Miss Billy Coutts' "Sally," Bull Terrier Bitch, 8 months:
1st Prize for "Big Dogs."



Photo by Ah Fong.

Mr. J. C. Thomson's "Byng," Boston Terrier Dog, 3.8 years: 1st Prize for "Small Dogs."



Photo by Young Photo Co.

Mr. H. G. Remedios' "Rex," dog, 1.3 years: 1st Prize for Groenendals, or Belgian Police Dogs.

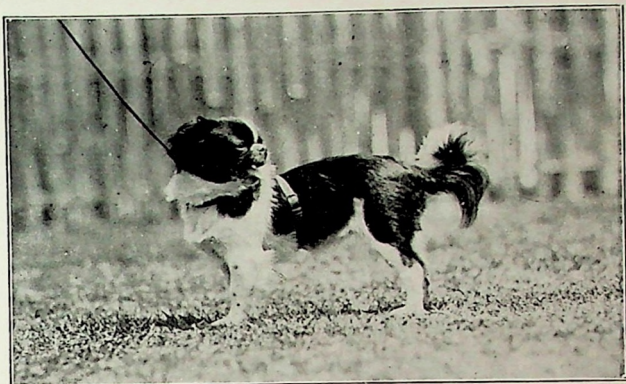


Photo by Ah Fong.

Madame Wellington Koo's "Tieh-Shi-Tze-erh," 1.2 years:
1st Prize for Pekinese Dogs.

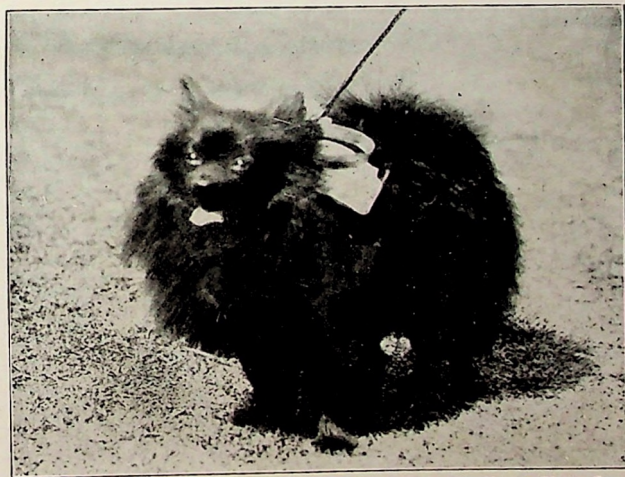
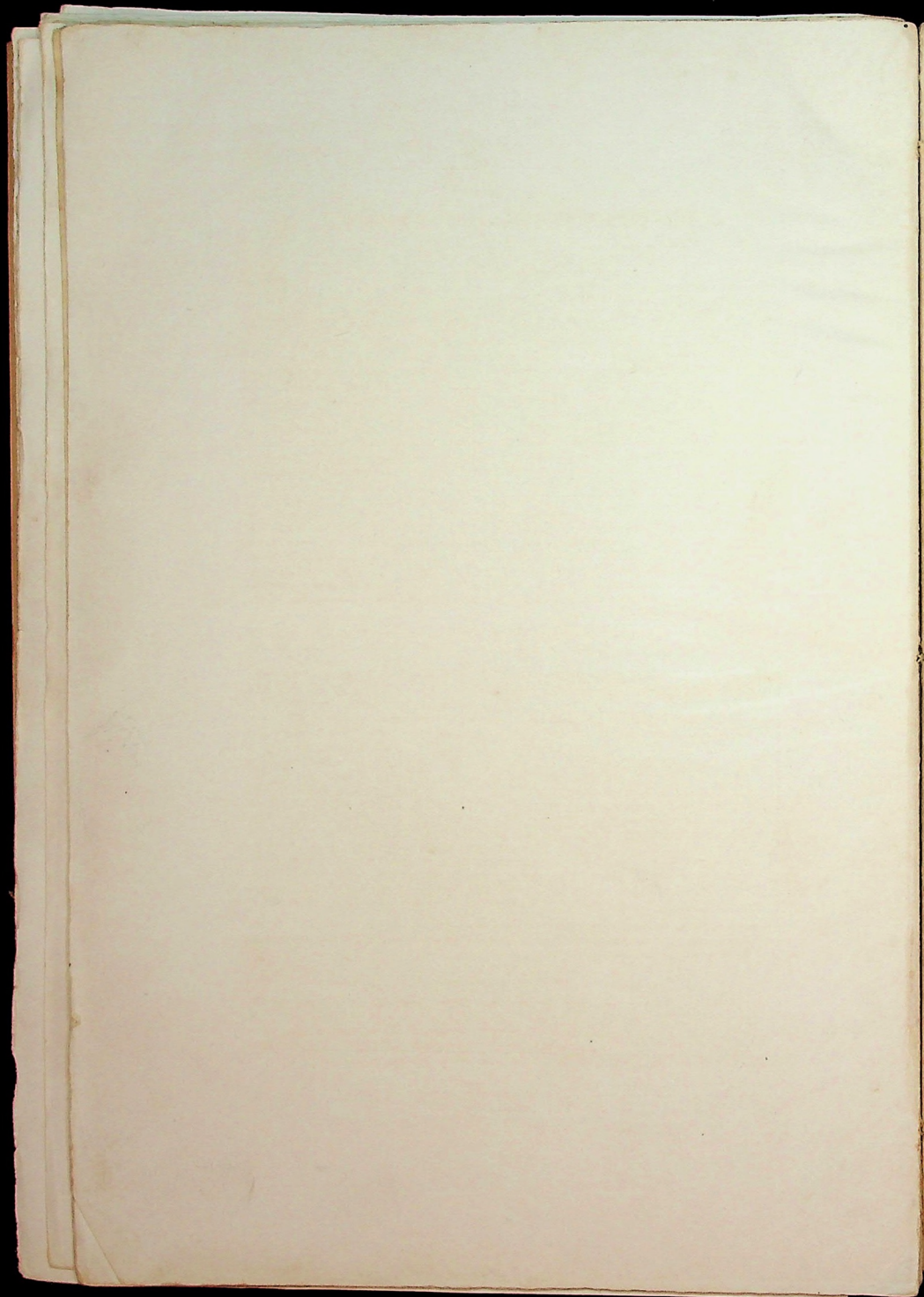


Photo by Young Photo Co.

Mrs. K. S. Sih's "Toy," dog, 1.11 years: 1st Prize for
Pomeranians.



SCIENTIFIC NOTES AND REVIEWS

BIOLOGY

VARIATIONS IN GOLDFISH: From the Biological Laboratory of the Science Society of China, Nanking, we have received an extremely interesting publication entitled "Variation in External Characters of Goldfish, *Carassius auratus*" by Mr. Shisan C. Chen. This deals with a careful investigation on the part of the author of the subject indicated extended over a number of years, in the course of which numerous famous collections of living goldfish in Nanking, Yanchow and Shanghai were examined and over a hundred domesticated goldfish and numerous wild ones actually measured. The wild goldfish has received the name of *Carassius auratus* (L.), and is known to the Chinese as *Chi Yu* (鯽魚). It is a close relation of the crucian carp, *C. carassius* (L.) of Europe and Siberia, from which it differs in being less deep in the body. This fish, which is common throughout China in ponds, creeks, streams and rivers, being able to live in stagnant ponds better, almost, than any other fish, has been proved to be particularly susceptible to variation, especially in regard to the length and relative depth of its body, its fins, its eyes and its colour; and it is from this species that the Japanese and Chinese have bred all the finny marvels known to us under the blanket term of goldfish. The treatise under review enumerates the known variations, classifying them under suitable headings and tabulating the results of measurements. Nine excellent plates, six in colours, illustrate the article. These show different varieties of fish as well as some microscopic views of colour elements in their scales. One of the latter shows that the colour elements are all present in the wild goldfish, and that it is merely a matter of the development or suppression of these that accounts for the variation in the colours of the cultivated varieties.

An interesting section of the paper deals with old Chinese literature upon the subject of goldfish, an investigation of which was made by the author in an effort to discover records of the origin of new races of goldfish. "The earliest reliable treatise on goldfish is a short section in the famous 'Materia Medica' (本草綱目) of Li Shih-chen (李時珍) published about 1570-1600. According to this author, although red-scaled fish were observed in nature as early as the Tsin dynasty (晉, 265-419), they were not domesticated as pets until the Sung dynasty (宋, 960-1278). At the time when Li Shih-chen wrote his book, goldfishes were reared everywhere and red, white and spotted fishes were already in existence." This introduces us to a subject not dealt with by the author, namely, the existence in a wild state of coloured fishes. We have come across this phenomenon in North China, where once in the Pao-ting Fu Lakes, at a place called Chi-li-hai, we saw a large catch of fish made by local fishermen which included numerous all red, all white, and red and white mixed specimens of *Carassius auratus*. From this it would seem that under certain conditions, not at present understood, this species in the wild state gives rise to remarkable colour variations. The Chinese, who are great lovers of nature, appear to have taken advantage of this, and, domesticating the species, have found it subject to further variations. It is claimed that the ancestral home of the domesticated goldfish is China and not Japan. To the latter country it was introduced about the year 1500, when "some goldfishes were brought from China to Sakai, a town near Osaka."

A bibliography is given at the end of Mr. Chen's paper, which, taken as a whole, forms a very useful contribution to our knowledge of the goldfish, at the same time being a tribute to the author's industry.

A CORRECTION: In the last (May) issue of this Journal in the paper by N. Gist Gee and C. F. Wu, on page 236, the illustrations of the skeleton and gemmule spicules, respectively, of *Spongilla (Eucnapius) geei* were placed the wrong way round: the spicules marked a and labelled the "gemmule spicules" should have been marked b and labelled the "skeleton spicules" and vice versa.

GEOLOGY

THE GEOLOGY OF THE LOWER YANGTZE VALLEY : We have recently received from the authors a reprint of a treatise published in the *Bulletin of the Geological Survey of China* (No. 7, 1925) entitled "The Geologic Structure and Physiographic History of the Yangtze Valley below Wushan." This has been prepared by Messrs. L. F. Yih and C. Y. Hsieh from their own surveys and those of other members of the Geological Survey that have been carried out in the region dealt with. We cannot help feeling that the authors have tried to deal with a vast subject in too small a space. The territory covered is enormous, while its geology is extremely complicated. In order to make it intelligible even to the trained geologist numerous maps, charts and diagrams should have been included, as well as more details concerning the numerous formations mentioned. Only one map is included in this treatise, and it is far from satisfactory. Important places mentioned in the text are not given on the map, while there is nothing to indicate the trends of the mountain systems. Numerous photographs are given to illustrate the text, but in most cases these are so poorly reproduced as to be useless : the English of the text is not what it might be—all of which tends to spoil what appears to be a great effort to produce a useful work on the part of the authors. It is greatly to be deplored that there is this falling off in the high standard hitherto characteristic of the *Bulletin of the Geological Survey*.

MEDICINE

CANCER RESEARCH : We have had occasion, in recent issues of this Journal, to draw attention to press reports of noted advances in combating this scourge of humanity. Whether these are to be discounted as the usual premature and vague newspaper accounts of untested hypotheses, we are not in a position to state. One thing, however, impresses itself upon the reader in connexion with these accounts ; and that is that much of the research that is now reported to be going on—if it be correctly reported—is likely to prove abortive.

This is in no wise intended to belittle the value of discoveries indicating that colloidal lead, administered under skilled supervision, arrests the development of cancer, or that the spectroscope is an efficient adjunct to its diagnosis : but we deem it pertinent to reiterate our observations, in our April issue, respecting not only new hypotheses in regard to *Dementia Praecox*, but also to Blood Tests in the Diagnosis of Cancer.

The alteration of the spectrum of the blood in precancerous conditions is a cue to its etiology that cannot be too closely pursued, and is likely to afford more conclusive evidence than the tentative isolation of a micro-organism. It points once more to the reasonableness, nay, soundness, of the contention that cancer is the outcome of abortion of function which in turn is to be traced to imperfect metabolism.

There are numerous instances on record where the application of organo-therapy has resulted in the dissipation of a definite carcinomatous condition. While there are, perhaps, as many objections to organo-therapy in this connexion as there are to the administration of colloidal metals, the former seems more in line with natural processes, since the administration of colloidal metals can bring about a favourable condition, due to a change in the inter-reaction of hormones, only *indirectly*.

The recent observations respecting *Dementia Praecox* already referred to, point once more to the likelihood of diet, in relation to intestinal auto-intoxication, being a vital factor in cancer. If the toxins introduced into the blood in this way can be held to account for impairment of mental function, it is equally reasonable to ascribe to their influence upon metabolism a corresponding predisposition to true carcinoma, the more so since the element of *heredity* which has played so important a part in predisposition to cancer, can best be accounted for by the assumption of the transference, from parent to child, of traits that have an important bearing upon metabolism.

SHOOTING AND FISHING NOTES

SHOOTING

THE SPRING SNIPE SEASON: We are now able to say something about the spring snipe season in Shanghai and neighbouring districts. As indicated in our last issue, the season being a particularly dry one, snipe shooting has been poor. Nevertheless some ardent sportsmen, refusing to be discouraged by adverse conditions, have gone afield, and have been rewarded with a few couple or so of fat spring birds. One party of three guns managed to secure ten couple along Battery Creek, where, in spite of the country's being bone dry, the birds were found in the fields of standing wheat. Probably these were feeding in the furrows, which were being kept clean by the farmers. We also visited these grounds and found a few birds, all either in the wheat fields or in the bean patches. This was all the more remarkable since it was low tide at the time, and the usual feeding grounds of snipe along the river's bank were therefore exposed. There is really no telling what to expect with snipe. In our case it was some time before we found the snipe, as we were looking for them in the usual spots frequented by these birds. It is well known, of course, that where grassy meadows and fields of low scrub lie adjacent to marshes, snipe may frequently be found on these during the warmer hours of the day, apparently resting; but, considering the state of the tides, this could hardly explain the presence of the birds in the wheat fields. They must have been feeding. Unless things change before we go to press the present season will have to be written down a failure.

Colonel N. H. Logan reports that he secured 7 couple of Swinhoe's and pintail snipe on May 7 at Kaochiao Creek, and another 7 couple and one golden plover at Henli on the 9th. He found them mainly in the standing wheat and broad-beans, though some were evidently feeding along the edges of rice-seedling patches.

Three guns shooting in the district above Minghong bagged 25½ couple of spring snipe on April 9.

SPRING SNIPE UNUSUALLY LATE IN HONGKONG: The lateness of the spring snipe season this year is attested to by news from Hongkong to the effect that some of these birds were shot there by Mr. G. H. Potts, a well-known China sportsman, on May 3. This is believed to be the latest date ever recorded for spring snipe in Hongkong. Usually the last birds are seen some ten days or a fortnight earlier.

A RECORD BAG OF WINTER SNIPE: It is not easy to secure details of good bags in China, where sportsmen are loath to give away information of the whereabouts of their favourite shooting grounds, so that we are all the more indebted to Colonel Logan for giving us details of what appears to be a record bag of winter snipe. Shooting with two companions, Messrs. George H. Potts and E. Oxley Cumming, to the north of Pakou on April 9, 1924, the three guns piled up a bag of 105½ couple in 3½ hours. This is almost exactly a bird a minute. We would be very glad to receive details of any further bags, that may compare with or beat this record.

BAMBOO PARTRIDGE SHOOTING: Under the title "Partridges in Bamboo Scrub" the well-known contributor to the *Field* on shooting and fishing, "Flaur-de Lys," publishes some notes in the April 1 issue of the paper on shooting the bamboo partridge (*Bambusicola thoracica*) in Central China, where he appears to have enjoyed good sport with these delightful little birds. According to this writer, while bamboo partridges like bamboo scrub near water better than any other covert, they may also be found in bramble brakes, and they are "by no means wedded to the hills, and there are many places in the Yangtze Valley where they are found close to the river." He says that "Rocky Point, five miles above Tunghy, is a good instance. Here there are both bamboo scrub, and large bramble brakes; the partridges seem

to be equally at home there in both kinds of covert." Again these birds "often when flushed take refuge in thick trees, and, when dogs are used, they are thus often completely lost." They are easy to kill, and, unlike pheasants, generally when dropped lie fluttering where they fall and so are easily retrieved. Opinions as to the sporting qualities of these birds may differ from the writer who says that altogether he supposes "bamboo partridges are not very sporting birds, yet still hunting for them is a mild sort of stalking, and has a fascination of its own." We can fully endorse Flour-de-Lys' experiences as regards the covert in which bamboo partridges are to be found, but rather consider them really sporting birds if the right method of tackling them, namely, beating through the coverts, is used. One seldom gets more than a snap shot, but the sport may often be fast and furious.

PHEASANTS IN THE WUHU DISTRICT: We have recently been informed by a resident at that port that the past season has been comparatively good for pheasants at Wuhu. One sportsman counted 82 head to his gun during the season, and another 37 head. Apparently pheasants are on the increase up the Yangtze as well as in the area between the estuary of that river and the Chientang River in Chekiang. Sportsmen are beginning to look forward to a return of the conditions of the good old days, when pheasant shooting in China was famous all over the world. It has always been said that the abundance of pheasants and other game in the Lower Yangtze Valley and South-east China generally was due to the devastation of the country committed by the Tai-ping Rebels. Possibly the present disturbed state of the country has something to do with the increase of game, since native pot-shooters dare not be seen out with guns. How much the Wuhu district has suffered in this way it would be interesting to know.

FOOCHOW DISTRICT AS A SHOOTING GROUND: A well known Shanghai sportsman has recently returned from a winter spent in Foochow, and he reports that the shooting there on the whole is poor. During the whole season he shot only a dozen or so pheasants, though he went out almost every week-end. Snipe shooting he found much better, while on two trips to the mouth of the Yungfu River he secured nine woodcock. This was in February. Snipe were plentiful within walking distance of Foochow, and he used to make a small bag almost daily before breakfast, on one occasion securing eight couple. But, taking it all round, the Foochow district is not to be recommended to sportsmen.

FISHING

SEA BASS FISHING: This month sees the commencement of the sea bass fishing at Wei-hai-wei and other northern summer resorts, and since there must be many who desire to take up this fascinating sport, but lack knowledge as to local conditions, we are publishing here a letter upon the subject written some years ago by Mr. H. P. Wilkinson, one of the pioneers in the sport, to the late Mr. W. E. Southcott of Wei-hai-wei.

"DEAR SOUTHCOTT,—I must apologize for my delay in giving you a few notes on Bass Fishing at Weihaiwei.

As to Rod: The ordinary 'Sea Rod' as used at home, namely one only 7 or 8 ft. long with a very stiff top is not suitable for the sort of fishing I have been doing at Weihaiwei, in which one combines casting a bait and also spinning it. The rod I make the most use of is a small Salmon or Grilse Rod with a fairly stiff top. I would recommend the length to be not longer than 11-ft. at the outside, as a longer rod would not be very handy in a boat. The rings should be 'snake' (or some other form of upright ring). *Note.* As brass stands the salt water better than other metals, any fittings should, where possible be of brass.

Reel: The Reel should be large enough to carry at least 60 yards of line. A wooden Sea Reel or a strong (and not too complicated) salmon reel, would do.

SHOOTING AND FISHING NOTES

Line : Sixty yards at least of water-proofed line. Either 'spinning' line, or a weight of line known as 'light salmon line.' You should have two or three lines, one say 80 yards. As lines should be dried always after use, a collapsible form of line drier would be a useful thing. As a matter of fact the back of a wooden chair does excellently.

Trace : You should get one or two stout traces (with two swivels, which should be brass) for use, and as models.

Made up traces have a short life I notice at Weihaiwei; and it is well to have the materials for making one's own. This can be done by either (a) getting 6 ft. 'gut casts,' 'light salmon' or 'light trout,' dividing them into three parts and then joining them up with two brass swivels, or (b) getting 'hanks' of suitable sized gut and making up one's own traces (with swivels of brass or some other metal which will not rust in salt water). You should get at least two dozen swivels, medium size, to make up your own traces. *Note.*—A 6 ft. trace is long enough for fishing at Weihaiwei. With light or medium gut, one can hook fish, but one loses more fish too, as the oyster covered rocks at Weihaiwei are very wearing on all tackle. You will need at least six traces.

Hooks : I have found the 'Archer Spinner' the most useful rig, small salmon size. You will need, say, two dozen of these, as you will probably lose a good many at first, and if luckily you do not, they keep fairly well if wrapped in oiled paper. *Note.*—Oil is bad for gut, but kerosene will keep rust off hooks and, if wiped off gut to which hooks are attached, does not seem to do the gut much harm.

Baits : I have been using preserved baits which I got from Tisdall & Co., Tackle-makers of Vancouver: Medium sized silvery fish, say smelts. I found, last season however, that the tail end of a good fat gar-fish was an excellent bait. The head of the gar-fish should be cut off, as the flanges of the archer spinner bite better on the body itself, and a firm hold of the bait is most essential. I have found that the tail of any bait should not be cut off, if the bass are to be deceived into taking it.

The great advantage of having preserved baits is that one can seldom get suitable fresh bait when one needs it; and moreover preserved bait is tougher, and lasts longer. Local smelts which come into the Harbour at Weihaiwei sometimes in shoals, or gar-fish which are practically always available, can be preserved in formalin. I am sure that Surgeon Commander Crosby will let you know the proper mixture.

Landing Net, or Gaff : For a good sized bass, a Gaff is the handiest method of getting him into the boat; but it is a most dangerous weapon, especially in the hands of an excited Chinese. A cut trace is the slightest accident to be feared. I recommend, therefore, a landing net of 18 inches at least in diameter on a stout staff 3 ft. 6-in. to 4 ft. long.

Places to Fish : There used to be many Bass under the Admiralty Pier on the Island, but the survivors are highly educated by now. There are Bass along the shore of the Mainland from just beyond the Elias' house round Half Moon Bay, and I have no doubt round the Islands at the North-Western entrance of the Harbour. I find that Sun Island is the best hunting ground, and especially the South and East sides of it.

Time : Half flood tide or nearly full, I found the best time at Sun Island, and sometimes half ebb tide. Fish however may, or may not be caught at any time.

Method of fishing : I have found spinning on the surface and without any weight off the rocks a good method. Personally I combine the spinning and casting the bait into the surf round the rocks. This method needs care of course, and it first results in loss of tackle.

Boat : A motor boat would be very handy to get to the fishing grounds, but should be slowed down on approaching them, as Bass are shy. I have found the small boat with a blunt bow, which I use, very handy for working round rocks, the blunt bow being an element of safety if one miscalculates and touches

THE CHINA JOURNAL OF SCIENCE & ARTS

a rock. Such a boat as mine you could easily tow to the fishing ground by your motor boat.

I would suggest your having a talk with Dr. Crosby on the above notes. Handley-Derry of the Consulate General at Tientsin, and other Tientsin men, have been having Bass fishing at Peitaiho. They got their tackle from America; and I am sure you could get useful hints from them."

Yours sincerely,

H. P. WILKINSON.

Shanghai, February 16, 1920.

From these detailed instructions the novice should be able to form a good idea as to how to proceed at Wei-hai-wei. At Pei-tai-ho similar tactics may be pursued, but there quite good fishing may be had off the rocks that occur at intervals along the shore.

CHINESE FISHING METHODS: Flour-de-Lys contributes a short article upon this subject to the *Field* for April 1, which will appeal to those interested in fishing in this country. What he has to say agrees well with our own observations and those of others who have contributed from time to time to the pages of the *China Journal*. Amongst other methods of taking fish, he describes that employed by guilds of blind Chinese who dive for the fish lying dormant in the mud at the bottoms during the winter.

At Kiukiang he found that the banks of creeks were apportioned out to separate families of fishermen, and here the chief method of fishing was the stringing out of lines of large, bare hooks across the creeks upon which large carp and other fish swimming along the bottom get impaled. Spearing fish is also indulged in in the shallows of the lakes, a sort of trident being used. Temporary dams are placed in streams, and when the water below these has been drained away small fish in great numbers are taken in the mud that is scooped up. Fishing with cormorants and the dip net are also described. Mention is not made of poisoning, which is extensively used in Chekiang, Fukien and neighbouring regions.

SOCIETIES AND INSTITUTIONS

GEOLOGICAL SOCIETY OF CHINA

FOURTH ANNUAL MEETING

At the fourth annual meeting of this Society, held at Peking, May 4 and 5, not only were new officers elected, but many papers of interest presented, including an address by Dr. W. D. Matthew, Director of the sections of Paleontology, Geology and Mineralogy of the American Museum of Natural History.

Following the reading of the Presidential Address of Dr. C. Y. Wang, the retiring incumbent, Dr. Wang Wen-hao was elected President of the Society for the coming year. Professor H. W. Grabau and Mr. L. Wang were chosen Vice-Presidents. The other officers elected were, Mr. H. T. Lee, Treasurer, Messrs P. L. Yuan and L. F. Yih, Councillors, and Mr. H. C. Chow, Secretary. In the absence of Dr. C. Y. Wang, the retiring President, his address was read by Mr. G. B. Barbour. The address was on "The Relation of Oceanic Deeps and Geosynclines to Ore Deposits."

The papers presented at the several sessions were as follows:

- H. T. Chang:—On the Geological Contemporaneity.
- W. H. Wong:—Position of Arsenic minerals in the metallogenetic series.
- L. F. Yih:—Types and Origin of the Iron Deposits in S. Anhui.
- C. Y. Hsieh:—Iron Deposits of N. W. Hupeh.
- H. S. Wang:—The Ta Yeh Iron Deposits.

SOCIETIES AND INSTITUTIONS

- H. T. Lee :—Corundum of Ping Shan Hsion, W. Chihli.
H. T. Lee :—On the pre-Cambrian dolomite in N. China.
E. T. Nystrom :—Some recently discovered intrusives in Shansi (Read by Title).
A. W. Grabau :—The Permian of Mongolia with a discussion of the history of the Mongolian Geosyncline.
H. C. T'an :—Cretaceous coal series in North China.
G. B. Barbour :—Note on the late Tertiary and Quarternary Geology of the Huai Lai Basin.
Sohtsu G. King :—Notes of the fossil shells of the San-Men series.
Thilhard de Chardin :—Palaeontological Notes on (A) The Sang-Kan-Ho Fauna. (B) St. Jacques (San-Tao-Ho) Fauna, (C) A new genus and species of fossil Rodent in China. (Read by Title).
G. B. Barbour :—The crystalline gneisses and schists of China.
J. S. Lee, J. Akasegnawa, Y. T. Chao :—Classification and correlation of the Palaeozoic Coal-bearing series of N. China with a note on the Microstructure of some Chinese coals.
W. H. Wong :—Classification of Chinese coals and a new nomenclature with notation.
P. L. Yuan :—Physiographic Problems of S. Shansi.
K. L. Fong :—Origin and distribution of sand dunes near Kaifeng.
F. N. Kolarova :—Clitambonites and Hemipromites in China.
A. W. Grabau :—Mesozoic Geography of China and its bearing on the distribution of Mesozoic faunas and floras. Illustrated with lantern slides.

The name of Dr. W. D. Matthew was added to the roll of Corresponding Members of the Society. His address, which was one of the outstanding features of the meeting, dealt with Mongolia's geological importance and showed how the fossil remains unearthed in the several expeditions under Mr. Roy Chapman Andrews throw light on the chain of life in the Animal Kingdom. Dr. Matthew demonstrated the difference between Mongolian types and those of North America and of Europe, stressing the fact that it is South America that yields forms closely resembling the Mongolian.

PEKING NATURAL HISTORY SOCIETY

In connexion with this session of the Geological Society, Mr. Roy Chapman Andrews gave an illustrated lecture at the P. U. M. C. under the auspices of the Natural History Society, his subject being Exploration in Mongolia. His address formed part of the programme of a reception extended by this Society to the Geological Society.

EDUCATIONAL NOTES AND INTELLIGENCE

THE ORIENTAL LIBRARY

Strangely apposite to Mr. J. C. B. Kwei's article on Chinese Library Development, which we publish in this issue, is an event in Cathay's educational world which we mark not only with supreme satisfaction, but as one of greater importance to China's studiously inclined than the founding of universities with Versailles-like buildings and equipment representing the very latest scientific dictum.

Sunday, May 2nd, witnessed the inauguration of The Oriental Library, comprising a collection of several hundred thousand books and periodicals, both in Chinese and English, accumulated in the course of more than twenty years by the Commercial Press, Ltd. of Shanghai, for the use of its Editorial Department, and now converted by them into a public library. The inaugural ceremony itself, presided over by trustees and officials, was quite impressive: far less so, however, than the fact that here is one more step in the right direction for leading the Chinese people into the light.

The biographies of great men—true servants of the people—in all lands, reveal that they were hard put to it to obtain an elementary education: and, had it not

THE CHINA JOURNAL OF SCIENCE & ARTS

been that access to books was facilitated for them, they might never have risen to the heights that they achieved. The public library, in conjunction with the common school, has done more for education, in its truest sense, than the university.

Here, then, is a noteworthy addition to educational facilities in Shanghai. Here are facilities for enlightenment placed within the reach of the common people. The sum of two coppers gains admission. A season ticket for one dollar entitles the holder to make use of the library for six months. A new building, five storeys high, houses this: and while much space is at present taken up by the executive offices and showrooms of the Commercial Press, the library itself has not been scanted and its future needs as to space have been taken account of in the planning. From 2.30 to 9 p.m. every day the studious may avail themselves of this source of valuable information. The sponsors of the institution are to be congratulated on rendering their countrymen a signal service.

The trustees of the Library are Messrs. Yuen-chi Chang, V. D. Kao, Y. C. Bau, Feng-chien Kao and Y. W. Wong. The Officials are: Mr. W. Y. Wong, Director, Mr. F. C. Kiang, Assistant Director, Mr. C. Dick, Librarian in Charge of Chinese books, Mr. S. Y. Pan, Librarian in Charge of Foreign books.

THE CHINESE STUDENTS' MONTHLY.

The March issue of this interesting Monthly (Vol. XXI, No. 5), which is published by the Chinese Students' Alliance in the United States of America, and emanates from the University of Michigan, Ann Arbor, is devoted, save for one contribution, to discussion of Railway Systems for China and Problems of Chinese Government Railways. The views of the late Dr. Sun Yat-sen, Mr. Tson Sou-pan, Mr. Yeh Kung-cho and Mr. John Earl Baker (Technical Advisor to the Ministry of Communications), are voiced as to the first, while Messrs. Sze Cheng, P. H. Ho, W. E. Mao, and Chon Yuen-tu are heard in the matter of the second.

Interesting as are their views, several of the authors having been previously employed by China's railways and being now in the employ of American, there is one contribution to this number, entitled, "Thus Spake Adam" which deserves to be made a part of the curriculum at all local schools. That a Chinese (Mr. K. C. Wu) should thus outspokenly present his opinion of the Chinese educated abroad, is little short of amazing, and is as healthy a sign as the founding of the library discussed above.

A PRIZE-WINNING ESSAY.

John Texeira, of Lihue, Kauai, (Hawaian Territory) an American schoolboy of Portuguese descent, last year wrote an essay that proved to be worth \$6 a word. He was recently informed that he had won the Harvey S. Firestone National Essay Contest for 1925. His essay, "Economies Resulting from Highway Improvement," provides him with a four-year scholarship at any American university. His was considered the best essay out of 200,000 submitted.

This is the second time in recent years that a schoolboy of Hawaii has taken first prize in such a contest. In 1923, Ah Sing-ching, 13 years old and of Chinese parentage, won the American Legion prize of \$750 for the best essay on "How the American Legion Can Serve the Nation." His paper was the best in 50,000 submitted.

PUBLICATIONS RECEIVED

Extreme Asia—Discovery—The Philippine Journal of Science—The French Colonial Digest—The Chinese Economic Bulletin—The New Zealand Journal of Science and Technology—La Revue Economique—Natural History—The China Weekly Review—Asia—The Asiatic Motor—Chinese Social and Political Science Review—The Bulletin of the Geological Society of China—The China Medical Journal—The American Journal of Science—Psyche—The Lingnaam Agricultural Review—The New Orient—The Annals and Magazine of Natural History—Man—The Modern Review—Health—Ginling College Magazine—Chinese Students Monthly—The New Mandarin—Mid-Pacific Magazine—Far Eastern Review—The Chinese Recorder.

TRAVEL IN COMFORT

The American Express has a special travel department in all their offices where you may book your steamship passage, hotel reservations, rail tickets and arrange your local sightseeing.

Yokohama—Tientsin—Peking—Shanghai—Hong-
kong—Manila—Singapore—Calcutta—
Bombay—Colombo

AMERICAN EXPRESS



Messrs. DAY, SON & HEWITT'S

“KOSSOLIAN” BLOOD SALT

(DOG BRAND)

“Kossolian” is the finest Blood Purifier, Tonic and Conditioner known to Veterinary Science.

*For supplies of the above and other preparations
for your Dogs Apply to*

GEORGE McBAIN

(IMPORT DEPARTMENT)

17 KIANGSE ROAD

SHANGHAI

Tel. C. 8751

RADIUM TREATMENT
OF RHEUMATISM, GOUT,
LUMBAGO SCIATICA, ETC.

"Radiwoll"

A cloth incorporated with Euxenit, a new mineral earth containing Radium. The parts of the body which are covered by Radiwoll are constantly under an even influence of Radium rays.

The total Radio activity never diminishes and the strength is guaranteed by a certificate issued by the Swedish Government Geological Expert, which is attached to each cloth.

Radiwoll has proved to be an infallible cure for Rheumatism, Gout, Lumbago, Sciatica.

Sole Agents for China:

STROMWALL TRADING
Co., Ltd., Dept. G.

17 Yuen Ming Yuen Road,

SHANGHAI

A fine product—

DUNLOP CORDS

THERE IS NO FINER TYRE

Remember DUNLOP is more than a name—it's a reputation—It stands for perfection in Tyre manufacture.

We stand behind every tyre we sell and state, without any qualification, that you can

fit DUNLOP and be satisfied

Obtainable from All Garages

A famous pair—

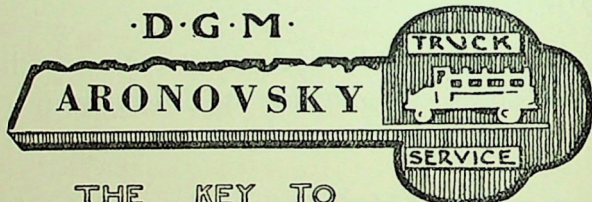
Dunlop Maxfli Golf Ball and Dunlop Lawn Tennis Ball.
Play them and see how it helps.



We have been Jewellers since 1901 that is twenty four years The Experience and Judgement gained during this period are at the service of the customers to day We believe that every article offered by us is worthy of its price and of your approval

TUCK CHANG & CO
Jewellers. Gem Merchants. Watchmakers
67 Broadway Shanghai

·D·G·M·



ARONOVSKY

THE KEY TO
SATISFACTORY SERVICE

Customs, Clearance, Forwarding Agent and Packers.

Cargo and Baggage delivered to or from Warehouse, Wharf,
Office or Residence

Goods, etc., stored at reasonable rates

D. G. M. ARONOVSKY
7 ZERA ROAD PHONE C. 1864 and 7189

Jardine, Matheson & Co., Ltd.

General Merchants Importers and Exporters

Head Office : HONGKONG

SHANGHAI—NEW YORK—YOKOHAMA—KOBE

BRANCHES THROUGHOUT CHINA

General Managers :

Ewo Cotton Mills, Ltd.

Proprietors :

Ewo Cold Storage Co.

Ewo Silk Filature

Ewo Press Packing Co.

General Agents :

Shanghai and Hongkew Wharf Co., Ltd.

China Sugar Refining Co., Ltd.

SHIPPING :

General Managers :

Indo-China Steam Navigation Co., Ltd.

Agents :

Ellerman & Bucknall S.S. Co., Ltd.

American and Manchurian Line

INSURANCE :

General Agents :

Canton Insurance Office, Ltd.

General Managers :

Hongkong Fire Insurance Co., Ltd.

CARLOWITZ & CO.

Established in China since 1846

138-140 SZECHUEN ROAD, SHANGHAI



CHEMICAL DEPARTMENT.

Sole Agents for China

LOBELIN-INGELHEIM.

The leading specific remedy for disturbances of the respiratory centre.

Recommended in all cases, where breathing fails.

CADECHOL-INGELHEIM.

Containing all pharmacologic effects of camphor without gastro intestinal disturbances

PERICHOL-INGELHEIM.

a mixture of Cadechol with papaverin against steno-cardiac attacks. Angina pectoris.

Manufacturing Chemists:

C. H. Boehringer Sohn, Nieder-Ingelheim.

TINCTURA FERRI ATHENSTAEDT.

(Athenstaedts Tincture of Iron)

a readily assimilable Iron-Preparation.

Manufacturing Chemists:

Athenstaedt & Redecker, Hemelingen/Bremen.

**THE HALL-MARK OF
PERFECTION**



CRITTALL MFG. CO. LTD.,
(China Branch), Shanghai

Agents:

Bradley & Co., Hongkong
J. Whittall & Co., Ltd., Tientsin
Lacey & Cannan, Hankow
L. J. Healing & Co. Ltd., Tokyo

BIANCHI'S

Wedding Cakes a
Speciality.

Wedding Parties and
Garden Parties
catered for.

23 NANKING ROAD,
SHANGHAI

Telephone Central 2264

DISCOVERY

A Monthly Popular Journal of Knowledge

Trustees:

Sir J. J. THOMSON, O.M., F.R.S., Sir F. G. KENYON, K.C.B., F.B.A.,
Prof. A. O. SEWARD, SO.D., F.R.S., Prof. R. S. CONWAY, LITT.D., F.B.A.

"Discovery" will be found in every part of the civilized globe where intellectual forces are at work. The articles, amply illustrated, are written by leading authorities.

"Discovery" is worthy of your support. The largely increasing daily list of new annual subscribers is sufficient evidence of this. If you want to do a good turn to your friend or acquaintance tell him or her about "Discovery." You will thereby earn everlasting gratitude.

We will send a Free Specimen copy of "Discovery" to anyone anywhere. All you have to do is to send us a Post Card with your name and address. The copy will be sent by return of post.

ILLUSTRATED

1/-

MONTHLY

Annual Subscription 12s. 6d. post free.

BENN BROTHERS, LIMITED

8 Bouverie Street, London, E.C.4, England

HONGKONG AND SHANGHAI BANKING CORPORATION

(INCORPORATED IN HONGKONG)

CAPITAL: Authorized Capital	.. ..	\$50,000,000
Issued and fully paid up	.. ..	\$20,000,000
RESERVE FUND: Sterling	.. ..	£4,500,000
" " Silver	.. ..	\$27,000,000
Reserve Liability of Proprietors	.. ..	\$20,000,000

Head Office: HONGKONG.

Court of Directors:

D. G. M. Bernard, Esq., <i>Chairman</i>	
Hon. Mr. A. O. Lang, <i>Deputy Chairman</i>	
W. H. Bell, Esq.	J. A. Plummer, Esq.
A. H. Compton, Esq.	T. G. Weall, Esq.
Hon. Mr. P. H. Holyoak	H. P. White, Esq.
W. L. Pattenden, Esq.	G. M. Young, Esq.

Branches and Agencies:

Amoy	Dairen	Johore	Nagasaki	Singapore
Bangkok	Foochow	Kobe	New York	Sourabaya
Batavia	Haiphong	Kuala-	Peking	Sungei Patani
Bombay	Hamburg	Lumpur	Penang	Tientsin
Calcutta	Hankow	London	Rangoon	Tokyo
Canton	Harbin	Lyons	Saigon	Tsingtao
Chefoo	Hollo	Malacca	S. Francisco	Yokohama
Colombo	Ipo	Manila	Shanghai	

Chief Manager:

A. H. BARLOW, Esq.

London Bankers:

The Westminster Bank, Ltd.

Shanghai Branch: 12 THE BUND. Sub-Agency: 9 BROADWAY.

Interest allowed on Current Accounts and on Fixed Deposit according to arrangement.

Local Bills Discounted.

Credits granted on approved securities and every description of banking and exchange business transacted.

Drafts granted on London and the chief commercial places in Europe, India, Australia, Africa, China, Japan and America.

Savings Banks Office:

Deposits of not less than \$1 will be received.

Not more than \$200 will be received during one month from any single Depositor.

Interest at the rate of 3½ per cent. per annum will be allowed upon the monthly minimum balance.

The maximum balance on which interest will be allowed is \$5,000.00.

Deposits may be withdrawn on Demand. Accounts will be kept either in Dollars or Taels, Local Currency, at the option of the Depositor.

Depositors will be presented with Pass Books, in which all transactions will be entered. Pass Books must be presented when paying in or withdrawing money.

Office Hours—10 a.m. to 3 p.m.; Saturday, 10 a.m. to 12 noon.

A. B. LOWSON, *Acting Manager.*

THE TASTE IS THE TEST



TRY U. B. BEER

17 MUSEUM ROAD, SHANGHAI

E. MERCK, DARMSTADT

is the oldest and most renowned German Factory of Chemical Products, which, due to their unsurpassed purity, enjoy the best reputation all over the world.

STOCKS of nearly all "Specialities" as well as a number of Chemicals carried at SHANGHAI, TIENSIN and CANTON. Inspection invited. Specially catering for Dispensaries and Missionary Hospitals.

CATALOGUES, PRICE-LISTS and LITERATURE free on application.

Sole Agents:

THE E-FOONG COMMERCIAL CO., 8B Kiangse Road, SHANGHAI, for Central and West China.

SCHMIDT & CO., TIENSIN and PEKING, for North China including Manchuria.

BORNEMANN & CO., CANTON and HONGKONG, for South China.



VARIOUS BOOKS
and PUBLICATIONS
from the PRESS of the
NORTH-CHINA
DAILY NEWS

A NATURALIST'S NOTE-BOOK IN CHINA, by ARTHUR DE C. SOWERBY, F.R.G.S. *Published September, 1925. 270 pp., illustrated, art canvas binding, \$8.* A guide book and companion for the amateur naturalist and a store house of interesting information for all nature lovers.

SHANGHAI: ITS MIXED COURT AND COUNCIL, by A. M. KOTENEV. *624 pp., 8vo., \$20.* An authoritative study of the origin, history and functions of the Shanghai Municipal Council and the International Mixed Court.

A NECKLACE OF PEACH-STONES, by W. ARTHUR CORNABY. *412 pp., 8vo., illustrated, art canvas binding, \$8.* A narrative of village life in China, with many sidelights on the customs, superstitions and folklore of the people, characterized by sympathetic insight and understanding.

THE GREAT RIVER by GRETCHEN MAE FITKIN, *156 pp., 8vo., illustrated with photographs by Donald Mennie, \$5.* A series of vivid pen pictures of things seen and impressions received while visiting the great towns and cities that lie along the Yangtze, the "strangest, most inexplicable river in the world."

GUIDE TO SHANGHAI: *186 pp., with map, street guide, and index, \$1.* An exceptional guide book in that it is as interesting to the permanent resident as to the casual visitor.

Obtainable from the Publishers and from Booksellers

NORTH-CHINA DAILY NEWS & HERALD, LTD.

Printers and Publishers

SHANGHAI

KELLY & WALSH, LTD.

(INCORPORATED IN HONGKONG)

Kelly & Walsh Building, 12 Nanking Road, Shanghai

A GREAT WORK

The Chronicle of the EAST INDIA COMPANY

trading to China

1635-1834

BY HOSEA BALLOU MORSE, LL.D

AUTHOR OF The Currency of China, The Guilds of China, The Trade and Administration of China, The International Relations of the Chinese Empire.

THE scope of this work is exactly indicated by its title.

The English trade between China and London was preserved as a strict monopoly for the benefit of the United Company of Merchants of England Trading to the East Indies, commonly referred to as the Honourable (English) East India Company. From the Canton records in which we have a graphic representation of the doings of the Company's agents in China, every fact has been extracted which could be of economic value to the student of the commercial history of the eighteenth and early nineteenth centuries.

In Four Volumes \$42.00

THE EKMAN FOREIGN AGENCIES, LTD.

6 KIANGSE ROAD

SHANGHAI

Representing :

EKMAN & CO. Paper, Pulp, Iron, Steel and Sundries.
Electrical Motors, Generators and Transformers.
Butts, Hinges, Screws and Hardwares.

LME Telephones, Switchboards and Line Material.
API Centrifugal Pumps.
AVANCE Crude Oil Engines. Stationary and Marine.

SKF

BALL AND ROLLER BEARINGS
DOUBLE ROW SINGLE ROW
SELF-ALIGNING RIGID
RADIAL AND THRUST

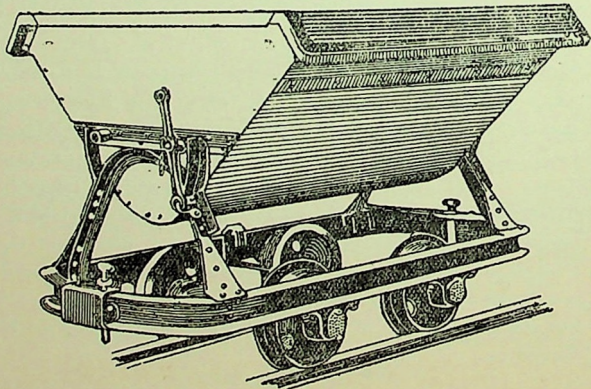
BALL BEARING PLUMMER
BLOCKS AND SHAFT HANGERS.
SPLIT BELT PULLEYS.
LINESHAFTING AND ACCESSORIES.

Agents for :

THE SWEDISH EAST ASIATIC CO., LTD.

Regular Sailings Between Sweden and Far East.

INDUSTRIAL RAILWAY MATERIAL



Koppel Industrial Car and Equipment Co.

2 CANTON ROAD

Box 743

SHANGHAI



**THE
ZEISS**

BINOCULAR
YOUR BEST TRAVELLING COMPANION

Obtainable from the Leading Stores.

Catalogues and price-list free of charge from :

The China Agents :
CARLOWITZ & CO.
OPTICAL DEPT.

Office and Showroom :
Corner Szechuen & Soochow Road
Tel. Central 6958

**CARL ZEISS
JENA**

**FOR PRINTING AND
ADVERTISING SERVICE**

CONSULT

The Oriental Press and Advertising Agency

We operate large outdoor advertising Plants throughout China which carry your sales message to all parts of the country

Our motto : "SERVICE"

Printing, Lithographic and Book-binding work of every description, neatly, cheaply and promptly executed

Colour Work a Specialty

THE ORIENTAL PRESS

PROPRIETORS

113 Avenue Edward VII—Shanghai



“HAZELINE”
(TRADE MARK)
SNOW”

The simple way to a clear and healthy complexion is the daily application of “Hazeline’ Snow.” It cleanses pores clogged with dust and gives the skin a freshness of appearance which is exceptionally charming. “Hazeline’ Snow” is not greasy and may be applied conveniently at any time.

*Supplied in glass pots by
all Chemists and Stores.*



BURROUGHS WELLCOME & CO.
THE WELLCOME FOUNDATION, LTD.,
(INCORPORATED IN ENGLAND)
LONDON AND SHANGHAI



Stocked by Grocers at Shanghai, Hankow and Tientsin

KLIM

POWDERED MILK

Packed in 1 pound, 2½ pound and 5 pound tins, so as to meet the needs of every consumer, KLIM, an ideal MILK food, is prepared only from the best dairy milk, within a few minutes of milking.

Klim has no undesirable bacteria, being well within the Certified Milk limit, and because its moisture content is well under 3%, bacterial action cannot take place. As pasteurization immediately precedes the powdering process, reliquified Klim is the utmost in freshness and is always safe.

It may be mixed when needed. It is quickly and COMPLETELY soluble in COLD water, showing no tendency to settle out of solution.

KLIM is in all essentials—MILK

GETZ BROS. & CO.

12 NANKING ROAD, SHANGHAI

LAOU KIU LUEN & CO.

The Lion Silk Store

SILK



SILK

Established 1918

莊 緞 綢

SILK

綸 九 老

P. 424 NANKING ROAD, SHANGHAI

Cable Address:
"LIONSILK"
SHANGHAI

Code Used:
A.B.C. 5th Edition
Tel. C. 3500

The Asiatic Petroleum Co. (North China), Ltd.

Represented all over Central and North China

Importers and Distributors of—

- KEROSENE For Lighting and Heating Purposes
"SHELL" AVIATION SPIRIT For Aircraft Motors
"SHELL" MOTOR SPIRIT
"FLYING WHEEL" MOTOR SPIRIT
"SHELL" MOTOR LUBRICATING OILS
"SHELL" DIESEL OIL For Internal Combustion Engines
FUEL OIL For Ship's Bunkers, etc.
"SHELL" MINERAL TURPENTINE
CANDLES
PARAFFIN WAX
FLOOR POLISH
"BLACK SHELL" BITUMINOUS PAINTS
A protective anti-corrosive and water-proof paint for iron and woodwork.



THE choicest of rich Turkish tobaccos blended with the best of American tobaccos. That's why—

They Satisfy
—and the blend
can't be copied

LIGGETT & MYERS TOBACCO CO.

"EVERY FOOD FOR EVERY PLANT"



BRUNNER, MOND & CO.
(CHINA), LIMITED

Agents for

BRITISH SULPHATE OF AMMONIA FEDERATION, LTD.

Dry Neutral Sulphate of Ammonia

99½ per cent. pure; Analysing 25.7%

Ammonia equals 21.1% Nitrogen

FOR ALL PLANTS

ALSO

CRESCENT COMPLETE FERTILISERS

FOR

Cereals, Vegetables, Fruits, Trees, Flowers, etc.

Specially adapted to China soil requirements and containing all essential plant foods in properly balanced proportions.

"CRESCENT" Complete Fertilisers are prepared in China under expert supervision and tested in our Experimental Garden, Yuyuen Road, Shanghai. Inspection invited. Phone Central 7371, Crescent Fertiliser Dept.

ALSO

BONE FLOUR

60 per cent. Phosphate, 1¼ per cent. Nitrogen.

Stocks of all the above held in Shanghai and at our Branches at Dairen, Harbin, Tientsin, Peking, Tsinan, Chefoo, Hankow, Chungking, Wuhu, Hongkong, Foochow, Swatow, Canton. Agents and Sub-Agents throughout China.

THE BEST FERTILISERS OBTAINABLE

Head Office: 41 SZECHUEN ROAD, SHANGHAI

NEVER VARIES

When or wherever you buy it the quality is always the same

Daisy Brand

BUTTER

Consistently maintains its perfect flavour and purity

\$1.20 per pound

Obtainable at all Stores

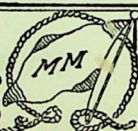
The Dairy Farm Ice & Cold Storage Co., Ltd.

(OF HONGKONG)

No. 404 Glen Building, Shanghai. Phone Central 3074



M. M.
MESSAGERIES MARITIMES



FRENCH MAIL STEAMERS AND CARGO STEAMERS

Offices:
London: 72, 75 Fenchurch Street
Telegraphic Address: LICORNE FEN
Paris: Head Office: 8 Rue Vignon
Passenger Office
8 bis Rue Vignon
Freight Office: 9 Rue de Sère
Marseilles: 3 Place Sadi Carnot
Telegraphic Address: LICORNE

FORTNIGHTLY PASSENGER SERVICE
JAPAN, CHINA, HONGKONG, SAIGON AND STRAITS
TO AND FROM MARSEILLES

MONTHLY SERVICE OF CARGO BOATS
FROM DUNKIRK ANTWERP, U.K. TO FAR EAST.

Far East Agency: Shanghai: 9 French Bund
Yokohama: 9 Bund
Kobe: 68 Kyomachi
Hongkong: No. 3 Queen's Building
Tel. Address: Messagerie.

AGENT GENERAL FOR FAR EAST—SHANGHAI

"AUTOMATIC ELECTRIC COOKING RANGE."

"Clean"

"Economic"

"Smokeless"

"Automatic"

"Cool-Cooking"

"Cooks-right"



COOK THE BETTER—WAY ELECTRICALLY

WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

No. 1 The Bund, Shanghai

Telephone C. 7487

MARDEN
MEANS THE
VERY BEST
IN ALL BRANCHES OF
TRANSPORTATION

G. E. MARDEN & CO., LTD., 10 Hankow Rd.

TELEPHONE C. 1394-5

AMERICAN DRUG COMPANY
PHARMACY

Perfumes, Toilet Articles, Candies, Chocolates, Rubber Goods,
Proprietary Medicines, etc., etc.

PRESCRIPTIONS A SPECIALITY

WHOLESALE DEPARTMENT

Drugs, Chemicals, Pharmaceutical Preparations, Druggist Sundries,
Hospital and Laboratory Supplies, etc., etc.

Price Lists will be sent upon request

房藥大發科海上

40 NANKING ROAD, SHANGHAI



FOR YOUR BABY