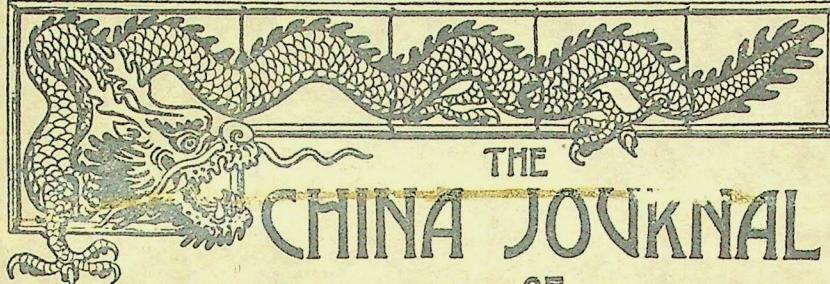


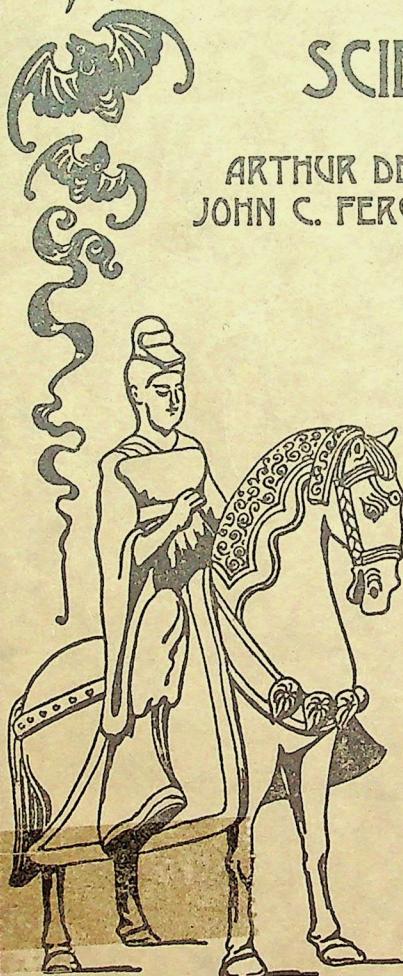
Earthquake in Japan



THE
CHINA JOURNAL
OF
SCIENCE & ARTS

EDITED BY

ARTHUR DE C. SOWERBY (SCIENCE)
JOHN C. FERGUSON, PH.D. (LITERATURE
& ARTS)



CONTENTS

Vol. I. NOVEMBER, 1923. No. 6.

The Earthquake in Japan.
An Analysis of the Four Books.
Autumn Longings.
The Story of Chinese Characters.
A Pilgrimage to the Diamond
Mountains.

What is a China Pony ?
The Genetics of Two Mutations
in the Fruit-Fly.
The Manufacture of Sulphuric
Acid.
Shooting Notes : Scientific
Notes: Reviews: Societies.

A. DE C. SOWERBY.

PRICE \$2 MEX.

Arts & Crafts

LIMITED

*Specialists in the Arts of Decorating and Furnishing
the Interiors of Public Buildings, Institutions, Banks
and the Home*

DESIGNERS AND MAKERS
OF
STAINED GLASS CASE-
MENTS, FIBROUS PLASTER,
INTERIOR WOODWORK,
AND FURNITURE IN ALL
PERIODS AND STYLES

Large Stocks are kept in our Showrooms of Fine
Fabrics, Oriental and European Carpets of the best
makes and of exquisite colourings.

Our trained and experienced staff of designers are
at the service of our customers to submit designs and
suggestions for every class of work.

Arts & Crafts, Ltd.

059-CH21/23/1-6

THE
HALL-MARK
OF
PURITY

TRADE

MARK

THE
HALL-MARK
OF
PURITY

AQUARIUS

A SPARKLING MINERAL TABLE WATER

MADE FROM

PURE DISTILLED WATER

BY

THE AQUARIUS CO.

CALDBECK, MACGREGOR & CO., LTD.

General Managers

Telephone Central 7216
(4 lines)

4 FOOCHOW ROAD
SHANGHAI

ROSE, DOWNS AND THOMPSON (Far East), LIMITED

29 CANTON ROAD, SHANGHAI.

Telegraphic
Address :

"ROSE DOWNS
SHANGHAI"

Works Established
at Hull, England,
1777

Telephones :
Central
3497-
5530

ENGINEERS AND MACHINERY
MERCHANTS.

Oldest and Largest Makers in the World of

OIL MILL MACHINERY

FOR THE TREATMENT OF ALL OIL-BEARING SEEDS AND NUTS AND FOR THE AFTER-TREATMENT OF OILS.

Sole Manufacturers of

THE "KINGSTON" GRAB DREDGER AND EXCAVATOR

FOR ALL DREDGING PURPOSES—ASHORE
AND AFLOAT

General Machinery Importers and Sole Agents for many
Leading British Manufacturing Engineers.

IN STOCK :—CRUDE AND REFINED OIL ENGINES, STEAM ENGINES, PUMPS, SMALL TOOLS, SUPPLIES FOR OIL AND FLOUR MILLS, BELTING, BELT FASTENERS, CANVAS HOSE, SEWING AND KNITTING MACHINES, MACHINE TOOLS—LATHES, PLANING MACHINES, DRILLING MACHINES, ETC. PICKERING GOVERNORS, MILL GEARING AND POLISHED SHAFTING, WIRE ROPES, SAW MILL PLANT, MARINE OIL ENGINES, OIL FILTERS, GRINDING PLANTS, ETC. ETC.

Asia Development Co., Ltd.

司 公 業 建 洲 亞

Engineers and Contractors

SHANGHAI, CHINA

3 Canton Road, 6th floor

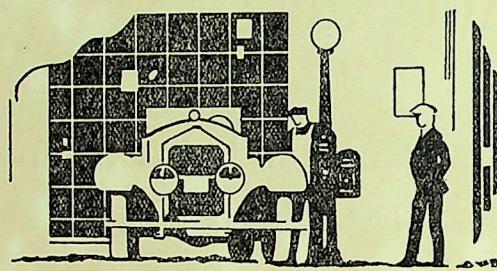
Tel. Central 6316

Telegraphic Address :
DVELOPASIA



Constructors of—

Railways, Port Developments, Electric Railways, Tramlines, Buildings, Industrial Plants, Power Plants, Waterworks, Bridges, Foundations and general developments of all kinds.



easy to get~
good to use

PRATT'S MOTOR SPIRITS



Standard Oil Co. of New York

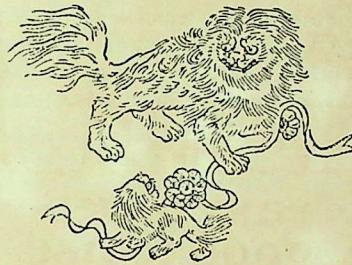
HOME SWEET HOME

Say it in Silk—But Make Sure it is

REAL ORIENTAL SILK AND
PURCHASED FROM

LAOU KIU LUEN & CO.

The Lion Silk Store



Established 1918

We have an exclusive Foreign Department
carrying enormous stocks of Rare Value

**Now is the time to Buy
and Mail Away**

TO FRIENDS ACROSS THE SEA

All Colours, All Designs, All New

Procurable only at

LAOU KIU LUEN & CO.

“The Lion Silk Store”

P. 424 Nanking Road

MERCHANDISING IN CHINA



We maintain the largest organization in the Far East devoted exclusively to advertising and can offer the foreign manufacturer a service covering all branches of advertising and merchandising in all parts of China. Our staff of artists, copy writers and experts in the various lines, both foreign and Chinese, are able to handle in the most efficient manner, every detail of an advertising campaign.

NEWSPAPERS. The volume of advertising we place in Chinese newspapers is twice that placed by any other concern, enabling us to secure the best possible rates and the highest agency discounts. The cost including our service fee would be less than if you dealt direct with the newspapers.

OUTDOOR ADVERTISING. We maintain the only standardized outdoor advertising plant in China and offer the only guaranteed and protected poster and painted bulletin service. The largest and most successful advertisers in China are using this service.

PRINTING. We write or translate, illustrate and supervise the printing of all kinds of advertising material, posters, circulars, booklets, calendars, etc., which can be produced cheaper in China than other countries.

Our experience in helping dozens of manufacturers and importers to solve the problem of advertising in China enables us to give clients the benefit of this experience which is the experience of the most successful advertisers in the country.

If you will write us fully about your advertising problem in China we will be glad to send you a suggested program.

CARL CROW, INC.
Advertising & Merchandising Agents

Cable: "ONAPRESS" Shanghai
Bentley and Private Codes

6B-Kiangse Road
SHANGHAI, CHINA

The Naturalist in Manchuria,

By

ARTHUR DE CARLE SOWERBY, F.R.G.S.,
F.Z.S., M.B.O.U.

Author of:—"Fur and Feather in North China": "A Sportsman's Miscellany": "Sport and Science on the Sino-Mongolian Frontier": and joint author with Robert Sterling Clark of "Through Shen Kan." : : : : : : : :

Illustrated with 3 coloured plates and numerous
Photographs and Sketches by the Author.

Price \$12.50

TIENTSIN PRESS, Ltd., Victoria Road, Tientsin.

ALSO

A Naturalist's Holiday by the Sea

Being a Collection of Essays on the Marine, Littoral, and
Shore-land Life of the Cornish Peninsula, including short accounts
of the Mineralogy and Geology, as well as of the Birds of the
Interior.

BY THE SAME AUTHOR

With numerous photographic and line-drawing illustrations

Price \$5.00

GEORGE ROUTLEDGE & SONS, LTD., London

E. P. DUTTON & CO., New York

These Books may be ordered through

THE CHINA JOURNAL OF SCIENCE & ARTS

102, The Ben Building, 25 Avenue Edward VII

SHANGHAI

Manufacturers of Furniture

Large variety of qualities and designs.

For Home and Office.

Designs and Quotations on application.

State particulars of requirement.

TAI CHONG & CO., LTD.

Office : P333 NANKING ROAD

Factory : 19 YU YUEN ROAD

Phone : CENTRAL 1543

FRESH BUTTER
“DAISY” BRAND
“HEATHER” BRAND
AND
“MEADOW” BRAND
in one-lb. pats
FRESH, PURE AND DELICIOUS

May be obtained from all leading Stores

Outport Orders.—Butter for outports (minimum 10-lbs.)
is packed with pure machine-made ice, free of charge.
Orders from outports may be sent to us direct.

GEDDES & CO., LTD.
31 PEKING ROAD, SHANGHAI
IMPORTERS

SPERMIN

The
Never Failing
PHYSICAL TONIC
REJUVENATING
HEALTH RESTORING

RECOMMENDED BY THE MEDICAL
PROFESSION

PRICE : \$3.00 per bottle

Obtainable from all leading Dispensaries

Sole Agents :

SINE COMPANY, LTD.

4 EZRA ROAD, SHANGHAI



British Firm—Established 1885

Insurance, Cartage Contractors, Expert Furniture
and Curio Packers, Warehousing at Lowest Rates.

GOODS DELIVERED TO ALL PARTS
OF THE WORLD.

Telephone Central No. 204

No. 9 Ezra Road, Shanghai

Garner, Quelch & Co., Ltd.

WINE MERCHANTS

(Wholesale)

Champagnes: Red and White Wines: Spirits:
Liqueurs: Cordials.

Lime Juice and Loganberry Juice

Choicest Brands: Highest Quality

73 and 73A Szechuen Road
SHANGHAI

JOHN RICHARDS & CO., LTD.

8 EZRA ROAD, SHANGHAI

FINE AND HEAVY

CHEMICALS

FOR ALL MANUFACTURING PURPOSES
DIRECT FROM WORKS

Telegraphic Address :
"RICHLY" SHANGHAI

Telephone C. 286

**THE CHINA JOURNAL
OF
SCIENCE AND ARTS**

NOTICE

The proprietors of "The China Journal of Science and Arts" are prepared to purchase old, good conditioned, numbers of the January issue of this Journal.

Price \$1.50

103 Ben Building, 25 Avenue Edward VII
SHANGHAI

V. K. Shen & Son

(FOUNDED 1894)

The Pre-eminent Furniture Manufacturers
in the Far East

Expert Designers with Unrivalled Knowledge of all Furnishing
Periods and Styles, Combined with Practical Manufacturing
Experience, have created our Reputation for Quality and Design

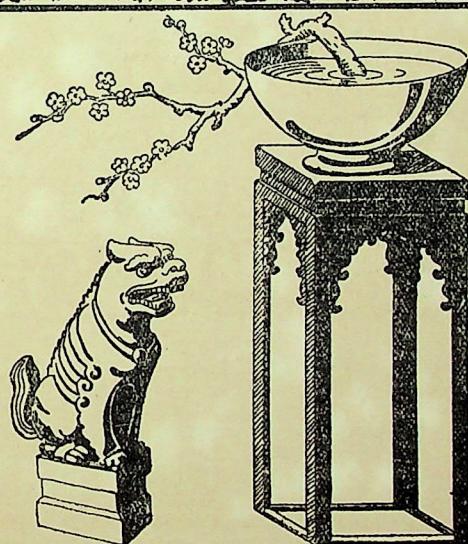
Office. 9 Bubbling Well Rd. Phone C. 1710
Works: 118 Yates Road. W. 2077

Shanghai, China

LACHAMP * THINGS CHINESE

17 NANKING ROAD - SHANGHAI

Offers a selection of objets d'art that are distinguished by the patient handiwork of the ages. We have brasses and bronzes, old embroideries, amber, jade, lapis lazuli, amethyst and other beads of all descriptions: furniture, lampshades, old or new, of any design; handbags and other hand-made articles. At request we send to your hotel or home a selection for your inspection. We specialize in things Chinese.



LACHAMP * THINGS CHINESE

17 NANKING ROAD - SHANGHAI

INTERNATIONAL BANKING CORPORATION

Capital paid up	U.S. \$ 5,000,000
Surplus and Undivided Profits	10,504,980

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	PANAMA
CALCUTTA	PEKING
CANTON	RANGOON
CEBU	SAN FRANCISCO
COLON	SANTO DOMINGO
DAIREN	SHANGHAI
HANKOW	SINGAPORE
HARBIN	SOERABAYA
HONGKONG	TIENTSIN
KOBE	TOKYO
YOKOHAMA	

Commercial and Travellers' Letters of Credit, Bills of Exchange and Cable Transfers bought and sold. Current accounts and Savings Bank accounts opened and Fixed Deposits in local and foreign currencies taken at rates that may be ascertained on application to the Bank.

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 South America and in the West Indies.

N. S. MARSHALL, *Manager.*

1A KIUKIANG ROAD, SHANGHAI.

THE FAR EAST

TOKYO

POLITICAL, SOCIAL, LITERARY, AND
DRAMATIC NEWS AND VIEWS
WEEKLY. ILLUSTRATED.

Annual Subscription Five Yen where
Japanese domestic postal rates apply; Foreign
postage, Four Yen extra.

Remittances (Money Orders) should be made payable to

Far East Publishing Company, Tokyo

INSURANCE

Personal Effects in China and Baggage whilst
Travelling.

The 'New China' Accident & Sickness Policy.
Fire, Marine, Motor Car, Burglary, Plate Glass
Accident and Special Risk insurances issued.

Prospectuses on Application

REASONABLE RATES — COMPREHEN-
SIVE COVER—PROMPT AND LIBERAL
SETTLEMENT OF CLAIMS

C. E. SPARKE, Insurance Office,

44 Kiangse Road, Shanghai

Agents : Excess Insurance Co., Ltd. of London
Whose Assets exceed £2,000,000

INTERNATIONAL BANKING CORPORATION

Capital paid up	U.S. \$ 5,000,000
Surplus and Undivided Profits .. .	10,504,980

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	PANAMA
CALCUTTA	PEKING
CANTON	RANGOON
CEBU	SAN FRANCISCO
COLON	SANTO DOMINGO
DAIREN	SHANGHAI
HANKOW	SINGAPORE
HARBIN	SOERABAYA
HONGKONG	TIENTSIN
KOBE	TOKYO
YOKOHAMA	

Commercial and Travellers' Letters of Credit, Bills of Exchange and Cable Transfers bought and sold. Current accounts and Savings Bank accounts opened and Fixed Deposits in local and foreign currencies taken at rates that may be ascertained on application to the Bank.

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 South America and in the West Indies.

N. S. MARSHALL, *Manager.*

1A KIUKIANG ROAD, SHANGHAI.

THE FAR EAST TOKYO

POLITICAL, SOCIAL, LITERARY, AND
DRAMATIC NEWS AND VIEWS
WEEKLY. ILLUSTRATED.

Annual Subscription Five Yen where
Japanese domestic postal rates apply; Foreign
postage, Four Yen extra.

Remittances (Money Orders) should be made payable to

Far East Publishing Company, Tokyo

INSURANCE

Personal Effects in China and Baggage whilst
Travelling.

The 'New China' Accident & Sickness Policy.
Fire, Marine, Motor Car, Burglary, Plate Glass
Accident and Special Risk insurances issued.

Prospectuses on Application

REASONABLE RATES — COMPREHENSIVE COVER—PROMPT AND LIBERAL
SETTLEMENT OF CLAIMS

C. E. SPARKE, Insurance Office,

44 Kiangse Road, Shanghai

Agents : Excess Insurance Co., Ltd. of London
Whose Assets exceed £2,000,000

AMERICAN DRUG COMPANY

Successors to Voelkel & Schroeder

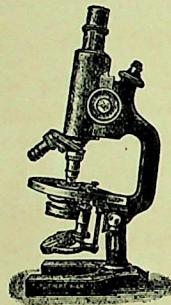
Established

SHANGHAI



1866

Cable Address
"KOFA"



Apart from our wholesale business in Drugs, Chemicals and Pharmaceutical preparations, we specialise in chemicals and apparatus for scientific work.

We sell from stock: Analytical Scales, Filters and Filter Paper, Microscopes, Jena Glassware, Stains for Bacteriological work, etc.

Agents for :

H. K. MULFORD CO., Philadelphia,
U. S. A., Biological and Pharmaceutical Products.

FAULTLESS RUBBER CO., Ashland,
Ohio, U. S. A., Rubber Sundries.

BERKEFELD FILTERS.
C. REICHERT MICROSCOPES,
etc. etc.

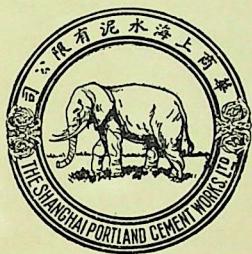
40-42 NANKING ROAD, SHANGHAI

The Shanghai Portland Cement Works Limited, Shanghai.

ELEPHANT BRAND PORTLAND CEMENT

“The perfection of art can only be attained by first perfecting the instruments therefor.”—Sayings of Confucius.

EXTRACT FROM EXPERT REPORT:



W. H. Brown, A.M.I. MECH. E., leading authority in England on cement manufacturing, says:

“Having visited most of the cement factories of Great Britain, America and Europe, I am in a position to form an opinion of the relative merits and faults of each . . . My experiences lead me to the conclusion that ‘pride of place’ must unquestionably be given to the Holderbank Factory in Switzerland . . . In design and construction it is a model without rival in any country.”

The wisdom of the ancient Sage and the technical experience of a modern authority on cement manufacturing have guided us to install a set of machinery in our Lungwha Works which is an exact model of the one used by the Holderbank Factory, Switzerland, and supplied by the original patentees with numerous latest improvements. The cement we are now supplying our customers is the product of that “perfect instrument.”

TOWN OFFICE: No. 3 SZECHUEN ROAD
Telephone Central 7617

ARTS

A NATURALIST'S SKETCH BOOK

By ARCHIBALD THORBURN, F. Z. S., Author of "British Birds." With sixty plates twenty-four of which are in colour and thirty-six in collotype ... \$30.00

BUDDHIST ART

In its relation to Buddhist Ideals, with special reference to Buddhist in Japan ... \$20.00

THE STORY OF THE OTHER WISE MAN

By HENRY VAN DYKE, Author of "The Mansion," "The Lost Boy," "The Child Christ in Art," Etc. With many drawings in colour and line by J. R. FLANAGAN \$10.00

LITERATURE

ENGLISH LITERATURE THROUGH THE AGES

Beowulf to Stevenson.
By ANY CRUSE, Author of "Elizabethan Lyrists and their Poetry," etc. This book aims at telling the story of English literature through the stories of individual books \$5.00

THE CRY FOR JUSTICE

Edited by UPTON SINCLAIR, Author of "Sylvia," "The Jungle," Etc. An Anthology of the Literature of Social Protest. The writings of philosophers, poets, novelists, social reformers, and others who have voiced the struggle against social injustice. Selected from twenty-five languages covering a period of five thousand years ... \$4.00

BUDDHIST PARABLES

Translated from the Original Pali. By EUGENE WATSON BURLINGAME, Fellow of the American Academy of Arts and Sciences, Lecturer in Pali (1917-1918) at Yale University ... \$10.00

MASTERPIECES OF AMERICAN WIT AND HUMOR

Edited by THOMAS L. MASSON. This anthology of American Humor represents a process of selection that has been going on for more than fifteen years.

6 volumes ... \$12.00

1. A SILENT PARTNER SCRAP BOOK
2. THE BUCK UP BOOK
3. BY THE SIDE OF THE ROAD
4. JUST COMMON SENSE

By F. D. VAN AMBOURGH.

4 volumes ... \$18.00

EDWARD EVANS & SONS, LTD.

30 North Szechuen Road

Shanghai

“THE NORTH-CHINA DAILY NEWS”

Established in 1850 as a weekly; in 1870 as a daily.

The “North-China Daily News” writes the history of China. It records the pulse of its politics; it reports the conditions of its finance and its markets; and it chronicles the daily doings of its people.

Annual Subscription \$28

“THE NORTH-CHINA HERALD”

Is the weekly edition of the “North-China Daily News” for readers abroad. It contains 95 per cent. of news and is the best medium for keeping in touch with events in China when out of reach of the daily.

Annual Subscription \$16

Copies of either of the above sent to anyone interested on request.

“The North China Desk Hong List”

Is the only Trade Directory of North China issued twice a year. Its information is the most accurate and complete. Published regularly since 1865 it has grown to 900 pages. In addition to voluminous classified information it contains the names and addresses of every foreign firm, resident, and missionary in China.

Price : Mex. \$7; with Map \$8. Postage extra

PAMPHLETS AND BOOKS

On Sale at the Offices of

THE NORTH-CHINA DAILY NEWS

SHANGHAI

“All-in-One” Exchange Tables, covering all currencies dealt with the Far East	\$ 8.00
Baron Richthofen’s Letters, 2nd Edition	6.00
Chinese Folklore, by J. Macgowan	2.50
Currency and Banking, by S. R. Wagel	10.00
Daily Exchange Quotations, by C. S. Addis	1.00
Finance in China, by S. R. Wagel	10.00
How to Avoid Collisions at Sea, by Capt. F. Davies	5.00
Lights and Shadows of Chinese Life, by J. Macgowan	3.00
Old Tartar Trails, by A. S. Kent	6.00
On Tramp Among the Mongols, by John Hedley	1.50

Glaxo is packed in a parchment bag inside a sealed, double-lid tin. Untouched by hand, never exposed to the air, it is kept entirely free from contamination.

Use Glaxo for cooking

With Glaxo in the house you are never without a supply of pure, fresh milk, milk that "keeps" in its tin, ready for use in any quantity at any time. Glaxo makes delicious coffee, cocoa and chocolate, milk-puddings, custards, blanc-manges, ice-cream, soups, sauces, and hundreds of appetising, nourishing dishes.

A lady from AMOY says: "I find that Glaxo and the many dishes made up from it are invaluable in a country like China where it is often difficult to get milk which one can accept as pure."

Everything you can do with ordinary milk you can do better with Glaxo, which is prepared in an instant by the addition of hot, boiled water.

Glaxo

The Super-Milk

For Infants, Growing Children, Invalids
the Aged, and General Household Use

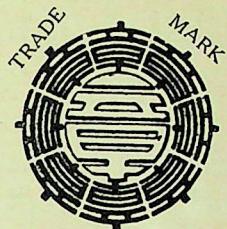
Write to our Wholesale Distributors:
THE BRITISH MEDICAL IMPORTS CO., 432 Kiukiang Road, Shanghai,
for Free Sample of Glaxo and interesting booklet

Proprietors: Joseph Nathan & Co., Limited, London & New Zealand.

LAOU KIU CHWANG & CO.

THE LEADING SILK SHOP

S I L K S
I L K S I L K S
S I L K S



EST. 1857

SATINS : CREPES : GAUZES : PONGEES :
EMBROIDERIES : CANTON EMBROIDERIES :
SHAWLS : SCARFS & VARIOUS
NEW DESIGNS OF PRINTED SOFT
CREPE DE CHINE : FURS.

WHOLESALE AND RETAIL

Samples Sent on Request

GENTLEMEN'S SHIRTS AND PYJAMAS,
FANCY SILK NECKTIES, ETC.

WE GUARANTEE SATISFACTION

LAOU KIU CHWANG & CO.

P.128 NANKING ROAD, SHANGHAI

Cable Address :

"LOSILKO"

Codes : A.B.C. 5th Edition

Telephone

Central No

3169

Branch: TIENTSIN

VAPOGEN

YOU MAY KILL ONE FLY AT
A TIME

with a swatter and you can lose your temper and a lot of energy doing it, but if you would only use VAPOGEN you can rid the room of all the flies in five minutes.

A few sprays of VAPOGEN, the new liquid fly exterminator, is ALL that is required.

VAPOGEN IS SUDDEN DEATH TO FLIES, AND ALL INSECT PESTS

Sole Distributors :

The Stanley Trading Co., Ltd.

Chung Foo Union Bank Building, Shanghai, China.

VAPOGEN

PRICE LIST

					Shanghai Currency
VAPOGEN	Outfit	-	-	-	\$3.00
$\frac{1}{2}$ Pint Tin	-	-	-	-	1.00
1	„	-	-	-	1.85
1	Quart Tin	-	.	-	2.95
$\frac{1}{2}$	Gallon Tin	-	-	-	4.85
1	„	-	-	-	7.75
3	„	-	-	-	21.00

EX GODOWN, SHANGHAI.

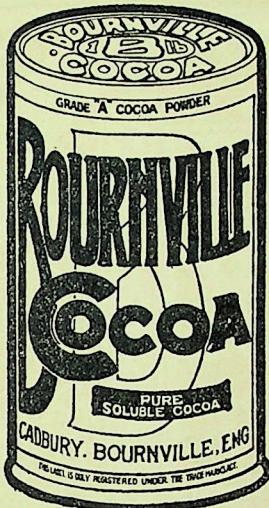
Sole Distributors:

The Stanley Trading Co., Ltd.

Chung Foo Union Bank Building, Shanghai, China.



BOURNVILLE COCOA



Manufactured by
CADBURY BROS., LTD.,
BOURNVILLE, ENGLAND.

本味可可粉

“A DELICIOUS BEVERAGE”

AND

“MAXIMUM FOOD VALUE”

BOURNVILLE COCOA can be obtained in
principal cities and outports throughout
China and Japan.

AGENTS IN CHINA:

GEO. McBAIN, Import Dept., 17 Kiangse Road, Shanghai
W. G. HUMPHRIES & CO., Des Vœux Road, Hongkong
TWYFORD & CO., 2 The Bund, Tientsin
F. J. BARDENS, Dairen, South Manchuria
J. WITKOWSKI & CO., Kobe and Yokohama, Japan

HOW MANY BOTTLES

Of Writing Ink were Broken on Your Last Consignment?

USE ANTOINE'S INK IN POWDER FORM **BROKEN**
AND YOU WILL HAVE NONE

\$0.35 cts. per quart bottle. Postage extra

Mix the powder with one quart of
water and the Ink is ready for use

Write to :

ORIENTAL PRESS, SHANGHAI

113/15 Avenue Edouard VII.

INK IN BOTTLES

		quart	\$1.20	pint	\$0.75
Copying Ink	...	"	1.00	"	0.65
Blue Black	...	"	1.50	"	0.85
Ferro Gallique	...	"	1.20	"	0.80

**ORIENTAL BOOKS, INDIAN and PERSIAN ART,
MSS., BRONZES, etc.**

LUZAC & COMPANY

Oriental and Foreign Booksellers

Agents to the India Office, Royal Asiatic Society, School of Oriental Studies, London; Asiatic Society of Bengal, Calcutta; Bihar and Orissa Research Society, India; Society of Oriental Research, Chicago, etc., etc. We specialise in all Books for the Study of Oriental languages, and other branches of Oriental Literature, of which we keep a large stock. Catalogues issued periodically, and sent gratis on application.

Latest Catalogues Issued.

BIBLIOTHECA ORIENTALIS: XXI. Second-hand Books and Manuscripts in and on the Arabic Language, including a few on Arabia. (1283 Nos.).

BIBLIOTHECA ORIENTALIS: XXII. Second-hand Books in and on the Sanskrit, Pali, Prakrit, and Jain Languages. (1284 Nos.).

BIBLIOTHECA ORIENTALIS: XXIII. Second-hand Books and Manuscripts in and on the Persian Language. (914 Nos.).

BIBLIOTHECA ORIENTALIS: XXIV. New and Second-hand Books on Egypt.

BIBLIOTHECA ORIENTALIS: XXV. Languages of India, and Further India. COMPLETE LIST OF BOOKS AND PERIODICALS, PUBLISHED AND SOLD BY LUZAC & CO., 1922.

46 GREAT RUSSELL STREET, LONDON, W.C.1.
(Opposite the British Museum)

THE FAR EASTERN LABORATORIES

ANALYTICAL AND CONSULTING CHEMISTS

16 NANKING ROAD, SHANGHAI

TEL. CENTRAL 1640

Undertake every kind of analytical and bacteriological work including the analysis of foods, egg products, milk and milk products, flour, vegetable oils and animal fats and waxes. Drugs, camphor, morphine, essential oils, etc. Drinking water, oil cakes, fertilizers, mineral fuel and lubricating oils and coal. Also mineral analyses of galena, antimony, zinc blende, tungsten, iron ore, etc., and alloys, steels, refractory materials, clays, cement, limestones, etc.

EVERYTHING ELECTRICAL

R. E. LINNESTAD

36 Jinkee Road,
Shanghai

Telephone No.
Central 6624

JARDINE, MATHESON & CO., LTD.

SHIPPING

Indo-China Steam Navigation Co., Ltd.
Head Office: HONGKONG

FLEET

OCEAN

Nam Sang Fau Sang
Lai Sang Chun Sang
Fook Sang Hop Sang
Kum Sang Kut Sang
Hin Sang Ho Sang
Kwai Sang Lee Sang
Chak Sang
Foo Shing
Yat Shing
Ma Sang

COAST

King Sing Wo Sang
Kwong Sang Wai Shing
Hang Sang Tung Shing
Yu Sang Yuen Sang
Tak Sang Sui Sang
Lok Sang Chip Shing
Tai Sang Cheong
Ming Sang Shing
Wing Sang Ting Sang
E Sang

RIVER

Kung Wo Chang Wo
Ping Wo Shun Wo
Fuh Wo Han Wo
Tuck Wo King Wo
Loong Wo
Sui Wo
Kut Wo
Luen Ho
Kiang Wo
Tung Wo

The Indo-China Steam Navigation Co., Ltd., with the above Fleet of Freight and Passengersteamers; maintains a First-Class Passenger Service in certain trades and handles every description of freight on all the following routes:

OCEAN—Main Routes serving: India, Straits Settlements, Borneo, Philippine Islands, Hongkong, China and Japan. Freight and Passengers.

COAST—All Coast Ports of China.

RIVER—Fast superior Freight and Passenger service between Shanghai and all River Ports as far as Chungking (1,300 miles from Shanghai).

General Managers:

JARDINE, MATHESON & CO., LTD.

Telephone Central 241

27 THE BUND, SHANGHAI

Private Exchange to all departments.

JARDINE, MATHESON & CO., LTD.

INSURANCE DEPARTMENT

FIRE,

MARINE

AND

MOTOR CAR

INSURANCE.

HONGKONG - SHANGHAI

and Agencies throughout CHINA

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
“POWERIN” MOTOR SPIRIT
“SHELL” DIESEL OIL For Internal Combustion Engines
FUEL OIL For Ship’s Bunkers, etc.
“SHELL” MINERAL TURPENTINE
CANDLES
PARAFFIN WAX
WELDED STEEL DRUMS For Wood Oil, etc.

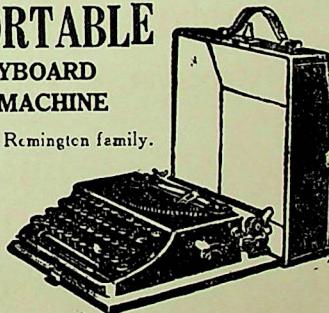
REMINGTON PORTABLE

SAME WRITING KEYBOARD
AS ANY STANDARD MACHINE

It is the latest addition to the famed Remington family.

You do not have to teach your fingers all over again when you write on the Remington Portable. It has the same writing keyboard as any standard machine—no shifting for figures.

Compact—it fits in a case only four inches high, can be carried anywhere and used everywhere. Weight, complete with case, only 1½ pounds.



FOR YOU—FOR EVERYBODY

MUSTARD & CO. INC.

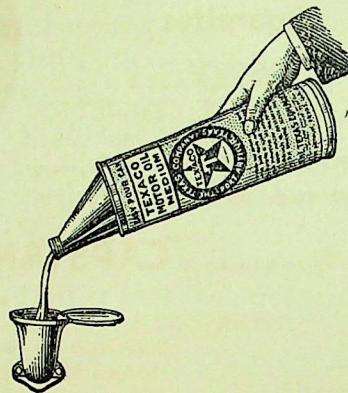
22 Museum Road Shanghai
Exclusive Representatives for China,
Hongkong and Macao
Branches: Hankow, Tientsin, Mukden,
Harbin, Hongkong and Canton



TEXACO

Easy Pour Can for your Car!

*Easy to carry
Easy to pour
No waste
Refinery clean
And
You don't have to
Bother
With an oil funnel
Any more*



I'll tell you it's mighty comfortable to know that you can fall back on the little old "Easy Pour" Can with two quarts of the right oil.

Obtainable at all Leading Garages

THE TEXAS COMPANY
SHANGHAI

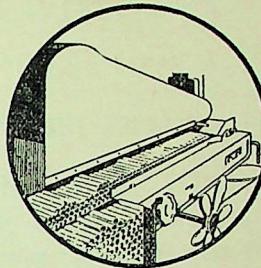


*Branches at all Principal Ports
of China and Agencies all over
China and Korea.*



HYGIENIC
MACHINE-MADE
Cigarettes

OBVIOUSLY
MACHINE-MADE CIGARETTES
are more HYGIENIC and more
CONSISTENTLY WELL MADE than
those made by any other process.



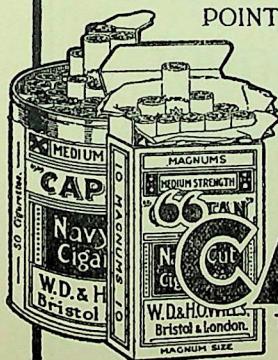
In the manufacturing of **"CAPSTAN"** Cigarettes for instance;

POINT N° 1

Pure dust-free tobacco leaf is fed to
Modern Machines in Model Factories
and no soiled human hand comes into
contact with the cigarette during the
process of manufacture.

POINT N° 2

Machine-Made Cigarettes are uniformly
well made. Each paper receives its
proper quota of tobacco leaf and is
rolled to the correct degree of
"tightness". This Uniformity is impossible
to attain under any other process.



CAPSTAN[™]
THE COOL HYGIENIC SMOKE

ASK THE MAN WHO KNOWS!

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

GRAND HOTEL DE PEKIN

"THE FINEST EAST OF SUEZ"

Telegraphic: "GRANDHOTEL"

OCCUPIES THE CITY'S CENTRAL LOCATION—

At The Grand Hotel de Pekin the guest enjoys the advantage of easy access to all the city's interests. Every wish is anticipated by our efficient staff. Possessing all the most modern hotel conveniences. 150 Rooms with bath.

J. M. MAILLE, *Manager.*

“Veuve Clicquot” Champagne

We stock both the “Gout American” and
“Dry England” Qualities

Sole Agents:

GANDE, PRICE, LTD.

48 Kiangse Road

Shanghai

THE CHINA JOURNAL OF SCIENCE & ARTS

[REGISTERED AT THE CHINESE POST OFFICE AS A NEWSPAPER]

VOL. I

NOVEMBER, 1923

No. 6

CONTENTS

	PAGE
THE EARTHQUAKE IN JAPAN	535
AN ANALYSIS OF THE FOUR BOOKS	BY KIANG KANG-HU 538
AUTUMN LONGINGS	BY ELFRIEDA HUDSON 546
YANG KUEI FEI	BY WU SHIH-HUAN 547
THE STORY OF CHINESE CHARACTERS	BY RAYMOND B. BLAKNEY 553
THE CHINESE FEMALE NAMES	BY L. C. ARLINGTON 561
REVIEWS	572
A PILGRIMAGE TO THE DIAMOND MOUNTAINS	BY HARLEY F. NACNAIR 573
TRAVEL NOTES AND REVIEWS	580
WHAT IS A CHINA PONY?	BY ARTHUR DE C. SOWERBY 582
MIGRATION NOTES	BY G. D. WILDER 587
THE GENETICS OF TWO MUTATIONS IN THE FRUIT-FLY, DROSOPHILA MELANOGASTER	BY TSE-YIN CH'EN 593
BIOLOGICAL NOTES AND REVIEWS	604
SHOOTING NOTES	608
ETHNOLOGICAL INVESTIGATIONS IN SIBERIA, MONGOLIA AND NORTHERN CHINA	BY S. M. SHIROKOGOROFF 611
THE MANUFACTURE OF SULPHURIC ACID BY THE GRILLO- SCHROEDER (CONTACT) PROCESS	BY G. W. HIMUS 622
SCIENTIFIC NOTES AND REVIEWS	629
SOCIETIES AND INSTITUTIONS	633
BOOKS AND PERIODICALS RECEIVED	642

Editors :

{ ARTHUR DE C. SOWERBY, F.Z.S. (Science).
JOHN C. FERGUSON, PH. D. (Literature & Arts).

Assistant Editor and Manager : CLARICE S. MOISE, B.A.

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

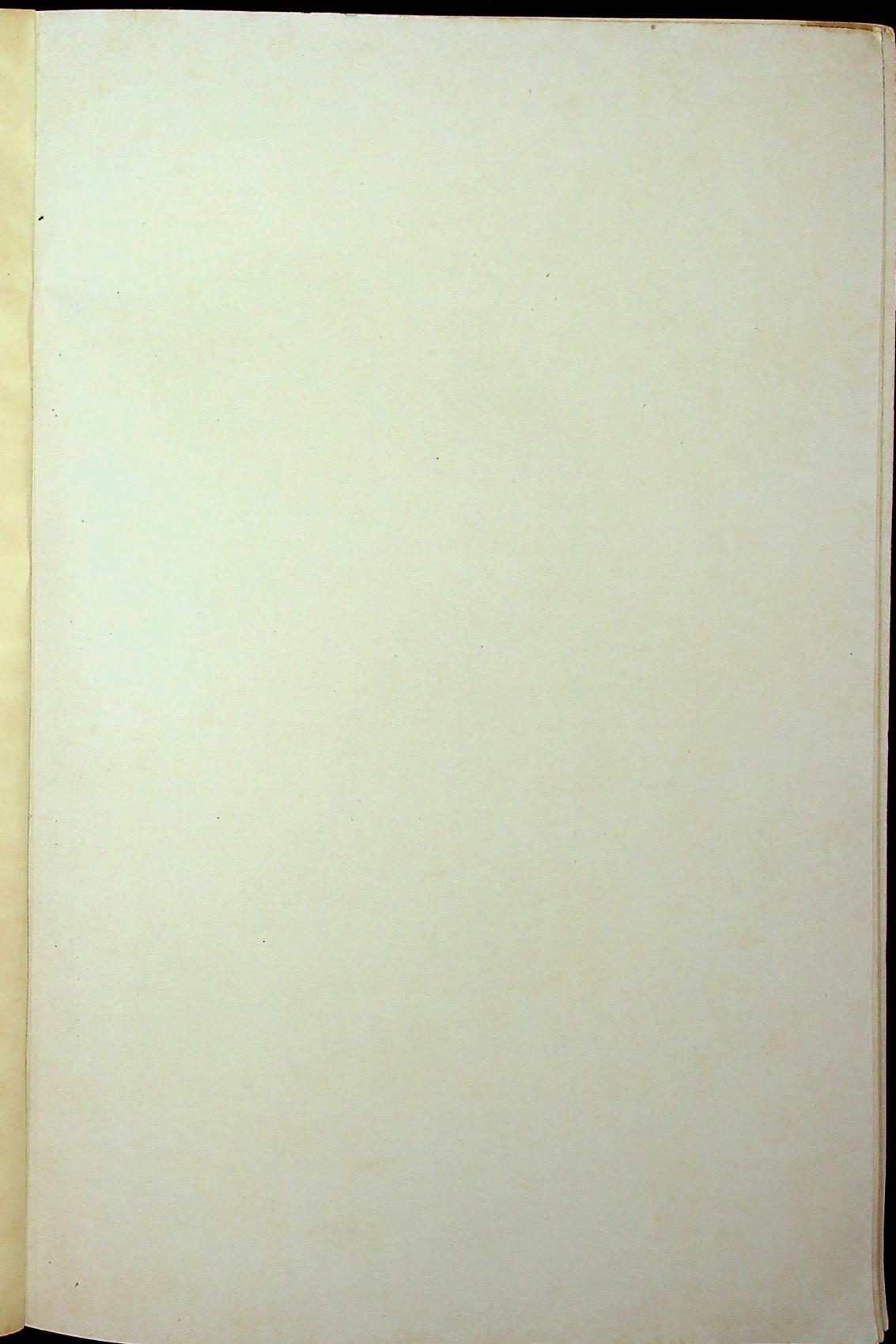
Books for review should be sent to the Editor as early as possible.

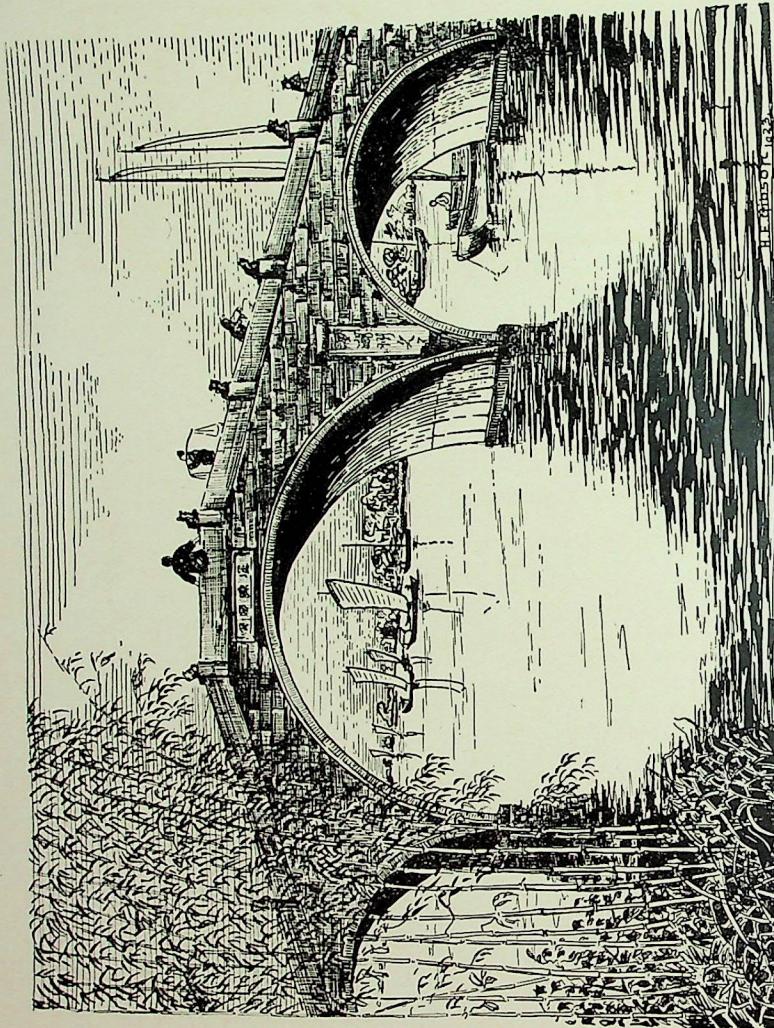
The subscription for the year (six issues) is \$10.00, Shanghai currency, or its equivalent. In the U.S.A. and Canada: Gold \$6.00. Postage free.

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 : 102, The Ben Building, Shanghai, China.

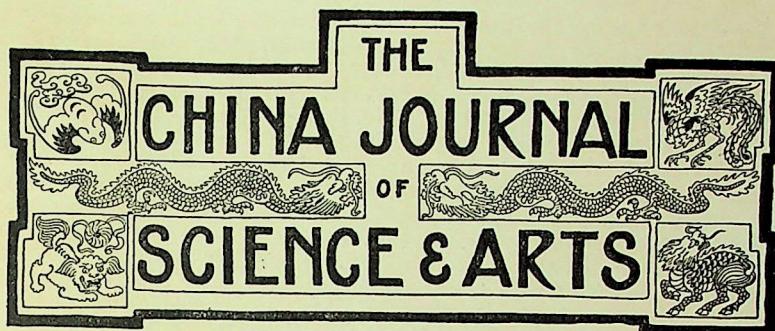
[All Rights Reserved]





Drawn by H. E. Gibson

A typical three-arch bridge of the Grand Canal
This is the last of the series of pen and ink sketches of Chinese bridges specially drawn for us by Mr. H. E. Gibson.
We hope to have a series of sketches of Chinese boats by the same artist during 1924.



THE CHINA JOURNAL OF SCIENCE & ARTS

VOL. I

NOVEMBER 1923

No. 6

THE EARTHQUAKE IN JAPAN

In giving voice to our sympathy with the Japanese in the appalling disaster that has overtaken them, we are sure that we carry our readers with us, though we are equally certain that we are fully expressing neither their nor our own feelings in the matter. At such times, when a nation has to record a death roll running into the hundreds of thousands, not to mention the losses of property sustained, which are almost beyond computation, it is impossible to express adequately the sense of horror and helplessness that fills the onlooker. The suddenness with which such a catastrophe as the earthquake in the Yokohama and Tokyo districts of Japan overtakes a community, projecting thousands of innocent victims into eternity, the chaos that follows as buildings rock and crash, and the finality of it all staggers the mind. It is impossible to grasp it in its entirety, and it is only bit by bit as the details come to hand, views of the scene of disaster are published, the announcement is made of the demolition of this or that familiar building, or the news of the death of some acquaintance or friend reaches us that what must have taken place is brought home to us.

Sufficient time has now elapsed since the terrible happenings of September 1st for those away from the scene of disaster to have gone over the reports, sifted fact from the rumour, and finally to form in their minds a fairly clear idea of what transpired. The result is a mental picture of a catastrophe second to none in the history of mankind, unless it be the destruction of Pompeii.

Earthquakes have happened before in Japan and other parts of the world, disasters have overtaken and annihilated large communities from time to time, but nothing so complete and widespread, resulting in such an enormous loss of life and property, has ever been recorded.

The official figure of the death roll in Japan is well over two hundred and fifty thousand, but rumour has it that the actual figure stands nearer a million. The area affected includes two of the largest cities in Japan, forms a large part of the industrial area of that country, and is probably the most thickly populated in the Japanese islands. It has been estimated that the loss of property to the State exceeds Yen 20,000,000,000, while some of the large American business concerns have lost stocks, buildings and equipment to the value of millions of gold dollars.

In times gone by, before modern civilization had raised its huge stone, brick and concrete buildings, and sent its countless electrically charged wires ramifying all over the towns, into every home, factory, shop, and office, earthquakes though terrifying enough could not in the very nature of things do the destruction that they do now. The San Francisco disaster in 1906 was the first to exhibit the terrible danger of fire following the destruction of buildings which is now added to the terrors of an earthquake. With live wires running all over the place, which get twisted and broken, short circuiting and emitting sparks as from a blacksmith's anvil, as the walls to which they adhere are riven asunder and come crashing, the danger of fire is increased an hundredfold over what it was before the discovery and use of electricity, though it was always bad enough, especially in Japan with their little open charcoal stoves and wooden houses.

So, in the recent earthquake in Japan, what the earth tremors spared, the fire consumed. Add to this the tidal wave in Yokohama, and the torrential rains that followed the disturbances, and we have a picture of destruction, suffering and woe worse than that foretold in the Book of Revelations.

Time was when such disasters were looked upon as divine visitations—the wrath of God descending upon mankind in punishment for its wickedness; but modern thought and ideas of the deity will not tolerate such views. Such catastrophes are rightly attributed to the inexorable workings of natural laws; and the real pity of the thing is that humanity either cannot or will not conform to nature's laws. Build on the slopes of a volcano, and you are liable to be overwhelmed with molten lava, or buried beneath volcanic ash!

The real misfortune under which Japan suffers is that she *has* to build her cities in such dangerous areas. Nor can human ingenuity devise a plan to overcome such a drawback except the evacuation of such dangerous areas as that in which the recent catastrophe has taken place. And, with the present state of the world's population, where are the Japanese to go?

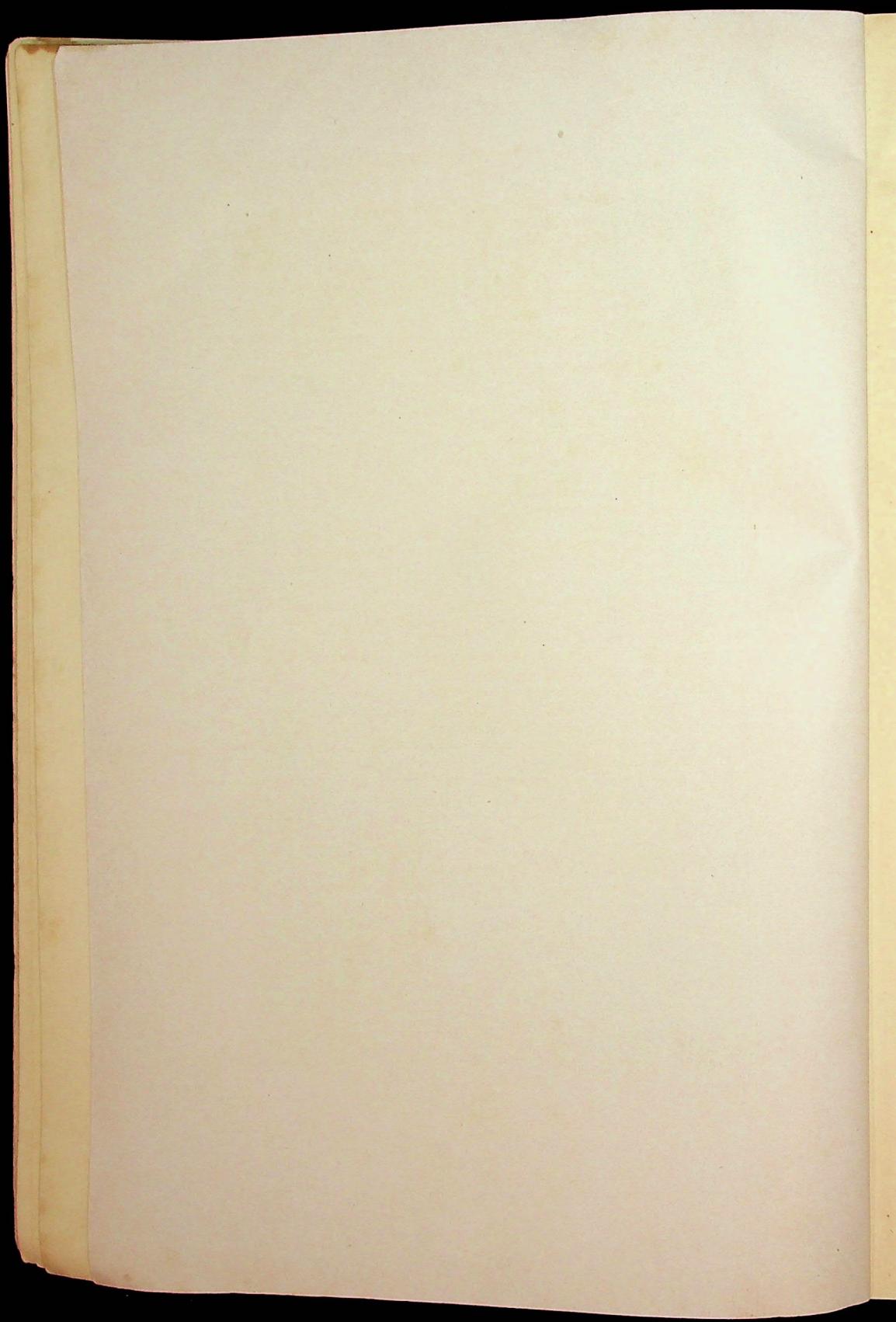
Let us review their position. Here we have a group of islands fringing a great continent from which they have become separated by sea within comparatively recent times. There is plenty of evidence to prove this. The character of their mammalian fauna alone shows that within what is known as the Recent geological epoch these islands were joined to the mainland, the island species being so closely related to the mainland forms as to show that they could only recently have been separated. Add to this the fact that one of the deepest parts of the Pacific Ocean lies



Near Hibiya Park, Tokyo



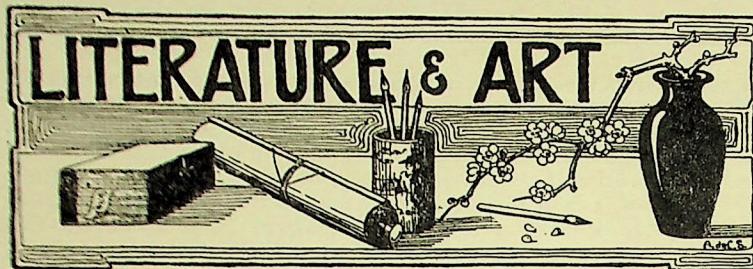
Destroyed houses in Hibiya Ward, Tokyo



THE EARTHQUAKE IN JAPAN

immediately to the east of the Japanese islands, and it must be apparent at once that these islands are in a very precarious position. If you walk along the edge of a cliff, or the bank of a river or lake with deep precipitous sides going down into the water, you will notice that section by section the cliff or bank is falling away, while cracks form, sometimes many feet away from the edge, showing where the next section is going to give way. If you examine a geological map of China, it will be to find that the faults (cracks and displacements in the strata) run roughly parallel with the coast line, while the islands of Hainan, Formosa, Japan, Saghalin, and the Kurils also run in a chain that follows the coast-line. These facts, coupled with that of the presence of the deep abyss in the Pacific Ocean immediately east of Japan, suggest that what happens in a small scale along the edge of a cliff or river bank is happening on a far greater scale along the East Asiatic coast; and, if our facts are rightly interpreted, it may be deduced that the Japanese islands are in danger of slipping off into the Pacific and becoming engulfed. It is perfectly evident that some considerable disturbance of the equilibrium of the East Asiatic land mass has been taking place within the last few years, for we know of at least two serious earthquakes in China, one in Kansu, in the region where extensive faulting of the strata occurs along the great Liupan range, and another, more recently, in Szechwan in an area where what may be considered as a continuation of this faulting occurs. It may be explained that severe and widespread earthquakes such as these are due to movements of the earth in the vicinity of such faulting, and where some severe stress or strain in the earth's crust is felt, rather than to volcanic action, though the latter usually takes place, as a result rather than as a cause, in such areas of seismic disturbance. It is probably some slight—slight, that is, when the enormous sizes of the land-masses involved are considered—movement of this kind that has caused all the trouble in Japan, though the immediate cause of the trouble in the Yokohama and Tokyo district is attributed by scientists to the weakening of the earth's crust at this point owing to the outpourings of immense flows of lava, probably under the sea, which withdraw the underlying support of the crust and cause it to sink or buckle. It should come as a warning to the Japanese people, if they need any, of the danger of building large cities in such areas. But we fail to see what else they can do; though we fully appreciate their obvious desire to get a footing on the main-land.

This brings us into the realm of world politics, which realm we prefer to avoid, though it may be said before leaving it, that we hope the more fortunately situated nations of the world will remember Japan's unhappy and perilous position on the earth's surface, and will be more inclined to allow her some outlet for her teeming population.



AN ANALYSIS OF THE FOUR BOOKS

BY

KIANG KANG-HU

(Formerly Professor in the Peking Government University)

I

THE TA HSÜEH OR THE "GREAT LEARNING."

The Ta Hsüeh was originally the thirty-ninth of forty-six individual works contained in the Fourth Canon, the Li Chi. After the great philosopher Chu Hsi's time (1130-1200), it became the first of the "Four Books"; in fact, the first volume of all the Confucian Classics.

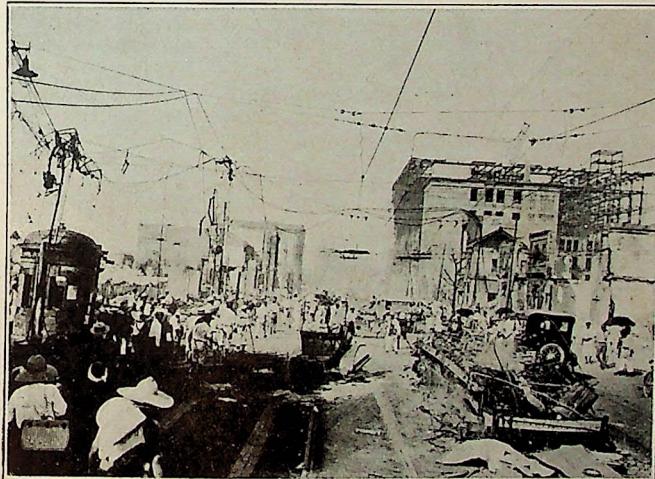
Chu Hsi not only elevated the Ta Hsüeh as the first of the Four Books from the Li Chi, he made also a new arrangement of its chapters and paragraphs which are now slightly different from the original in the Li Chi, but supposed to be the restoration of the real original. This new arrangement is based upon the decision of Ch'êng Hao, the teacher of Chu Hsi.

According to the new arrangement, this book was divided into one classical text and ten chapters of commentary. The former was supposed to be written by Tseng Tzü, the first disciple of Confucius, in the words of his master; and the latter by the disciples of Tsêng Tzü containing his views. The fifth chapter of commentary was, according to Ch'êng Hao and Chu Hsi, lost, except two sentences. Chu Hsi had taken the views of Ch'êng Hao and supplied its completion. This supplement has been admitted by the Imperial Government as a part of the Classics since the latter part of the Sung Dynasty; however, it has been at the same time criticised and disputed by many scholars of other schools, among whom Wang Yang-wing is well known as the strongest opponent of Chu Hsi, who attacked him especially for the new arrangement and supplement he made for the Ta Hsüeh. From a broader view, we see this is but a matter of opinions differing in detail. As regards the teaching as a whole, it is common to and above all these schools.

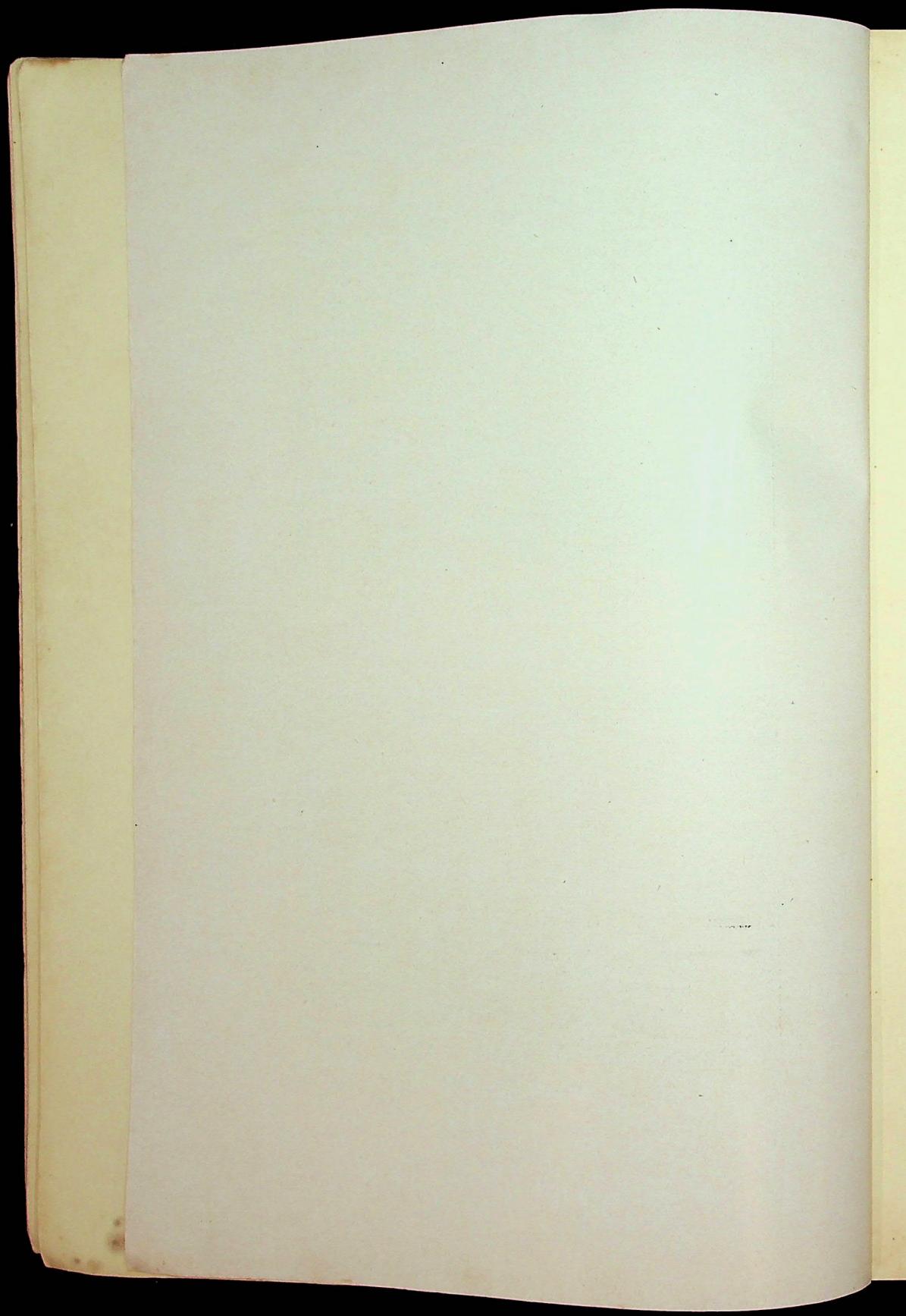
The term Ta Hsüeh means the Great Learning or the Great School, which is opposite to the term Hsiao Hsüeh or the Small School. For, in the Chou Dynasty, the public school system was of two general grades. The Small School was in every district and village for the training of common citizens, and the Great School was in the capital of each feudal kingdom and the national capital for the education of lords, officials and scholars. In the former, the six arts were taught, namely: elemental



Marunouchi Quarter in Tokyo in flames seen from the back of the Imperial Hotel



Ginza Street, the busiest thoroughfare in Tokyo.



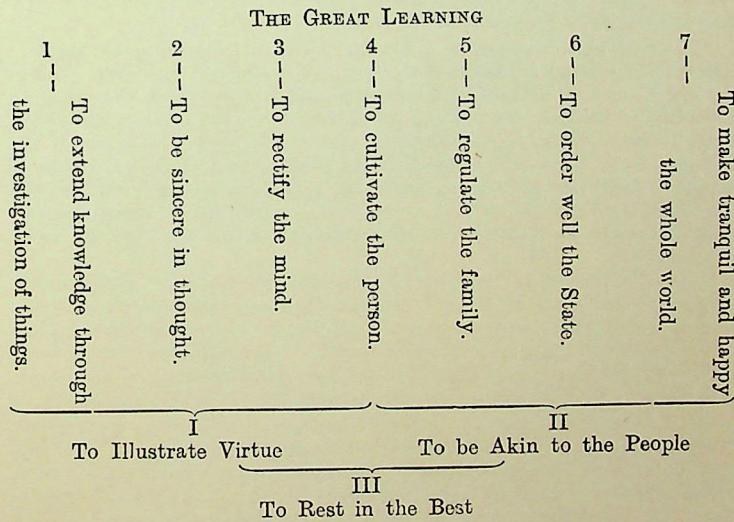
AN ANALYSIS OF THE FOUR BOOKS

rites, elemental music, archery, chariot driving, writing and counting. In the latter, the old five Canons were taught, and besides, this book was used as a textuary schedule.

The whole of the *Ta Hsiüeh* is devoted to discussing three main principles and seven related acts. The first of the three principles is to illustrate one's own illustrious virtue ; the second, to be akin to others (in Chu Hsi's explanation, to renovate the people) ; and the third, to rest in the highest excellence. The seven acts are : first to investigate things in order to extend knowledge, then to be sincere in thought, then to rectify the mind, then to cultivate the person, then to regulate the family, then to order well the state, and last to make tranquil and happy the whole world. Thus everybody's illustrious virtue is illustrated.

The seven are all thus related and completed. They can only be accomplished in due order one after another. Among them, however, the fourth act, the cultivation of one's own person, is especially emphasized. The text says, "From the emperor down to the mass of the people all must consider this act the root of everything else."

In examining these acts we find that they are of the nature of two groups. The first three acts work inwardly from the root, the cultivation of the person ; while the last three work outwardly from the same. And again, the acts of the first group are of the first main principle, i.e., to illustrate illustrious virtue ; and the acts of the second group are of the second main principle, i.e., to be akin to the people. After all, the acts of both groups should be in accordance with the third main principle, to reach and rest in the highest excellence, or, in other words, the best. This may be illustrated as follows :



Let us now examine the Principles and Acts separately: "To illustrate illustrious virtue" is because this virtue is human nature or nature's gift to every human being. Nobody can add anything to it nor lessen it. One ought simply to develop it. This virtue is like a metal mirror. The more you polish it the brighter it will be. The word "illustrious" denotes the origin of the virtue and the word "illustrate" emphasizes the importance of study.

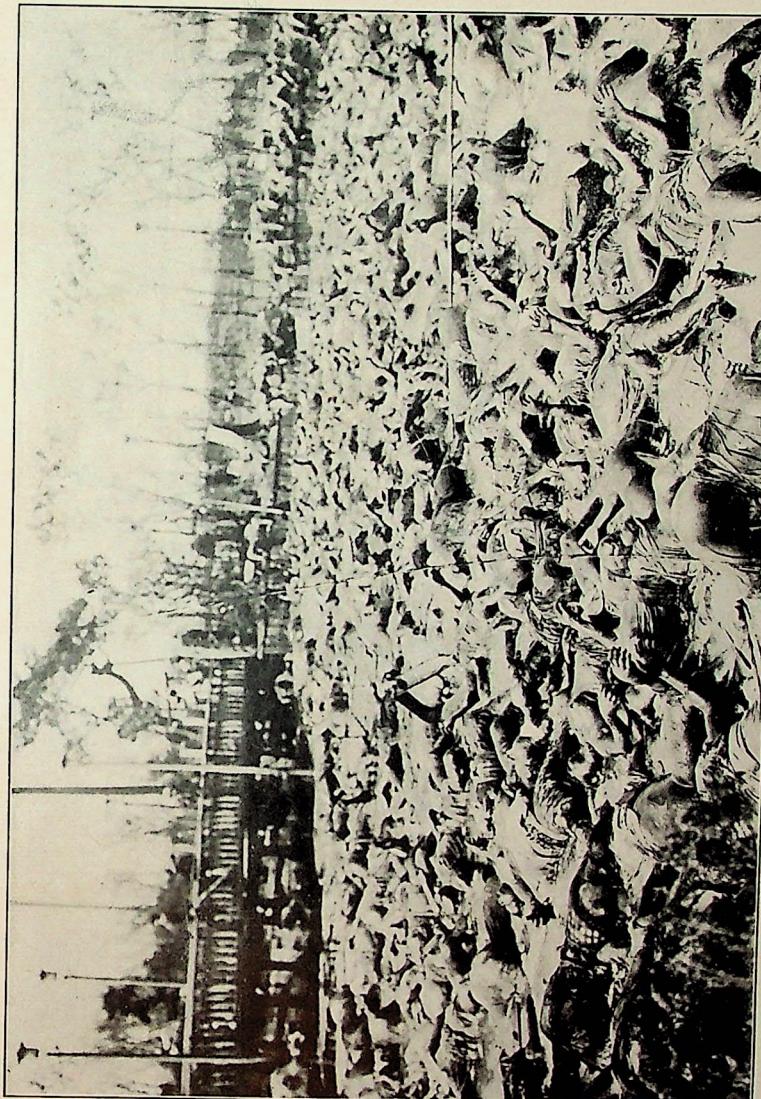
"To be akin to the people" is because one is naturally and originally so. Without others there could be no recognition and manifestation of self. Be careful in every action towards others, for the same will accordingly return to you. Unless others are happy one can never be happy all alone. To be akin from the individualistic view is to think every other is as reasonable as yourself and to treat another as you would have him do to you; but from the collective view of the universe and life, one should be aware that self and others are one.

"To reach to and rest in the highest excellence or the best." What is the best and how to reach and rest in it? The best is in no particular place but it is somewhere. To every person in every thing at every moment there is a point of the best. Each should use his own judgment in dealing with a subject which is presented to him and find the best in it. The judgment differs from the state of one's virtue. The more virtue is illustrated the more the judgment is reliable. After determination as to what is the best, then one should start along the right line towards this goal. Do not stop in the middle of the way or change for any other direction unless "the best" has been modified or altered into a different position by the circumstances without and the conscience within. There is, however, such a point as one thinks to be the best and in which one should take his rest.

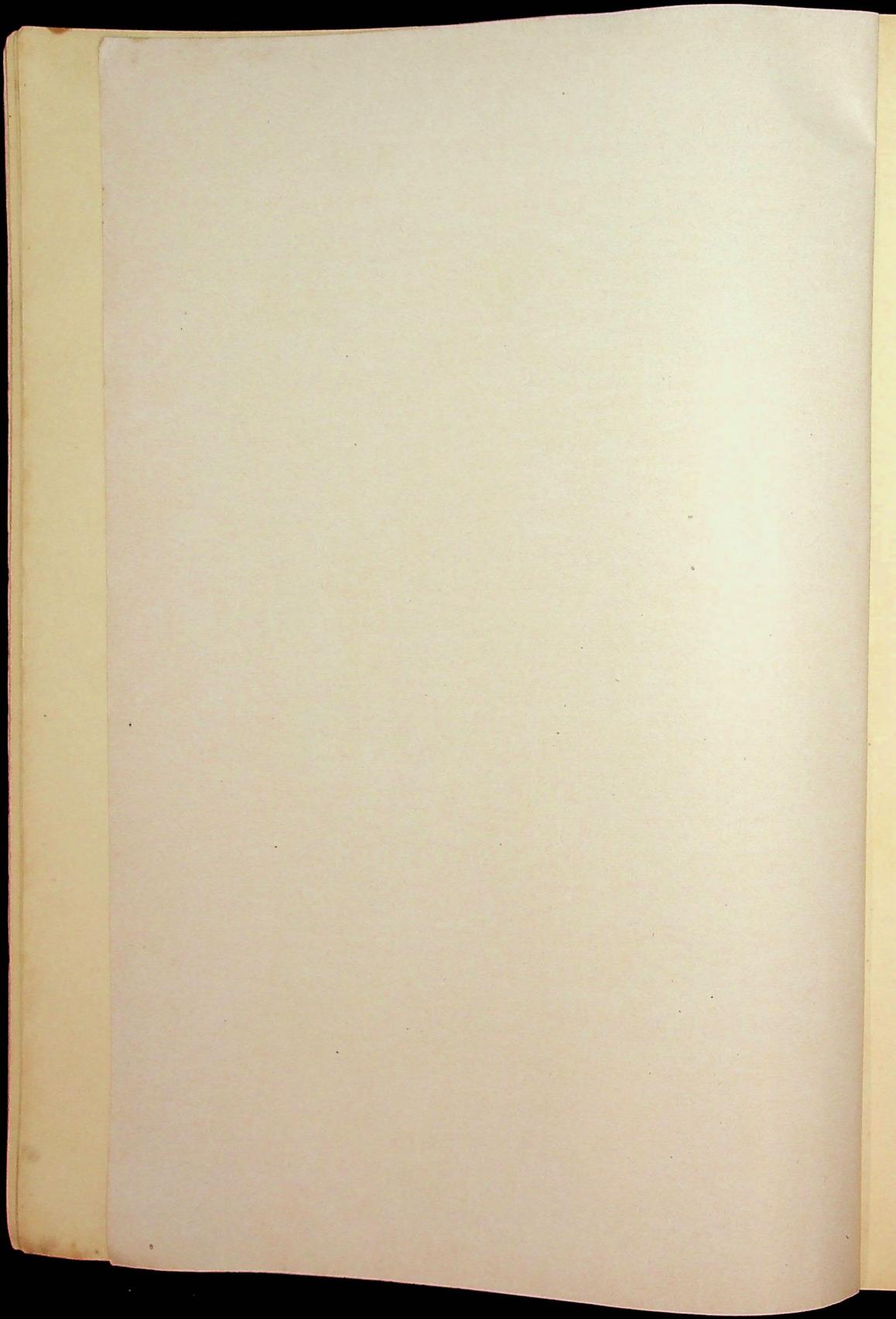
"To extend knowledge" lies in "The investigation of things." These two form one act which is the first step in illustrating virtue. Things are the causes or sources of knowledge and knowledge is the effect or reflection of things. On the one hand, things are materials while knowledge is ideas; but on the other, things are the embodied ideas of the universe while knowledge consists of the abstract materials in the human mind. Things and knowledge, materials and ideas, are one; but, for the convenience of discussion, named by two opposite terms. It is for this reason that the Ta Hsüeh treats these two acts as one, for they are really inseparable.

"To be sincere in thought." "Thought" is the issue of the mind. "To be sincere" means to seek self satisfaction in every issue. This is a thing which is only noticed by one's self, but every issue has its result in return and is effective on the whole world. "Be watchful over yourself when you are alone." "There are ten eyes that behold and ten hands that point to you." This is the way to keep the thoughts in sincerity.

"To rectify the mind." "Mind" is the central station from which every thought is issued. "To rectify" means to be free from all incorrect influence. Mind is the king or the master. He should make everything else as his subject or slave; but not to be subject or a slave to everything else. Let the king be powerful yet peaceful on his throne. If he



In the compound of the Military Clothing Depot at Honjo, where 32,000 people were burnt to death or suffocated, having gathered there for safety, but, being overtaken and surrounded by the flames, were unable to escape.



AN ANALYSIS OF THE FOUR BOOKS

is in power, everything will yield its power to him. If he is in peace, everything will share its peace with him.

“To cultivate the person” is to do as with the land. The quality and quantity of harvest depends only on what seeds have been sown, what soil has been chosen and how much time and labour have been spent on it. The Chinese proverb says, “If one plants melons, he will obtain melons; if one plants beans, he will obtain beans.” It also says, “Do not ask how much will he reap, but ask how much did he plow.” Moreover, the cultivation of the person is not only good for one’s self, but means also to form a good model for all. For every action of one’s self will throw an invisible shadow over others and will receive a corresponding echo from others alike. This is the reason why this act, being the root of all, is the last step to illustrate one’s own virtue, and, at the same time, the first step to make one’s self akin to others. One’s own person is the centre of the universe.

“To regulate the family” is to be akin to the people who are mostly near by. The word family in Chinese means more than a person with his wife and children. It means the whole community or a clan or a tribe. Whenever and however a community is formed, regulation is necessary and important. Every person has to perform his various duties in his family, for he has various relations to the various members in his family. Besides performing all these duties, one in the Great School ought also to know the science of regulating the whole family in which he is as the head, the speaker of the legislature, the president of the executive, and also the judge in the jurisdiction of this home government.

“To order well the State.” This refers, of course, not only to the feudal states of that period, but also to the independent state now. The only difference is that no militarism and imperialism existed in Confucian times, for China was the whole world and the states were mere provinces. Be a patriotic and devoted citizen and be also a broad-minded and honourable statesman. “To order your one state and to order it well”—Chinese at the present time should be ashamed to be challenged by this statement.

“To make tranquil and happy the whole world” is to establish a democratic empire on the earth. For a state, the words “to order” or “to govern” may be suitable; but for the whole world, it must be made tranquil and so it will be happy. After this result is obtained, the virtue of everybody else is well illustrated, and then one’s own virtue reaches the perfection of its illustration. This is the final stage of the Great Learning. A scholar from the Great School ought to have wisdom equivalent to that of the emperor of this empire or “all under heaven.” The science of making tranquility and happiness in the world was provided not only for the emperor but for every university student; for among them the emperor was one of the school fellows or classmates, receiving the same education. This meant government by the scholar. The holder of that highest position in the government, the emperor, should be equipped as well as the best scholar, the sage. Every person in the empire had the same opportunity to receive the best education, making it possible for him to be a sage and qualified to be an emperor. From this

THE CHINA JOURNAL OF SCIENCE & ARTS

we see the ideal government of the Chinese is the democratic empire, and the ideal scholar of the Chinese is he who fits himself to be the emperor of this democratic government.

In order to become such a person, one has to illustrate his own virtue and to be akin to the others through all the acts and in every detail of them, only resting in the best. This is the teaching of the Great Learning.

II

THE CHUNG YUNG OR THE "DOCTRINE OF THE MEAN."

The Chung Yung was also originally one of the forty-six individual works contained in the Book of Rites or the Li Chi, the fourth canon of the Confucian Classics. Since the time of Chu Hsi, the great philosopher of the Sung Dynasty, this work has been removed from the Li Chi and becomes the second of the Four Books, the next to the Great Learning or the Ta Hsüeh.

The author of the Chung Yung was Tzü Ssü, the grandson of Confucius. According to the great philosophers Ch'eng Hao and Chu Hsi, this work is divided into eleven chapters. The first chapter is the main text or "the sum of the whole work," edited by the author; and the other ten chapters are its explanations which are principally quotations of Confucius' words in completing the meaning of the first chapter.

The words "*Chung Yung*" are two independent characters which have two different meanings. *Chung* means centre or middle while *Yung* means common or general or ordinary. Confucius says "I know how it is that the Path of the Mean is not walked in:—The knowing ones go beyond it and the stupid ones do not come up to it. I know how it is that the Path of the Mean is not understood:—The men of virtue and talents go beyond it and the worthless do not come up to it. . . . There was the Emperor Shun who indeed was great and wise. . . . He took hold of the two extremes and determined the Mean, employing it in his government of the people." This well expresses the *Chung*. He says also, "To live in obscurity and practise wonders in order to be mentioned with honour in future ages:—This is what I do not do. . . . The Path is not far from man. When men try to pursue a course which is far from the common indications of conscience, this course cannot be considered the Path. . . . The superior man is quiet and calm, waiting for the natural result which his conduct produces, but the mean man works in dangerous paths looking for lucky occurrences." This well expresses the *Yung*.

The Chung and Yung describe the Path of Tao which is solemnly mentioned in the beginning of the main text. In fact, the whole work is devoted to dealing with Tao. Now, what is Tao? After reading over carefully the whole work, we may give the definition of Tao, or at least the word Tao as meant in this work, as follows:—

First: Tao is Nature's Way or the Natural Way. It is said in the very beginning of the text that "What Heaven has conferred is called Nature. Accordance with this nature is called Tao." We see, therefore, that anything that is made artificially or arbitrarily is not Tao.

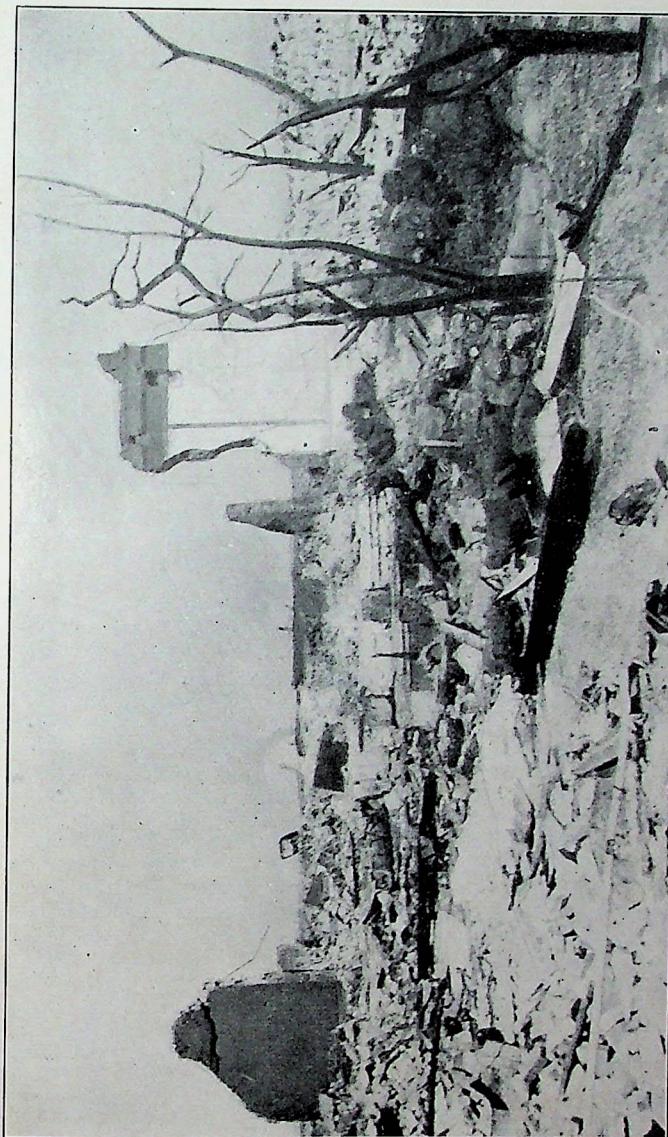
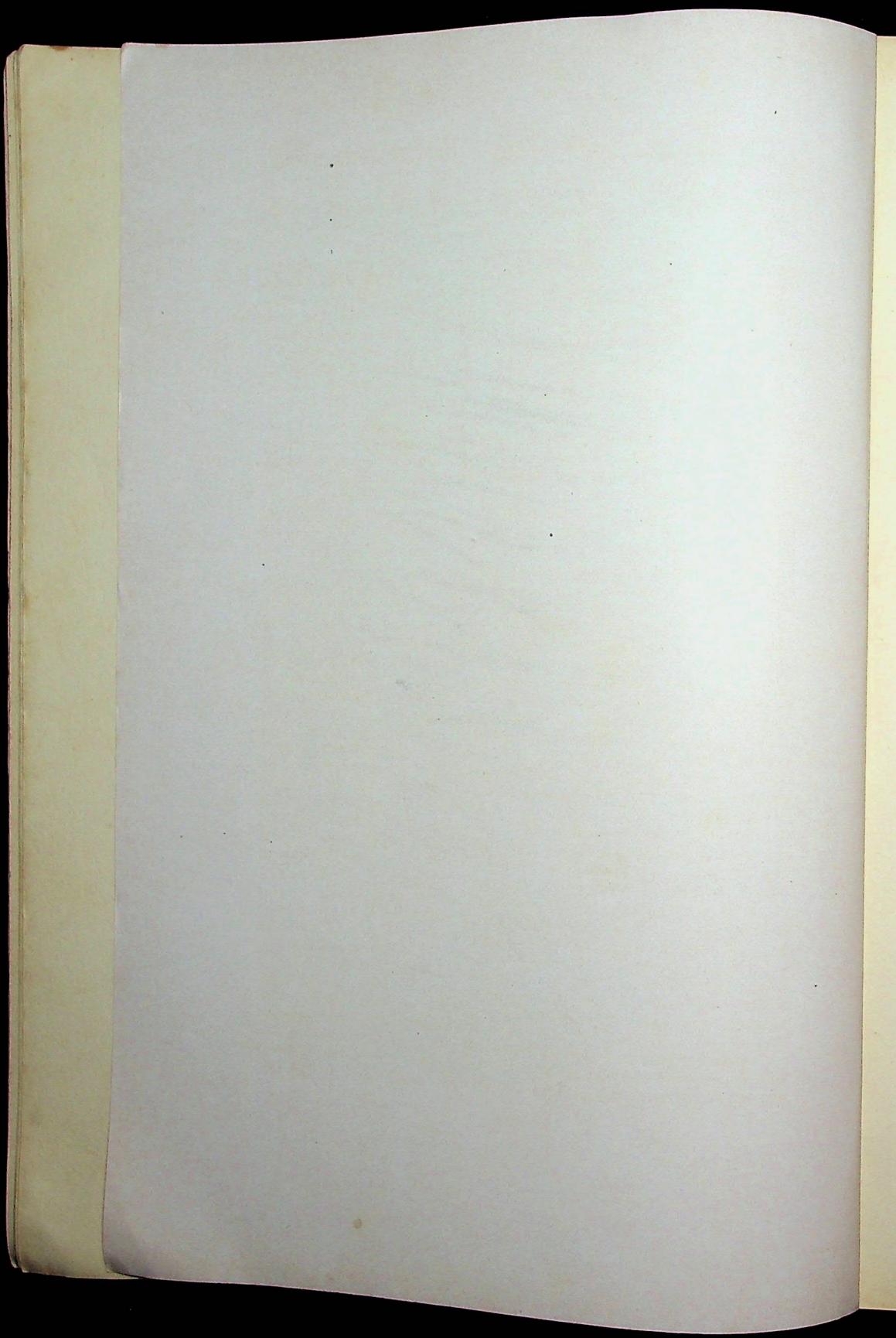


Photo by courtesy of Dr. Collier and the Kodak Shop, Tientsin.

Remains of the Grand Hotel, Yokohama.



AN ANALYSIS OF THE FOUR BOOKS

Many religious beliefs, government laws and social orders and customs are unnatural and against nature, and they are, therefore, not what we mean by Tao.

Second : Tao is the one or the only way for human beings as well as for the universe. There is but one truth. That which is true in one case must be also true in any other similar case. We see, therefore, that something is wrong with the so-called civilized modern world, for there we have double-standard morality :—The morality for individuals and the morality for the State or nation. They conflict with each other. Besides, we have many opposite “isms” in our schools of philosophy, each declining or adhering to one side. These could not both be true, and either of them alone could not be true. Hence they are not what we mean by Tao.

Third : Tao is everywhere. It is beyond time and space. It is ceaselessness and boundlessness. Tao is in the invisible as well as in the visible world. Therefore the superior man is always watchful over himself even when he is alone. “He is cautious where no one sees, and he is apprehensive where no one hears.” For Tao is present and acting regardless of whether an action is in secret or in public. “Tao cannot be left for an instant. If it could be left, it would not be Tao.”

Fourth : Tao is acted by everyone, but is only conscious to the superior man. The same Tao which is applied by the highly educated scientist is also applied by the primitive savage ; that which is applied by the sage is also applied by the wicked person. Our ancestors many thousand years ago practised chemical combustions to support their lives and employed electric power to kill their enemies. The natives in central Africa are fond of using the newest methods of modern inventions in accomplishing their every-day work. The animals of the lowest type, such as bees and ants, live collectively in an organized society and work skilfully according to the rule of efficiency. But they are doing these either by instinct or by chance. Only men of great learning are able to discover the reasons and establish the general laws by which results are assured. Confucius says “There are no people who do not eat and drink ; but there are few who can distinguish flavours.” People of the masses live and die in Tao, succeed or fail through Tao ; yet no one knows why and how and what it is that makes it so save the superior man :—The superior man is not the mightiest but the wisest, not of the German type but of the Chinese type.

After all, Tao is the law of causation. A certain cause will produce a certain effect. This is strongly guaranteed without a single slip. But we must take the whole world into consideration, and must not expect a quick result in a short duration of time or space from a near-sighted view. When we murmur in a small secluded room, we can hear the echo of it at the same time ; but if we shout in the open air, the echo does not come back, yet the wave of the voice moves on and will stop somewhere. When we plant a seed of grain, we can reap it in the same year ; but if we cultivate a pine or cedar tree, we hardly see it growing, yet it will yield to us a wide shade some day or perhaps to some future generation. This is not only true in action or speaking, but is equally true in thinking.

THE CHINA JOURNAL OF SCIENCE & ARTS

Thinking is an unexpressed action or a silent speaking ; it is a cause and so must have its effect. We may sometimes find many exceptions :— a cause without an effect, or a certain cause producing a certain effect entirely foreign or contrary to our expectations. Each of these exceptions must have its special reason, and this is again in accordance with the law of causation. The law of causation is altogether too deep and very complex for human knowledge to apprehend it all. When it is expressed in easy terms or represented by a simple formula, a common man or woman may understand it and practice it. One should study this deep reason of the complex phenomenon beginning with the easiest and most simple starting point.

Through the experiences of the whole history of all races of mankind and under the great wisdom and hard task of the superior men, a very small portion of the whole course of Tao is gradually discovered, and a few laws or generalizations are roughly drafted and shown through easy and simple forms. We are then able to know better how to walk in and pursue our way along the Tao. We are, of course, walking in and pursuing it anyway ; but since we have this guiding light, we are, instead of blindly wandering, led into a path which is narrow but safe, slow but sure. This path is the Chung Yung. Keep to the point which is away from both extremes and follow straightly the road which most usually leads to the destination we are wishing to reach. Should it finally fail, return to self and examine whether or not you have done the best. Confucius says "In archery we have something like the way of the superior man. When the archer misses the centre of the target, he turns round and seeks for the cause of his failure in himself."

The Chung Yung is easy and simple. But it is very difficult for an unlearned person to attain to. For it is very difficult first to know it exactly, then to determine it promptly, then to get hold of it firmly, and then to practice it constantly. This is why its study is of great importance. There are three grades in obtaining it. "Some are born with the knowledge of it ; some know it by study ; and some acquire it after a painful feeling of their ignorance. Some practice it with a natural ease ; some from a desire for their advantage ; and some by strenuous effort. There are five methods in studying it. It requires 1, extensive learning ; 2, accurate inquiring ; 3, careful reflection ; 4, clear discrimination ; and 5, earnest practice.

When the Chung Yung is applied to the mental morality, we find two words to describe the states of the mind. "While there are no stirrings of pleasure, anger, sorrow or joy, the mind may be said to be in the state of equilibrium. When those feelings have been stirred, and they act in their due degree, there ensues what may be called the state of harmony." These two states are the Chung Yung existing in the human mind. Some believe that one ought to be free from all emotions as certain schools of Buddhism and Taoism preach. But this, however is impossible while one has one's senses. Some others believe that one ought to preserve only the emotions of pleasure and joy but not those of anger and sorrow. In other words, to encourage the positive or constructive emotions of love and abolish the negative or destructive emotions of hatred. The ideal

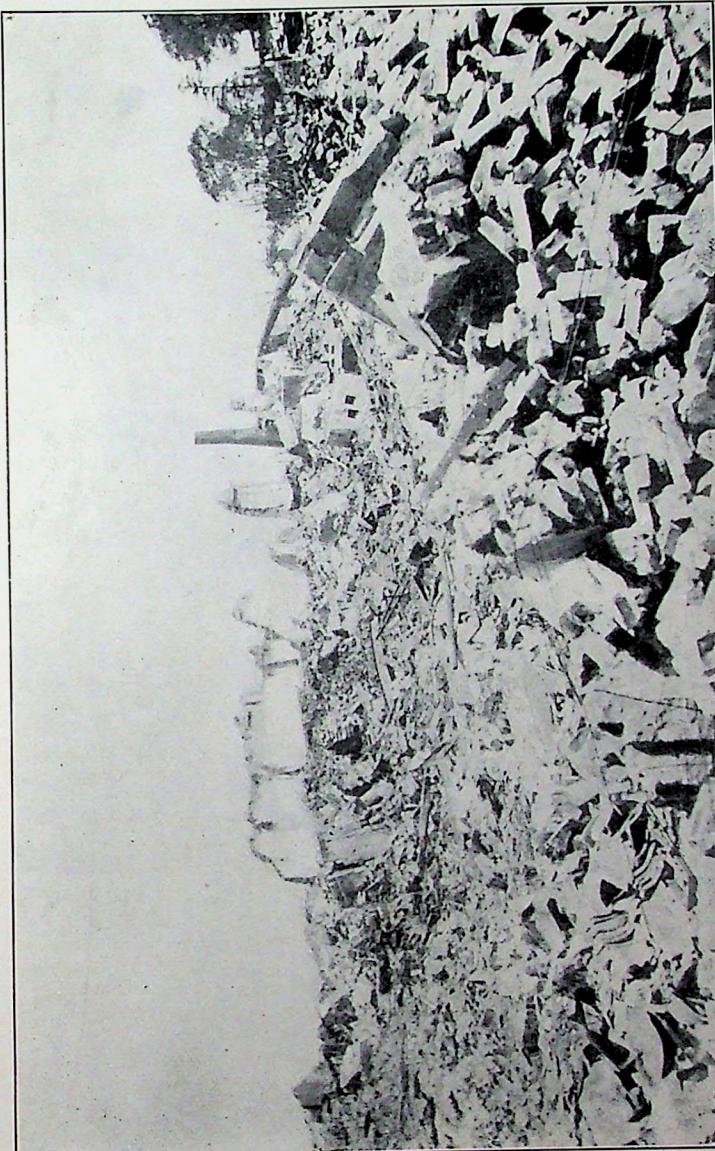
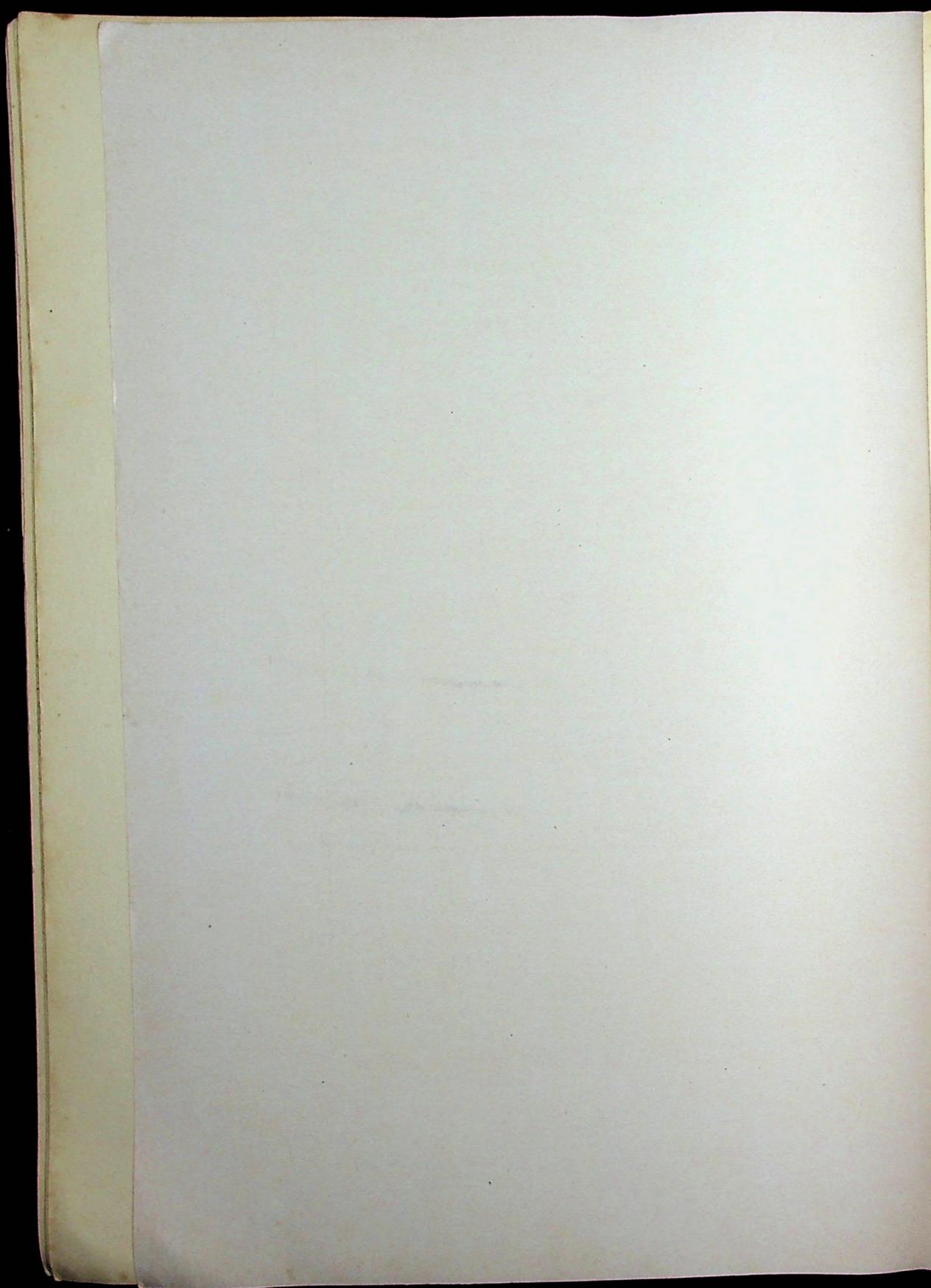


Photo by Courtesy of Dr. Colbert and the Kodak Shop, Tientsin.

Business Section, Yokohama.



AN ANALYSIS OF THE FOUR BOOKS

is indeed very beautiful ; but, alas, emotion is formed of two phases as everything else, and hatred will never be entirely uprooted. No Christian will turn to you his left cheek after you hit his right. Moreover, the excess of positive emotion will also do as much harm as the negative. Many crimes are committed and many diseases are produced by the overaction of love. The Chung Yung emphasizes that every emotion of either side should only act in its due degree, so it will do no harm to others or to self either to body or mind. These states which can be seen in the human mind can also be seen in the whole universe. Nothing can exist unless the different powers are well balanced and the various elements are all harmonized both within and without.

When the Chung Yung is applied to ethical action, two principles are essential. The principle of loyalty and the principle of reciprocity. The first applies to one's self while the second applies to others. The definition of loyalty is "To do what is proper for the position in which one is ; and not desire to go beyond it." The definition of reciprocity is "Do not do to others what you dislike to be done to yourself." These principles are practised through three universal virtues ; namely, intelligence, kindness and courage. The first of these virtues appeals to the human faculty of knowing, the second of feeling and the third of will. Or, we may say, the first is mental training, the second moral training and the third physical training.

When the Chung Yung is applied to social service, there are two characteristic elements—benevolence and righteousness. The first is to love and the second is to honour. "The measures of the love due to relatives and the steps in honour due to the worthy are the roots from which propriety is produced." To practise these characteristics goes through the five relations :—1, the relation of master and subject ; 2, that of parents and children ; 3, that of husband and wife ; 4, that of brothers and sisters ; and 5, that of friends. These five are the duties of universal obligation.

When the Chung Yung is applied to political science or the government, it follows nine standard rules :—1, the cultivation of one's own person ; 2, the honouring of men of virtue and talents ; 3, affection towards relatives ; 4, respect towards great ministers ; 5, kind and considerate treatment of minor officers ; 6, dealing with the masses of the people as children ; 7, encouraging the resources of all classes of artizans and labourers ; 8, indulgent treatment of men from a distance ; and 9, kindly cherishing of the kings or lords of the States. These are the standard rules of the government of the empire of all under-heaven with its states and families.

All the facts above-mentioned, under different numbers and subjects, are carried into practice by the means of singleness or oneness of heart, or in other words, sincerity or the truth. "Sincerity or the truth is the beginning and the end of all things. Without it there would be nothing." Everything in the universe is formed from the movements of this truth. The universe comes from it and enters into it. This is oneness but not noneness. Oneness cannot be produced by noneness, nor can it return to noneness. All the nine standard govermental

THE CHINA JOURNAL OF SCIENCE & ARTS

rules, five social relations, and three universal virtues, two characteristic elements, two essential principles, two mental states, and even the three grades of human dispositions, and the five methods of study, are but various forms of the manifestation or illustration of this one Tao. The most convenient and most secure path in pursuing it is the Doctrine of the Mean, the Chung Yung. It begins with the easiest terms and simplest formulas in the every day life of the common people, and is in accordance with the law of the deepest and most complex phenomenon—the law of the whole universe throughout heaven and earth, reaching its highest stage.

AUTUMN LONGINGS*

BY
ELFRIDA HUDSON.

This town is circled by the river Pey,†
It clasps it like a silver girdle gay.
When day declines, I like to rest my eyes
On this old wall—the moat—the sunset skies.
Sometimes I hear the sound of music sweet,
Of flute and harp and the 'koo's' dulcet beat.

I wonder why the flute makes me feel glad,
And lovely harp-tones make my heart feel sad ?
These people gather in the open air
To hear the warblings of some singer fair
Or watch a dancing girl swing round with grace,
Her red shoes flashing in the sun's last rays.

The autumn winds among the branches sigh ;
The falling leaves whisper their last 'good-bye.'
Reluctant swallows their old nests forsake ;
The wild geese gather their long flight to take.
Oh, had I wings ! How I would ply the air
To my dear native town ! My heart is there.

The river 'Loo'‡ holds it in its embrace ;
From this west tower I can see it race
Like cataract down hill, then stayed it grows,
With brown sails dotted as it sea-ward flows.
Oh, had I wings ! How swift would be my flight
To my old home ! My heart how glad and light !

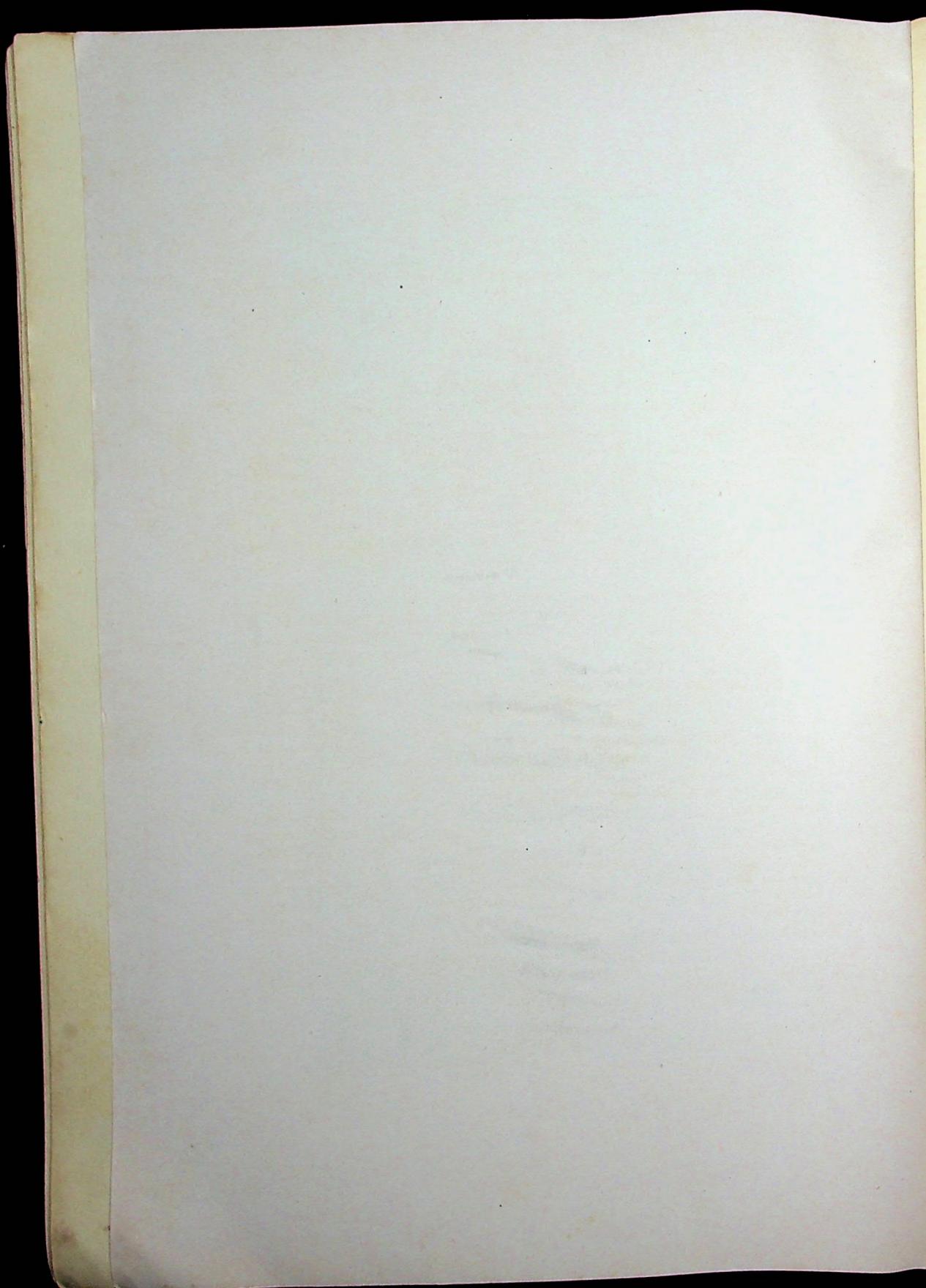
Ho Hsün (5th century A.D.)

* 日夕望江. † 濒. ‡ 洛.



Photo by courtesy of Dr. Collert and the Kodak Shop, Tientsin.

All that is left of the U. S. Naval Hospital on the Bluff, Yokohama.



楊 貴 妃

YANG KUEI FEI

ONE OF THE MOST FAMOUS BEAUTIES OF CHINA,

BY

WU SHIH-HUAN

(Continued from page 437)

IX. THE GARDEN BANQUET AND ITS SEQUEL

On a subsequent occasion, the emperor invited several princes and courtiers to a garden banquet. The guests asked to be granted an interview with Kuei Fei, to which his majesty graciously consented. He accordingly led his beautiful spouse to a raised seat in the garden. After the banquet was over, and the guests had departed, Kuei Fei seized a flute belonging to Prince Ning and played it for a while. The emperor jokingly said to Kuei Fei, "Why don't you blow your own flute as Prince Ning has just used that one and it is still warm with his breath?"

Kuei Fei slowly put the instrument aside and answered, "What harm can there be in blowing a flute previously used by another. I have been told that somebody's shoes were once stepped upon, and yet Your Majesty did not mind it.* Why then reprove your humble wife for using the flute?"

The emperor was already displeased with her constant bickerings over Mei Fei. Instead of offering thanks to him for the evening's entertainment, she showed her temper over a jest. Such a silly complaint roused the wrath of the sovereign to such a pitch that he scolded her in a loud tone, "Yu Huan †, how dare you behave so rudely before me. You have indeed gone too far." He at once commanded the chief eunuch to send her back without delay to her parents' home at Hua Ying and forbade her to wait upon him again. Kuei Fei felt as if a thunderbolt had struck her unawares. Her whole frame quivered under the shock, and she broke down into bitter tears and remorse. She imagined herself struggling vainly against torturing Nemesis, not knowing where to turn for help or pardon. There appeared now no hope for her, her ambition was thwarted and her career ended. The once powerful favourite was unable to save her own position, seeing nothing before her but the decline of power and the dwindling of her peace and happiness.

Torn by conflicting emotions, she journeyed home accompanied by her personal eunuch. Sorrowfully she bade him gather all her treasured belongings and despatch them after her. She could think and hear of nothing except the ruffling of the wind as it moaned fitfully through

* See chapter III.

† Kuei Fei's maiden name.

the trees along the way. Her sobs choked her further utterances until relief came in a surging flood of tears, when the door of her house was burst open and her relatives stood there in utter dismay, knowing not what to make of this unlooked-for event. The poor mother noticed that her daughter was in a deplorable condition—a forlorn, forsaken, worn-out and dejected being. She had been the sole pride of the family, and in her all their high hopes had centred. Now these expectations were all of a sudden dashed to the ground, like broken porcelain, and their grief and disappointment were beyond words.*

X. RECALLED TO GREATER GLORY

In the meantime, the emperor was acutely distressed, and, try as he would, he could find no solace from any of the thousand and more of court maidens around him. He missed Kuei Fei's presence most keenly. The loneliness was more than he could bear. He was soon laid up for several days. He seriously considered the recall of his earlier love, the neglected Mei Fei, but was informed that Kuei Fei contemplated her assassination, so this plan had to be abandoned. The palace attendants witnessed frequent outbursts of torrential rage from the Son of Heaven. Every one from the highest official to the lowly eunuch and maid attendant suffered his majesty's displeasure, and often undeserved punishment for the slightest offence. Nothing seemed capable of pleasing the emperor, and it appeared as if consolation was only possible if the disgraced favourite were brought back to his side. The whole world looked desolate and meaningless, for the separation had intensified the emperor's moments of enforced solitude.

The head eunuch, anticipating his master's true needs, skilfully contrived with Yang Kuo-chung to restore his cousin Kuei Fei to power. Kuo Chung urged a certain courtier to find means to effect a reconciliation between the two lovers. Consequently, this wily official at an early audience greeted the emperor with the following words: "May it please Your Majesty! Her Highness Kuei Fei, whose beauty and charm excel anything the princesses and fair maidens in the six palaces can lay claim to, has committed a grave crime and deserves to die. Nevertheless, she should do so within a small place inside the palace grounds. Why disgrace her by allowing her to die outside?"

The disconsolate ruler could not suppress his grief on hearing this. He forthwith left the audience hall and gave orders for the chief eunuch to prepare many costly presents to be sent to Kuei Fei. When the messenger arrived, her heart leapt with joy, though mingled with uncertainty. In those weeks of disgrace, life had indeed been a misery to her, and this sudden news was almost too good to be true. Amid tears she said to

* This temporary exile was described in verse by the poet Li T'ai-po thus:—

"Before my hall sweet flowers perfume the calm and sweet night,
I wish to roll the blinds—but, ah! am checked by spring's despite.
Dimly, guitar beneath my arm, the glancing moon I see,
The wavering colours of the trees obscure my lost delight."

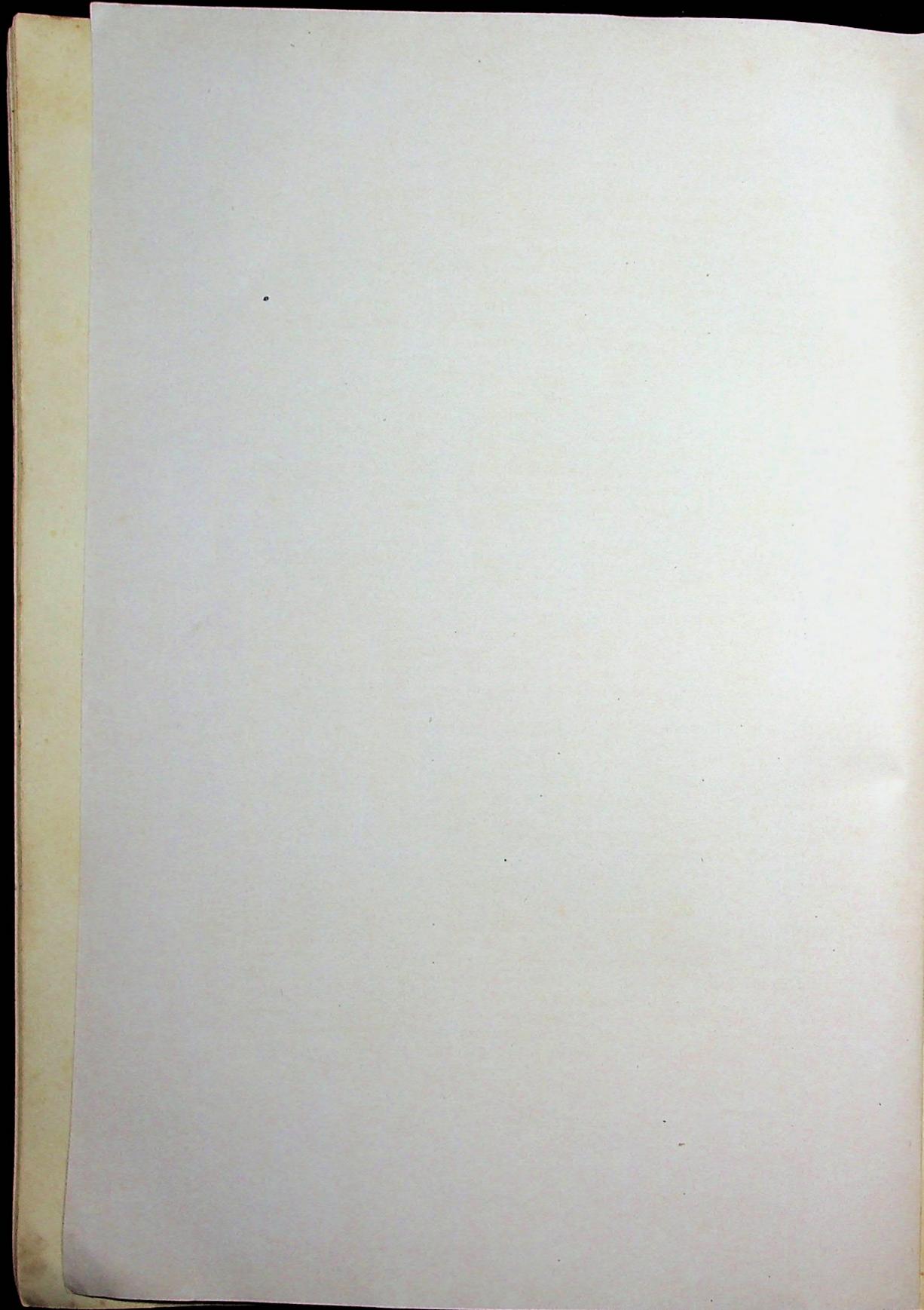
(Translation by W. J. B. Fletcher).



The only building intact in Yokohama. Reinforced concrete structure designed by American architects.



Photos by Courtesy of Dr. Colbert and the Kodak Shop, Tientsin.
Business Section, Yokohama.



the eunuch, "I have sinned and deserve to die, but have now received forgiveness from my illustrious lord. To-day my sovereign commands me to return to my former glory. How can I face the world? Shall I not be jeered at? There is nothing I possess that has not come from my beloved sovereign, except my miserable body, which my parents gave me. Under such circumstances, I regret having nothing worthy to present to His Majesty except this small lock of my hair, which please take back to my lord as a token of my undying love and gratitude. You can tell the emperor that I am about to kill myself and beg him not to worry any more about me."

The eunuch was frightened and immediately conveyed to the waiting sovereign the serious news together with the token of her farewell. His majesty was overwhelmed with remorse and issued orders at once for some trusted messengers to start at midnight and fetch Kuei Fei back to the palace in the fragrant chariot. On their arrival at her mansion, she felt that the tide of fortune had at last turned and that Heaven's favour once more smiled upon her. She undertook the journey of two hundred *li* without delay*, and permitted her mind to dwell upon former luxuries and future pleasures. She was dressed in a simple fawn-coloured gown, and when arrived at the palace proceeded directly to the emperor, kneeling before him in silent entreaty. Her voice was broken by sobs, and she could scarcely command herself to speak. The monarch gently lifted her up. He was stifled by his own emotions and pity and by a maddening desire to hold this pale, stricken creature in his arms and protect her from this wrongful world. Tears of life's supremest joy flowed from the eyes of both lovers. He whispered words of tender love and devotion to the lady and ordered the maids-in-waiting to clothe her in imperial robes. Hand in hand, trembling still under the torments of the long days which had separated them, they became enraptured by the thrill of their heavenly reunion. Thus, they spent a joyous evening, renewing their affection.

On the following morning, the palace was agog with excitement, and banquets were once more the order of the day. All the imperial clans assembled to congratulate Kuei Fei on her restoration to fame and glory. Henceforth, the emperor lavished unstintingly his love upon the returned favourite, and gave himself up entirely to a life of reckless orgy and dissipation.

XI. A FOSTER SON

At this time a youth of Tartar descent, named An Lu-shan, of crafty and daring disposition, was introduced to the court. The emperor took a great fancy to him and thought that he was an honest simpleton. An Lu-shan soon gained the full confidence of the emperor who showed great partiality towards him and made him his favourite courtier. Later on, he was permitted unusual liberties in the privacy of the palace.

One day he brought a pretty white parrot with red legs in a golden mounted cage and presented it to the emperor. He pretended to be ignorant of etiquette by kneeling only before the emperor and not before

* One *li* is one-third of an English mile.

THE CHINA JOURNAL OF SCIENCE & ARTS

the Heir Apparent. On the emperor asking, "Why don't you salute the Prince?" An Lu-shan replied, "Your humble subject knows not what a Prince's title is; how dares he therefore pay the same homage to the Prince in the presence of the Supreme Ruler?"

The emperor said again, "The Heir Apparent is the Son of Heaven. Some day when I mount the dragon, he will succeed to the throne and rule the empire."

An Lu-shan quickly apologized and made obeisance to the Prince and exclaimed, "I only know that I must worship and serve the emperor with entire devotion, and had no idea His Highness was entitled to the same honour. Pray forgive this ignorant servant." The emperor turned to the Prince and said, "I like this simple-minded lad, he seems very frank."

While the emperor and prince were talking, a group of court maidens escorting Kuei Fei in her fragrant chariot* arrived. Kuei Fei pointing to An Lu-shan asked, "Who is that man and what is his rank?" The emperor replied, "He is an official in Fan Yang, a man of Tartar descent. I am keeping him to serve me in the court. He is a foster-son of Chang Shou-kuei (張守珪) and as he is staying with me, I look upon him as my own foster-son as well."

Kuei Fei said, "He looks indeed a fine lad," to which the emperor replied, "If you regard him in the same way, then we will keep him as our joint foster-son."

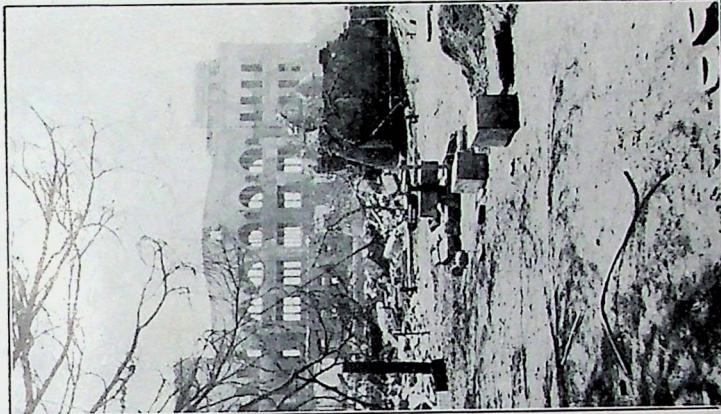
An Lu-shan had long ago heard of the famous beauty, and now seized this opportunity of making her acquaintance by kneeling down and addressing her thus, "Long live my foster mother and great empress!" Kuei Fei could not conceal her unusual liking for him. She cast upon him her amorous eyes and bewitching smile to reciprocate his attentions. The emperor said to An Lu-shan, "You ought to make obeisance to the father first and then the mother." An Lu-shan responded, "It is our Tartar custom to pay respect first to the mother." The emperor smiled and said to Kuei Fei "Isn't he dense?"

One day when An Lu-shan was leaning on a chair opposite to that occupied by the emperor, the latter remarked to him, "I wonder what is inside your big stomach?"

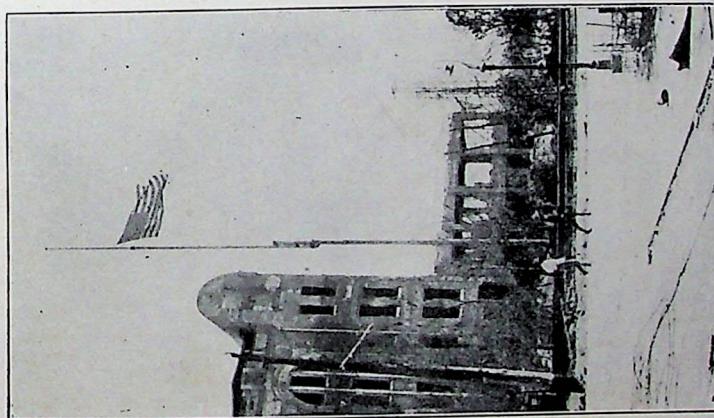
An Lu-shan replied, "There is nothing inside but my loyal devotion to Your Majesty,"

The emperor was highly pleased with this flattery and trusted him more fully than ever. All the time the monarch was not aware of An Lu-shan's treachery and hypocrisy. Since their first meeting, Kuei Fei and An Lu-shan had been attracted to each other. Mutual love and admiration developed. As the days passed, the man's infatuation for his imperial mistress increased. This fact excited much attention and gossip in the palace as well as in the outside world. The sovereign, being a weak debauchee, noticed nothing, as his entire mind was centred blindly upon his faithless spouse. Their natures met in that fusion of pleasure and abandon wherewith love itself could lend even tragedy and pain to its own use.

* Made of sandal wood.

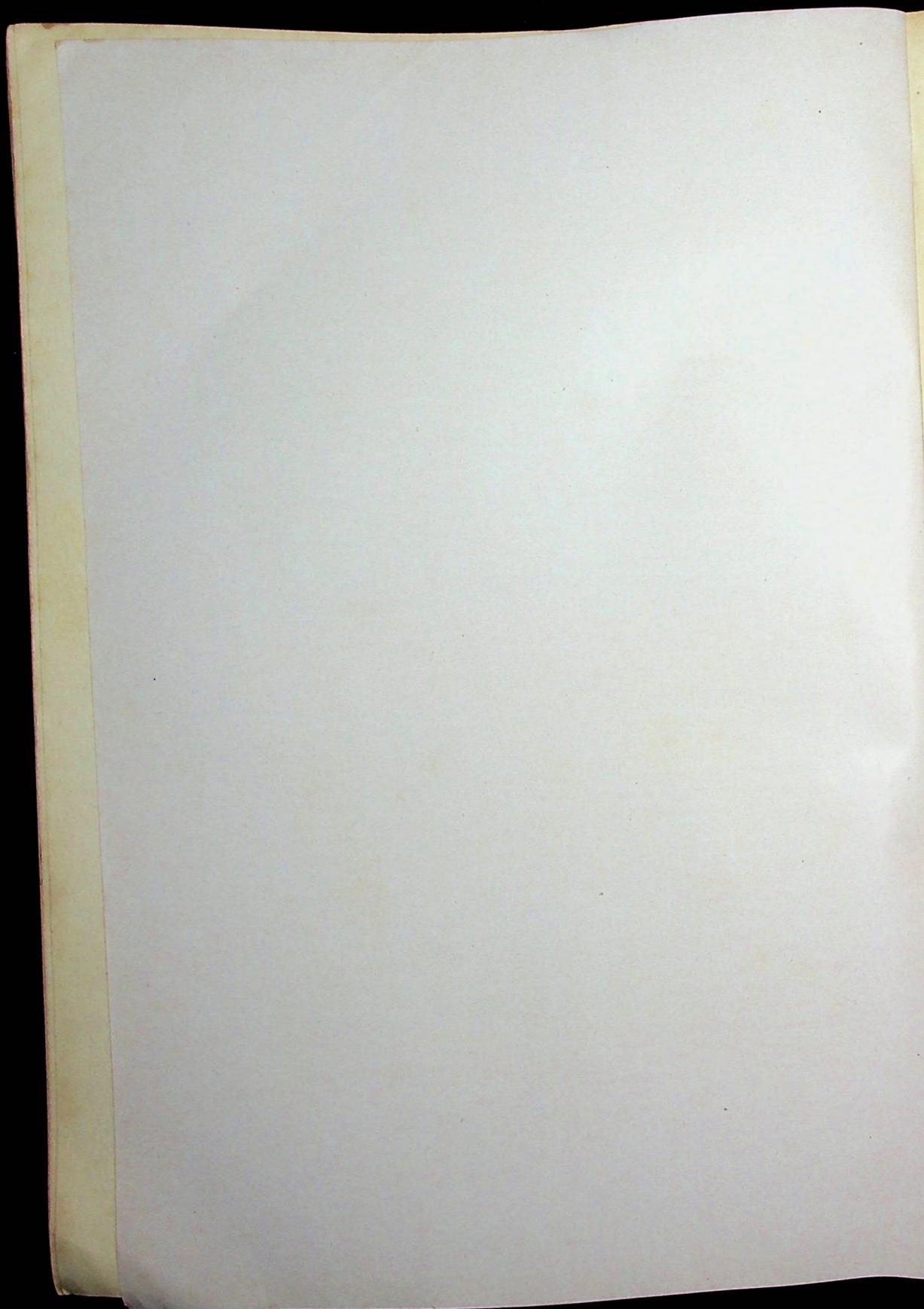


Business Section, Yokohama. British Consulate and Coffins of British subjects in foreground.



The American Consulate, Yokohama. (only the flag pole left).

Photos by courtesy of Dr. Colbert and the Kodak Shop, Tientsin.



XII. An INDISCREET SCENE

When An Lu-shan's birthday came, the emperor, Kuei Fei and all her relatives celebrated the occasion elaborately for three days. At the end of the festivities, An Lu-shan arrived to offer thanks to his foster parents. He asked for permission to visit his foster mother, to which the emperor replied, "She has just retired after having spent half a day in entertaining. You may go and look her up yourself."

Kuei Fei was in a half-sleeping and half-intoxicated condition* when An Lu-shan entered. Her cheeks were rose-coloured, while her lovely dreamy eyes were half closed. She looked exceedingly beautiful, enchanting and desirable. On noticing him, Kuei Fei said in fun, "My foster son, it is the custom for a new-born babe to have a bath in three days. Your birthday is just over and you should observe the same custom." So saying, she ordered the attendants to seize him, remove his outer gown and wrap silk around his bare body. He was then placed in a chariot and wheeled about in the courtyard, indicating that they were proceeding to give a bath to him just like a bady. Everyone was tickled and the noise aroused the attention of the emperor, who was reading in the garden beyond. His Majesty made haste to see what was going on. He, too, enjoyed the lively scene and presented twenty thousand taels to An Lu-shan as a bath present.

One beautiful spring afternoon, while the soft wind was blowing, and the air was filled with the fragrance of numberless flowers, the emperor and An Lu-shan were admiring the spring weather in the palace hall. The former looked round for Kuei Fei but she was not to be seen. He sent word for her to come out in her ordinary dress. She had just finished her bath and looked unusually charming in her loose flowing garments. This attracted the emperor's attention and he remarked, "You look exceedingly pretty, my sweetheart."

At this moment an embroidered case containing some foreign perfumes arrived and was laid in front of His Majesty. The emperor asked Kuei Fei to face the mirror and himself sprinkled a few drops of the contents over her face. He brought a chair, sat next to her and applied the remaining perfume to her half bare shoulders. Accidentally the large sleeves dropped down exposing her beautiful pinkish white breasts. The emperor exclaimed, "Oh ! how lovely, how exquisite !"

An Lu-shan who was standing by the side inadvertently remarked, "Yes, as smooth and delicate to the touch as satin !"

The secret was out ! All save the emperor stood still, aghast and speechless. What if His Majesty should suspect the illicit relations between Kuei Fei and An Lu-shan.

No wonder Kuei Fei was greatly alarmed. She shivered from head to foot and perspired all over for fear that the emperor would find out their relationship. Many maids and eunuchs held their breath, staring at one another in fright. But the emperor was not in the least suspicious. He asked smilingly, "My Tartar lad, you dull boy, how do you know that it is as smooth and delicate as satin ?"

* Kuei Fei was very fond of the wine cup. One of the greatest plays on the Chinese stage is "Kuei Fei Drunk" (貴妃醉酒). See picture.

THE CHINA JOURNAL OF SCIENCE & ARTS

The emperor seemed to be under the spell of Kuei Fei's hypnotic influence. He concentrated every thought upon the great living idol before him and laughed merrily. Kuei Fei and the attendants thereupon followed with louder screams of laughter in order to save this most embarrassing situation.

It is recorded that every one at court knew of An Lu-shan's improper intimacy with Kuei Fei. Many queer remarks were made inside the celestial palace, high and low expressing their wonder at An Lu-shan daring so publicly to express his secret love for his mistress. As An Lu-shan grew in years and in favour with Kuei Fei, so also his arrogance increased. His conceit soon knew no bounds and this brought enemies.

Kuei Fei's cousin Yang Kuo-chung (楊國忠) entertained an intense hatred for An Lu-shan because both of them were in love with the youngest sister. Kuo Chung plotted to get rid of An Lu-shan by expelling him from the court. The latter, realizing his perilous situation, prepared an application for temporary retirement. Yang Kuo Chung suggested the following plan to the emperor: "Ho Tung is a strategic fortress. As An Lu-shan is the only general competent to take charge of that city, may I suggest his being sent there?" The emperor agreed and summoning An Lu-shan to him, said, "You have served me faithfully. I ought to keep you near me, but Ho Tung is a very important place. I want you to go and do your best to maintain peace there for me." The emperor appointed him as military governor of three frontier cities—Ping Lu (平盧), Fan Yang (范陽) and Ho Tung (河東), all lying along the northern borders of the present Chihli and Shansi provinces. This meant that he had the best and largest armies of the empire under his immediate command. An Lu-shan thanked the Sovereign and proceeded on his mission. Kuei Fei secretly invited her lover to come to her private chamber. She held his hands for a long time and weeping said, "Your leaving the palace is entirely due to my cousin Kuo-chung's jealous disposition. We have spent many happy hours together in the most secret corners of the palace. How can I bear to miss you now? Who shall compensate me for the tears of sorrow at our parting? Rest assured that I will use every means, by diplomacy or otherwise, to influence the emperor to recall you to court."

These fond words gave much comfort to her lover. An Lu-shan took his departure with great reluctance. This humiliating treatment by Yang Kuo-chung so exasperated him that he vowed he would one day seek his revenge. He, therefore, sowed the seeds of dissension throughout the land, which lasted a long time. Little dreaming to what depths of folly his presumption would lead him, he played a desperate game to betray his sovereign and jeopardise the security of the State.

Kuei Fei, yearning for her young lover, lost her usual appetite and sleep and became greatly depressed. The emperor, not suspecting the true reason and thinking only of his pleasures, sought to please his concubine in every way. Secure thus in the increasing love and blind devotion of her doting sovereign, she kept him practically under her thumb as if he were a mere puppet in her hands! No wonder the country steadily decayed, largely because of the powerful fascination exercised by one woman upon the absolute ruler of the land.

(To be continued.)



Kuei Fei undressing for a bath. The attendant was a eunuch.

THE STORY OF CHINESE CHARACTERS

BY

RAYMOND B. BLAKNEY.

(Continued from page 447)

For the student of Chinese writing, the Chou Dynasty (B.C. 1122-255), in which the foregoing developments were chiefly consummated, is especially noteworthy. It was the epoch in China's history, to which only the Han Dynasty (漢朝) B.C. 206-A.D. 221) is comparable. It was during this period that the great sages or Holy Men of China did their work, and in the production of their books the Ta Chuan script was used. These men, during that early period of intellectual brilliance, when the whole world seemed to have received a common divine impulse, practically moulded the Chinese people for all time, in every department of life. While but few authentic copies of their works are still extant, these men were real personalities whose influence was beyond question, and among other things, one of their great achievements was the demonstration that their native written characters were capable of recording sublime and prophetic thoughts fully comparable with those of the sages of Greece, Persia and India. Among these men are to be noted King Wen of Chou (周文王), born about B.C. 1120 and the originator of the famous I⁴ Ching¹, (易經) or Book of Changes ; the Duke of Chou (周公) whom Mencius enumerates as one of the three great sages of ancient China, who perfected the I⁴ Ching¹, the Mariner's compass, and who was the reputed author of the Ceremonial of Chou (周禮), commonly called the "Bible of China" ; Lao³ Tzu³ (老子), born about B.C. 600, the founder of philosophical Taoism, and author of the Tao⁴ Té² Ching¹ (道德經) or Canon on Reason and Virtue ; Confucius (孔子), born B.C. 551, founder of China's famous ethico-religious system and author of an authentic classic history, and other works of importance ; Licius (列子), probably a contemporary of Epicurus, and philosopher of pessimism ; Mencius (孟子), contemporary of Aristotle, Confucian apostle, and author of classic works under his name ; Micius (墨子), born about B.C. 360, famous for his altruistic thought, his teaching of the immortality of the soul, and his general teachings which point China to Christ ; and lastly Chuang Tzu (莊子), who lived in the latter part of the Chou Dynasty, famous as an interpreter of Taoism, a mystic and moralist. The great bulk of China's subsequent literary progress has been little more than studies of, and commentaries on, the works of these great men.

The greatness of these men probably helped to prolong the longevity of the Chou Dynasty, but before the latter part of this period was reached there were unmistakable signs of approaching revolution. It was the period of feudalism and internecine wars with all the attendant racial demoralization. The mutual jealousy of the small states led even to the extreme of each developing a peculiar dialect with distinctive scripts. Such confusion caused a growing ignorance of the best in writing,

THE STORY OF CHINESE CHARACTERS

BY

RAYMOND B. BLAKNEY.

(Continued from page 447)

For the student of Chinese writing, the Chou Dynasty (B.C. 1122-255), in which the foregoing developments were chiefly consummated, is especially noteworthy. It was the epoch in China's history, to which only the Han Dynasty (漢朝) B.C. 206-A.D. 221) is comparable. It was during this period that the great sages or Holy Men of China did their work, and in the production of their books the Ta Chuan script was used. These men, during that early period of intellectual brilliance, when the whole world seemed to have received a common divine impulse, practically moulded the Chinese people for all time, in every department of life. While but few authentic copies of their works are still extant, these men were real personalities whose influence was beyond question, and among other things, one of their great achievements was the demonstration that their native written characters were capable of recording sublime and prophetic thoughts fully comparable with those of the sages of Greece, Persia and India. Among these men are to be noted King Wen of Chou (周文王), born about B.C. 1120 and the originator of the famous I⁴ Ching¹, (易經) or Book of Changes ; the Duke of Chou (周公) whom Mencius enumerates as one of the three great sages of ancient China, who perfected the I⁴ Ching¹, the Mariner's compass, and who was the reputed author of the Ceremonial of Chou (周禮), commonly called the "Bible of China" ; Lao³ Tzu³ (老子), born about B.C. 600, the founder of philosophical Taoism, and author of the Tao⁴ Té² Ching¹ (道德經) or Canon on Reason and Virtue ; Confucius (孔子), born B.C. 551, founder of China's famous ethico-religious system and author of an authentic classic history, and other works of importance ; Licius (列子), probably a contemporary of Epicurus, and philosopher of pessimism ; Mencius (孟子), contemporary of Aristotle, Confucian apostle, and author of classic works under his name ; Micius (墨子), born about B.C. 360, famous for his altruistic thought, his teaching of the immortality of the soul, and his general teachings which point China to Christ ; and lastly Chuang Tzu (莊子), who lived in the latter part of the Chou Dynasty, famous as an interpreter of Taoism, a mystic and moralist. The great bulk of China's subsequent literary progress has been little more than studies of, and commentaries on, the works of these great men.

The greatness of these men probably helped to prolong the longevity of the Chou Dynasty, but before the latter part of this period was reached there were unmistakable signs of approaching revolution. It was the period of feudalism and internecine wars with all the attendant racial demoralization. The mutual jealousy of the small states led even to the extreme of each developing a peculiar dialect with distinctive scripts. Such confusion caused a growing ignorance of the best in writing,

and this ignorance in turn was responsible for the falsification of texts and the mistaken writing of characters. Even in the time of Confucius, there was cause for the mournful remark that "The Master said, 'I can still still go back to the days when a scribe (who was doubtful of a character or statement) left a temporary blank in his records. . . . Now, alas, such things are no more.'" (Analects: XV, 25. (子曰,吾猶及史之闕文也. . . 今亡已夫) Dr. Wieger says: "According as the decadence of the Chou Dynasty became accentuated, studies were neglected and the scribes became more and more ignorant. When they did not remember the true character they improvised a false one, without shame. These false letters, recopied by other ignorant people, became usual." Some such condition of affairs will readily account for the difficulties in the etymology of modern Chinese. The climax of decay was reached for the literary Chinese as well as for the political with the advent of the Ch'in Dynasty (秦朝).

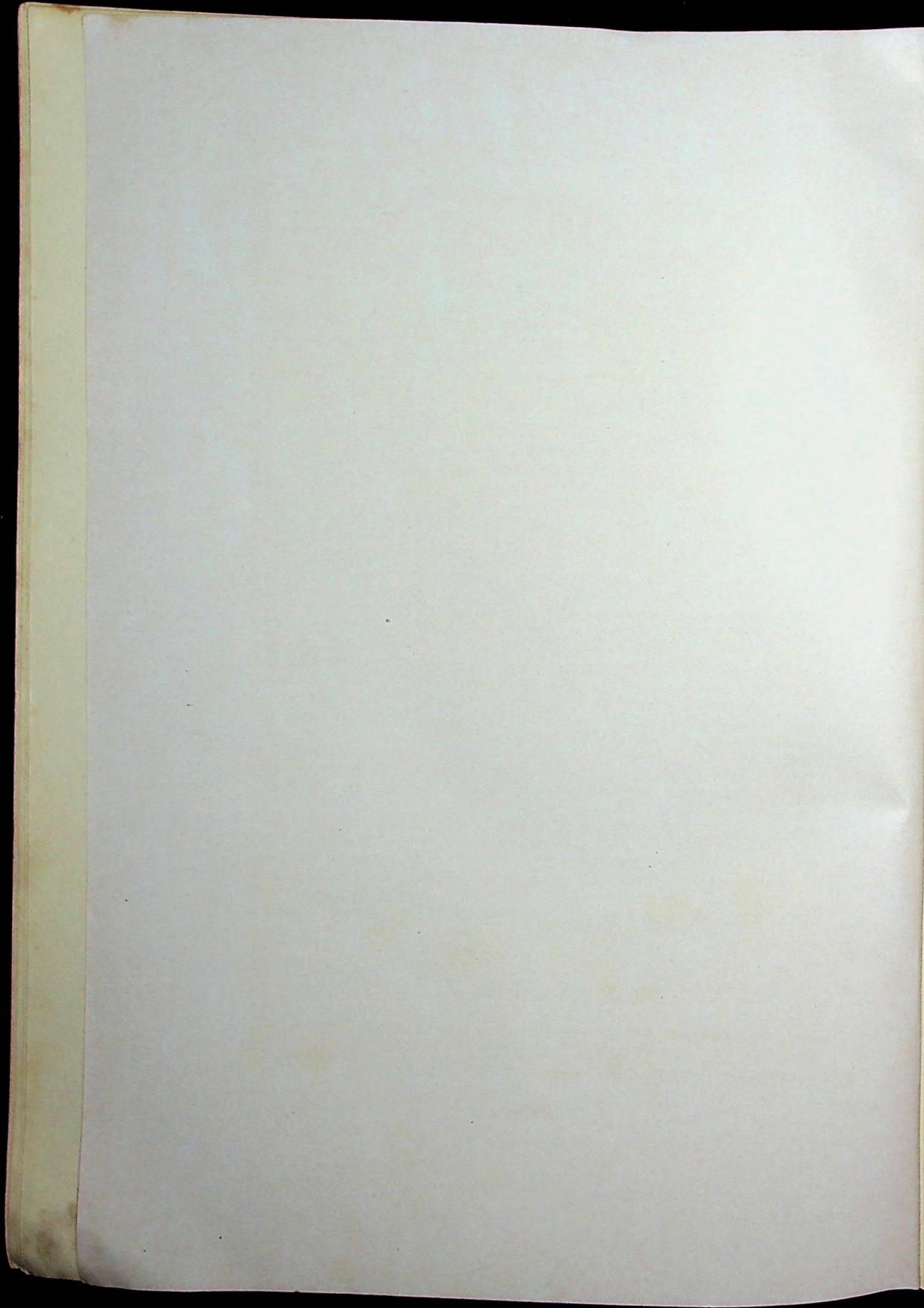
Before passing on to the next period, it is worth while to note the Chou Dynasty methods of writing and two other etymological works the Erh Ya (爾雅) and the Fang Yen (方言).

During the Chou Dynasty period, there was little other means of writing characters than that of engraving them on stone, metal or on bamboo strips. Specimens of bronze styluses have been found which have been assigned as having been used in this age. The nature of these utensils and other writing material have been supposed by some to be the cause of the "sinuous character" of the Ta Chuan script, for soon after the invention of the hair brush and ink, the forms of the characters written change abruptly to squareness. Other authorities mention that the ancient Chinese had a sort of coloured varnish with which they daubed their writing on bamboo sheets. As for these sheets, and the books into which they were made, numerous references of the ancients to their bulk and to the leatherthorn thongs with which they were bound together give us some inkling of their size and appearance. It is no wonder that the ancient Chinese developed so succinct a literary style; a modern volume might have required several coolies for its transportation.

About the earliest attempt at lexicography in a systematic way that has come down to us intact is the *爾雅* Erh Ya or "Your Elegance." This work is at present included in a very small volume comprising nineteen chapters. The first chapter is made up of notes on lists of synonyms; the second is a meagre set of notes on lists of phrases; the other chapters consist of notes on the names of family relationships, officials, utensils, music, astrology, geography, botany, zoology, and the like. Some attention is also given in this work to the study of phonetics, which must have been a rapidly growing subject at that time. The Erh Ya in its present form is considered as greatly embellished over its original form. Originally it probably consisted of little more than the present first chapter. Its author is unknown, but, following the custom that prevailed during the early days, he attributed it to the Duke of Chou, so famous as the author of the Chou Li or Ceremonial of Chou. This ruse was successful, for many of the terms studied in the first chapter are contained in the Ceremonial of Chou, and it was thought that the Duke



Kuei Fei drunk but still drinking. Note the jade wine-cup and the way it is served by the kneeling eunuch.



THE STORY OF CHINESE CHARACTERS

of Chou actually did write it as a companion to his greater work. Another work, of doubtful authenticity, that must have been almost contemporary with the Erh Ya, was the Fang Yen 方言, or "Local Dialects." The author of this is also perhaps unknown, but it was known to be due to the curiosity of one of the great feudal families about the languages of other Chinese clans.* They sent representatives, who travelled all over the China then known and gathered specimens of local expressions and pronunciations. If the authenticity of this work can be proved it will be a tremendously valuable asset in the study of phonetic characters. The only real clue we have to the date of either of these early works is that Confucius recommended the study of the Erh Ya to Duke Ai of the ancient state of Lu. This would place its composition prior to the lifetime of Confucius.

V. 小篆 Hsiao³ Chuan⁴. The Lesser Seal Writing. The last years of the Chou Dynasty saw China in a most deplorable condition both intellectually and physically. Ignorance and superstition, the corollaries of petty wars and mutual jealousy, finally became established facts. It was a time of complete anarchy, ripe for the kind of revolution that speedily came. One of the most powerful of the feudal lords, the Duke of Ch'in, finally gained ascendancy over the rest of the nobles, mounted the Imperial throne, and styled himself Ch'in Shih Huang Ti, or "Ch'in, the First Emperor." His first attention was given to the sorely needed unification of China, and he had not proceeded very far when he saw that one of the first means to this end was the unification of China's languages. Under his direction, one of the imperial ministers, Li Ssu (李斯), undertook to reform the system of writing, but almost at once met with opposition from the literary classes and scholars who have ever been the conservatives in China's social history. Their opposition at last became so fierce that the emperor felt that the only hope for the achievement of his great project lay in the complete destruction of the old learning and its exponents. The destruction was brutally and thoroughly accomplished, many books and documents that would be invaluable at the present day perishing, and a new system of literature was begun using Li Ssu's new script, since termed the Hsiao Chuan, or Simplified Seal Writing. (Lesser Seal.)

The collection of characters made by Li Ssu, which were legally fixed as the form to be used by all future scribes, consisted of about 3,000 transcribed Ta Chuan characters. The work itself reveals Li Ssu's lack of preparation for his task, for many of his new forms indicated that he misunderstood the constructions of the older forms and thus many errors were bequeathed to modern scholars for their greater confusion. He attempted no new inventions, but was content with the effort to prune and rearrange the elements of the older complex writing. The results were more artistic even if not etymologically correct, and paved the way for the development of modern characters.

* Lacouperie says that parts of the Erh Ya were made from the materials of these collectors of colloquialisms, and contain regional words from other than Chinese stocks of vocables. There are 928 words, or about one-fifth of the general stock that do not appear elsewhere than in the Erh Ya.

Another great factor in the development of Chinese characters was the invention of the hair brush, which is ascribed to the reign of the "First Monarch." The difficulty of the previous methods of delineating the characters, necessarily forced the Chinese to look round for some more practical means of committing their thoughts to writing. Like the man who first thought of putting an eraser on the end of a lead pencil, it must have been an ingenious man who could make the leap from the bronze stylus to the hair brush—an invention that has stood the test of over 2,100 years, as being the best and most practical means for delineating the Chinese written language, and an invention that will probably stand the test as long as this people continue to use such a writing. The invention of the hair brush must have had somewhat the same effect on the literature of China that the invention of the printing press had on the literature of Europe.

VI. **隸書** Li⁴ Shu¹. The Official Script. The Hsiao Chuan was not destined to a long life of undivided supremacy. As the Emperor Ch'in's projects grew more numerous and far-reaching, the work of keeping the records, even with the simpler system, became so arduous that the imperial clerks began to wish for a system even simpler. So, the Chinese historians say, a banished officer of the palace, named 程邈 Ch'eng Miao, during his banishment, developed a new system of writing, and when the emperor received samples of it, he was so pleased that he recalled the banished one and had him install his production in the imperial offices. Thus a new system came into vogue. However, this can hardly be so, for universally adopted systems of writing require long periods of time and many people for their perfection and introduction. But it is fairly well established that it was during the reign of the First Emperor that the system known as the Li Shu came into being, and it was probably due to the combined efforts of the imperial clerks.

In this system, again, the number of strokes in the characters was reduced without essentially altering the structure of the character. Furthermore, this system of writing shows the effect of the introduction of the hair brush—it marks the end of the time when the Chinese people would use "sinuous curves" in writing. The official characters, indeed, have a sort of official appearance, being severe rather than graceful; and in general, they are of a square, printable form. In the Shu, the written system of China received practically its present form, and since that time, the changes that have been made have been of a very minor character. Anyone familiar with the present Chinese writing could easily make out the Li Shu.

VII. **草書** Ts'ao³ Shu¹. The Grass Script. As events soon disclosed, Ch'in Shih Huang Ti was not to be the founder of a long-lived dynasty. In fact, his son and successor ruled three years, and then the Han dynasty was founded (B.C. 210). Superficially, the fall of the house of Ch'in was probably due to causes similar to those that caused the fall of Akhnaton of Egypt. The first emperor had changed the lives of his people without changing their hearts, and the Han dynasty therefore represents a reaction against the reforms of the Ch'in dynasty. For a while the effect of the reaction was anarchy and misery, but under the brilliant

THE STORY OF CHINESE CHARACTERS

reign of Wu Ti (武帝) B.C. 140-87, the greatest literary revival of China's history commenced, when efforts were made to restore the damage done by the preceding dynasty. A premium was put on scholarship and restorations of the works of the Sages were made in Imperial editions. Coming from this period, there is one work that is especially important for the history of Chinese character. It is the Shuo Wén 說文 of Hsü Shén 許慎, a famous scholar of the period. The Shuo Wen is an etymological dictionary of high value as a clue to the interpretation of seal writings, many of which but for this work might still remain undecipherable. It appeared posthumously, about the year A.D. 120, and gives the seal, and in some cases even the Ku Wen forms of about ten thousand characters. These are classified under approximately 540 radicals—an unwieldy and almost impossible number to keep in mind. But the radical selected in each case was chosen on purely etymological grounds.

Part and parcel of the developments connected with the fall of the Ch'in and the rise of the Han dynasties was the gradual reduction of the number of strokes in characters and finally the establishment of a new fashion of writing called the Ts'ao Shu. The development of this type of writing probably was the natural consequence of intense literary activity. It attempted the supreme simplification of the character, namely, the reduction of the number of strokes to one two. Whether this style was first tried before the end of the Ch'in or after the beginning of the Han Dynasty is not known, but it was one answer to the general demand of that time for a system of script which could be written in less time. Since the Han Dynasty, when the Grass writing played a large part in the great literary revival, the system has not been in very general use because of the great difficulty of learning the characters. The Ts'ao Shu was a distinct system of writing, with the form of each character pretty generally recognized, and by comparing the appended chart, it will be readily seen that these characters would be difficult even for one who was well initiated into the mysteries of the official script. The system is chiefly used to-day in the writing of display mottos. It should not be confused with the modern handwriting of the Chinese, which is not systematic but subject only to the idiosyncrasies of the writer.

VIII. 八分書 Pa¹ Fen¹ Shu¹. The "Eight-tenths Script." The beginnings of this type of character were similar to those of the Hsiao Chuan and the Li Shu. During the reign of Kuang Wu Ti, ca., A.D. 25, a scholar named Wang Tz'u Chung (王次仲) prepared a catalogue of characters in which he introduced a style of writing called "eight-tenths script" because the separate characters were supposed to be written eight-tenths in the Hsiao Chuan style, and two-tenths in the Li Shu style. Various authorities differ on the writing of this period and some claim that traces of many ancient styles are to be found in the characters of the Pa Fen Shu. It is probably true that this writing represents a reaction against the innovations of the earlier part of the Han Dynasty. But it is difficult to believe that any one man could make a system of writing which would be widely adopted by a great people; it is far easier to think that some scholar gathered up a script which he found people

using and catalogued it for the sake of permanence. The Chinese themselves even charge that he invented this system in order to attract students to himself and thus earn a larger reputation. However, the Pa Fen Shu does not seem to have attained any very great currency except as display writing and as another real step towards the final form of Chinese characters.

IX. 楷書 K'ai³ Shu¹. Legible Writing. The last system to develop and that of the present day, was the K'ai Shu or Legible writing. Probably some tendency to this type of character could be found as far back as the Han Dynasty among the expert writers of the Li Shu, but it was left for the period of the Eastern Tsin Dynasty, China's age of calligraphy, to make the final step in the development of the national writing. The Legible Writing is considered as chiefly due to the work of a great calligrapher Wang Hsi Chih (王羲之 A.D. 400). This man and his son, who inherited his father's genius, gathered around themselves some of the best artists of the day and gave their lives to the work of perfecting China's written characters. From that time until now, so great has been the approval of the Chinese people of the work of these men, that Chinese schoolboys have been given rubbings from the stone tablets of Wang Hsi Chih and his school, in order that they may have before them perfect models. The preservation of this style of writing through fifteen hundred years has in part been due to its favour and beauty in the Chinese eye, and in part due to the invention of printing by Feng Tao (馮道 A.D. 932). This last invention found favour with the imperial court and the emperor then reigning, Ming Tsung (明宗), ordered an edition of the classics to be printed at once, using the K'ai Shu script and the new wooden block dyes. The rapid growth of printing has preserved the K'ai Shu almost without change.

X. 行書 Hsing² Shu¹. This is simply the handwritten version of the K'ai Shu, and, as with writers of romanized scripts, each writer has his own. Usually in the free style certain of the more difficult strokes are omitted and in general it may be said that the style develops from long practice and the abbreviation of the K'ai Shu rather than as the result of a deliberate effort. It may be a first look towards a new system of writing that will be inaugurated at a future date.

Among the characters of the present Legible Writing, the Chinese, with something of an historical principle in mind, recognize* six classes of characters, into which the whole body of the written language may be divided with more or less indistinctness. They are first mentioned in the Chou Ceremonial, and are as follows :

(a) 指事 Chih³ Shih⁴, Indicative Characters, or those which point the reader directly to the object they refer to. Examples of these are : 上 Shang⁴, up or above; 下 Hsia⁴, down or below; 一 i, one; 二 érh⁴, two; 三 san¹, three.

* There is a work which the present writer has found very useful and which is called 六書通 Liu Shu T'ung or "Explanation of the Six Classes of Characters," a phonetically arranged list of characters, with their ancient forms compared, and which purports to explain the "six classes of characters."

THE STORY OF CHINESE CHARACTERS

(b) 像形 Hsiang⁴ Hsing², "to resemble the form," i.e., pictographs. Examples of these have already been given, such as 日 Jih⁴, the sun, 月 Yüeh⁴, the moon, etc.

(c) 形聲 Hsing² Sheng¹, or 諧聲 Hsien² Sheng¹. Phonograms. This is a large class comprising all composite characters which derive their sound from some primitive form contained in them. For example: 神 Shen, a spirit; 饑 0⁴, hungry, etc. For the explanation of the first example see the text on character analysis; as for the second 我 gives the character its sound. This class is not mutually exclusive with the following:—

(d) 會意 Hui⁴ I⁴. Ideographs, or suggestive compounds of associated ideas. In this class 饑 also falls, for literally it means: 我 I (wish) 食 to eat. Also 婦 0², beautiful; literally, my woman.

(e) 轉注 Chuan³ Chu⁴, or characters which have been turned about or reversed. This is a somewhat artificial class of characters, which time or usage have caused to be written in a slightly different position from that of the original pictograph or ideograph. Sometimes the change of position is made solely for convenience in writing. A common example of this type of character is 目 = ☽ Mu⁴, the eye.

(f) 假借 Chia³ Chieh⁴. Borrowed characters. This class is also a very large one, for it includes all of the grammatical particles, adverbs, conjunctions, and the like, which are not expressly constructed for their purposes. In the early centuries of human speech, people were not much concerned with refinements of grammar such as inflections, cases, and those small words which give modern languages, and even Latin and Greek, their smoothness and beauty. At least as far as their written language is concerned, the Chinese seem to have been comparatively late in developing the grammatical accessories or 虛字 Hsü Tzu⁴. But by the time that a need for them was felt, there were already a large stock of pictographs and ideographs which had fallen into disuse, from the number of which, characters phonetically appropriate to the sound in question could be selected, without particular reference to their original meaning. Take for instance the simple pictograph 旦 Tan⁴, the dawn. It has been practically disused for some time but was selected as phonetically appropriate to the colloquially used word "but," and in order to distinguish it from the original pictograph, the ninth radical was added and a new character obtained.

An interesting example of this selective and somewhat perverting process is to be found in such dialects as that of Foochow, where the ordinary spoken language does not universally parallel the written language. The difficulties of such a situation are at once obvious, so that attempts have been made, by means of borrowing characters from the literary language and suiting them to sounds already in existence, to construct a colloquial written language. The result is often very perplexing to Chinese scholars themselves until the phonetic key is explained. As already pointed out, such a method of language-making has volumes of historical precedent, but it meets with more or less disfavour as misusing and deforming the literary forms so dear to the hearts of the learned Chinese. However, the need remains and the method is fundamentally

sound if those who use it will be sure that the characters selected for such service are really obsolete as well as suited to the sound. There is harm to be done by attempting to use common characters for sounds and ideas not suited to them. The final result must be confusion rather than the real enlightenment sought after. The success of the proposed phonetic and romanized systems is also problematic. Certainly the weight of tradition and usage is against them. They are exotic and before they can completely substitute the written character, some revolutions must take place in the Chinese language itself. In the case of the dialects of Fukien and similar places, which seem to be in a state of suspense, the final solution of their problems will likely be a balance between the colloquial and classical languages similar to that already reached in Mandarin-speaking districts. The present tendency in China is towards less of a distinction between the classical and colloquial and the gradual formation of a simpler, homogeneous script and style, which all who run may read. The present Pai Hua or colloquial Mandarin seems to meet the need. Its characters are etymologically adapted and its vocabulary can be easily learned. It is written as it is spoken and hence should be a great factor in educational movements among the common people of China. The next step in the linguistic unification of China must be to get this written language recognized in the Southern coastal provinces.

The final chapter in the history of Chinese writing is that dealing with the great dictionaries of modern times which have standardized Chinese characters. The first of these is the great work done by the scholars of the reign of K'ang Hsi (康熙), the second emperor of the Ch'ing dynasty, A.D. 1662-1722. Among other great works of almost fabulous size, K'ang Hsi had a dictionary containing over 44,000 characters made. As far as possible the authenticity of each character is established by quoting accepted authorities for it and the whole number of characters were classified under 214 radicals as compared with the 540 of the Shuo Wen. The simplification was inevitable, but it is hard to understand why the writers of the K'ang Hsi dictionary stopped at the number of 214. It is probably not too much to say that at least one hundred more radicals could have been omitted and classified under the remaining 114. Again, many of the radicals are obsolete and have no characters classified under them that are used often enough to make them worth printing in dictionaries. Nevertheless the K'ang Hsi dictionary is very thorough and although usually published in very inconvenient editions will well repay study. It has set the form and standard for every work since published. Based on the K'ang Hsi dictionary but of quite recent publication is the Tz'u Yuan (辭源) or "Word Source." Throwing aside most of the useless and obsolete words of the K'ang Hsi, it gives a list of from 10,000 to 15,000 characters with their pronunciation, authority, examples of their uses, various definitions, phonetic classification and explanations of names and phrases in which the characters occur. It is considered of great authenticity in all questions relating to China and besides enjoys the great advantage of being readily obtainable in readable editions.

THE CHINESE FEMALE NAMES

BY

L. C. ARLINGTON

(Continued from page 462)

Owing to its length the list of Chinese female names given by Mr. L. C. Arlington at the end of his paper upon the above subject, which appeared in our July issue, has had to be continued in the preceding and present issues.—ED.

Name.		Meaning.	Remarks.
English	Chinese		
Yü-han	玉菡	Jade-Lotus Bud.	<i>Chi nü.</i> Signifies a snow-white complexion.
Ts'ai-ch'in	採芹	Gathering Water-cress.	This curious name refers to a girl who disguised herself in male attire and impersonated her brother, who was ill, at the examinations, taking the first degree of <i>hsu-ts'ai</i> .
Yü-mei	玉玫	Jade Rose.	<i>Chi nü. Sc.</i> White Rose, and signifying a white complexion.
Yü-ts'an	玉簪	Tuberose.	<i>Chi nü.</i> <i>Polianthes tuberosa.</i>
Chiu-hua	九花	Chrysanthemum.	<i>Chi nü.</i> That is, she was born in the 9th moon when the chrysanthemum blossoms.
Ting Hsiang-hua	丁香花	Lilac.	<i>Chi nü.</i> The dried flower buds of the <i>Eugenia caryophyllata.</i>
Hsüeh-t'ao	雪桃	Snow-Peach.	<i>Chi nü.</i> Name of a large white peach grown at Shenchou (深州) in Chihli. Signifying a girl with a full-face and white complexion.
Ying-t'ao	櫻桃	Cherry.	Signifying a mouth like a cherry and dimpled-cheeks. An allusion to her drinking capacity. The Chinese believe that people with <i>Chiu wo erh</i> 酒窩兒 "wine-nests," <i>Sc.</i> dimples, are fond of wine.
Mei-chiao	美蕉	Beautiful Banana.	<i>Musa paradisica.</i>
Hsiao Hsing-êrh	小杏兒	Little Apricot.	That is, Little Almond Eyes.
T'ung-hua	桐花	<i>Pawlonia imperialis.</i>	Signifying that she was born in the 3rd moon when this tree flowers.
Chin-chü	金橘	Golden Orange.	The <i>Citrus japonica</i> , commonly called Cumquat at Canton.
Wu-shan	梧珊	Well-formed Sim-pletion.	Signifying a tall, well-built figure, and of simple nature—half witted.

sound if those who use it will be sure that the characters selected for such service are really obsolete as well as suited to the sound. There is harm to be done by attempting to use common characters for sounds and ideas not suited to them. The final result must be confusion rather than the real enlightenment sought after. The success of the proposed phonetic and romanized systems is also problematic. Certainly the weight of tradition and usage is against them. They are exotic and before they can completely substitute the written character, some revolutions must take place in the Chinese language itself. In the case of the dialects of Fukien and similar places, which seem to be in a state of suspense, the final solution of their problems will likely be a balance between the colloquial and classical languages similar to that already reached in Mandarin-speaking districts. The present tendency in China is towards less of a distinction between the classical and colloquial and the gradual formation of a simpler, homogeneous script and style, which all who run may read. The present Pai Hua or colloquial Mandarin seems to meet the need. Its characters are etymologically adapted and its vocabulary can be easily learned. It is written as it is spoken and hence should be a great factor in educational movements among the common people of China. The next step in the linguistic unification of China must be to get this written language recognized in the Southern coastal provinces.

The final chapter in the history of Chinese writing is that dealing with the great dictionaries of modern times which have standardized Chinese characters. The first of these is the great work done by the scholars of the reign of K'ang Hsi (康熙), the second emperor of the Ch'ing dynasty, A.D. 1662-1722. Among other great works of almost fabulous size, K'ang Hsi had a dictionary containing over 44,000 characters made. As far as possible the authenticity of each character is established by quoting accepted authorities for it and the whole number of characters were classified under 214 radicals as compared with the 540 of the Shuo Wen. The simplification was inevitable, but it is hard to understand why the writers of the K'ang Hsi dictionary stopped at the number of 214. It is probably not too much to say that at least one hundred more radicals could have been omitted and classified under the remaining 114. Again, many of the radicals are obsolete and have no characters classified under them that are used often enough to make them worth printing in dictionaries. Nevertheless the K'ang Hsi dictionary is very thorough and although usually published in very inconvenient editions will well repay study. It has set the form and standard for every work since published. Based on the K'ang Hsi dictionary but of quite recent publication is the Tz'u Yuan (辭源) or "Word Source." Throwing aside most of the useless and obsolete words of the K'ang Hsi, it gives a list of from 10,000 to 15,000 characters with their pronunciation, authority, examples of their uses, various definitions, phonetic classification and explanations of names and phrases in which the characters occur. It is considered of great authenticity in all questions relating to China and besides enjoys the great advantage of being readily obtainable in readable editions.

THE CHINESE FEMALE NAMES

BY

L. C. ARLINGTON

(Continued from page 462)

Owing to its length the list of Chinese female names given by Mr. L. C. Arlington at the end of his paper upon the above subject, which appeared in our July issue, has had to be continued in the preceding and present issues.—ED.

Name.		Meaning.	Remarks.
English	Chinese		
Yü-han	玉菡	Jade-Lotus Bud.	<i>Chi nü.</i> Signifies a snow-white complexion.
Ts'ai-ch'in	採芹	Gathering Water-cress.	This curious name refers to a girl who disguised herself in male attire and impersonated her brother, who was ill, at the examinations, taking the first degree of <i>hsiu-ts'ai</i> .
Yü-mei	玉玫	Jade Rose.	<i>Chi nü. Sc.</i> White Rose, and signifying a white complexion.
Yü-ts'an	玉簪	Tuberose.	<i>Chi nü.</i> <i>Polianthes tuberosa.</i>
Chiu-hua	九花	Chrysanthemum.	<i>Chi nü.</i> That is, she was born in the 9th moon when the chrysanthemum blossoms.
Ting Hsiang-hua	丁香花	Lilac.	<i>Chi nü.</i> The dried flower buds of the <i>Eugenia caryophyllata.</i>
Hsüeh-t'ao	雪桃	Snow-Peach.	<i>Chi nü.</i> Name of a large white peach grown at Shénchou (深州) in Chihli. Signifying a girl with a full-face and white complexion.
Ying-t'ao	櫻桃	Cherry.	Signifying a mouth like a cherry and dimpled-cheeks. An allusion to her drinking capacity. The Chinese believe that people with <i>Chiu wo érh</i> 酒窩兒 "wine-nests," <i>Sc.</i> dimples, are fond of wine.
Mei-chiao	美蕉	Beautiful Banana.	<i>Musa paradisica.</i>
Hsiao Hsing-êrh	小杏兒	Little Apricot.	That is, Little Almond Eyes.
T'ung-hua	桐花	<i>Pawlona imperialis.</i>	Signifying that she was born in the 3rd moon when this tree flowers.
Chin-chü	金橘	Golden Orange.	The <i>Citrus japonica</i> , commonly called Cumquat at Canton.
Wu-shan	梧珊	Well-formed Simpleton.	Signifying a tall, well-built figure, and of simple nature—half witted.

THE CHINA JOURNAL OF SCIENCE & ARTS

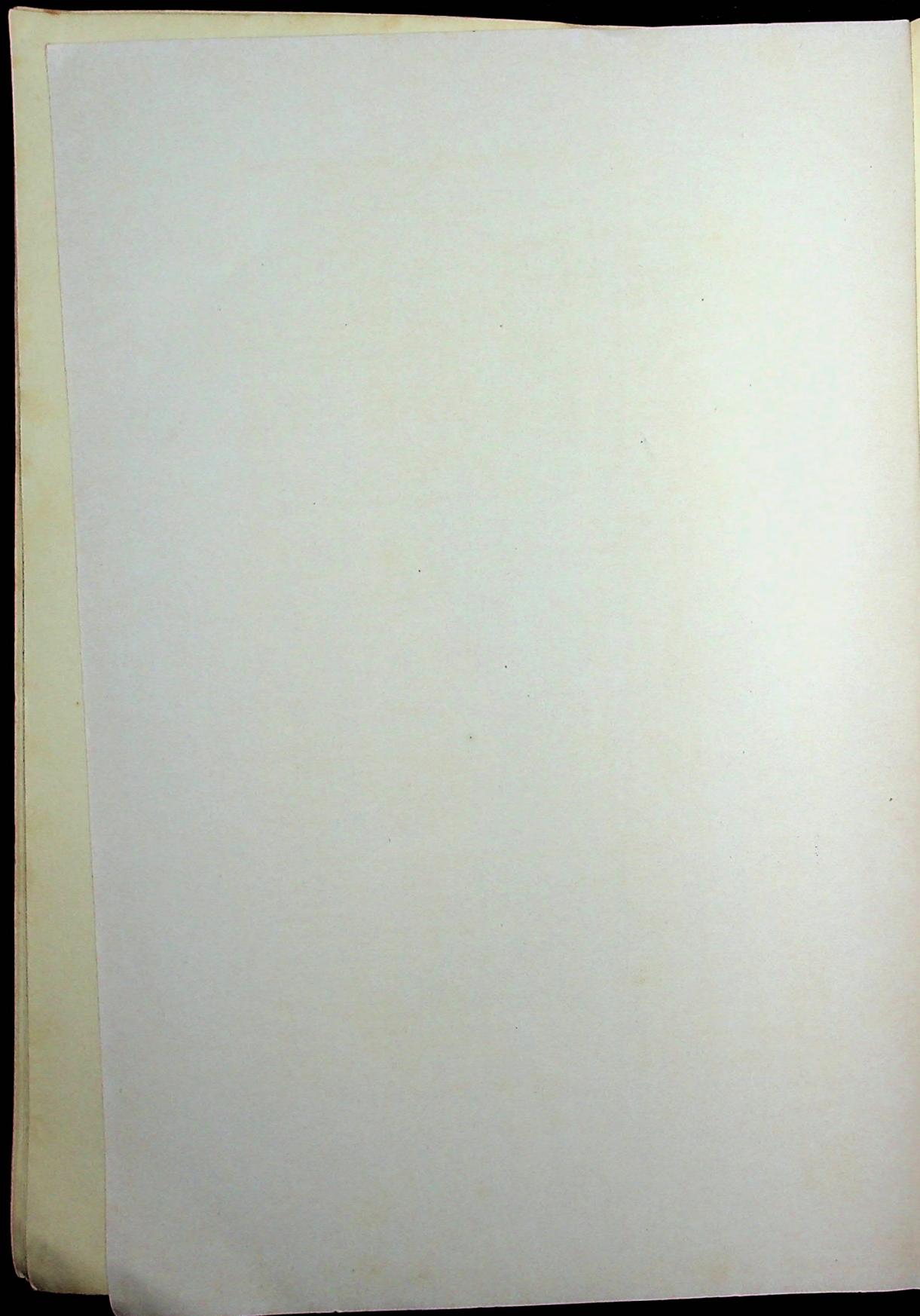
Name		Meaning.	Remarks.
English	Chinese		
Tsao-hua	棗花	Jujube Blossom.	Signifying that she was the youngest child of the parents's old age—like the date tree which blossoms late in the season.
Fu Kuei-hua	富貴花	Riches and Honour Flower.	An alias for the tree peony.
Fu-hua Yüeh-chi Hsü-fen	馥月芬	Fragrant Flower. Monthly Rose. Willow catkins thick as snow.	
Yü-lan Po-ho Yü-chih Mo-li Fu-ti	玉蘭荷玉茉	The Blue Gem. Peppermint. White Gardenia. White Jasmine. Younger Brother's Protector.	<i>Mentha arvensis.</i> <i>Gardenia florida.</i> <i>Jasminum samboc.</i> <i>Mulas floribunda.</i> 樂 is used for 弟 younger brother, taken from the legend of two brothers who were on the point of dividing the patrimony, when two trees standing in front of the door began to wither as if in protest. One night their father appeared in a dream and advised them not to divide the family inheritance, which summons they obeyed, when the trees put forth their green leaves again. Owing to this legend, 樂 is invariably used for 弟 in letters when wishing to indicate the younger brother. The allusion is to the sister who fostered him.
Hung-yen	紅豔	Red-Beauty.	The Lily. Another name for the 百合花 (also called the <i>Hu pi lien</i> , Tiger skin lily), taken from a painting by Ssü-Ma Chung (司馬鍾) of the Ch'ing dynasty depicting a chrysanthemum and a lily, on which he wrote the following inscription 紅豔對秋 "The Red Beauty (Lily) fears the Autumn, Sc. the chrysanthemum." 秋 stands for the chrysanthemum because it blossoms in the autumn.
Yü-shuang	玉霜	Jade Frost.	Signifying a pale complexion and a cold nature.
Yü-hung Pao-hsing	玉寶虹	Jade Rainbow. Precious Star.	Sc. of a fine complexion. Name of a constellation; also known as <i>Wu Nü</i> (婺女) and <i>Hsü Nü</i> (須女) <i>Aquarius</i> ?

CHINESE ART THROUGHOUT THE AGES

(George Crofts Collection, Toronto)



Sepulchral Jar of the Tang Dynasty, A.D. 617-906.
Pottery Jar with own cover and stand: 33" high, green glaze with
silver irridescence



THE CHINESE FEMALE NAMES

Name		Meaning.	Remarks.
English	Chinese		
Yüeh-ku	月 姑	Miss Moon.	Signifying that she was born at the time of full moon.
Hsiao-hung	曉 虹	Morning Rainbow.	Signifying that she was born at dawn under a red sky. 虹 is here used for 紅 red.
Yün-ch'i	雲 樓	Cloud Rest.	Signifying that she was born on a calm, but cloudy day.
Ch'iao-yün	巧 雲	Clever Clouds.	Signifying that she was born on the seventh day of the seventh moon, just at a time when the clouds formed all sorts of strange shapes.
Ah-hsia	阿 霞	Miss Red Cloud.	Signifying a fine complexion.
Jui-yün	瑞 雲	Auspicious Clouds.	Signifying seasonable spring clouds.
Ch'ing-wén	晴 玫	Fine Coloured-Clouds.	Signifying a fine sky after rain, with light coloured clouds.
Ni-hsien	霓 仙	Rainbow Skirt Fairy	Taken from the poetical line 霓裳羽衣 rainbow skirts and feather jackets—of young ladies seen in the moon by the Emperor <i>Tang Ming Huang</i> .
Su-yün	素 雲	Silvery Clouds.	Sc. Fair glossy hair.
Tzü-yen	紫 雲	Purple Beauty.	Signifies a winning, fascinating woman.
Yen-ju	靚 如	Handsome-like.	Sc. of a woman who is not naturally beautiful, only handsomely dressed—"clothes make the woman."
Shao-chén	韶 貞	Keeping Chaste.	This girl's mother had a Memorial table erected to her memory because she refused to marry again. This name signifies that she will continue her mother's reputation for chastity.
Tiao-ch'an	貂 蟬	Sable and Cicada.	Name of a singing-girl in the establishment of Wang Yün, who presented her to Tung Cho after he had offered her to Lü Pu, which so inflamed the latter that he murdered Tung Cho. "Sable and cicada" refer to the ornaments with which the hats of the higher military officers (also eunuchs) were decorated. These were called <i>Chin I Kuan</i> (鯉鶴冠) the Argus pheasant, the long-tailed feathers of which together with designs of the cicada the hats were decorated.

THE CHINA JOURNAL OF SCIENCE & ARTS

Name.		Meaning.	Remarks.
English	Chinese		
Hsiang-yü Ch'iang-wei Kan Lan-niang Chin Chung-êrh	香 玉 薔 蔷 橄 榄 嫩 金 鐘 兒	Tuberose. Red Rose. Miss Olive. Golden Bell.	<i>Rosa multiflora.</i> Another name for the Tiao chung (弔鐘) or <i>Enkianthus quinqueflorus</i> .
Huai-hua Ts'u-i-ch'iao Ho-pao	槐 翠 荷 花 篓 包	Acacia Blossom. Larkspur. Broken Heart.	<i>Delphinium grandiflorum.</i> <i>Dicentra spectabilis.</i> Lit. a purse—so called from its likeness in shape to the lotus leaf. <i>Viburnum fragrans.</i> Another name for the chin chan hua (金盞花). <i>Calendula officinalis.</i> <i>Hibiscus syriacus.</i>
T'an-ch'un Chin-ch'en	探 金 针	Peeping Spring. Marigold.	This name indicates that at a very early age, this maiden refused to disport with the male sex.
Chin-hsiang Su-ch'en	槿 凤 香 貞	Hibiscus. Early Chaste.	<i>Sc.</i> loveable; pleasing; merciful; attractive; and respectful.
Wu-k'o	五 可	Five Attributes.	<i>Kuo</i> is the name of a cap worn by women in ancient times—also by eunuchs. It, therefore, signifies femininity. We might translate "Female hero" and be quite correct from a Chinese view.
Kuo-chieh	帽 杰	Headdress Heroine.	This curious name signifies the wish that she may attain happiness, emolument, and long-life.
San-kuan	三 宦	Three Officials.	Referring to the tufted or crested style in which her hair is dressed.
Fêng-yün	鳳 雲	Phoenix Clouds.	Referring to the butterfly shape her hair is dressed.
Tieh-yün	蝶 雲	Butterfly Clouds.	<i>Sc.</i> long legs.
Lu-hsien Ch'un-yen Hsiao-hung Hsueh-yen	鷺 春 仙 燕 鴻 雁 春 小 雪	Egret Fairy. Spring Swallow. Little Goose. Snow Goose.	<i>Sc.</i> Light and Graceful. <i>Sc.</i> a good dancer or posturer. Signifying a snow-white complexion.
Yü-o	玉 蛾	Jade Moth.	Signifying a snow-white complexion and moth-like eyebrows.
Mêng-luan	夢 鶯	Phoenix Dream.	A fabulous bird said by some to be the phoenix, and by others the peacock. Her mother is said to have dreamt of a <i>luan</i> while pregnant, hence, the name <i>Meng-luan</i> .
Wêng-ying	紋 鶯	Striped Parrot.	

THE CHINESE FEMALE NAMES

Name		Meaning.	Remarks.
English	Chinese		
Fêng-hsiao	鳳簫	Phœnix Flute.	The Panpipes said to have been invented by Ling-lun on the banks of the Yellow River; where two birds, the fêng and the huang (male and female) assisted him in discovering the octave; each uttering six notes, the male the odd notes and the even notes by the female, all of a different pitch; on the strength of which Ling-lun cut twelve bamboos, thus perfecting the flute.
Fêng-chu	鳳竹	Phœnix Bamboo.	Signifies almond eyes: in allusion to the speckled bamboo resembling birds' eyes called the Fêng yen chu (鳳眼竹) grown at Canton.
Miao-yü Yün-fang	妙 玉 芳	Superior Jade. Concentrated Fragrance.	This was the name of Prince Kung's son's wife.
Hsiang-ch'ün	湘 裳	Light Blue Skirt.	This extraordinary name refers to the light-blue tints of the Hsiang river in Hunan.
Yao-hsien	瑤 仙	Jasper Fairy.	Taken from the legend of Hsi Wang Mu, the Western Royal Mother, who is supposed to live on the Jasper Lake attended by fairies.
Chin-chien	錦 繡	Ornamental Note Paper.	Name of a slave-girl.
Shun-hua	舜 華	Hibiscus Face.	Taken from the <i>Shih Ching</i> sentence 頤如舜華 with a face like a <i>hibiscus</i> —of a beautiful girl.
Ts'ui-lü	翠 縷	Green Strands.	Sc. Likened to the green wavy branches of the weeping Willow tree—name of a slave-girl.
Yin-hsiang	吟 香	Chanting Fragrance.	Sc. To make sonnets to the flowers.
Jui-hsiang Ch'un-fang	瑞 香 舓	Lovely Fragrance. Spring Boat.	Sc. Seasonable flowers. This curious name signifies the gay pleasures of a trip on a boat.
Ya-nan	亞 男	Man's Quality.	Signifying that she is not inferior to "mere man."
Yü-wan Yü-ch'i	玉 繡 緺	White Silk Fan. Pure White Silk.	Sc. A chaste and perfect lady. Signifying an elegantly dressed and beautiful lady.
Yü-fan	玉 帆	Jade-white Sail.	Taken from the poetical lines 鳳凰一帆懸 "when the wind is fair we hoist the sails." Sc. of a woman who is correct in morals and can hold her head up proudly anywhere.

THE CHINA JOURNAL OF SCIENCE & ARTS

Name.		Meaning.	Remarks.
English	Chinese		
Ling Tang-hua	玲瓏花	Bluebell.	
Chin-hung	金紅	Precious Favourite.	<i>Chi nü.</i> 金=precious, and 紅=寵 to love.
Hsing-ts'un	杏村	Apricot Hamlet.	<i>Chi nü.</i> Signifying that she was born in a village where apricots are grown.
Hsü-huang	煦篁	Red Bamboo Sprouts.	<i>Chi nü.</i> Signifying a girl who is kind and genial by nature.
Yün-k'o	韻珂	Jingling Gems.	Signifying a sweet voice like the sound of tinkling gems.
Yen Wu-chou	麗五洲	World's Beauty.	<i>Chi nü.</i> Beauty of the Five Continents.
Ju I-hua	如意花	As you wish Flower.	<i>Chi nü.</i> Sc. of a girl who pleases everybody.
Hsiao Hsien-hua	曉鮮花	Fresh Morning Flower.	<i>Chi nü.</i>
T'ung Yüeh-ch'in	桐月琴	T'ung Guitar.	<i>Chi nü.</i> This curious appellation is difficult to translate. The <i>yüeh ch'in</i> is a four-stringed guitar with a round belly like a banjo. The <i>T'ung</i> is the <i>pawlonia</i> ; the girl is evidently from the South and she plays the guitar which is made from the <i>T'ung shu</i> .
Shui Hsien-hua	水仙花	<i>Narcissus.</i>	<i>Chi nü.</i> Lit. the immortal of the water.
Chin Ling-pao	金陵寶	Gem of the Golden Mound.	<i>Chi nü.</i> Chin-ling is the archaic name of Nanking, where she was born.
Chin P'ing-mei	金瓶梅	Golden Vase Prunus.	<i>Chi nü.</i> Signifying a precious beauty. Also the name of a licentious novel.
Chin Hsiang-yü	金鑲玉	Gold mounted Jade.	<i>Chi nü.</i> Signifying that she is as valuable as the Imperial seal. Sc. 玉璽.
Yü T'uan-hua	玉團花	Cluster of white flowers.	<i>Chi nü.</i> Sc. of a pretty fat woman.
Sao Ying-tzü	驟蠅子	Troublesome Fly !	<i>Ju ming.</i> Term of reproach:
Niao P'en-êrh	尿盆兒	Chamber Pot !	<i>Ju ming.</i> The utensil in which she was born.
K'u Lung-êrh	窟窿兒	Hole !	<i>Ju ming.</i> This curious name indicates that the parents were in debt when she was born, and had to borrow funds to rear her. Sc. Head over ears in debt. <i>Vide</i> the saying 捣窟窿弄洞.
Yen-êrh	眼兒	Eyes !	<i>Ju ming.</i> Signifying that she had a defect in her eyes—such as an upturned eyelid.
Ch'ou-êrh	臭兒	Stench !	<i>Ju ming.</i> The reason given for this name can better be imagined than described !

THE CHINESE FEMALE NAMES

Name		Meaning.	Remarks.
English	Chinese		
Hsiao P'i-êrh	小屁兒	Small Buttocks !	<i>Ju ming.</i> Signifying the youngest child of the family.
Huo Hsia-tzü	火匣子	Fuel Casket.	<i>Ju ming.</i> Among the poorer classes in China, the coffins for children are simply four ordinary boards nailed together ; such wood as may be used for fuel if necessary. It is thought that if a child is given such an inauspicious name, her life will be spared.
Niu Ch'ê-êrh	牛車兒	Bullocks' Cart.	<i>Ju ming.</i> These carts are much larger than the ordinary carts, and are used by the poorer classes in the country districts much in the same way as we do a "hearse." Hence, <i>Niu ch'ê-êrh</i> is a synonym for "hearse." Used for similar reasons as the last entry above.
Jêng-êrh	扔兒	Cast out !	<i>Ju ming.</i> Used for similar reasons as given above.
Shih-tan	屎蛋	Ball of excrement !	<i>Ju ming.</i> Signifying that she was born in a privy.
T'ieh Tan-êrh	鐵蛋兒	Iron Ball	<i>Ju ming.</i> Signifying a strong and healthy child.
Ta Ch'ien-êrh	大錢兒	Large Cash.	<i>Ju ming.</i> Signifying that she is not worth more than a single cash—a depreciatory term with a view to cheat the gods and ensure long life.
Tiao-êrh	勺兒	Virago !	<i>Ju ming.</i>
Mao-êrh	毛兒	Hairy !	<i>Ju ming.</i> This girl is said to have been born with a very hairy body.
Mao Lü-tzü	毛驢子	Hairy Donkey.	<i>Ju ming.</i> This name was given to this maiden because she was born on the same night that the family donkey gave birth to a foal.
Ko Shih-êrh	狗食兒	Dog's Food !	<i>Ju ming.</i> This name indicates that she was not even worth the scraps thrown to dogs. Usage : worthless vixen, signifying that she is too vile for the gods to have any mercy on, with a view of hoodwinking them, and thus spare her life.
Ko Shêng-êrh	狗膾兒	Dog's Remains !	<i>Ju ming.</i> This girl had only just been born, when a hungry dog attempted to devour her, and was saved by her mother who happened to return in the nick of time ; hence, the name as above.

THE CHINA JOURNAL OF SCIENCE & ARTS

Name		Meaning.	Remarks.
English	Chinese		
Ko Pu-li	狗不理	Not even noticed by the dogs !	<i>Ju ming.</i> She is said to have been so ugly that even the dogs spurned her !
Ch'iang Huo-êrh	强活兒	Forced to live !	<i>Ju ming.</i> Sc. A charmed life. This girl had gone through many dangers without meeting death.
*Wêng-t'ou	甕頭	Earthen Jar.	<i>Ju ming.</i> This curious name was given to this maiden because she was hidden in a large jar when the place was attacked by bandits. When the family returned three days later, she was found to be still alive.
Chüeh-t'ou	鋤頭	Pickaxe.	<i>Ju ming.</i> Note. The children
Tun-tzü	墩子	Chopping Block.	<i>Ju ming.</i> of husbandmen are
Liu-to	碡	Stone Roller.	<i>Ju ming.</i> mostly given the
Po-ch'i	簸箕	Winnowing-fan.	<i>Ju ming.</i> names of farming
Hei-t'a	黑塔	Black Pagoda.	<i>Ju ming.</i> implements.
Lü Fên Ch'iu-êrh	驢球黃兒	Donkey's excrement!	<i>Ju ming.</i> This girl was ex-
Hsia Lo-tzü	瞎驢子	Blind Mule.	ceedingly dark-skinned and
K'u-tou-tzü	褲兜子	Trouser Bag !	tall for her age.
P'êng-êrh	盆兒	Basin.	<i>Ju ming.</i>
P'a-tzü	筢子	Bamboo Rake.	<i>Ju ming.</i> Said of one who
Shao-êrh	勺兒	Ladle.	cannot look at the light without squinting—weak eyes.
			<i>Ju ming.</i> Signifying that she
			was born suddenly, before her
			mother was prepared for it.
			<i>Ju ming.</i> This name is derived
			from a curious custom called
			<i>Ch'uang ming</i> (闖名) "sud-
			denly to choose a name at
			random." In this particular
			case, at the moment the child
			was born the mother could not
			think of a suitable name to
			give her, so rushed out of the
			house, and the first object that
			met her gaze was a hawker
			selling basins. So she gave
			her the name of a "Basin."
			<i>Ju ming.</i> This name is derived
			from the custom called <i>Chua</i>
			<i>chou</i> (抓迴) "to choose play
			things for a child"—to de-
			termine its aim in life. This
			child chose a bamboo rake,
			hence the name.
			<i>Ju ming.</i> Signifying a half-
			witted person.

* T'ou here does not mean "head," "top," etc., but is a suffix in general use in the country districts of North China used instead of "êrh," "tzü" or "ko" for the sake of euphony.

THE CHINESE FEMALE NAMES

Name		Meaning.	Remarks.
English	Chinese		
T'ieh-niu	鐵牛	Iron Cow	<i>Ju ming.</i> Signifying a strong and healthy girl, but stupid.
Ts'ang-êrh	倉兒	Granary.	<i>Ju ming.</i> This curious name is given to a child which has a small globule at the front of the ear, at the apex of which is a tiny hole just large enough to insert a small grain of rice.
Chuang-êrh	椿兒	Post.	<i>Ju ming.</i> Signifying a child with a small fleshy protuberance in front of the ear; resembling a post or stake *.
Ch'ün-tzü	暉子	Protector of the flock.	<i>Ju ming.</i> Signifying that she is the protector of all the children in the family.
Shan-tzü	衫子	Shirt.	<i>Ju ming.</i> No particular significance. Girls are also called skirt, trousers, cap, waistband, button, collar, etc. Taken from the <i>Ch'uang ming</i> and <i>Chua chou</i> custom already mentioned above.
Tsao-êrh	鼈兒	Kitchen God.	<i>Ju ming.</i> Signifying that she was born on the 23rd day of the 12th moon—the Kitchen God's birthday.
Ch'iang-êrh	牆兒	Wall	<i>Ju ming.</i> We have here another example of the <i>Ch'uang ming</i> . The family began the building of a wall on the day she was born.
Lai-pao	來寶	Incoming Treasure.	<i>Ju ming.</i> Signifying that she was adopted into the family.
T'ao-êrh	套兒	Noose.	<i>Ju ming.</i> Signifying that she is "tied up" and cannot escape <i>p'ao liao</i> (跑了)—a euphemism for death.
Liang-êrh	亮兒	Daylight.	<i>Ju ming.</i> Signifying that she was born at daylight.
Tung-ying	洞英	Cave Gem.	<i>Ju ming.</i> Signifying that she was born in a cave.
Yü-t'ang	育堂	Court born.	<i>Ju ming.</i> This curious name was given to this maiden because she happened to see the light while her mother was undergoing trial in a court of justice.

* The Chinese frequently name their children after a felicitous expression as, for example, in the case of " Post " here given : a family of three children (either boys or girls, or both) would be named *shuan* (拴), *ma* (馬), *chuang* (椿) in the order of their birth, signifying a " post for tying up horses," denoting strength and unity. A family with four children would name their children *fu* (福), *shou* (壽), *shuang* (雙), *ch'uan* (全), the combination would thus represent " Happiness and long life all complete."

THE CHINA JOURNAL OF SCIENCE & ARTS

Name.		Meaning.	Remarks.
English	Chinese		
Tsao-pao	竈寶	Treasure of the Stove.	<i>Ju ming.</i> Signifying that she was born in the kitchen.
T'ing-shêng	艇生	Boat born.	<i>Ju ming.</i> Signifying that she was born in a small boat.
Mo-shêng	莫生	Late born.	<i>Ju ming.</i> Signifying that she was a posthumous child.
Fu-hung	復紅	Returned to joy.	<i>Ju ming.</i> Signifying that she had taken monastic vows, but fell in love, became married, and returned to the world of pleasure.
Yü-ch'üan	玉泉	Jade Spring.	<i>Ju ming.</i> The real significance of this name disappears altogether within the ordinary meaning of the characters "Jade spring." It is said that the girl was born with a closed fist, and that 泉 is euphemistic for <i>ch'uan</i> 翳 a "fist," the <i>yü</i> "jade" signifying her purity of character.
I-yüan	宦媛	Beauty of the North East Corner.	<i>A ta ming.</i> Signifying that she was the daughter of the concubine. The N. E. corner being synonymous with <i>p'ien-fang</i> (偏房)—a concubine.
Hsieh-t'ien	燮天	In harmony with Heaven.	<i>Ta ming.</i> Signifying that she was her husband's assistant. 天 here=夫. When a woman mourns for the death of her husband, she is said to <i>k'u t'ien</i> (哭天) "cry out to Heaven." V. the saying 夫者妻之天也 "The husband is the wife's Heaven."
Ch'ing-lin	慶霖	Congratulatory Rain.	<i>Ta ming.</i> This name signifies that she was born at the time of a heavy rainfall after a prolonged drought.
Tsé-huan	謫寰	Banished to Earth.	<i>Ta ming.</i> Signifying that for some fault committed amongst the immortals, she was banished to earth. The name is not derogatory, but auspicious implying that she is an angel.
Mo-hua	默花	Silent Flower.	<i>Ta ming.</i> Signifying that she is likened to a sweet-smelling fresh flower which one may enjoy the fragrance of, but not converse with. Sc. a reticent beauty.

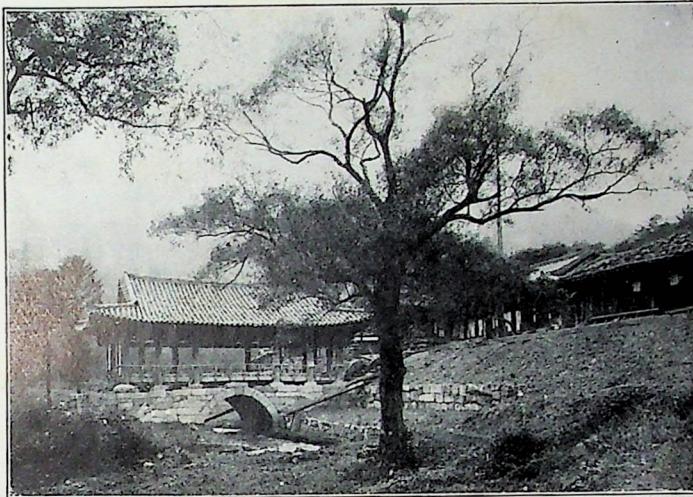


Photo by J. H. Morris

The Water Gate at Yu-chom-sa Temple

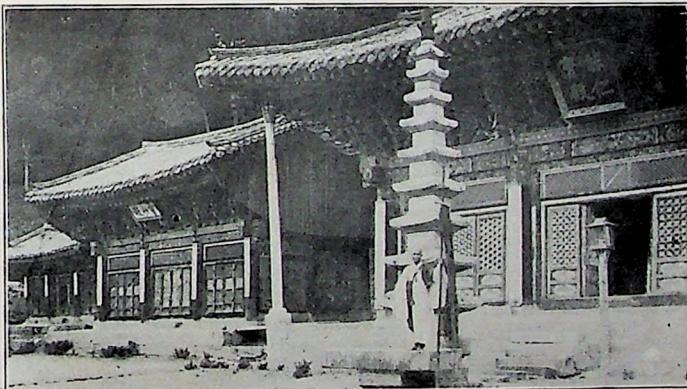


Photo by J. H. Morris

Pavilions of Yu-chom-sa Temple on the same site as the first Temple
built by the priests upon their arrival from India

THE CHINESE FEMALE NAMES

Name.		Meaning.	Remarks.
English	Chinese		
Hsiao-pan	效班	Imitating Pan.	<i>Ta ming.</i> Signifying that she emulated the famous Pan Chao (班昭) who was left a widow in early life, and devoted her energies to literature. She was lady-in-waiting to the Empress, under the title of <i>Ts'ao Ta ku</i> (曹大家), the Lady <i>Ts'ao</i> .
Hsüeh-lou	雪樓	Snow Tower.	<i>Ta ming.</i> Taken from the name of a tower covered with snow at the time of her birth. Probably a <i>Ch'uang ming</i> .
Yüeh-ting	月汀	Moon Brook.	<i>Ta ming.</i> Signifies the reflection of the moon in a clear stream—so shine her moral qualities.
Cho-yüeh	綴月	Variegated Moon.	<i>Ta ming.</i> Signifying the light and shade of the crescent moon. <i>Claro-oscuro.</i> Said to refer to the way her hair is dressed and combed down over her ears and sides of the face.
To-yün	朵雲	Clouds cluster.	<i>Ta ming.</i> Referring to the style in which her hair is dressed resembling layers of piled up clouds.
Jén-chüan	稔娟	Harvest Beauty.	<i>Ta ming.</i> Signifying that she was a twelve month's child; <i>jen</i> represents the yearly harvest.
Ching-yüan	鏡緣	Mirror Fate.	<i>Ta ming.</i> Signifying that she was conceived after her parents were reunited following a separation. Cf. 破鏡重圓 the broken mirror is round again—of a couple who are re-united, not "he has married a second wife" as Giles says under No. 9410 in his dictionary.

REVIEWS

THE DAWN OF CHINESE CIVILIZATION. This is the title given to a book issued by the American Woman's Club, and containing papers read before the literary department of that enterprising organization during the past few years. The list of contents shows that the Club has been regaled with a rich feast in the art, literature, and history of China, and as the papers almost without exception delve into the past, and in their entirety give the reader a very good summary of the progress of Chinese civilization from the earliest times, the book is well named.

The papers, almost exclusively by members of the gentler sex, show a considerable amount of research on the part of their authors, while the number of contributors shows that there is a very vigorous flow of intellectual life and activity at least amongst the women of Shanghai. We recommend this valuable book to all who are interested in the mental life of the Chinese. It is well got up and printed, but better paper might have been used, for the book is one to keep and not just to be read and thrown away.

FIVE HUNDRED PROVERBS COMMONLY USED IN WEST CHINA : compiled by Capt. A. J. Bruce, F.R.G.S.

Chinese proverbs are always interesting to the western mind, so that this little book will be welcomed by all who take an interest in the mentality of the people of China. Giving the Chinese character and a free translation, the compiler groups his 500 proverbs under several headings, such as Moral Teaching, Human Nature, Family and Society, etc., in some places adding well-known passages in the English language that have their equivalent in Chinese, for example : Heaven helps the prosperous man—Heaven helps those who help themselves : It is for man to plan but for God to execute—Man proposes but God disposes.

There is room for more work of this kind, since the more we know of such common sayings and proverbs of the Chinese, the more are we likely to understand their minds.

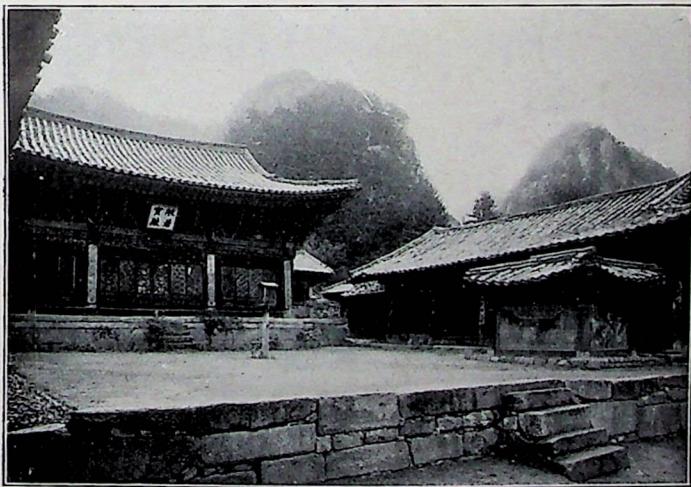
EXERCISES IN TRANSLATION : by J. B. Grant and Tai Fu Kiu. Macmillan & Co., Ltd., London, 1923.

This is a small book of useful exercises that may be recommended to the beginner in the study of the Chinese language. Beginning with quite simple exercises it gradually goes on to difficult passages, and by the time the student has reached the end, he should be comparatively proficient. A short foreword by Doctor MacGillivray is given.



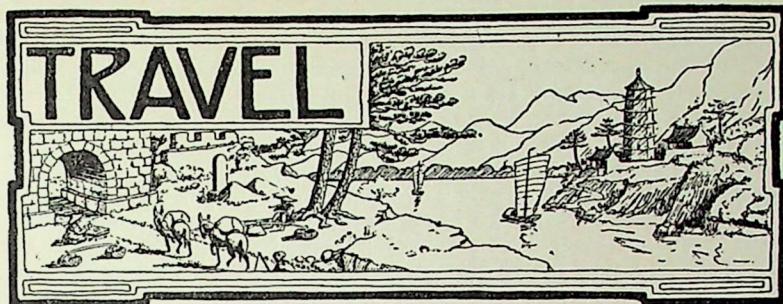
Photos by J. H. Morris

Chang-An-Sa Temple where the Abbot regaled us with honey-water
and pine-nut candies



Photos by J. H. Morris

Pyo-Hun-Sa Temple in the Inner Diamond Mountains



A PILGRIMAGE TO THE DIAMOND MOUNTAINS

BY

HARLEY FARNSWORTH MACNAIR, PH.D.

The Chinese have a saying, "Above is heaven—Soochow and Hangchow are below." The Japanese say, "Speak not of splendour until you have seen Nikko." But best of all is the advice of the Koreans who tell us not to discuss scenic beauty until we have beheld the Diamond Mountains.

In the eastern part of the Land of the Morning Calm, in the province of Kangwon, lies a mountain chain forming part of a great range, the backbone of the peninsula. Here, in an area the circumference of which may be fifty miles, far away from civilization, is scenery incomparably the finest in eastern Asia. The Koreans call this chain the Keumkang San or Diamond Mountains. Here, so they say, twelve thousand jagged peaks of granite scale the vaults of heaven.

From the city of Wonsan on the eastern coast of Korea—a city of interest to Americans as the place in which was signed the first treaty between Korea and the United States—three of us travelled one July night by a small coasting steamer a distance of fifty-five nautical miles to the quaint little whaling town of Cho-zen at the entrance to the Diamond Mountain country. Inland six miles lies the village of Onchyonli surrounded by mountains and at the entrance to a precipitous valley. In Onchyonli in a small new native house on the bank of a rushing mountain stream we made our headquarters.

Not only are the Diamond Mountains rather difficult to reach but they are wild and far from easy to travel through. Many parts are not yet fully explored and the greater number of travellers, native or foreign, do not care to attempt more than a few of the better known parts. These are rough enough and full of peerless scenes. The sections generally visited are known as the Diamond Sea, the Outer, and the Inner Diamond Mountains.

THE CHINA JOURNAL OF SCIENCE & ARTS

From Onchyonli we made our first excursion to the Diamond Sea. In several places the coast has impressive and beautiful rock formations. Some of these are sharp and craggy, and, indeed, seem to be miniatures of the mountains themselves. In one spot magnificent basaltic rocks lift themselves sheer from the sea to a height of seventy feet. With their regular crystal formation they seem like columns of some titan temple fallen to ruin after countless ages.

Not far from the Sea is Sam-il-po, or Three Day's Lake, so named from the tale of the fairies who were sent from heaven with a message to the children of earth, and who on the return journey stopped to rest on the shores of this lake. So enchanted were they with the beauty of the place that they loitered three days preferring earth to heaven. In less romantic times the pine forest that once surrounded the lake and covered the islands therein was largely cut away, and the spell of primeval beauty has been broken—no longer do the heaven-dwellers daily here.

July and August, the rainy months in Korea, are not generally considered to be a favourable season for visiting the mountains. There had been heavy rains a few days before our visit and the streams were comparatively high. In spite of this, however, we were tempted to make a trip to the Nine Dragons' Pools. Tradition has it that in this secluded spot nine dragons took refuge two thousand years ago when driven from their home at Yu-chom-sa by Buddhist monks from India who made these mountains a stronghold of their religion.

A four hours' walk and climb in which we crossed a mountain spur and negotiated rushing streams by leaping from boulder to boulder brought us to a high narrow valley enclosed by sharp-toothed mountains of granite. Twice we were aided by chains and at one place ascended an almost perpendicular cliff by means of a log staircase resting on drilled-in iron bolts.

The Ninth Dragon Pool is fed by a hundred and fifty foot waterfall from the eight Dragon Pools above. The flow of water through many thousands of years has worn smooth a huge circular basin out of solid rock. On a stone wall close to the pool quotations from classic poets in praise of the beauties of nature have been cut in large characters.

After tiffin and a rest we climbed one of the smaller peaks going up hand over hand, using the branches and roots of trees and bushes. From the summit of this crag we looked down on the eight pools of the dragons which, however, we could not reach either from above or below. From this point of vantage was opened out to us one of the finest views of the serrated peaks of the Outer Diamonds. Hundreds of sharp, grey granite points seemed to be within a stone's throw. It had been no easy climb to the place but the view now made it worth while—once.

Having accustomed ourselves to the strenuous pleasures of the mountains we started out to cross from the Outer to the Inner Diamond Mountains. A cheerful and strong young Korean accompanied us as a combination pack-bearer and guide. The pack consisted of blankets to soften monastery floors at night, a few clothes and toilet articles, and food consisting of several loaves of bread which turned moldy the first day, tinned butter and milk, and sugar.

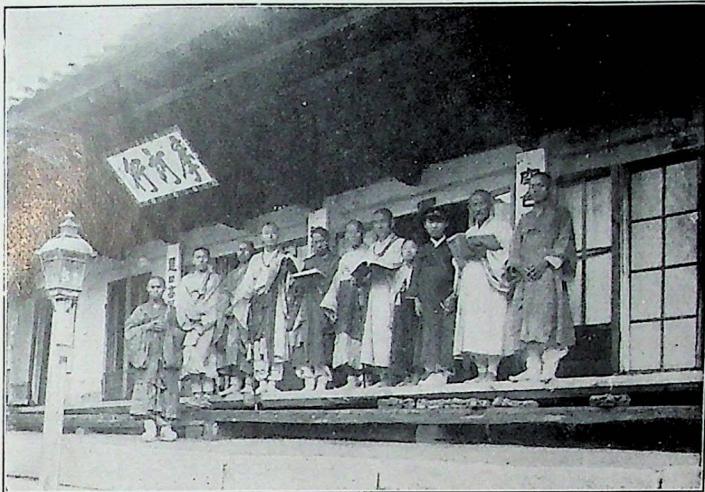


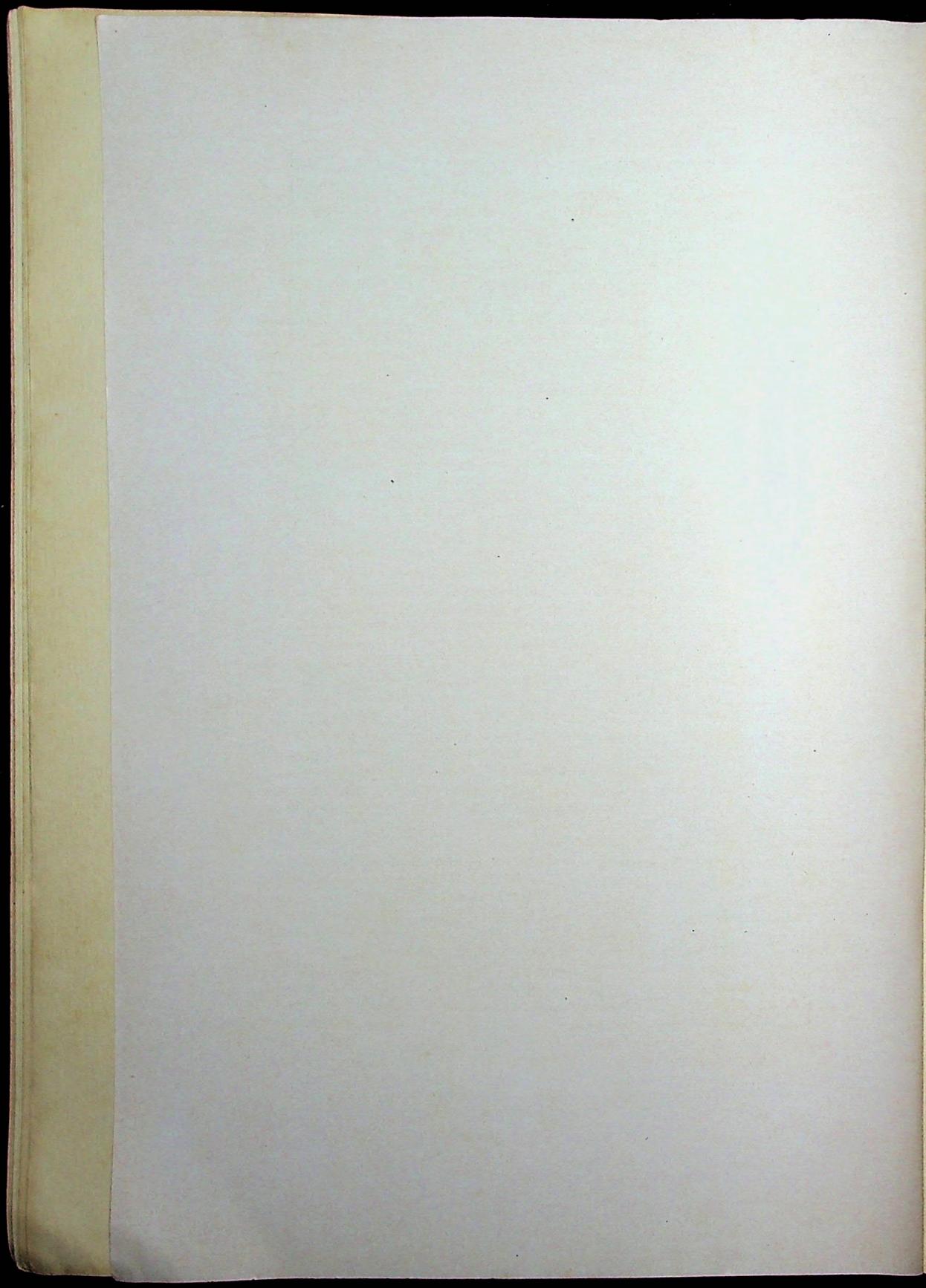
Photo by J. H. Morris

Abbot, Monks and Acolytes of Makayun-am Monastery, not far from the Great Stone Buddha



Photo by J. H. Morris

Temple Pavilion near the Abbots' Cemetery. The paintings and decorations are done in vivid reds, blues, greens, gold, white, etc., enriched by time. Note the bronze temple bell of medium size in the right front of the pavilion.



A PILGRIMAGE TO THE DIAMOND MOUNTAINS

From early morning to mid-afternoon, with the exception of a rest at noon at a Japanese police station, we tramped across hot lowlands—chiefly ricefields—with the mountains lying before us in the distance. Then the climb to the first Pass began. Up, up a narrow, thickly forested valley of dream-like beauty over a well-built mountain trail that wound along a rushing torrent we proceeded in the cool of the afternoon. As we neared the top of the ridge we looked behind to catch glimpses of the glittering blue Sea of Japan. Views of the mountains became broader, and finally in the late afternoon we could distinguish the valleys we had traversed, and the winding streams flowing across the plain of our morning's walk. Far in the distance could be seen the Three Day's Lake and the Diamond Sea where we had tramped and picnicked two days before. One sweeping view embraced mountains, valleys, plain, rivers, lake, and sea. This we had at the pleasantest time of day, when the sea gleamed in the sunset light, and the mountains were lilac with evening shadows. Around us were pine and fir and maple forests; below, but near at hand, a brook dashed over the rocks. It was cool now and the sights and sounds were exquisite. As we took in the beauty of it all we could well appreciate and indeed believe the mass of legend, tradition, and history of dragons, warring kings and fleeing princes, of Buddhist saints, of artists and poets, with which the region abounds.

At dusk we reached the top of the Pass. A four-mile walk down a thickly forested valley brought us to Yu-chom-sa Monastery, the most famous centre of Buddhism in Korea, where we were to spend the night. We were kindly received by the Abbot and his monks. No medieval pilgrim in the dark ages of Europe was ever gladder to partake of the hospitality of a Christian monastery than were we three modern travellers to be received by the Buddhist monks of the Keumkang San. Three small cells in the great guest hall, next the temple itself, were assigned us where we ate first and then spread our blankets to sleep.

In a Buddhist monastery one gets no meat or fish, for the true believer must avoid taking animal life. Our supper consisted of rice, dried sea-weed fried, bean-curd, native vegetable-sauces, delicious mountain honey, and some bread—with the moldy spots cut out—and butter. Dried sea-weed and bean-curd are good after a day's journey over plains and mountains; and finer honey never was tasted than that of the Korean mountains gathered by the monks of Yu-chom-sa.

Spreading our blankets on the floor which was carpeted with oiled-paper we were comfortable enough—at first. The Koreans have a custom, rather disturbing to an Occidental traveller, of heating a room by building a fire under the floor. The first thing done when guests arrive is to "fire up" the guest room. In the winter time a heated floor is, without doubt, comfortable enough, but in the middle of July it leaves something to be desired, especially if the would-be sleeper has no cot and perforce must lie upon the floor. In the middle of the night I picked up my bed and sought a cooler spot in another room.

Hardly had I settled myself and drowsed off than the slow and solemn booming of a huge bronze bell aroused me. The rich tones of a temple bell as it is struck by a suspended beam must be heard to be fully appre-

THE CHINA JOURNAL OF SCIENCE & ARTS

ciated. No clash of sound jarred the air : dull and yet penetrating waves of harmony came forth—waves which seemed to surround and envelop us, and which spread throughout the temple precincts and echoed back from the near-by mountain sides. Scarce half-a-dozen strokes had sounded ere the great courtyard was filled with the rapid movements of the monks as they gathered at the well to perform their ablutions prior to attending the service held nightly at 2 o'clock.

The Abbot having learned the evening before that his foreign visitors wished to attend the service sent his Guest-master to lead us to the main pavilion in which the service was held. Here, kneeling and sitting on three sides of a square facing a candle-lighted altar on to which a line of gilded images looked down, the monks arranged themselves.

The service was simple in form but uncomfortably long—so long in fact that one of the acolytes fell asleep during a long obeisance and had to be unceremoniously awakened. The interminable monotone of the monks in their antiphonal chants was broken only by the clacking of wooden gongs at regular intervals. The service was impressive not alone for its chants of swaying monks who cast flickering shadows in the candle light before lacquered altars and gilded Buddhas but because of the fact that such services occur nightly throughout the year—in spring and summer, in autumn and winter, in fair weather and foul—in this and other almost inaccessible temples and monasteries in the wild heart of Korea.

In the morning after a breakfast of foods similar to those of the preceding evening the Abbot showed us over several of the pavilions or halls of the monastery. They number more than twenty, some of them dating back to the thirteenth century. The monastery was founded, it is probable, as early as the fourth or fifth century of the Christian era, although tradition incorrectly places the founding in the first century.

After showing us the buildings and some of the art treasures of the monastery the Abbot accompanied us a short distance on our way to Makayunam Monastery a day's journey from Yu-chom-sa. The trail led us up another thickly wooded narrow valley along a rocky-bedded turbulent stream which had frequently to be crossed.

In the middle of the afternoon we reached the summit of the second Pass and were in the very heart of the Diamond Mountains. Here we met a young Japanese from Tokyo who was spending his vacation in the mountains. Accompanied by a guide and fortified with spy-glass, binoculars, and the inevitable camera he was crossing from the Inner to the Outer Diamonds and trying to get photographs—a difficult enough task on account of the peculiar lights.

Descending from the Pass we spent the next two hours in jumping, sliding, sprawling, and even falling down a primevally forested, canyon-like valley along a trail which was mildly described in the guide-book as being "extremely bad."

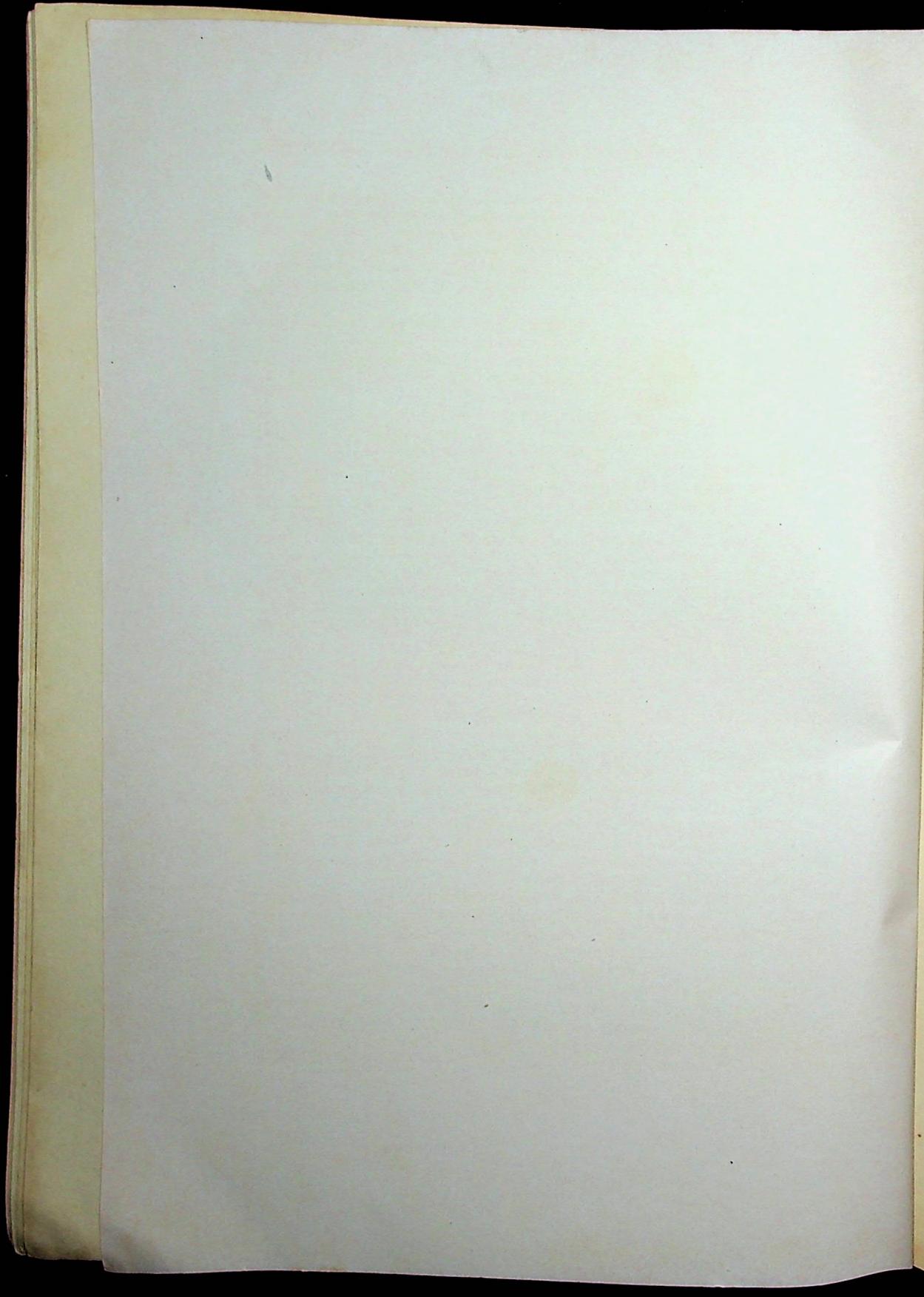
Myoukilsang, a high cliff with a bas-relief of Buddha cut from the living rock, was passed in the late afternoon. The Buddha is some fifty feet in height and is supposed to have been sculptured by Chinese artists many hundreds of years ago. Below is a stone-paved terrace, with a solitary stone lantern ; this terrace on which a hundred monks and acolytes



Photo by J. H. Morris
Colossal Image of Buddha, hewn out of the Living
Rock at Myonkilsang, Korea



Photo by J. H. Morris
A Beautiful Waterfall in the outer
Diamond Mountains, Korea



A PILGRIMAGE TO THE DIAMOND MOUNTAINS

could easily assemble in a service, seems to serve as a pedestal for the great image above. Perhaps it is the beauty of his surroundings that has caused the face of this Buddha to develop an expression of pious satisfaction rather than that of serene abstraction such as one generally connects with his kind. If this be so we can forgive the god; for certainly the view from his niche is one of which no nature lover could tire in all eternity.

A few minutes' further scramble over boulders with more crossings of the stream brought us to Makayun-am Monastery just ahead of a heavy storm which continued until early morning. Makayun-am is one of the most secluded of the monasteries and is in the midst of scenery as beautiful as can be found in the East.

After a night's rest—interrupted only by another move from the inner room to a narrow verandah on account of the too-hospitably heated floor—we wandered slowly in the morning down one of the most lovely of all valleys imaginable. The rain of the preceding night had made the stream along which we proceeded only the more beautiful. The day though sunny was cool enough to make walking enjoyable. The mountains towered high above us clothed with forests almost to their peaks. The trail passed a succession of the clearest of pools ranging in colour from crystal to jade-green. These pools have fanciful names such as Green Dragon, Fire Dragon, the Pearl, the Wailing, and were once the homes of dragons and the bathing places of mythical Buddhist saints. In no other mountains have I seen such pools as those of the Inner Diamond Mountains as they reflect the trees, flowers, ferns, and shrubbery which thickly cover these mountains.

There is a distinct difference between the Inner and the Outer Diamonds. In the former the notable features are the softness in the contour, a certain round massiveness, and the thickness of the foliage. The Outer Mountains are harsher and more grand, sharper in outline, grey and brown in colour because of the enormous masses of unforested and eroded rock. The majesty of a medieval castle combined with the airy pointedness and grace of a Gothic cathedral are the characteristics of the Outer Diamonds. The two sections are not to be compared—each is perfect in its type.

This day we passed two more monasteries, the last visited by us in the mountains. These were Pyohun-sa and Chang-an-sa, both founded some thirteen or fourteen centuries ago and having buildings dating back three hundred to five hundred years.

The Abbot at Chang-an was as hospitable as his spiritual brother of Yu-chom-sa. A small table with a modern European tablecloth was set on the little verandah outside his quarters overlooking the courtyard and the main approach to the temple. Here the Abbot served us cold honey-water and small pine-nut confections, considered to be the choicest delicacies of the mountains. These constituted our mid-day meal.

From Chang-an-sa the return trip to Onchyonli was made over the northern route. The early afternoon was spent in a section of country that might well have been in the eastern part of America. Wild roses, goldenrod, buttercups and bluebells; wild plum trees heavily laden,

THE CHINA JOURNAL OF SCIENCE & ARTS

raspberries that helped atone for our slender refreshment at Chang-an-sa ; fields of potatoes and corn and oats—the only oats I have seen in the Orient—all these seemed like home.

We were by this time in good hiking form and during the afternoon covered eighteen miles. Two-thirds of this was over a good road with a gentle rise and the rest was mountain climbing over a well-built trail but up—up—and over the Onchyonli Pass which would take us back to our starting point in the Outer Diamond Mountains. The last two miles was a mad scramble down from the Pass over a trail strewn with boulders as hard and pointed as medieval theology.

The Pass is about two miles long and in it are the remains of a village that might move Goldsmith to another attempt could he but visit them. A tungsten mine had failed and the whole village of considerable size was deserted except by a few mountain families who have probably lived there for centuries. The small Korean and Japanese huts were falling to pieces ; emptiness and ruin were all around. The mine itself was being dismantled and all materials of value were being carried down the mountains on men's backs.

In the valleys we had walked in sunshine, but as we ascended and crossed the Pass we ran into thick fog. It was dusk when we reached a tiny inn at the end of the Pass. Assuredly it was never intended that Westerners should stop at that inn. There were four rooms—three small ones, size seven by seven, including the kitchen, and one larger one about seventeen by twenty-five in which last all "guests" were to be entertained, In spite of our being Americans and therefore democratic we could not quite resign ourselves to the Common Room. Fortunately we were able to bargain with the wife of the innkeeper for a family room next the kitchen. Here we again slept on a heated floor and ate Korean "chow" for supper and breakfast.

Only a few miles now separated us from our headquarters at Onchyonli. One side trip early in the morning allowed us to see a famous bit of scenery, known as Manmulsang or 'Aspects of Myriad Things.' From a great cluster of huge and weirdly shaped rocks we had an impressive view of fog-covered peaks, and deep, narrow, wooded valleys studded with gem-like pools. Three hours' easy walk down a valley from many points of which we had splendid views of the Japan Sea brought us to our starting place—Onchyonli.

Here we rested two days before leaving the mountains for Wonsan Beach which we had left ten days previously. Instead of going back by a coasting steamer we were fortunate enough to travel in a "universal" Ford car. The little car did valiant and violent service in covering seventy-five miles in eight hours. The road reminded us of descriptions of ancient Roman empresses—"beautiful but terrible." The greater part of it is beside the sea shore to which in many places the mountains drop sharply. Sections of it are cut in the mountain side high above the sea. From these parts magnificent views of mountains, bays, islands, and open sea could be enjoyed between prayers breathed for the safety of those "travelling by land and sea," inasmuch as at times it was a little uncertain by which route we were travelling.

A PILGRIMAGE TO THE DIAMOND MOUNTAINS

The seeker for thrills should take a ride on this sharply curving, narrow, and unguarded mountain road—preferably after a heavy rain, as we did. Several bridges were washed out. In one place a small bridge had been dislocated but not swept away. One side was “tip-tilted like a rose” so everyone except the driver got out and stood on that side to hold it down while the machine passed over. When all is said, however, the fact is that the road from the Diamond Mountains to Wonsan is one of the great—if almost unknown—scenic highways of the world. For it the Japanese are responsible.

Thus we spent ten days in a section of country which for more than a thousand years has been famed throughout the Far East for its natural beauty, as well as for being a centre of Buddhism in which great temples and monasteries flourish. Poets have sung its praises, and distinguished men have retreated to its monasteries to meditate on its beauties as well as on the metaphysical. We passed over one route and returned by the other thus circling the district. One might spend any length of time in exploration of old and new valleys and peaks—for many parts have never been explored. A small group of Japanese soldiers learned this to their cost, some few years ago, when they got off the trail and wandered two days without food being unable either to advance or retreat because of the cliffs and trackless canyons which barred their way. According to report they were reduced to chewing shoe-leather for sustenance before one of their number happily found his way to a small village from which help was sent.

Inaccessible, relatively speaking—although the Japanese Government is beginning to make smooth the way nowadays—the mountains when reached are not easy to penetrate. But for the lover of the beautiful in nature, the exponent of the strenuous life, the hunter of game—from birds to tigers—the collector of botanical specimens, or the student of Korean Buddhism and temple architecture the trip is one to be taken, to be enjoyed, and never forgotten.

TRAVEL NOTES AND REVIEWS

THE TEMPLES OF THE WESTERN HILLS visited from Peking,
by G. E. Hubbard. La Librairie Francais, Tientsin and Pe-
king : printed by The Tientsin Press, Ltd.

In the preface to this little book Mr. Hubbard forestalls criticism of his choice of material by saying "This is, in the main, a record of persons, impressions and . . . the book aims at giving a general idea of the character and atmosphere of the temples and their surroundings rather than a tabulated series of facts in the manner of a guide-book." On the whole he achieves his purpose. A reading of this book leaves one dreamily recalling his own experiences in the Western Hills. Throughout the chapters Mr. Hubbard writes as one who loves the hills and the temples. Here and there he brings in a charming little legend like that of the old man riding the hen who sits on the corners of temple roofs.

It seems, however, that in many places Mr. Hubbard forgets that his subject is the "Temples of the Western Hills" and puts his emphasis on *travelling* in the hills. For example, the chapter entitled "T'an Che Ssu" devotes one paragraph to a description of the monastery and its treasures, while four pages are spent over the trip from Chieh T'ai Ssu to T'an Che Ssu and the return to Peking by way of Men T'ou K'ou. The author could very easily tell us much more about this famous monastery without even suggesting the "manner of a guide-book" of which he is afraid.

In the pages on Pi Yun Ssu one loses entirely the feeling of exaltation which is present after one has climbed flight after flight of steps, finally going up through the heart of the uppermost structure and coming out of the darkness upon the top of the terrace with its marble dagoba and stupas. Looking down upon the magnificent grove of white pines in the court below, then on across the plain to the Jade Fountain is an experience not easily forgotten. Mr. Hubbard's omissions in describing this beauty spot arouse in the reader a vague wonder whether he ever climbed to the summit of this particular temple.

The detailed description of Hsiang Chieh Ssu will be most useful to a newcomer. The author describes the various temple courts with their deities and gives a picture of temple architecture, all of which applies in a general way to the majority of the temples of which he writes and is information for which a stranger to these parts will be grateful. The chapter on temple worship and the description of the temple music at Chieh T'ai Ssu will prove enlightening to those who are making their first acquaintance with the charming temples of the hills. The notes on "Routes to the temples from Peking" together with the map of the temples described are likewise very helpful in planning excursions westward from Peking. The book is attractively illustrated with photographs from various sources and with pencil sketches made by the author. The

TRAVEL NOTES AND REVIEWS

publishers would be well advised to take a little more care in the matter of proofreading. Typographical errors detract from the general attractiveness of a book.

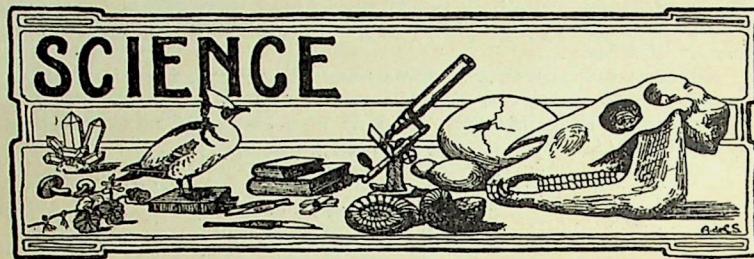
On the whole this little volume should be very well received, bringing as it does to the novice useful information and a foretaste of the joys of trips to the hills, and to the old resident memories of many delightful days spent in the hospitality of the kindly priests.

M. E. F.

THE GREAT RIVER, by Gretchen Mae Fitkin: North-China Daily News & Herald, Ltd., Kelly & Walsh, Ltd., Shanghai, 1922.

The Yangtze Kiang is always a subject of interest to travellers and residents alike in China. There is something very romantic about this "Great River," and we are always ready to hear more about its wonders. Miss Fitkin's book, the result of a journey undertaken by her on behalf of the "North-China Daily News," to which paper she supplied the fascinating articles which go to fill its pages, is more than welcome. It is probably due to the fact that these articles were penned on the journey, hot from the griddle, as it were, that the book owes its freshness and spontaneity. The authoress deals with each of the great cities and treaty ports from Nantungchow, near the mouth of the Huangpu, to Chungking, the City of Seven Gates, as she calls it, and what she has to say is interesting and very much to the point. Occasionally digressions are made, as when she discusses "Opium in the West" and "West China Boxers of 1921," but they only add to the charm of the book, which is full of atmosphere, and redolent of the East.

A foreword by Mr. A. de C. Sowerby, the well-known naturalist and explorer, tells of the geographical status of the river above Chungking, and gives some physiographical statistical facts, which will be of help to the reader. The book is illustrated with some of Mr. Donald Mennie's beautiful photographs. Its printing and get-up are of the best, an attractive cover design having been supplied by the well-known artist and caricaturist, Mr. Sapajou.



WHAT IS A CHINA PONY?

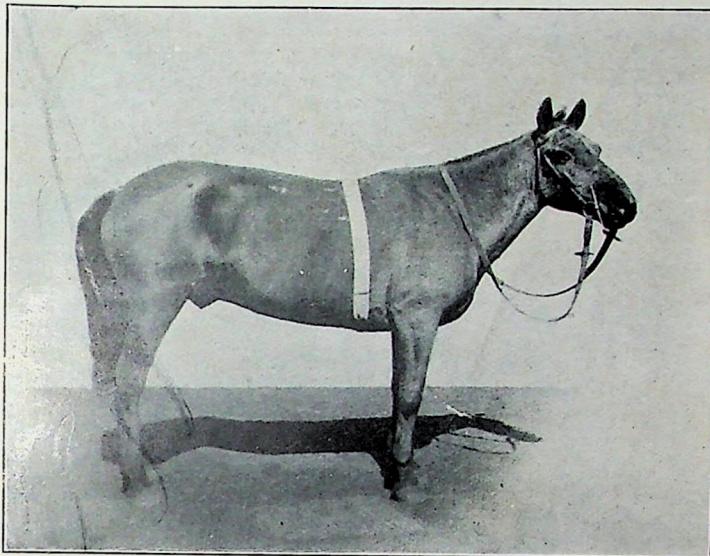
BY

ARTHUR DE C. SOWERBY.

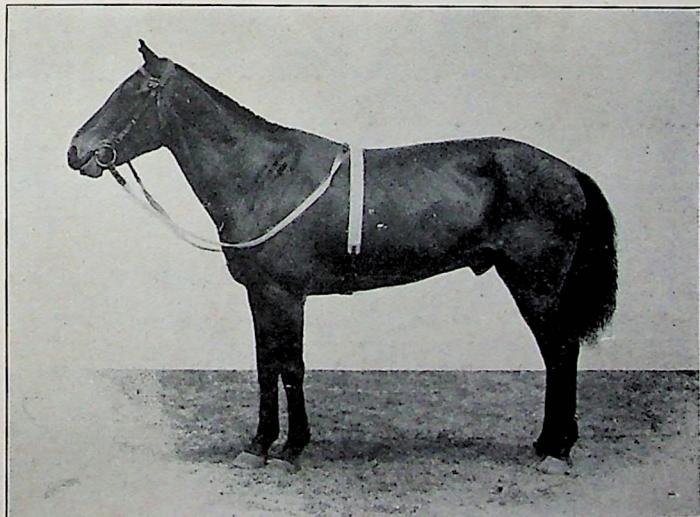
Ever since Europeans first came to China, and more especially since the Treaty Ports were opened and settlements of Britishers began to establish themselves up and down the coast and along the Yangtze Valley, the so-called "China Pony" has been of very general interest—to many of paramount importance—for he has supplied the means of indulging, at a comparatively low cost, in the British national sport—racing. Not only so, but he supplies to all a very good mount, and many a foreign resident in China, missionary as well as business man and merchant, is able to enjoy his daily canter or cross-country gallop, who could never afford the luxury of a horse in the home lands.

A hardy little beast, needing but little care, and with an endurance that is astounding, our friend has found for himself a very warm corner in the hearts of nearly all of us, and this finds echo in the heat of the discussion that has recently arisen over the questions in racing circles as to whether the past standard of racing ponies is to be maintained, and if so, how is it to be managed with the increasing difficulty of securing first-class animals of a pure breed; and how racing is to be kept within the means of the average member of the race clubs.

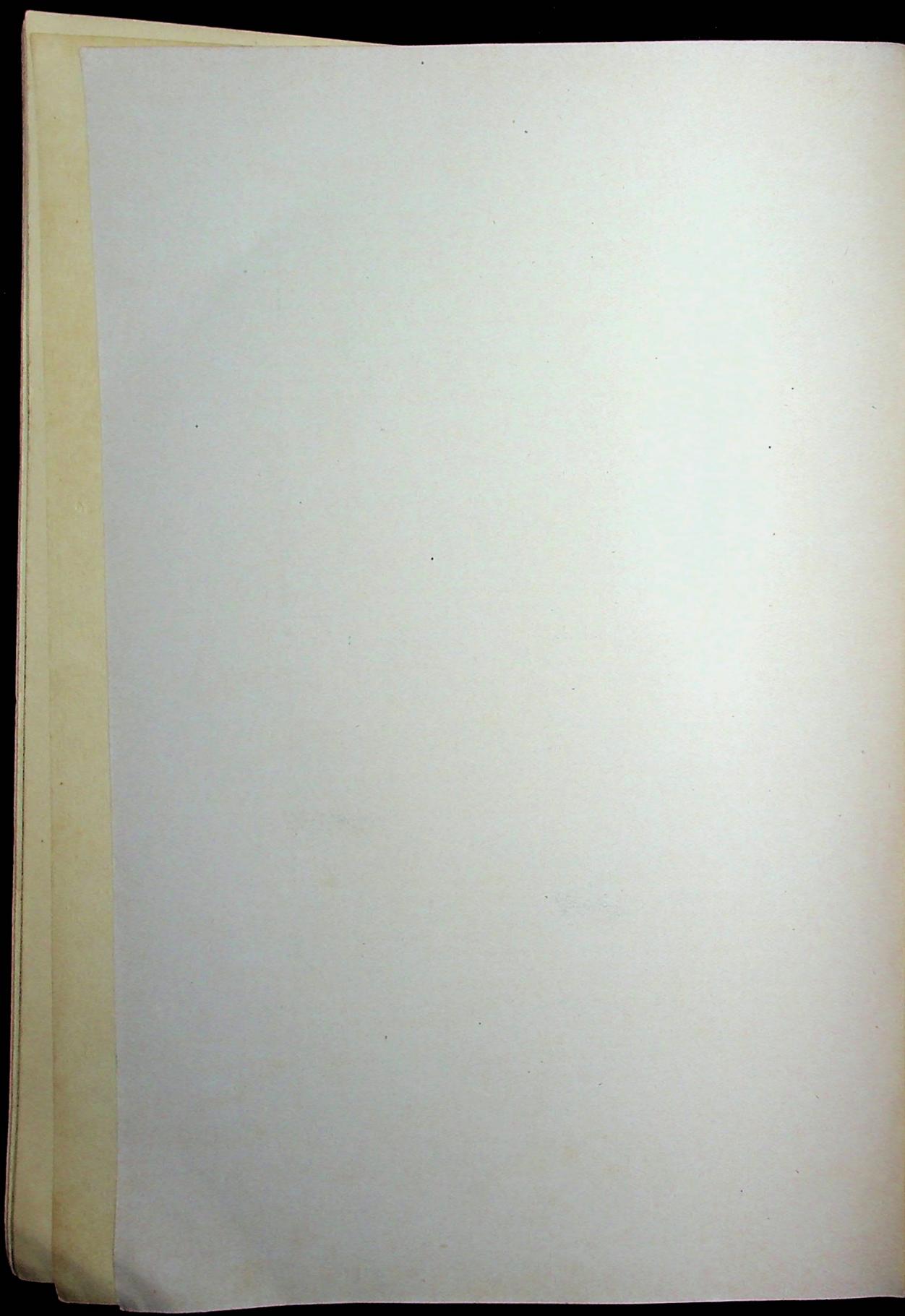
These discussions have centred, to a considerable extent, on the question as to what the China pony really is, a question which up to the present no one seems to have had the temerity to undertake to answer. In a short article which appeared in the *North-China Daily News*, I tried to point out the line that would be followed by a biologist if he had to determine whether or not the animal known to racing men as the "China Pony" was a distinct species, race, breed, or type, and since that was written I have further investigated the problem, and, with the aid of numerous photographs of past race winners on the Shanghai courses, have arrived at certain conclusions, which, however, are provisional only, and the validity of which depends on whether they are confirmed by measurements taken in the flesh of a large series of ponies. To complete



"Bedfield," Kiangwan Sub. 13.1, won the 1½ mile handicap, carrying 175 lbs., the second pony 13.3, carried 129-lbs., won by very many lengths



"Beaconsfield," a good type of "China Pony," slightly longer in the leg than "Bedfield," however, and less deep in the body.



WHAT IS A CHINA PONY

the investigations along these lines would require more time than I have to devote to the task, but I feel confident that if some one will undertake to measure, say, a hundred race ponies, strike averages of each set of measurements, and compare them with each other, so as to get their relative proportions, and also with similar measurements of other known breeds of horses and ponies, he will be able to define very accurately what constitutes a China pony, and those interested will be in a position to amend any rules in their clubs which are affected by the question.

But apart altogether from the racing side of the question, it is of considerable interest to everybody who has anything to do with the pony in China to know whether he is or is not a distinct type, and if so, exactly what are his individual characteristics.

To begin with we are confronted with an anomaly in the very name of the animal with which we are dealing. He is called the "China Pony," which name presumably dates from the time when foreigners first came to China and bought ponies from local native dealers without knowing that they all came from Mongolia. There are real China ponies, that is to say, ponies that are born and bred in China and belong to breeds that are indigenous to the country, but these come from the west, are small, and are never used for racing, and seldom for any other purposes, except for children to ride, by Europeans in China. Thus the "China Pony" is in reality a "Mongol Pony," and while we may continue to use the old name we should never lose sight of this fact.

The real questions to be determined are whether or not the ponies that are reared throughout the length and breadth of Mongolia can be considered as conforming to one type, and, dependent upon that question, whether or not the ponies that have been raced in China up to date have all been of one type, and that the same type as the one found in Mongolia.

It is impossible to go over Mongolia and take measurements of series of ponies in various parts, and so, in our efforts to determine whether or not there is one breed or number in that country, we must depend on the evidence of those who have travelled there or who have taken sufficient interest in the matter to find out where the animals they have seen in China came from, and whether amongst these there is sufficient variation according to locality to show if there are a number of types or only one.

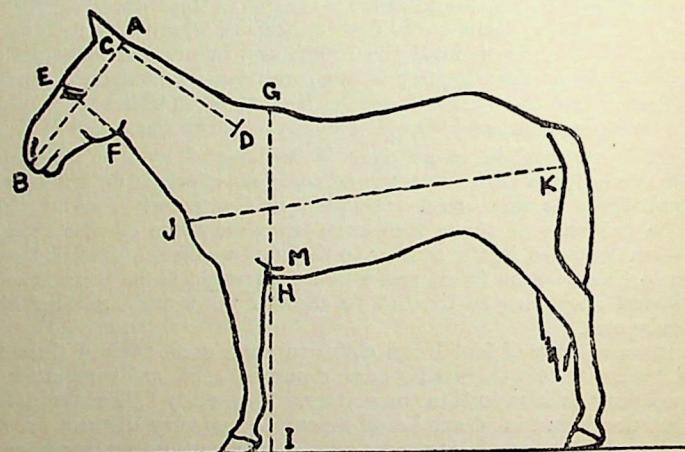
As a matter of fact I can claim to have done both of these things, and I find that others who have done the same are very much of the same opinions as myself in the matter. Personally I should consider that the ponies found in Mongolia all belong to one very distinct type, their relative proportions being very much the same, no matter from which part of Mongolia they come, though the animals themselves vary to a considerable extent in size according to the district in which they are born and reared. Thus the pony from the Ordos Desert is very small; that from the Ili district in the extreme west very large; that from the Grass Lands of Inner Mongolia is intermediate between these two, as also is that from the Urga districts.

But as far as I have been able to make out, the proportions of all these animals are about the same, that is to say, the length of the neck

and legs in proportion to the length and depth of the body are about the same, whether the individual be a small pony from the Ordos or a large one from the Ili district. It may be mentioned that in North Shansi the Chinese carters use an animal that is somewhat heavier in build than the average Mongol pony, but I have been unable to ascertain where these are bred, or how the Chinese come by them. They may represent a distinct breed, or it may be that all heavily built ponies found throughout the herds in Mongolia are taken to this part of China for sale, since there is a special demand for that class there.

Incidentally it may here be given as a very general opinion amongst experts, and one with which I concur, that the Mongol pony is the direct descendant of Przewalski's wild horse, whose home is in the steppes of Western Mongolia and Central Asia. Domestication may account for the differences that occur between the Mongol pony and Przewalski's wild horse, or they may be due to the introduction of other blood. Przewalski's wild horse is the nearest modern representative of the pre-historic wild horse of Europe, and the Mongol pony is the nearest thing in domesticated horseflesh to Przewalski's animal living to-day. It is from the latter animals that our Mongol pony gets, amongst other things, its large head and short neck.

According to Lydekker, quoting Campbell, who travelled extensively in Mongolia, the best ponies in Mongolia come from the Kurulen Valley



Outline of a typical "China Pony," which shows the average proportions as suggested in the accompanying article, and the points between which it is suggested that measurements be made.

A-B. Length of Head

C-D. Length of Neck

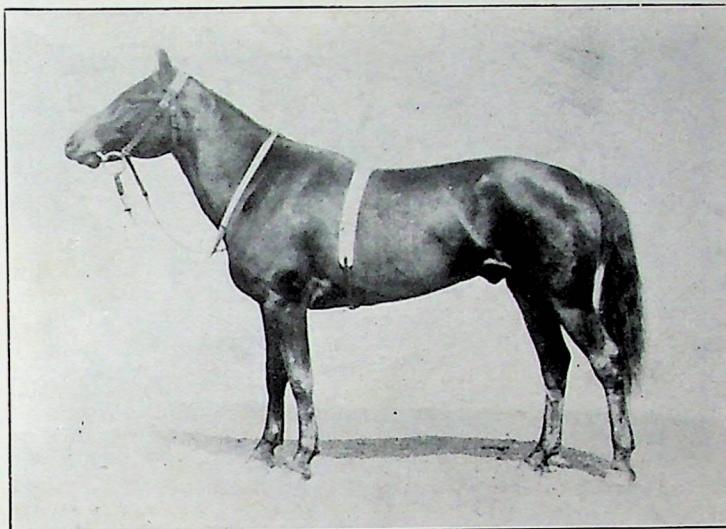
E-F. Depth of Head

J-K. Length of Body

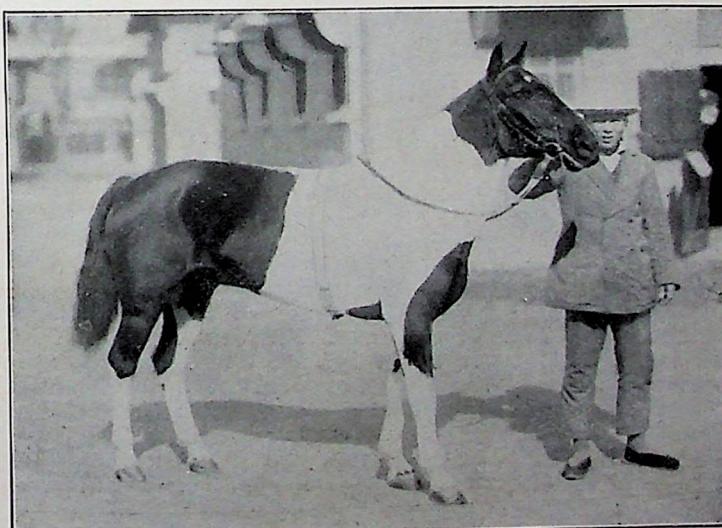
G-H. Depth of Body

G-I. Height at Shoulder

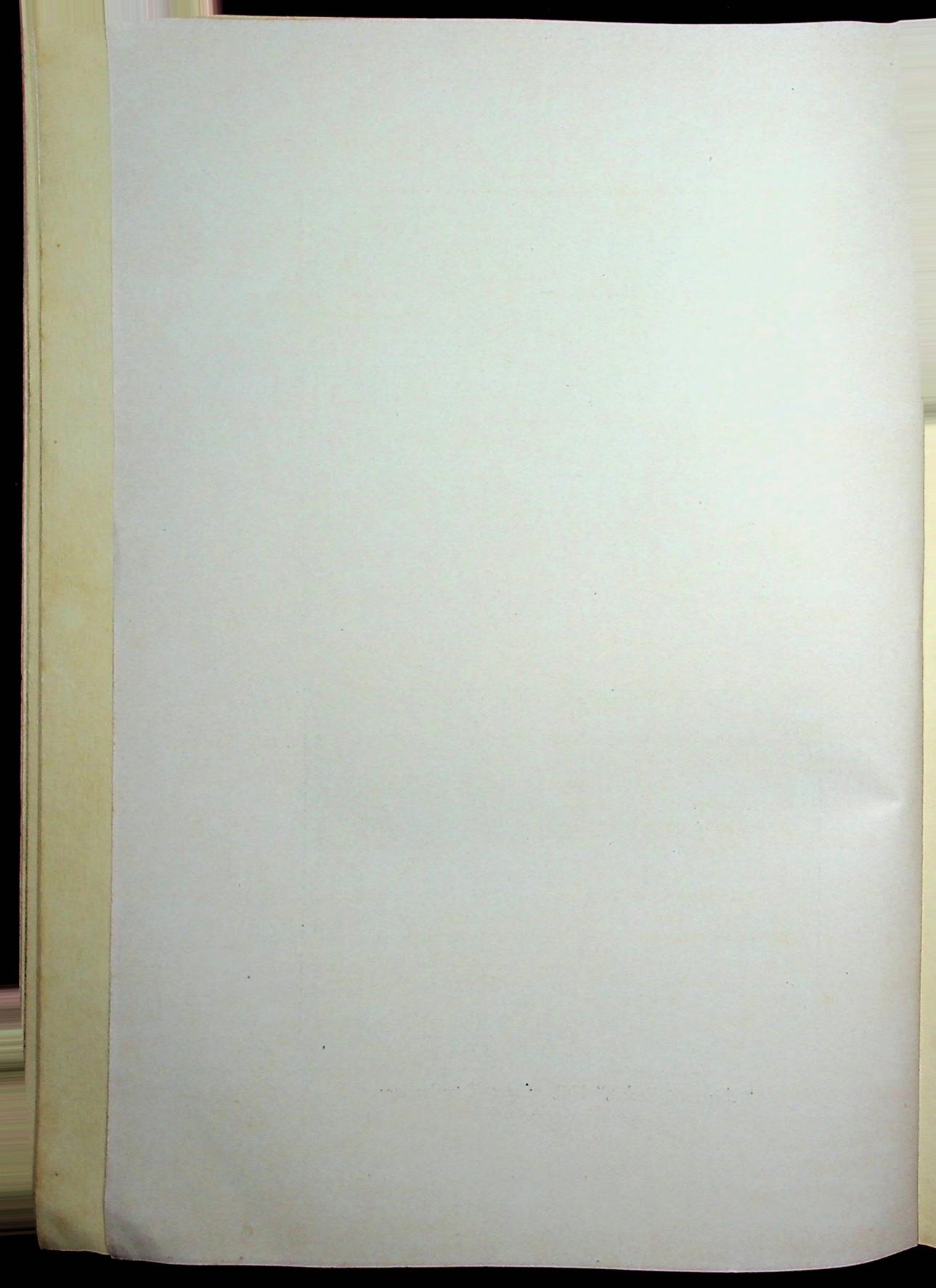
M-I. Length of Leg



"Wakefield," a famous long-distance pony. Exceptionally long in the leg and neck.



"Thomas à Becket," 13-2, winner of twelve races.
Owner : A. G. Nugent



WHAT IS A CHINA PONY

in the north-east, and this introduces us to the crux of the whole matter that has raised the question of the status of race ponies. Are these ponies that are bred in areas adjacent to Siberia pure specimens of the stock as represented throughout Mongolia generally? And that is a question that can only be settled by biometric methods; that is to say, by taking a set of measurements of a great many individuals from all over Mongolia, and classifying the animals accordingly. If it be found that marked variations occur only in animals that have been bred along the Siberian frontier or in closely adjacent areas, it will be necessary to assume that there is an infusion of outside blood in their veins from Siberian animals in which the varying features are prevalent. That is to say; if from an area close to the Siberian frontier, where the large so-called Russian horses (whatever they are), with their comparatively long legs and necks, are prevalent, we find that the animals bred by the Mongols have a tendency to be markedly longer in the legs and neck than those from elsewhere, then we must assume that they have Russian horse blood in their veins. Occasionally one meets an animal from Ili in which the proportionate length of leg is distinctly greater than in the average, and the neck is longer and more arched. Such animals show very plainly that they have some other strain in them. They are most common in Western Kansu, and the Chinese say that they have some foreign horse in them.

The chief distinguishing characteristic of the China pony as displayed in animals that have won races in China and therefore have been photographed are:—

1. The large size of the head and its proportionate depth from the forehead between the eyes to the bottom of the jaw near the angle.
2. The shortness of the neck and the fact that it shows a slightly concave outline (ewe-necked) instead of being convex (arched) as in other breeds.
3. The great depth of the chest.
4. The shortness of the legs.
5. The great length of the body.
6. The thickness of the hocks.
7. The rather sharp slope of the rump.
8. The low set of the tail.
9. The excessively shaggy and long winter coat.
10. The hairiness of the fetlocks.
11. The heavy mane and tail, the latter having the long hairs extending right up to its junction with the body.

The first five of these characters can be put to the test of measurement. As far as I have been able to ascertain the following proportions distinguish the "China Pony":—

(a) The length of the head goes into the length of the body about $2\frac{1}{2}$ times.

THE CHINA JOURNAL OF SCIENCE & ARTS

- (b) The depth of the head is more than half the length.
- (c) The length of the neck is less than the length of the head.
- (d) The depth of the chest, measured from the top of the shoulder, is a little less than half the height at the shoulder. In some cases it is exactly half.
- (e) The height at the shoulder is considerably less than the length of the body.

The proportions and the characters listed above define the "China Pony."

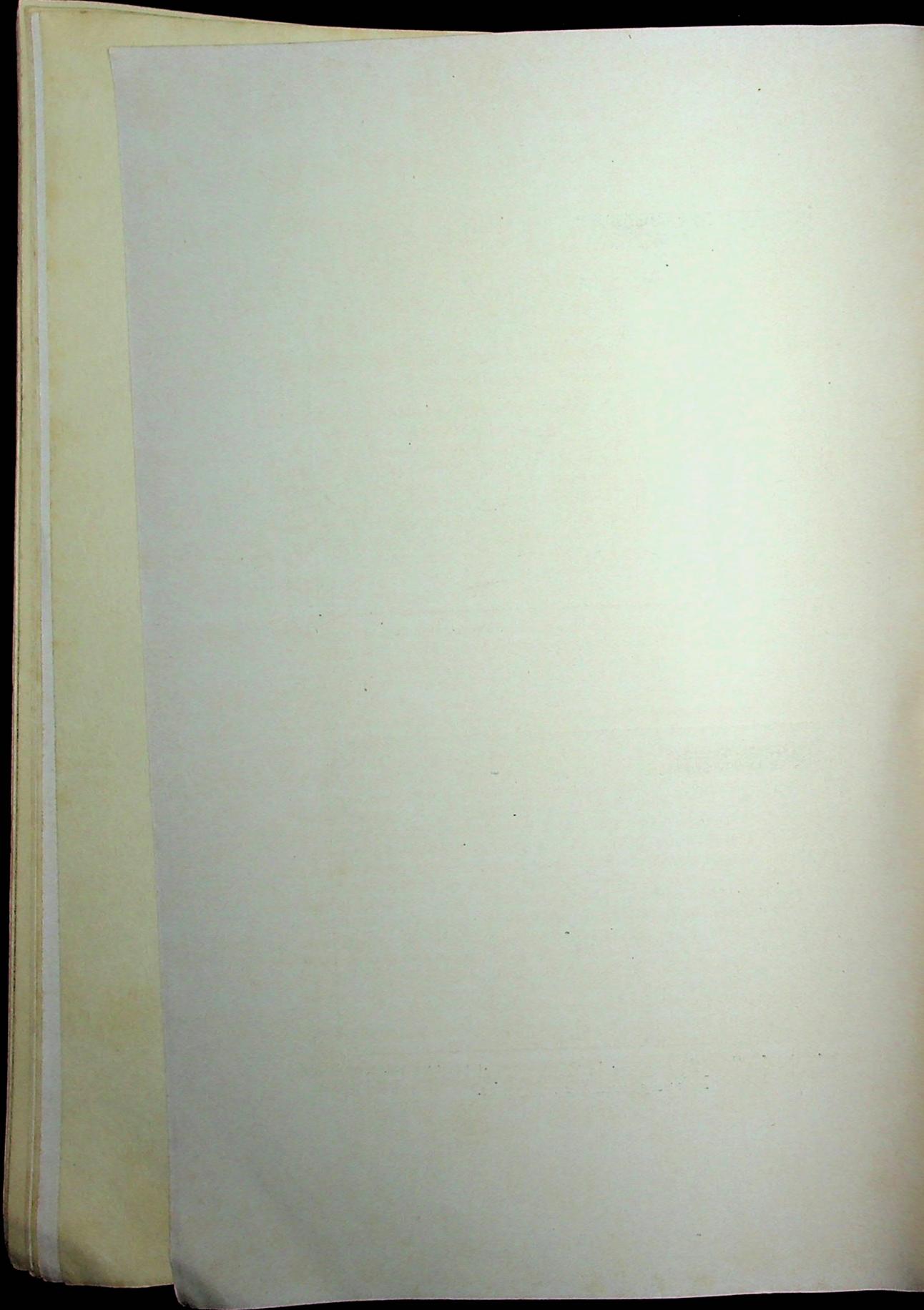
Now an average of each of the measurements suggested here can be derived from a large series of actual ponies, and a definite standard can be evolved. If an animal conforms to this standard with but comparatively little variation (the maximum of variation allowed to be fixed), then it may be considered as a pure bred "China Pony." If it does not then it must be looked upon as having some other strain in it, or else as belonging to some other breed altogether.



A typical Ili pony. Note the large head, short neck, and sloping rump, typical points of the "China Pony." This photograph was taken by the Clark Expedition in Shensi, 1909.



"China Ponies" as they appear in the rough, and in which state they look very much like wild ponies.



MIGRATION NOTES

BY

G. D. WILDER

NESTING OF THE FOREST WAGTAIL, HOPOE, RED-FOOTED FALCON, AND BLACK-CAPPED KINGFISHER.

The southerly migration began here (Peking) early in August with the departure of the Peking swifts (*Micropus apus pekingensis*, Swinhoe). The date is not certain as they were gone already when I returned to the city, August 13th. The same was true a few years ago on my return on Aug. 18th and I have never noted the exact date. The Chinese say they leave at the feast of *Li Ch'iu* or "Establishment of Autumn," which was on August 2nd this year. They are so numerous around the towers and palaces of Peking, and they so intrude themselves on one's notice as they fly in screaming wisps all day and even on moonlight nights during the nesting season, that even those who do not watch migration could easily note the time of their coming and going. They nest under the tiles in the eaves of buildings and on the tops of tile-roofed walls in great numbers. The piercing scream is uttered as an encouragement to the sitting female by the male as he dashes past the nest. Fledglings were seen out of the nest on July 7th. They are said to leave the country for the winter by way of Szechuan, and it is not known, I believe, where they spend the winter, just as the swift in America, which leaves the United States by way of Florida in the Fall and returns by Mexico in the Spring, has not yet revealed its winter habitat to naturalists.

The wood sandpiper (*Tringa glareola*) and the yellow shanks (*Tringa ochropus*, Linnaeus), with other waders were passing over at night as early as August 16th. Their cheery calls to each other as they flew recalled pleasant days of bird study and hunting in the marshes where the same calls rang on every side. The red-breasted flycatcher (*Muscicapa parve albicilla*, Pallas), one of our most constant and dependable birds of passage, arrived from the north on August 27th, announcing his arrival with his persistent little "tzzzt." Some unidentified species of willow warbler arrived a few days before and another a few days after. The grey flycatcher (*Muscicapa laticrostris*, Raffles), and the dusky warbler or brown bush warbler (*Phylloscopus fuscata*, Blyth) arrived on Sept. 2nd and 3rd, respectively. These were noted in the city, and, judging from the game markets, larks, pipits, and both streak-eyed and white-faced wagtails arrived soon after. We are now, September 29th, watching daily for the arrival of the jolly jackdaws.

Whether these early-arriving birds come from the mountains to the west and north, where they breed, or from Mongolia and beyond, they truly form the vanguard of the migrants. Here on the plain migration is going on every month in the year except perhaps July and midwinter.

THE CHINA JOURNAL OF SCIENCE & ARTS

Along the coast, probably, even these exceptions do not need to be made, as Mr. La Touche has pointed out in his "Spring Migration at Chinwangtao," in *The Ibis*, October 1914.

Writing at this date the most outstanding features of the bird life observed since the last issue of the journal are not so much movements that come under the heading of migration proper as facts concerning the breeding birds of the midsummer, that is, the ones that arrive late and nest in June and July. The species that breed thus on the plain are not numerous. Orioles, cuckoos, drongos, Peking swifts, the yellow-rumped and the common swallows, and the reed-warblers are the conspicuous ones, and on land almost the only breeders outside the resident woodpeckers, crows, rooks, magpies, chichadees, nuthatches, and turtle doves. Visits to ponds and watercourses will add Bengal kingfishers, coots, moorhens, and little grebes to the list of migrant breeders. Access to the secluded groves in palace grounds will reveal the nests of the white egret, the grey and the night herons. The rarer water-cock and jacana also belong to the list.

These birds have been commonly observed breeding on the plain. But this summer the writer has had an unprecedented opportunity (for him) to study the breeding birds of the foothills and highest mountains of the province in July and the first half of August. While this was too late to see many eggs, even of the late comers, yet the presence of the breeding birds was easily noticed because of the feeble flying fledglings and the movements of the parents in feeding their young. Most of the common plain birds push into the foothills and mountains in suitable habitats up to 2,000 or 3,000 feet above sea level. Higher than that they give place to other species to which I may refer later. In these foothills many species were breeding which I never expect to see on the plain in the summer, though they may pass in migration. Let me mention a few in detail, some of which are rarely seen.

At Wofossu, on the very edge of the plain, June 11th and later at the Western tombs in a similar location of large trees at the base of the hills, I saw and heard for the first time the beautiful Korean flycatcher*, the size of a sparrow, jet black, with rich lemon yellow rump, throat and breast, and white eyebrows, wing patches and belly. Therefore it was called in older nomenclature *Xanthopygia tricolor* or three-coloured yellow rump. It is now more properly named *Muscicapa narcissina zanthopygia*, Hay. It was in full song in June, and early in July the young were flying and still being fed by the parents.

In the same places I also saw several nests of the forest wagtail, *Dendroanthus indicus*, Gmelin. Its song is a constant repetition of "Teacher, teacher, teacher, teach" with strong accent on the first syllable. It sounds like the creak of a carrying pole, from which it gets one of its Chinese names. Though its song becomes insistently monotonous on a hot summer day, yet its movements are most entertaining and sprightly, and it is an attractive little bird. It is easily identified as it has the long, slender body and tail of the wagtails and is the same size.

*Also called the Tricolor Flycatcher.

MIGRATION NOTES

The upper parts are olive green the lower white. The wings are marked by two broad bars of yellowish white separated by black, almost perpendicular, as it stands. It walks on the ground as other wagtails do, but also on trees, running lengthwise even on slender twigs and wagging its tail slowly from side to side instead of up and down like the rest of its tribe. This bird alone of the wagtails builds a finely woven nest on a strong horizontal branch of a tree from one foot to a few feet from the trunk.

On June 11th at Wofossu, I was sitting under a large *ch'iu* or catalpa watching a Korean flycatcher, high in a neighboring pine, posing and sunning itself and singing desultorily. It sat so for ten minutes spreading its square tail with feathers and wings fluffed out loosely as it sang its astonishingly clear, loud song. A forest wagtail whose notes had drummed in my subconscious ears for a long time finally forced itself on my attention by alighting a few feet away with wings loose and quivering from side to side and tail trembling in ecstasy as it sang. Then it caught a long, naked worm, and with it in its beak flew as though chasing a dodging fly on the wing, but still holding the worm. Then it would festoon the open spaces between the trees with its flight making loops or scallops five or six feet across, hovering for some seconds at the highest point of each loop with beak and worm pointing straight up in the air and tail straight down to the ground. It did this for some minutes until finally its scalloped flight brought it to a branch near me where it sat for some time quiet and watching me. Then it darted like a flash ten feet to one side into a cluster of sprouts that rose from a horizontal branch several inches in diameter. In an instant it darted away again without the worm. I surmised at once that its nest was there, and on changing position slightly I could see its mate's head and tail projecting over the edge of the nest saddled on the limb among the leaves. Ten minutes later the male returned and for three or four minutes repeated the festooning, fastening the loops to imaginary nails in the air as before until its last hover brought it only a foot or two from the nest, and without alighting it flashed in to feed the mother bird and away. In another fifteen minutes it was back again, lit on a wall and sang several times a sort of muffled song with the worm in its beak. After a long wait it fed its mate again as before scalloping the air in its flight. But this time before the female had swallowed the worm she was off the nest and away with the male. They returned together five minutes later and the male stood close by watching the female solicitously as the latter settled daintily on to the eggs.

On the morning of July 3rd, having pitched camp in the dark the night before, I awoke in my camp cot under the pines and discovered, with scarcely a turn of my head, nests of the hoopoe, the red-footed falcon and forest wagtail in the trees above. The wagtail's nest was discovered in the same way as that of the forest wagtail by seeing the male carry food to the young in a nest on a pine branch 30 feet from the ground and about five feet out from the trunk. This bird reversed the order of the other for it flew directly to the nest with the food, and then, on flying away, made the same kind of series of loops, punctuated with hovering

upright for an instant at the top of each loop, and finally settling to earth 50 yards away to hunt worms. The hoopoes made trips every minute or two to feed their young in a hole in a big branch high up on a small-leaved poplar. The hoopoes seemed to be digging their food from the ground. Sometimes a black drongo, that came to the pool near by to scoop water while on the wing, would sit and watch one of the hoopoes at work. As soon as the hoopoe was successful the drongo would pounce down upon it to seize the morsel of food before it could fly away with it. The birds fought repeatedly and the hoopoe was always successful in driving the drongo away, when it would return to the same spot, apparently to look for the food it had dropped in the battle. On the fine brick buildings of the tomb, there were many thin brick plaques set in the wall carved through in a fretwork flower design to give ventilation to the wooden pillars built into the outer wall of the building. Every pillar hidden in the wall had two of these, perhaps four, about seven feet above the foundation. Nearly every one of the higher bricks had had the holes on the brick enlarged by the pecking of the hoopoes to admit them to the hollow inside, where they reared their young. Many of the holes were unoccupied, but several had nests at the time, and on the pavement below were piles of the filth cast out by the birds from their homes.

The twittering scream of the red-footed falcons (*Falco vespertinus amurensis*, Radde) as they approached their nests to their young was sufficient to prevent an early morning nap, and reminded me of morning naps having been disturbed in the same way at a Chinese inn on the plain many years ago, where a pair had their nest in a big poplar. The Chinese say that this sprightly and handsome falcon is unable to build a nest for itself. It always attacks a pair of magpies when they have their nest about finished, drives them out and sets up housekeeping itself. This is the only falcon I find breeding on the plain, it is about the size of our American sparrow hawk, deep plumbeous above and grey blue beneath with white lining of the wing contrasting strongly with the black wing quills as seen from below in flight. Bill, feet and thigh feathers are red, making the bird easily distinguishable. But the young birds of the year, striped buff and brown below, vary greatly from their parents.

While watching the three nests of falcon, hoopoe and forest wagtail, from my cot in the early morning sunlight, I glimpsed flashing by in the shade of the pines a blue backed bird the size of an American robin, with large apparently white wingpatches, which proved to be a delicate lilac, visible only in flight. It had a long cylindrical bill of bright red colour, and when it lit for an instant on a pine branch near the ground, it seemed to have a white collar at the sides of the neck. It proved later to be what I surmised, the black-capped kingfisher (*Halcyon pileatus*, Boddaert.) It came to be a familiar friend, as its nest was not far from our camp and the loud chortling laugh, that seems to be common among the *Halcyon* group of kingfishers, frequently resounded through the woods when the birds were a quarter of a mile or more away. They had several loud calls, a repeated resonant whistle with one or two trills or changes of note at the end. When near their nests, however, they were silent and often sat like statues in the sun high up on a pine stub for a quarter

MIGRATION NOTES

of an hour at a time, with the clear translucent bill a most striking object. They would spread one or both wings at a drooping angle of 45 deg. with the body. Again they would sit low down in the shade out over the water watching for fish in the little stream near their nests. Though shy and wary, hard to see even when constantly heard, to one who would sit quietly they become a most charming feature of the landscape.

Dresser says "Respecting their nesting habits, I find nothing on record" though of course they follow the customs of their family. I found three nests, each of which was the regulation hole in a bank. The Chinese said that they also nested in holes in rotten branches of trees, and some young birds were brought me, which they said were taken from such a nest, but I could not get them to take me to it, so that it is still doubtful whether this kingfisher ever so departs from the traditions of its race as to dig in rotten wood rather than in a clay bank. One nest was in a loess bank by a stream, about two feet from the top of a twelve-foot bank. The birds had tried in vain to dig in hard clay and in loose sand and had finally triumphed over the difficulty by constructing the hole at the top of a stratum of sand, easily excavated and yet with the hard earth stratum above it for a roof that would not cave in, held together still more firmly by the grass sod on top. The hole was four inches in diameter and about a meter in depth, slightly rising to the rear where it was enlarged to accommodate the four fledglings. At the mouth there was a ridge in the centre of the passage way with a groove $\frac{1}{4}$ of an inch deep on each side worn by the feet of the old birds as they went in and out. The floor of the passage was paved a half inch deep with a collection of the *débris* from the food of the young. This *débris* was mostly the black wing-covers and carapaces of dung beetles. It was moist with the juices of the insects, and formed a crust on the sand, which held together in plates as we dug away the opening. There were also the hard parts of locusts and grasshoppers still moist from the juices of the soft parts. There were no signs of fish remains although the smell of fish was strong for some distance about the nest and doubtless fish formed part of the food. The old birds were very careful not to enter the nest while we watched, but one of them sat on a tree thirty yards away across the stream and scolded loudly all the time we were examining it. We watched in vain for half-an-hour to see them return, but we know they did for they continued the care of the brood. On July 9th the young, nearly full sized, and probably a week or more old, looked like bluish hedgehogs with the pin-feathers that bristled all over them. In another nine days, they were handsomely feathered and able to fly two hundred yards at a stretch. Another nest found near camp was in a low bank about five feet from the bottom and a foot from the top. It sloped upwards to about six inches from the surface of the ground above at a depth of 34 inches from the face of the bank. This contained five fledglings. Their main food also was beetles, but they had plenty of fish, and, I think, the remains of a frog and of fresh water shrimps, and mole crickets in their gizzards. Some small boys robbed both nests and brought me in all eleven young to sell. I gave them a few coppers to take them back to the nest, which they did, the old birds adopting the

THE CHINA JOURNAL OF SCIENCE & ARTS

extra ones that came as they said from the nest in the tree. When entering the nest the old bird would swoop down to the surface of the water and rise with a sweep to the hole, entering and leaving in an instant, with an interval of ten to twenty minutes between trips. When suspicious of watchers they would sit for fifteen or twenty minutes on a tree fifty yards to one side of the nest, to which they had come by stealthy flights, behind other trees and banks. At other times, when confident of safety, they flew in one bold flight to the hole, but always made the dip to the surface of the water in front.

The Chinese at the Western Tombs and elsewhere called them *hsı ch'iao ts'ui*, or turquoise magpies, referring to their blue colouring and black and white markings, just as the roller is called *lao kua ts'ui*, or turquoise crow, being dark like a crow with blue markings. In Peking the kingfisher is called *ch'in chiao tsui*, or red pepper bill, for the bill resembles small red peppers in size, shape and colour.

THE GENETICS OF TWO MUTATIONS IN THE FRUIT-FLY, DROSOPHILA MELANOGLASTER.*

BY

TSE-YIN CH'EN.

INTRODUCTION

In Sturtevant's monograph on "The North American Species of *Drosophila*" 202 species are described under the genus *Drosophila*, from the main faunal regions of the world. These "dew-lovers" as the name *Drosophila* literally means, of such wide occurrence, are no doubt of cosmopolitan distribution. As to the occurrence of these flies in the Asiatic continent and in China particularly, though they are found in that part of the Oriental region, like Australia and New Zealand, so far no reference to them in China has been made. This is because China is a virgin field of faunal and floral life. But there is no reason why *Drosophila* should not be found widely distributed in this country. Indeed three species of *Drosophila*, two in Peking and one in Shanghai, have already been secured. One of the Peking species has been identified by Dr. Sturtevant of Columbia University as normal *Drosophila melanogaster*, while the other Peking species and the one found in Shanghai were reported by him as unknown at present.

This tiny little fly, *Drosophila melanogaster*, has in recent years come to be widely used in the study of heredity. The Chromosome Theory of Heredity that is now generally accepted is based chiefly on the results obtained with this fly which has come to be one of the most famous experimental organisms in Biology. It has many well-defined characters, such as eye-colour, wing-pattern, body-colour and others that can be easily observed under the hand-lens. Another advantage is the short life cycle. A pair of these flies produces two to three hundred descendants that in turn are ready to produce similar families of their own within two weeks. It lives successfully upon a bit of banana in a milk bottle plugged with cotton. For specific study, however, a carefully prepared medium is used.

The first paper on the Genetics of *Drosophila* was published in 1906. (Castle, W. E., et al.—The Effects of Inbreeding, Cross-breeding and Selection upon the Fertility and Viability of *Drosophila*—Proc. Amer. Acad. Arts and Sci. 41.) The first mutation, the white eye colour, in *Drosophila melanogaster* was reported in 1910. (Morgan, T. H.—Sex-linked inheritance in *Drosophila*—Science 32, pp. 120). Since that time about 150 books and papers dealing with heredity in *Drosophila* have been published. About 250 different mutant types have been discovered and studied, and at least 10,000,000 living individuals have been etherized and examined by scores of investigators. The problems studied include practically every branch of the subject of heredity. Because of the ease with which it can be reared, and its mutating condition, *Drosophila* has proved to be a veritable bonanza to the geneticist.

* A Thesis presented to the Faculty of the College of Science and Arts, Peking University, as partial fulfillment of the requirements for the degree of Master of Arts.

The great work of Mendel in heredity can be summarised in the form of two laws : the law of Segregation and the law of Independent assortment of the Genes. But though his statements were exact, they were made without any suggestion as to how the processes involved take place in the living organism. Sutton, in 1902, was the first to point out clearly how chromosomal mechanism, which was at that time the subject of much investigation, supplied the necessary mechanism to account for Mendel's two laws. Since that time much careful work in Cytology has thrown light on the nature of the nuclear structure of germ-plasm to the minutest details, and on the basis of these facts has been formulated the generally accepted Chromosome Theory of Heredity. As a result of this cytological work the following facts are established. At each cell division the chromatin or the deeply staining portions of the nucleus becomes resolved into a number of separate bodies known as Chromosomes. The number of chromosomes in each cell of any individual is constant and characteristic, of the species to which the individual belongs. Not only so, but each chromosome possesses a definite individuality. It appears to be made up of a definite number of chromatin elements called chromomeres. Not only is each chromosome made up of a definite number of chromomeres, but each of these smaller bodies is regarded as occupying a definite place in the chromosome. The experiments and observations of the last two decades have led to the conclusion that the chromosomes are the bearers of hereditary materials, and the increasing cytological knowledge of gametogenesis has made it clear that they are qualified to serve as the material basis of heredity. The chromomeres are identified by some modern workers as the material substance responsible for the development of morphological characters of an individual such as hair colour in man and wing pattern in flies and so forth. In the terminology of genetics they are called factors or genes. An individual, therefore, genetically speaking, is the complex expression of the factors or genes which he has. The characters are produced by factors or genes which lie in the chromomeres. These make up the chromosomes that can be studied and observed under a microscope. The recent work in genetics, therefore, puts the question of heredity on a physical basis.

In *Drosophila melanogaster* there are four pairs of chromosomes. The factors or genes that give rise to the morphological characters in *Drosophila* fall into four groups corresponding to the four pairs of chromosomes of the same, and furthermore the relative sizes of these groups correspond roughly to the relative sizes of the different pairs of chromosomes. There is a large group of sex-linked factors all of which display the same type of inheritance of sex-linked characters. The white-eye is the well-known example. This group corresponds to the X-chromosomes. There are two groups of factors which correspond to the two large pairs of autosomes. Finally, there is a small group consisting as yet of only two characters which corresponds to the small pair of autosome.

If the characters of Extreme Rudimentary and Yellow found in the Peking strain of *Drosophila melanogaster* are to be explained on the basis of the chromosome theory of heredity, then they are to be ascribed to two given factors or genes which are located in the chromosomes and at

THE GENETICS OF TWO MUTATIONS, ETC.

particular loci in the chromosome mechanism. Thus the problems at issue are : (a) to determine the genetic behaviour of Yellow and Rudimentary, (b) to determine in what chromosome these factors lie, and (c) to determine their relation to other factors in the same chromosome.

MATERIAL AND METHOD

A. The Material.—The material used in this experiment consisted of local wild banana flies, *Drosophila melanogaster* secured in July, 1922, from a fruit-store in Peking. Since the store is located only three minutes' walk from the College, it was suspected that they might be descendants of *Drosophila* (brought from the United States) which were being bred in the Laboratory, for it is quite possible for them to travel such a short distance. An effort was made to collect some wild ones outside of the city, several miles away from the school. This was eventually carried out with success. Information from fruit-men told that these flies have been here for a long time and they come in from year to year. When banana skins turn black they soon appear in summer time. They are known to fruit-men as "fast-eating flies."

*B. Method of Rearing *Drosophila*.*—The fly food used in the preliminary tests was prepared according to the Alcohol-Banana Method. The pulp of sound ripe bananas was put in a shallow wide-mouthed dish and covered with enough 3 per cent. alcohol. The dish was covered to keep from infection and contamination. Since enough wild yeast was usually present in ripe banana pulp, no yeast was added. The food was at its best when it had fermented for about 24 hours. The optimum amount of fermented bananas was about 50 grams per 300 cc. bottle, or 25 grams per 120 cc. bottle. The large bottles were used for mass culture and the small bottles were used for pair culture. The banana was put upon the bottom of the culture bottle and absorbent paper strips were matted down on the top. On small scale and general work this method gives fairly good results, but the disadvantage in this method is that the food is susceptible to mold and bacterial growth. When such growth occurs the food value is not uniform and so hinders the growth of the flies. Moreover, data from such cultures will hardly be reliable and accurate. The food condition was improved and found fairly sure and uniform through the rest of the tests by the use of Bridge's Agar-Banana Method. It was prepared according to the following formula :

1. Peel sound ripe or over-ripe bananas and weigh the pulp (100 grams is sufficient for four bottles).
2. Weigh dry agar-agar, 2 grams for four bottles.
3. Place in readiness the bottles which should have been washed and properly sterilized. Grind up some magic yeast. Prepare squares of absorbent paper 3-in. by 2-in., and cotton. The cotton may be used over and over again, but should be dry sterilized after each experiment by enclosing over formalin. Cotton stoppers are better covered with very soft clean cheese-cloth or paper.
4. Add agar-agar to the water, e.g., 2 grams of agar-agar to 100 cc. of water, and heat until the agar has dissolved.

THE CHINA JOURNAL OF SCIENCE & ARTS

5. Press and wash the bananas through a coarse sieve or with knife and rods.
6. Stir the bananas into the hot agar solution. Mix the solution thoroughly. The mixture should not be heated any longer.
7. With ladle and funnel pour about 50 cc. of the solution into each half pint bottle.
8. Sprinkle top lightly with yeast powder.
9. Put in contact with medium the absorbent paper.
10. Stopper with cotton.
11. Use on the same day as soon as the medium cools. Not good after two days.

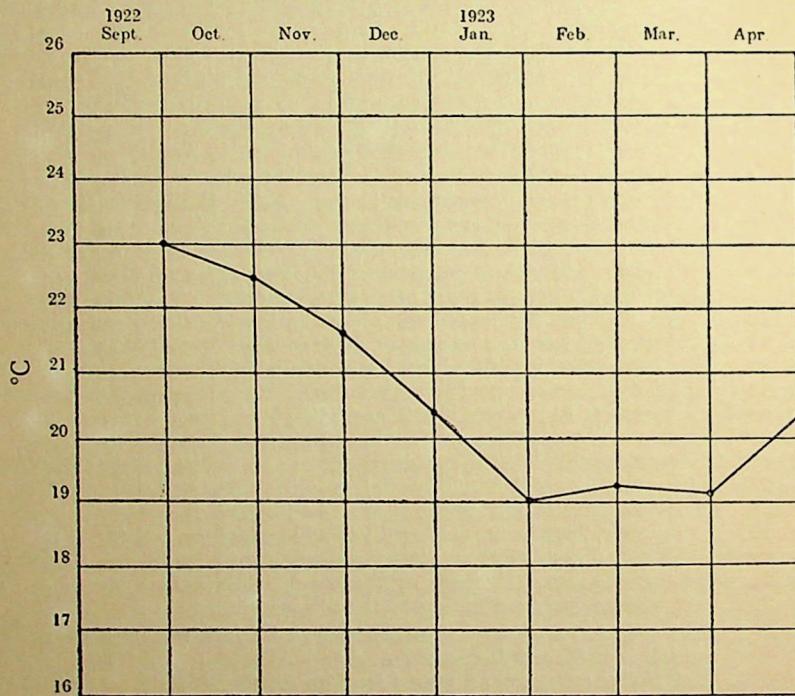


Diagram I.—Graphic representation of the Temperature from September 1922 to April 1923 inclusive.

Flies were mated in small vials first and then transferred to the culture bottles at the end of the same day or the next morning. The progeny from each crossing were counted and examined under the hand lens or microscopically after being etherized just long enough to render them motionless.

THE GENETICS OF TWO MUTATIONS, ETC.

C. Temperature.—The whole experiment was carried through in a building heated with radiating steam system from November, 1922, to April, 1923. The temperature during that period was fairly even and rather dependable. The range of temperature during the period from September to April was from 17° C. min. to 23° C. max. and with a difference of 3° C. between the day and night. The readings of temperature during that period are presented in Table I, and also plotted in Diagram I.

TABLE I. READINGS OF THE TEMPERATURE IN D, FROM SEPTEMBER, 1922 TO APRIL, 1923 INCLUSIVE.

Date	1922 Sept.	Oct.	Nov.	Dec.	1923 Jan.	Feb.	Mar.	Apr.
1	30	23	21	21	18	21	18	21
2	26	22	20	21	17	21	18	21
3	23	23	21	21	17	21	20	20
4	25	22	21	20	17	21	20	20
5	25	22	21	20	17	22	20	18
6	24	24	21	20	19	22	21	18
7	25	23	21	21	19	21	18	17
8	24	22	20	21	19	21	19	18
9	24	20	19	21	19	21	19	18
10	23	23	20	21	20	21	19	18
11	25	25	20	21	20	20	19	19
12	24	23	21	21	20	20	18	19
13	23	23	22	20	20	20	19	19
14	25	23	22	20	19	20	19	20
15	23	24	21	20	19	19	20	20
16	24	23	21	20	20	19	20	21
17	22	21	22	20	20	19	21	20
18	20	22	22	21	19	21	21	22
19	21	23	22	21	20	21	21	22
20	23	23	21	20	20	21	20	23
21	24	22	22	22	19	19	20	23
22	20	24	22	21	19	19	20	22
23	22	22	22	21	19	21	20	22
24	22	23	21	20	18	21	21	20
25	21	21	21	20	18	18	21	20
26	22	22	21	20	20	18	20	23
27	20	22	21	21	20	18	21	23
28	19	23	21	21	20	18	21	22
29	20	22	21	21	21	—	21	22
30	23	22	21	18	21	—	20	23
31	—	20	—	17	21	—	21	—
Average	23	22.5	21.7	20.4	19	19.4	19.2	20.4

PEKING FLY AND THE MUTANT CHARACTERS

The Rudimentary flies originated from the Peking strain of *Drosophila melanogaster*, and the Yellow from a cross involving wild females and Rudimentary males.

A. *Drosophila Melanogaster from Peking*.—The upper surface of the thorax is olive yellow, the olive shade being very faint. The colour deepens as the flies get older. Some of the wild flies have a black trident pattern on the thorax, but many of them do not show this marking. The trident marking varies in colour intensity. The abdomen of the females is banded with lemon and black. In the males there are three bands as a rule, the end of the abdomen is black. The wings are very transparent, blue or gray in colour. The veins appear dark, but are seen to be dark brownish yellow under the microscope. The under surface of the abdomen is more yellow in the males. The upper surface of the head is coloured like the thorax. These flies are normal *Drosophila melanogaster*.

B. *Rudimentary Flies*.—On the fifth of September, 1922, a single male fly with short wings appeared in the third generation of the Peking strain of *Drosophila melanogaster*. A close examination showed that this short winged fly had wings not long enough to reach the tip of the body but only to the next segment to the last. The tip of the wing was broad and the wing had a wrinkled surface. Later, in the short winged flies that have newly emerged, it was found that at the tip of each wing there was a drop of clear liquid enclosed in a sac formed by the wing itself. The liquid was found to be acid in reaction. Evidently the circular area on the wing of fully grown short winged flies was the remnant left by the liquid sac, and the wrinkled surface in that area was produced by the shriveling of the sac as the liquid dried up. It was also found that the short winged character was subject to considerable variation. The variability of this is given in more detail in a separate section. In every respect this mutant character is like the wild fly except the wing character described above. This mutant character has been identified by Dr. Sturtevant as an extreme form of Rudimentary. Some flies show the character in more extreme form.

C. *Yellow Flies*.—On the morning of November 28th, 1922 two flies of yellow body colour and wing colour were picked out from flies of the second generation, or F_2 of a cross (RMab2) between wild females and Rudimentary males. Two more flies of that yellow character came out on the following morning from the same culture. Still one more yellow fly came out on the third day. Thus five yellow flies, all of them males, were secured from this cross (RMab2) in three successive days. The character yellow is very obvious and can be distinguished from the gray of normal flies with ease. The upper surface of the thorax is yellow ochre in colour and lighter than that of wild flies. The dark markings which are present in some of the wild flies are always absent from the yellow flies. The light bands on the abdomen are of the same colour as the thorax, i.e., pure yellow ochre.

THE GENETICS OF TWO MUTATIONS, ETC.

and lighter than those of wild flies. The dark bands are deep brown. The legs are the same colour as the thorax. The veins of the wings are yellow. The hairs on the body and legs are deep brown, instead of black as in the wild flies.

Both Rudimentary and Yellow came out suddenly, bred true, and met all requirements for a mutation. The Rudimentary first appeared in Morgan's stock in June 1910 and was the second sex-linked character found in *Drosophila*. The Yellow occurred in January 1911 first in black stock and later in gray stock kept by Morgan.

INHERITANCE OF "RUDIMENTARY" AND "YELLOW"

The study of the inheritance of the "Rudimentary" and "Yellow" characters was divided into three sections. In the first place their Mendelian inheritance in the F_1 and F_2 generations. Secondly localization of the factors or genes which gave rise to Rudimentary and Yellow in the chromosome group. Lastly the determination of the relative locus the two genes occupied in the chromosome mechanism.

A. Mendelian Inheritance of Rudimentary and Yellow.—The Rudimentary males were crossed with wild females. In the F_1 appeared wild type flies both males and females, none of them showing the rudimentary character. In the F_1 2,302 flies were secured of which 1,125 males and 1,177 females. The distribution of sex was, therefore, very even in the ratio of 1:1. From the above figure the rudimentary character is in the Mendelian terminology recessive to the long wing of wild flies. In the F_2 the Rudimentary character came out again, but confined solely to males, none of the females showing that character. Rudimentary is thus a sex-linked character. In the F_2 generation flies came out in a total number of 2,492, of which 1,575 males and 2,560 females of wild type, and 777 males of Rudimentary type. The sex ratio is about 1:1, but the Mendelian ratio of a monohybrid crossing in F_2 has been modified into sex-linked ratio. And the sex-linked ratio of Rudimentary and long (wild type) is approximately 1:7, a departure from the typical one. This is due to the low viability of flies having this character. The F_1 females of a crossing in which wild females and Rudimentary males are mated are back crossed to Rudimentary males. In the F_1 of the above crossing flies of Rudimentary character appeared in males and females. In the F_1 5,885 flies were secured, of which 2,470 were males and 2,626 females of the wild type, and 451 males and 341 females of the Rudimentary type. The sex-linked ratio is 1:1, and the ratio of Rudimentary and wild types is 7:1. The ratio, however, is not what is expected and needs further explanation. The Rudimentary flies were self-crossed and left no offspring at all. The Rudimentary females were mated to males of other strains and produced very few offspring. The infertility of the Rudimentary females is treated more fully elsewhere in the separate section.

Like Rudimentary Yellow exhibits also the sex-linked inheritance in the F_2 . Yellow males were crossed with wild females. In the F_1 there were flies of the wild type in males and females. In the F_1 524 flies were secured of which 274 were males and 254 females. The

THE CHINA JOURNAL OF SCIENCE & ARTS

TABLE 2. WILD TYPE ♀♀ × RUDIMENTARY ♂♂

Reference	F ₁ Males		F ₁ Females		Total
	Wild	Rudi.	Wild	Rudi.	
WRAa	73	—	65	—	138
WRAb	103	—	158	—	261
WRAc	114	—	121	—	235
WRAdd	71	—	78	—	149
WR Ae	103	—	127	—	230
WR Af	162	—	131	—	293
WR Ag	158	—	143	—	301
WR Ah	141	—	169	—	310
WR Ai	95	—	90	—	185
WR Aj	105	—	95	—	200
Total	1,125	—	1,177	—	2,302

TABLE 3. WILD TYPE ♀♀ × RUDIMENTARY ♂♂

Reference	F ₂ Males		F ₂ Females		Total
	Wild	Rudi.	Wild	Rudi.	
WRCa4	192	23	266	—	481
WRCa6	67	45	117	—	229
WRCb2	69	52	121	—	242
WRCb3	61	38	74	—	173
WRCb5	99	41	119	—	259
WRCb6	31	9	37	—	77
WRCb7	83	72	186	—	341
WRCb8	74	48	142	—	264
WRCc1	47	27	81	—	155
WRCc2	93	53	148	—	293
WRCc4	90	33	117	—	240
WRCc5	32	14	64	—	110
WRCe6	105	50	185	—	340
WRCd1	65	—	105	—	170
WRCd2	29	19	46	—	94
WRCd3	17	14	17	—	48
WRCd4	17	4	30	—	51
WRCd5	23	17	49	—	88
WRCd6	43	31	80	—	154
WRCd7	48	16	66	—	130
WR Ce1	39	34	98	—	151
WR Ce2	42	21	70	—	133
WR Ce3	66	50	84	—	200
WR Ce5	36	20	56	—	112
WR Ce6	71	41	151	—	267
WR Ce7	36	5	51	—	92
Total	1,575	777	2,560	—	4,912

THE GENETICS OF TWO MUTATIONS, ETC.

TABLE 4. WILD TYPE ♀♀ × RUDIMENTARY ♂♂.

B. C. F₁ WILD TYPE ♀♀ × RUDIMENTARY ♂♂

Reference	F ₁ Males		F ₁ Females		Total
	Wild	Rudi.	Wild	Rudi.	
WRBa	89	15	125	13	242
WRBb	55	19	70	16	160
WRBc	17	1	27	1	46
WRBd	37	2	36	1	76
WRBe	54	3	61	2	120
WRBf	56	4	64	2	126
WRBg	133	12	191	14	350
WRBh	101	13	128	26	269
WRBi	109	23	102	39	273
WRBj	134	42	104	39	319
WRBk	199	14	196	22	431
WRBl	192	50	134	28	404
WRBm	122	13	158	19	312
WRBn	77	11	84	16	188
WRBo	105	22	123	14	264
WRBp	32	12	64	—	108
WRBq	82	20	70	13	185
WRBr	72	20	75	15	172
WRBs	219	37	194	20	470
WRBt	220	46	231	11	507
WRBu	149	32	142	10	333
WRBv	216	40	246	20	522
Total	2,470	451	2,626	341	5,888

TABLE 5. WILD TYPE ♀♀ × YELLOW ♂♂

Reference	F ₁ Males		F ₁ Females		Total
	Wild	Yellow	Wild	Yellow	
WYAA	34	—	41	—	75
WYAb	35	—	28	—	63
WYAc	70	—	63	—	133
WYAd	53	—	46	—	99
WYAc	82	—	76	—	158
Total	274	—	254	—	528

THE CHINA JOURNAL OF SCIENCE & ARTS

TABLE 6. WILD TYPE ♀♀ × YELLOW ♂♂

Reference	F ₂ Males		F ₂ Females		Total
	Wild	Yellow	Wild	Yellow	
WYBa1	228	140	279	—	547
WYBa2	174	197	535	—	906
WYBb1	159	159	329	—	647
WYBb2	151	173	374	—	698
WYBc1	126	126	292	—	544
WYBc2	77	69	225	—	371
WYBc3	78	63	210	—	331
WYBc4	164	124	304	—	592
WYBd1	166	133	251	—	515
WYBd2	141	120	209	—	470
WYBd3	215	162	234	—	611
WYBe1	161	133	237	—	530
WYBe2	182	164	245	—	591
WYBe3	193	151	229	—	573
Total	2,050	1,914	3,953	—	7,917

TABLE 7. WILD TYPE ♀♀ × YELLOW ♂♂.

 B. C. F₁ WILD TYPE ♀♀ × YELLOW ♂♂

Reference	F ₁ Males		F ₁ Females		Total
	Wild	Yellow	Wild	Yellow	
WYCa1	180	142	173	164	659
WYCa2	202	149	189	141	681
WYCb1	255	199	253	212	819
WYCb2	179	151	207	169	606
WYCc1	145	148	147	137	577
WYCc2	141	136	169	135	581
WYCd1	157	137	162	133	589
WYCd2	112	133	147	148	540
WYCe1	194	161	173	164	692
WYCe2	175	170	166	172	683
Total	1,740	1,559	1,753	1,565	6,627

sex-ratio is therefore 1:1. In the F₂ 7,917 flies came out with 2,050 males and 3,953 females of the wild type, and 1,914 males of the Yellow type. The sex-ratio is 1:1. The ratio of Yellow and wild type is normal. The F₁ females of a cross between wild females and Yellow males were back crossed to Yellow males. The Yellow character appeared in both males and females in the F₁. The flies secured in F₁ totaled 6,627, of which 1,740 males and 1,753 females were of the

THE GENETICS OF TWO MUTATIONS, ETC.

wild type, and 1,559 males and 1,565 females were of the Yellow type. The sex-ratio is 1:1. The ratio between wild type and Yellow is 1:1. The Yellows were inbred and proved to be very fertile. The Yellow character is therefore recessive to the wild type and is sex-linked as it appeared in males only in F_2 of a cross between wild females and Yellow males.

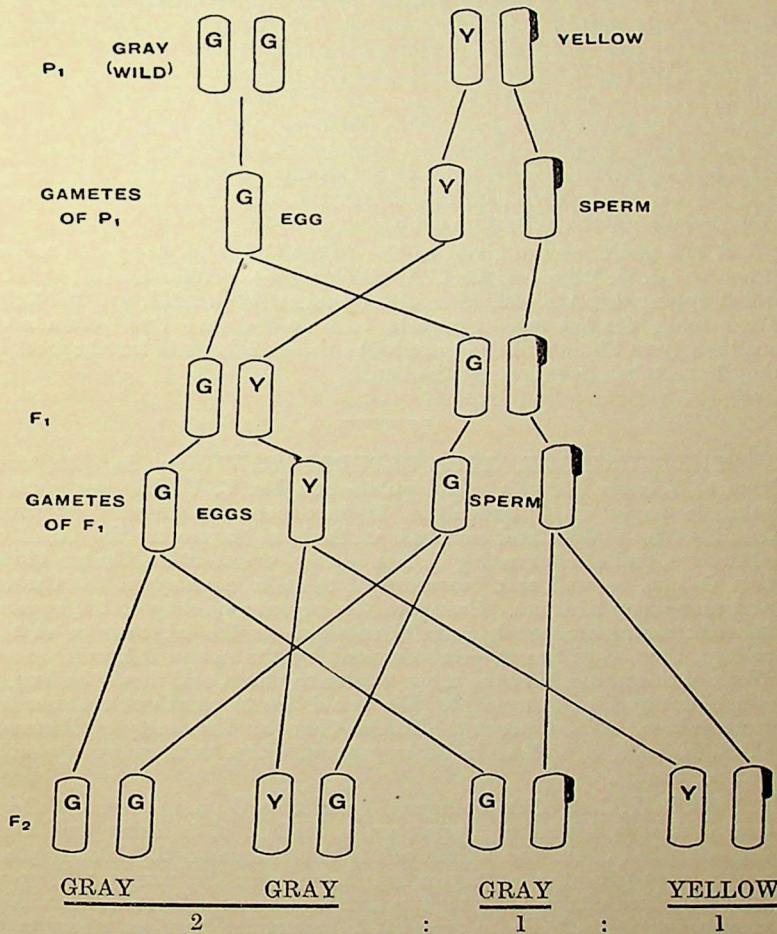


Diagram II.—A Cross of Gray (wild) Females with Yellow Males—A typical Sex-Linked Inheritance

(To be continued.)

BIOLOGICAL NOTES AND REVIEWS

In the 1923 issue of the *Journal of the North-China Branch of the Royal Asiatic Society*, which was issued early in the summer, there is considerably less material of a biological nature than there was in that of 1922. We feel, however, that it does not suffer on this account, being full of valuable material of more general interest. Mr. A. P. Jacot continues his paper on "Oribatoidea Sinensis," which deals with certain forms of mites found in China and neighbouring regions, and describing some new forms, and giving notes on previously known forms. Mr. Jacot is doing extremely useful biological research work in China, as this and other papers published by him show.

A few additions are given to the "Partial Bibliography of Chinese Birds" by J. H. Riley and Dr. C. W. Richmond (Smithsonian Institution) which appeared in the 1922 issue of the journal (Vol. LIII, pp. 196-237). These make the list more complete, and we feel sure that students of ornithology in China will feel grateful to these authorities for the trouble they have taken in preparing the list.

THE LINGNAAM AGRICULTURAL REVIEW: In the first issue of Volume I of this useful publication Mr. C. W. Howard gives a valuable paper on "Sericulture Improvement in China." It gives details of up-to-date and scientific methods of improving the breed of silkworms, and of eliminating disease as carried out at the Canton Christian College, as well as a summary of the silk industry in the Canton and Hongkong districts. Owing to the superior quality of the eggs of the silk moths secured by careful selection in the laboratories of the college, these eggs are in great demand by the native silk cultivators. Work of this nature is of the utmost value to China, and should be largely subsidized by the government. We would like to point out that similar work is being carried out at the Fukien Christian University by Professor C. R. Kellogg, as well as in other parts of China with eminently satisfactory results.

Mr. G. W. Groff of the College of Agriculture, Canton Christian College, contributes an interesting paper on a method of indexing and filing Chinese plants. As the writer points out "Indexes to Chinese plant names that give the corresponding Latin scientific names will prove indispensable links in bringing together Chinese and Western knowledge concerning plants." So he proceeds to summarize previous attempts to do this, coming to the conclusion that the "logical procedure of those interested in the flora of China is to encourage the organization of district herbaria where local plants will be collected and names assembled, and where these will be linked to their Latin equivalents only by national or

BIOLOGICAL NOTES AND REVIEWS

world-renowned botanists, who alone are sufficiently equipped and experienced to do so." We would refer all systematic botanists in China to this paper, from which they will obtain many useful suggestions. Valuable work along the lines suggested is being carried out at the college in question. On page 59 an example of the systematic classification used is given.

Dr. Frank Oldt gives "A Preliminary Report of Hookworm Investigations," which shows that such work is of the utmost importance, as a very large proportion of the agricultural population of this, and presumably other, parts of China is infested with this noxious parasite.

PHILIPPINE SHARKS AND EELS: In *The Philippine Journal of Science* (Vol. 23, No. 1, July, 1923) issued by the Bureau of Science, Manila, Mr. A. W. C. T. Herre publishes notes on some Philippine sharks, describing a new genus, *Hermitriakis* and a new species *H. leucoperiptera*. The whole of the August issue of the same journal is devoted to "A Review of the Eels of the Philippine Archipelago" by the same authority. We call the attention of students of marine ichthyology to these papers, owing to the fact that the marine faunas of South China and the Philippines are very closely related, in many cases identical. There is a lamentable paucity of literature on Chinese fishes, especially marine, and the student has to turn to that dealing with the fishes of neighbouring countries for the information he requires.

The Japanese marine fishes have been well studied, and an abundant literature upon them is in existence. This helps the student of Chinese ichthyology, since many of the Japanese forms occur in Chinese waters. The same applies to the ichthyology of the Philippines, so that a monograph, such as Mr. Herre's paper on the eels is in effect, must prove of value to research workers in China.

BIOLOGICAL COLLECTING IN FUKIEN. This summer Kuliang, near Foochow, was made the headquarters of several biologists in China. These were Professors S. F. Light and Chung of Amoy University, Professor Kellogg of Fukien Christian University, Foochow, and Mr. A. de C. Sowerby for the United States National Museum, who with their native assistants made collections of all kinds of animals and plants, taking excursions in different directions for this purpose. Professor Chung, M.A., of Harvard University, being a botanist, devoted his time to plants, making a very extensive and valuable collection for the Amoy University. Professor Light was specially interested in termites (white ants) and was very successful in securing several forms hitherto unrecorded from China, and at least one new species. He secured the first fully developed queen termite that has been reported from China. He also collected reptiles, amphibians, fishes and insects. Professor Kellogg devoted his time to insects, while Mr. Sowerby, with his own assistant, and the taxidermist of the R. A. S. Museum, Shanghai, secured specimens

THE CHINA JOURNAL OF SCIENCE & ARTS

of birds, mammals, reptiles, amphibians, fishes, and insects. Nothing very remarkable was secured, except what may turn out to be a new species of Silurid fish, though the collections made were thoroughly representative of the area covered at that season of the year. The wet weather was much against field work, especially in regard to the collecting of reptiles and insects, while both birds and mammals were found to be very scarce.

Professors Kellogg and Light made a short excursion to Hai-tan Island near the mouth of the Min River, where they investigated the marine animal life of the beaches and neighbouring mud-flats. Here they encountered some large colonies of small brightly coloured crabs, which occurred in swarms, and had the remarkable ability of apparently changing colour, *en masse*, their numbers being so great as actually to alter the colour of the mud flats when these changes took place. The well-known Chinese king-crab (*Xiphosura longispinus*) swarms on to the mud-flats along the south-eastern coast of China to breed, occurring in pairs half submerged in the mud. The natives catch them and sell them as food, while the horse-shoe shaped carapace is used to make water dippers.

Later Mr. Sowerby and the R. A. S. Museum assistant secured a collection of marine fishes containing a number of interesting forms not hitherto represented in the Museum.

BIOLOGICAL COLLECTING IN HAINAN ISLAND.—Mr. Clifford Pope, assistant zoologist of the Third Asiatic Expedition of the American Museum of Natural History, has returned from a ten months' stay in Hainan Island where he made extensive collections of mammals, reptiles, amphibians and fishes, the three latter branches of animal life being his specialty. Mr. Pope has been over a considerable part of China, including Shansi, Chihli, Shantung, and Hunan. While in Shansi he secured specimens of trout, the only place such fish have been discovered in China outside the Eastern Tombs area in North-eastern Chihli. His collections in Hainan Island were very satisfactory, containing a great many varieties of reptiles and amphibians, as well as numerous species of fresh-water fish. Of mammals he and his native assistants collected over 900 specimens representing between thirty and forty species. He reports that the natives maintain that the island supports two species of bear and many large deer, in which line, however, he did not secure much, as his time was devoted to his herpetological and ichthyological work. Throughout his work in China Mr. Pope has carried with him a native artist whose sole occupation is to make accurate colour drawings of the reptiles, amphibians and fishes collected, which, having to be preserved in spirits or formaline, soon lose their original colours, often very bright and attractive. In this way valuable records of colour as well as of the natural forms of soft-bodied specimens, which have a tendency to shrivel up in preservatives, are kept, and these will prove of the utmost value when the collections come to be worked out. This material has been shipped to America, where it will be worked out by Mr. Pope and others as soon as possible.

OBITUARY

We deeply regret to have to announce the death at a comparatively early age of a young and very promising field naturalist, Charles M. Hoy, who was sent to China early this year by the United States National Museum to make biological collections in the Yangtze Valley. He died after an operation at Kuling last September.

Some of our readers will remember an interesting article on the "White Flag" dolphin of the Tung Ting Lake in our March issue, in which Hoy described his capture of the first specimen of this interesting cetacean, and how it was this capture that altered his career. Through it he got into touch with the authorities in the Smithsonian Institution, who secured for him a post on the United States Biological Survey. Here he got his training as a collector and field naturalist. During the war he joined the American Navy. He got his discharge soon after the Armistice was signed, and was sent by the Smithsonian Institution to Australia, where he made remarkably good collections of the fast disappearing marsupial mammalian fauna, fully justifying the confidence placed in him. On his return to America he asked to be allowed to collect in China for a while, and so was sent to this country, where he has been doing excellent work during the late spring and summer. Hoy was one of those men in whose ears the "call of the wild" rings louder than any other, and who can only be happy in the wilderness, studying its denizens, hunting, fishing, or making collections of the wild things about them. They cannot and will not live any other life, and it is from their ranks that collectors and explorers are drawn. They are none too numerous. Love of the wild is inherent in most people to a certain degree, but it is seldom so strong that to gratify it the individual will forsake all else—the comforts of civilization, its security, pleasures, and sociability, and seek instead the hardships, dangers, privation and loneliness of the wilderness. Hoy was one of these, however, and had he lived was bound to have made a name for himself. The Smithsonian Institution and the world at large have suffered a great loss in the passing of this young man. Our deep sympathy extends to his parents, who are missionaries in Yo-chow, Hunan.

SHOOTING NOTES.

THE BLUE SHEEP IN SHANSI. In regard to this animal a correspondent writes :

“ With further reference to the question of the range of the Bharal in China, I enclose three photographs showing the one shot by Captain V. James (15th U. S. Army) in the North of Shansi—or I think more correctly over the border into Mongolia—last China New Year.

“ Colouring :—From the hide and head of this specimen I should say that the general colouring of the fur is what might be described as grey with just a tinge of brown-green. Belly white, with a black line dividing this from the general grey. Darker—almost black line (indefinite) running down the spine to a short stumpy tail bordered with white, as is also the underside of same. Knees and feet black. White band along the hoof (fur) and on back of legs. Head is general grey, lighter from the eyes to the muzzle with a dark line from forehead to nose. Nose and lips black. It has a slight beard or rather longer hair down the throat which is decidedly darker in hue until it reaches the chest where it is very dark. It seems to have the same excretion glands below the eyes (as in the ordinary wild sheep?—Ed.) which part is also darker than the general colouring.

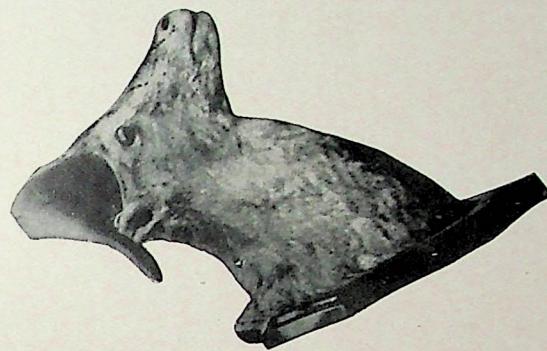
Horns :—In this specimen which I do not consider a fully matured beast the horns had a basal circumference of 11-in. with a length of 18-in. along the curve. The horns are typical of the Barhal in that they grow upwards in a curve from the top of the head and then down and back. They were of an olive grey very slightly corrugated—almost smooth and as in Barhal flattish on top but cylindrical elsewhere.

Ears :—Distinctly goatlike, dark on the outside, fringed with white and light-grey on the insides.

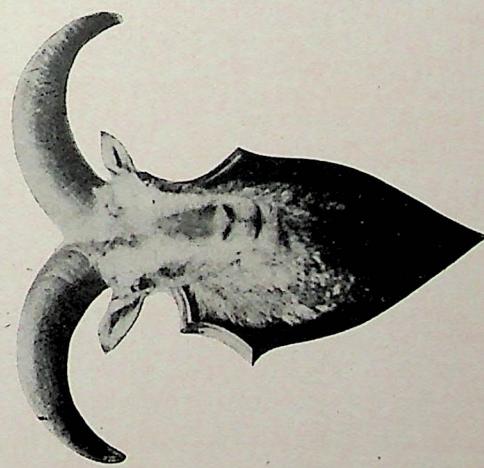
Size :—Difficult to judge from the hide but should estimate roughly about 30-in. at the shoulder. Head about a fifth longer than a roedeer's, say 12-in. long.

Habit :—As far as I can ascertain they inhabit the same locality as the bighorn sheep bordering that of the Wapiti, but in this district the mountains are not as precipitous as those in the Kweihua district. They seem to collect in flocks as do the sheep and frequent the boulder strewn slopes.”

As pointed out in a previous number of this journal the blue sheep of China has recently been separated from the Himalayan form by Lord Rothschild (*Ann. & Mag. Nat. Hist.*, Ser. 9, Vol. 10, No. 56, 1922, p. 231) who described it under the name *Pseudois nahoor szechuanensis*, basing



Side View



Front View

Head of a Bharal or Blue Sheep shot in N.W. Shansi

SHOOTING NOTES

his description on specimens from Shensi and Szechuan. Comparing his description with the one here given we must assume that the North Shansi sheep belongs to the same subspecies or race. It is of extreme interest to sportsmen in China that this sheep has been discovered within comparatively easy reach of the coast. We may now say definitely that it occurs in West Szechuan, South-western and Northern Kansu, Southwestern Shensi, and North-western Shansi, from all of which places it has been secured by sportsmen within the last few years.

We do not quite understand what our correspondent means in referring to the coat of the specimen under discussion as having "just a tinge of brown-green." His estimate of the height at the shoulder of the specimen is probably away below what it should be, to judge from the mounted specimen of a blue sheep in the R. A. S. Museum in Shanghai.

THE RIVER DEER IN NORTHERN ANHUI. The following comes to us from a correspondent at Penpu, on the Tsin-Pu Line, Anhui:

"On the 15th inst., at Suyihsien, on the Hungtze Lake, North Anhui, I shot what I believe to be a specimen of the Yangtze Valley deer. It was brown in colour and stood thirty inches high at the shoulder. It had no horns, but from its upper jaw there protruded a pair of sharp tusks, an inch and a half long, measured from the gums."

Our correspondent is right in assuming the deer mentioned to be the little Yangtze River deer (*Hydropotes inermis*), and his record is an interesting one as showing how far north of the Yangtze it ranges. The height of his specimen—30-in. at the shoulder—shows it to be an unusually large one, and some indication of its weight would have been interesting.

WILD BOAR IN FUKIEN. While on his recent collecting trip into Fukien, Mr. A. de C. Sowerby secured a fine specimen of the wild pig that inhabits that province. It was a full-grown boar of five or six years' age, and in its summer pelt looks somewhat different from the pigs from further north, the colour being distinctly brownish instead of grey. It was secured after an exciting drive and chase, having been wounded four times as it ran across the hill-side in full view of Mr. Sowerby's station, showing no signs whatever of having been hit. Mr. Sowerby, accompanied by Professor C. R. Kellogg of the Fukien Christian University, followed the wounded animal into the dense sword-grass jungle, and after about a quarter of a mile's tracking they were suddenly charged by the infuriated brute, both being knocked down, though fortunately escaping injury. Following it up they came upon it again when a couple more bullets settled it. It weighed some 300-lbs. and measured 65 inches from the tip of the snout to the tip of the tail. The district in which it was secured lies to the north of Foochow, well up in the mountains, and is known as Pei-liang. Here and elsewhere in the mountainous and hilly areas of the province, pigs do a great deal of damage to the sweet-potato crop.

THE SHANGHAI CLAY PIGEON CLUB.—The Annual Championship Shoot of this club, which took place on the 6th of October was in every way a very successfull gathering. A large number of competitors took part and the shooting on the whole was very good, considering the adverse weather conditions. In the morning the competitors were hampered with a rather stiff breeze which died down towards the end of the afternoon. In spite of this the shooting in the morning was very much better than it was in the afternoon, some five or six competitors running each other very close for first place. By the end of the day, however, Mr. H. H. Read was well in the lead which he maintained, finally winning the championship for the fourth time in succession and the sixth time altogether, by 91 birds. Mr. H. E. Gibson was second with 85 birds, while Mr. F. J. Milne and Mr. E. H. Himrod were tied for third place with 84 birds, Mr. Milne having the advantage in the number of barrels. The season's shooting has been very good on the whole, being chiefly notable for the recovery of Mr. Himrod to his old form and the excellent shooting of Mr. H. E. Gibson throughout. Mr. Milne, who once represented Scotland, did so well during the season that he was somewhat of a favourite for the championship, and we may expect to hear more of this sportsman. It is interesting to note that Mr. H. E. Gibson gave up the use of his automatic shotgun on the present occasion, discarding it for the usual double-barrel. Mr. I. Tuxford, with a new gun acquired from Captain Beatty, has shown great improvement recently, which seems to suggest that up to date he has not been properly suited with his weapon.

ETHNOLOGICAL INVESTIGATIONS IN SIBERIA, MONGOLIA AND NORTHERN CHINA

BY

S. M. SHIROKOGOROFF

(Anthropologist of the Museum of Anthropology and Ethnography of the
Russian Academy of Sciences at Petrograd).

(Continued from page 522)

The Tungus group of the Kumara River lost their reindeer some seventy or eighty years ago and now use horses exclusively and also a very peculiar kind of canoe, in which the body is made of bent wood covered with the bark of the white birch (*Betula alba*). A canoe for three people is so light that a man can easily transport it on his shoulders.

These Tungus speak a dialect which is a little different from the dialects of other Tungus groups, except the Tungus of the Khingan Mountains. However, the differences between all these dialects are so insignificant that the Tungus speaking different dialects very easily understand each other. The influence of the Manchus on this group can be seen at a glance. The clothing, the manners, and especially the Manchu books that can be found in some tents showed that we had met a Tungus group connected with another cultural complex. However, they have preserved their Tungus characters as well as their language. The occupation of these Tungus consists in hunting and fishing, as may be noted at once, since they use the skins of fish and animals to a considerable extent.

The use of the fish skin is not a privilege of the *Yu-pi-ta-tse* of the banks of the Sungari River. All Tungus groups—in the Transbaikal, Mongolia, Manchuria, the Maritime Government and to the north—use this material for clothing and waterproof sacks. The Tungus groups that have reindeer skin use this material, but if they do well at fishing, they also use fishskins for clothing and other purposes. Thus this Chinese classification, Fish-skin Tatar, as with Chinese ethnographical observations generally, is not exact enough to use as a basis in our ethnographical studies.

The ethnographical observations that we made among these Tungus were especially interesting because this group is evidently influenced by the Manchus. The success of the Manchus' influence is due to the military organization in which these Tungus were incorporated. Practically the military service gave them little trouble, except very occasional visits to Aigun or some other administrative centre. The Manchus incorporated these Tungus with a view to "civilizing" and organizing them as an advance-guard. This measure, however, was not effective in the face of such a danger as the growing Russian migration. It was an anachronism, nothing more. However, the Tungus were very loyal in their service in the Manchu army, and they received the

news of the fall of the Manchu Dynasty no less sadly than the Manchus themselves.

Because of the season we could not stay long amongst these Tungus, but had to continue down the river very soon. In the upper course of the Kumara River we were about 200 miles from any place where we might hope to find any food for our horses except dry grass of the *taiga* and some poor water weed in the lakes. Meanwhile the animals were becoming weaker from day to day. On the Manchurian Plateau we were obliged to unload one horse because it could no longer bear its burden. I hoped it would recover, but it did not. During the following march of fifty to sixty miles we lost another horse. This one was too young for *taiga* journeys.

The picture of its slow dieing was very painful. Quite unexpectedly for us, because we had been moving very slowly, the horse began to sweat so profusely that it had to be unloaded immediately. Nevertheless it continued to sweat, the water running off it like rain. Rapidly the poor animal became thinner and thinner. The Cossacks have a special term for such a condition—"the horse is losing its trousers." In fact, the progress of the ailment was so rapid that half-an-hour of sweating was quite enough to change absolutely the appearance of the poor animal. In a little while the horse could not follow us and looked piteously after the other horses. However, it refused to leave the other horses, and slowly followed us to our camp. But next day it could not go more than some two miles, and finally stopped altogether. The Cossack with his eyes full of tears said: "Good-bye, my dear, you shall die here." He took off its halter and left it as we turned to follow our caravan.

The loss of this horse was a second catastrophe for us. The question arose: would we be able to reach the Amur River, or, after our horses had perished one by one, would we be lost in the *taiga*? We all knew of many cases of this kind!

Some days later another horse began to show dangerous symptoms. It was, of course, immediately unloaded, and its saddle and some supplies left behind.

Thus we moved slowly, while I continued my observations on the long periodic migrations of the Tungus to their winter stations.

Fortunately during the last stage of our journey we lost only one more horse, and all our collections and men arrived in safety at a small village on the banks of the Kumara River, composed of four houses of Chinese type and twenty to twenty-five Tungus tents. There we got better food for our horses. We were now separated from the Amur River by a distance of only fifty or fifty-five miles.

Here we had the bad luck to meet a band of Chinese *Hunghutse*. It consisted of twelve men armed with the best German guns. We were only six. They were sure that we had with us gold from the gold-mines of the upper course of the Kumara River, which is known as very rich in this mineral, but inaccessible to Chinese adventurers. My explanations and diplomatic manœuvres were useless—they would not believe that our loads consisted of ethnographical collections only. For-

ETHNOLOGICAL INVESTIGATIONS IN SIBERIA, ETC.

tunately I was informed of their intentions by a Tungus girl, who had been taken by the Chinese for her father's debts and who understood Chinese perfectly, but did not show it. The *Hunghutse*'s project was very simple, namely, on the first night, when we should go down to the Amur River, to ambush and kill us and take "the gold."

My plan to avoid this danger was less simple. I became very friendly (sic) with our enemies and proposed that they should go together with us and take with us the Dahir merchants, who expected to buy some merchandise in a Chinese village on the bank of the Amur River. They agreed to my proposal and a day for starting was fixed. Then, early in the morning I ordered my Cossacks and Tungus to saddle the horses. The *Hunghutse* hurried to follow our example, and in a little time saddled and loaded their horses. Meanwhile, I ordered, in a low voice, my men to stop the saddling of our animals. When the *Hunghutse* asked me why our horses were not ready, my explanation was that the Cossacks were not proficient at saddling. They agreed to act on my advice to them to go ahead and wait for us at some fixed place. Of course, I knew very well that loaded horses do not like to stand still for long and that the *Hunghutse* must start as soon as possible or unload their horses. So they started off. I had now to send before us the Dahir merchants of whose honesty I was not at all sure, thinking they might be connected with the *Hunghutse*. I repeated my manœuvres with another variation. I ordered my men to "boil tea" for me. The Dahurs, as is usual with nomad people, have a special esteem for their master's wishes, especially if he wants to take tea. The Dahurs did not wait for us to finish our tea, but started off. Then I ordered the horses to be loaded and in a few minutes we started off by another path used exclusively by the Tungus. It was straight through the frozen swamps. The Tungus sent some men in advance and also kept guard behind us. We advanced very cautiously during the next forty hours and finally arrived safe and sound at the banks of Amur River. Three days later the Dahurs arrived and told us that during the first night they had been attacked by the *Hunghutse*, one of their horses being wounded. The *Hunghutse* soon recognized their mistake, however, and drew off. In all these diplomatic manœuvres to outwit our enemies I made only one mistake—the Dahurs did not plot with the *Hunghutse*.

Our arrival at the Amur River completed this part of our expedition, so we sold our horses and went by the railway to Blagoveschensk, which seemed to us like a capital city after our seven months or so of life under canvas. From Blagoveschensk we soon went to the Aigun district, where ethnological investigations are not so mixed up with the dangers of geographical discoveries.

Our visit to the Aigun district and our journeys on the banks of the Amur River, from Aigun to the Little Khingan Pass, and neighbouring sections, also our visits to Korea, Southern Manchuria, Shantung and Chihli Provinces, do not need to be described from a geographical point of view, because these countries are better known. I shall, therefore,

THE CHINA JOURNAL OF SCIENCE & ARTS

omit any description of our journeys giving only details of the investigations made.

In the Aigun district I investigated the Manchus, who have been living there since the XVII Century as a military colony of agriculturists. Besides the Manchus there are located in this district some Dahir villages, which I visited as well. At a glance I could see that the Manchus from the linguistical standpoint were very close to the above mentioned Tungus. Their spoken language does not differ essentially from the literary Manchu. The upper classes of the Manchus, *i.e.*, the former officials and officers, speak the literary language, but the main mass of the Manchus speak a dialect which differs in phonetic and some grammatical forms from the literary language. As already shown, the literary language was investigated by my predecessors, while the spoken Manchu dialect is very little known. I, therefore, devoted my attention to the latter and worked on the literary Manchu only for the sake of certain translations and for comparison with the spoken Manchu dialects.

The Manchus, generally speaking, are in a state of decline. At the present time, besides the Manchus of the Aigun district, there are very few people who speak this tongue. In Manchuria, namely in the Tsitsihar district, the Manchu tongue is used, it seems to me, by the Dahurs and Tungus only, also possibly it is used, but very little, in Kirin province. Some Manchu colonies in Sinkiang province have preserved their original language up to the present time. In Peking the Manchus do not speak their mother tongue but generally use Chinese, so that now they use the Manchu alphabetic script as the Chinese character is used, *i.e.*, by its external aspect and not phonetically. Thus this language is spoken only in the periphery of the former Manchu Empire. Therefore, fearing that some tens of years hence any Manchu speaking his original tongue would not be found, I considered the immediate investigation of this dialect of great importance. By the end of 1915 I started to study Manchu and a little while after I began the collecting of Manchu tales and stories. I have also translated a Manchu manuscript entitled "Nisan Shaman," the sole written document on Shamanism.* In this manuscript is related the Shaman's journey into the land of the dead. Afterwards I discovered an old Manchu woman, sixty or sixty-one years of age, who knew the Manchu Odissey, "Teptalin." This old woman was usually called after the title of this epic-poem, *Teptalin-mama*, and during the winter she used to sing this poem in the houses of the rich. Besides this woman, as far as I know, in this region nobody knows this poem. Amongst other Manchu colonies, I think, this poem is now forgotten. Therefore I decided to write this poem, taking it directly from the mouth of the old woman, who, considering her age, is likely to die with her poem very soon. I worked with her for five weeks twice a day, except on the days when she was hopelessly drunk. This epic-poem consists of about 250 pages of manuscript and is of great interest as to its contents as well as to its poetic forms and linguistic material.

* The well-known Manchu manuals for sacrifice, written in the XVIIth Century and translated by L. Langlès and later by Ch. H. Harlez deal with clan-ritual and not with shamanism. However, the sacrificier is also called shaman (*p'jogun saman*).

ETHNOLOGICAL INVESTIGATIONS IN SIBERIA, ETC.

At the same time I investigated Shamanism. Being familiar with the shamanist theories of other Tungus and Mongols, I became a kind of specialist, very appreciated among the Manchus, and was elected—a very rare occurrence—into the jury to elect a new Shaman. Of course, I was very glad to be honoured by this election, because it opened for me the Manchu *sancta sanctorum* and facilitated the collecting of ethnographical material, since it enabled me not only to assist at all the shamanist performances, but also to copy the most interesting documents concerning shamanism and clan organization, hidden from the foreigner.

In 1916 I also lived for a long time amongst the Tungus of the banks of the Amur River, called by Russian and other investigators *Birar* or *Byraly*, after the name of their *yamén*—*Birar Yamén*, i.e., Yamén of the River (Bira) District. This Tungus group is absolutely similar to the Tungus group of the Kumara River. Some years ago several families of that Yamén were living in the basin of the Kumara River. Among them I continued the collecting of anthropological, ethnographical and linguistic material.

During the summer of 1916 I organized archeological excavations and excursions along the Amur River. I invited to assist me the curator of the Museum at Blagoveschensk, Mr. M. K. Tolmacheff, who was interested in my researches. I also invited Mr. A. Z. Fedoroff, at that time the secretary of the Southern Ussuri Branch of the Imperial Geographical Society in Nikolsk Ussuriisk. He was interested in archeological investigations and had excavated some historic places in the Ussuri region. I further secured the assistance of Mr. A. P. Guroff, who was living in the vicinity of Blagoveschensk, and who for several years collected archeological evidences on the banks of the Amur River. As with amateurs generally, he could not distinguish the important from the unimportant, but he knew many places of great interest, and during my work was absolutely indispensable.

I obtained from the Amur River Communication Board a good cutter and took with me the necessary number of workmen. Such an organization for archeological investigations permitted only a six weeks' visit to the most interesting places, from the archeological standpoint, and to excavate a cemetery of the XI-XII Century and many underground houses, to investigate a fortified place, to make a large collection of stone age (neolithic) implements, and excavate three prehistoric stations of neolithic date.

In the beginning of 1917 I continued investigations among the Manchus and Tungus. These have shown that some interesting evidence can be gathered in North-eastern Mongolia and the Tsitsihar district. I was informed that in the above-mentioned region are some prehistoric stations abundant in stone and bone implements and many reindeer bones—good signs of the possible discoveries of great interest. Besides, I wanted to visit the Solons, who speak a Tungus dialect (during my journey in Mongolia I met some Solons), the Dahurs and the Manchus of those regions. For this purpose I needed to reach Mongolia. The season (April) was not favourable for a journey in a Chinese cart *via* Mergen-Tsitsihar, so I chose the railway *via* Blagoveschensk, Chita and

THE CHINA JOURNAL OF SCIENCE & ARTS

Khailar. I took with me a Tungus from Birar Yamén, sending (via Harbin) by the steamer, that was expected in two or three weeks, two Manchus with my collections. It was intended that we should all meet at Khailar, and from there begin our further investigations. I took these men (Tungus and Manchus) with me for the purpose of comparing dialects, so that I should have living representatives of other dialects. These men were accustomed to my work and could buy manuscripts and ethnographic specimens cheaper than I could from the natives.

At that time (April of 1917) owing to the failure of the "Ancient regime" in Russia, "Committees of social safety" were organized in every small town, village, and even railway station. The attention of these committees was devoted to the "defense of the revolution." In every station the representatives of these committees came to us to examine my documents, passport, certificates of the Academy of Sciences, and the like. This unwelcome attention to my wife and myself did not promise any good end. In fact, the day after our departure we were all arrested at the station of Ruhlovo on the Amurskaia Railway, as "sympathizing with the ancient regime." They explained to me that it must be so, because I had documents issued by the Academy of Sciences in 1915, *i.e.*, "under the ancient regime," and I must according to their logic be pro-Tsarist. Avoiding the question of my political ideas I showed them that the documents could not be changed because of the lack of time. Then they preferred another charge. They said that we were arrested as German officers (my wife included), that all our collections, journals, instruments, clothing and other things belonged to a "good Russian man, who died in Aigun" and were taken by us Germans with the purpose of impersonating this man and so escaping. This charge was based on my correspondence and daily journal, in which they found some entries showing that I was ill of pneumonia in 1915. The telegrams from Petrograd—I wired, it seems to me, to all possible authorities—and especially from the Blagoveschensk Committee, which promised to send a Cossack detachment with artillery if I were not immediately liberated, were enough to compel the Ruhlovo authorities to release us after ten days of arrest.

Arriving at Khailar we found that in the vicinity of this place the Mongols were in a state of war, so that all investigations in this region became impossible. At this we decided to leave for Petrograd.

My personal experiences in Ruhlovo station and the very instructive journey by railway to Petrograd convinced me that at such a time and under such conditions Russia and her new authorities had no use for an ethnographer. This new aspect of Russia was not at all to my liking, as I wanted to continue my explorer's work. As this could not be done in Russian territory, it became necessary to go abroad.

In Petrograd I put in order all my collections, and four months later was on my way back to China. The Russian Academy of Sciences had agreed with my proposition to continue investigations in North China and neighbouring regions, and had charged me with this task.

During a short journey into Southern Manchuria, Korea and Shantung I could not collect much ethnographical material and so my investigations

ETHNOLOGICAL INVESTIGATIONS IN SIBERIA, ETC.

were confined almost exclusively to anthropological observations. But in Peking, where I found Manchus from Western China, I continued my linguistic studies.

After the communists usurped the power in Russia, I became practically isolated from the Academy of Sciences, and during the last five years I have been unable to establish connection with it. Though my expedition was thus interrupted, I continued to work out the material I had gathered, the results in part being ready for publishing, though, because of the political conditions during this period, I could not, of course, publish them in Russian. Two works have, however, been published, one on the geographical description of North Western Manchuria, and another one—a preliminary essay on "The General Theory of Shamanism among the Tungus" (Both in Vladivostok, 1919 : Russian text.) As a result of my investigations the following observations may be made:—

The population of the part of Asia investigated is composed of four principal groups, *i.e.*, the Tungus, the Mongols, the Chinese and some relics of the ancient inhabitants of Eastern Asia, amongst which may be placed the Koreans. All the various ethnical groups are the result of the intercultural relations of these complexes which in different degrees have influenced each other.

The Tungus can be divided according to their languages into two main groups: the Northern Tungus and the Southern Tungus. In the first can be included all Tungus groups which actually call themselves or were called in the past, *evenki*. In the second can be included all Tungus groups connected with the Manchus, as for example, the Manchus proper, including three groups, namely, the Ancient, Modern and Mongol Manchus: the Hedzen or Hedjen of the Sungari, Ussuri, and Amur Rivers, called by the Russians *Goldi* and by the Chinese *Yupitatse*: probably the Tatse of the Maritime Government: and some other groups who now live within the basin of the Amur and Sungari Rivers.

The northern Tungus now speak several dialects, as for example the Yenissei River Tungus dialect, the Lamut dialect, the Barguzin dialect, the Amur Government Tungus† dialect and so on. The differences between these dialects are probably due to the influence of neighbouring tribes—the Yakuts, the Manchus and the Mongols. As has been stated, they call themselves *evenki*, but they differentiate various groups, recognizing at the same time their very close relationship. These differences are based on the one hand on the local characters of the technical culture, and on the other hand on the dialects.

The origins of different names, by which these groups are usually distinguished, are extremely various. For example, the name Tungus, which is now generally adopted to designate all groups speaking the dialects of this linguistic family, was introduced from the Yakut tongue by the Russians; the name *Maniagir* is the name of a Tungus clan, very numerous among the Tungus of the Kumara River; the name *Birar* was explained above; the name *Lamut* or *Lamuk* is a Tungus definition for the people who live near the sea (*lam* or *lamu* in Tungus); the name *Kile* is of

† I have not visited this group myself, but I have the grammatical material and texts collected by Miss Afanasiéff, who belongs herself to this Tungus group.

THE CHINA JOURNAL OF SCIENCE & ARTS

Chinese origin, from *kilin* or *chilin*; the names *Orochon*, *Orochi*, *Oronchon*, *Oroki* and so on are derived from *oron*—the reindeer—of all Tungus dialects, including the Manchu, and translated simply meaning: “using (or having) the reindeer”; the name *Tatse* (and *Yupitatse*) is of Chinese origin, and now in the mouth of the Chinese of Manchuria means barbarous; the name *Hamnagan* or *Hamnegan* is of Mongol origin. Thus all this classification is based on the linguistic misunderstandings of the observers who did not speak Tungus. But the ethnographical differences between the Tungus groups are sometimes so significant that the groups can be classified after ethnographical characters, as for example the Tungus of the Khingan Mountains and those of the Barguzin district, or the Tungus of Mongolia (the Solons) and those of Sakhalien Island. But all these groups are always the same *evenki* influenced by their neighbours in different degrees.

Indeed, the origin of some Tungus groups has now become very confused because of the losing of their mother tongue. This is the case with the Tungus of the Selenga River region (the Hamnagans) who now speak a Mongol dialect and the case of the Dahurs, who also speak a Mongol dialect (The latter, it may be supposed, are of Tungus origin). It might be that these two groups have been connected with the Southern Tungus branch, but it might also be that these groups came into the Mongol area as an advance-guard of the later Tungus migration, caused by the pressure of the Yakut invasion into Siberia. If it is so, they lost their tongue and reindeer culture in the same way as the Tungus groups which are now in the process of assimilation by and amalgamation with the Mongols.

The principal occupation of the Tungus consists of hunting and fishing, also the breeding of reindeer or horses. They are organized into patriline clans. The study of the clan names is especially instructive. The number of clan names is very limited if the new names, introduced by the Russians and Manchus and also adapted officially by the Tungus themselves, are left out of consideration. All ancient clan names can easily be recognized by the suffix *gir* or *gyr*. The geographical distribution of these ancient clan names shows that some time ago the Tungus occupied the present Tungus territory in different order. Some of the clans left their names in other parts of the Tungus area than now inhabited by them, from which it is not difficult to establish the principal directions taken by the various Tungus migrations. Tungus folk-lore can help us in this study.

Judging from the cultural Tungus complex, some anthropological data, linguistic deductions and so on, it may be supposed that the Tungus were originally living in some southern country with a very mild climate. Such a country may have been present day Central China, whence they have been pushed out, probably, by the pressure of the Chinese migration. During their migration northward they appropriated the reindeer and many elements of some ancient culture. They met in the new territory paleasiatic tribes and partly assimilated them, partly pushed them on to the outer confines of the former paleasiatic area. Afterwards, under the pressure of the later Mongol and Turcic migrations, they moved back, southward, their secondary migration leaving many traces in the Tungus folk-lore.

ETHNOLOGICAL INVESTIGATIONS IN SIBERIA, ETC.

The Southern Tungus left their former territory also under the pressure of the Chinese migration and stopped in the basin of the Sungari River. They assimilated there some paleasiatic groups, from which they appropriated some ethnographical elements. Therefore the Manchus from the ethnological standpoint seem to be of this mixed origin. Some of these Southern Tungus groups controlled the other ethnical groups and became the leading ethnical units. These I designate "leading ethnoses."* The Manchus at an early date became the leaders of Tungus groups and fought with the Chinese, who little by little invaded the north-east of Asia. The Chinese movement was many times stopped by the Manchus, but in the XX Century with only the indirect assistance of Europeans and after the failure of the Manchu Dynasty the north-eastern region was largely opened to Chinese colonization.

The anthropological measurements of Chinese from Shantung, Chihli and Manchuria (395 males), Koreans (142 males), Manchus (81 males and 50 females), Dahurs (50 males) as well as different Tungus groups (177 males and 76 females) have been worked out, and some of the results are now being published by the North China Branch of the Royal Asiatic Society under the title: "Anthropology of Northern China." My general deductions are as follows: the Northern Chinese from the anthropological standpoint are an amalgamation of four different types, one of which is characteristic of the Chinese exclusively, the other three types being more or less numerous amongst the Koreans, Mongols and different Tungus groups. The influence of these types over the Chinese is so great that the fundamental type of the early Chinese is not now the principal one in that race. Some influence of a type that is very common among the Tungus can be observed amongst the Chinese, whence I have concluded that the Tungus were probably absorbed by the Chinese, but left some traces among the latter. The Manchus and Koreans are also the product of the amalgamation of ancient types, with which was partly amalgamated a new type introduced, possibly, with the Mongol invasion.

The ethnographical material concerning the Tungus' and Manchus' social organization and religion is partly worked out and prepared for publication. Besides the above-mentioned manuscript "Ethnography of the Reindeer Tungus of Transbaikal," and the published essay on Shamanism, I have written a study of "The Social Organization of the Manchus. The Clan Organization." This study will soon be published by the same society. The social organization of the Manchus is interesting because it shows very ancient customs, as well as some very curious survivals of the archaic forms of the classificatory system of mater-line relationship.

The beliefs and the very complicated system of Shamanism, which is highly developed among the Tungus groups, including the Manchus, are of great importance, even up to the present time, to these people, and I consider their shamanist functions as a necessary biological self-defense

* The definition of "ethnos" and its functions I gave in my work: "Ethnos. General Principles of Ethnical and Ethnographical Variations" (In Russian). Shanghai 1923.

THE CHINA JOURNAL OF SCIENCE & ARTS

of their social organization. The outline of this theory was given in the above-mentioned Essay, and I expect to publish all my observations dealing with the philosophy, religion and shamanism of the Tungus, particularly with the biological function of shamans, and the shamanist texts, which will form a special work.

The observations concerning the technical culture of the Tungus—in the great part dealing with the study of the correlation between the technical forms and materials used—their ornaments and notes on their methods of hunting and fishing are so closely connected with the description of the collections, which together with photographs are now in the Museum of Anthropology and Ethnography at Petrograd, that I expect to write and publish this part of my investigations only when political conditions in Russia shall become more favourable for scientific work.

The archeological excavations on the banks of the Amur River have shown that there one can expect to find evidence of three different periods, namely, (1) the neolithic culture, very wide-spread and rich in Amur-land, which was densely populated by fishermen and primitive hunters, probably of paleasiatic origin; (2) a culture imported, I suppose, by the early Mongols; and (3) the later culture of the predecessors of the Manchus. Besides these I have found some hint of a paleolithic culture at a station, the final excavation of which in 1916 was unfortunately postponed owing to the season and rainy weather—the end of September is not favourable for this kind of work in the Amurland. The publication of the reports on this archeological material must also be postponed.

The linguistic material, consisting of texts, Manchu manuscripts and grammatical data, gathered by me, have been partially worked out to supply the principal ethnological deductions given here. Some of this material has already been translated, annotated and prepared for publication, as for example the three volumes of "Tungus Folk-lore," including the text, translation and notes of the Manchu manuscript "Nisan Shaman."

A preliminary dictionary of the Tungus dialects, as well as an essay on its grammar have been prepared. This linguistic family is absolutely independent of other families. Though the Tungus grammar is based on the principle of agglutination, as well as on Mongol and Turcic grammars, the Tungus vocabulary, suffixes and phonetics are absolutely original. Indeed, if this linguistic family ever was connected with other groups, the separation of the Tungus branch took place at such an early date that the connection, apart from the common construction, borrowed words and some similarity of the phonetic, cannot be established.

The Tungus folk-lore is also of great interest, not only from a general point of view, but also as supplying new data on the history of these ethnical groups. The Manchu Odissey, "Teptalin," is, of course, otherwise interesting as being an epic-poem. Up to the present time this kind of folk poetry is not abundant and every new one discovered furnishes new material for the philologist.

As may be seen my investigations more or less fill in the gaps in our knowledge of the Tungus. The question arises: For what purpose were these Tungus investigated? I shall try to answer this question.

ETHNOLOGICAL INVESTIGATIONS IN SIBERIA, ETC.

Besides the collecting of new evidence dealing with problems in the history of social forms, development of religious thought, technical knowledge and so on, investigations upon the Tungus can help us to understand more clearly the real character of the ethnical movements in Asia, the greater part of which have been connected with the people. Though they were not very illustrious and have left nothing behind them like the Egyptian and Assiro-Babylonian civilizations, yet they have left other kinds of evidence—the continuity of their offsprings—in the Manchus and Chinese. The political rôle of the Manchus is almost finished, they are peacefully living among the Chinese, who are assimilating little by little their former masters ; the Manchus will not arise from their ethnical apathy, but they furnish us with many facts that help us to understand the Chinese of the present day.

The investigations of the Tungus and particularly of the Manchus show that the Chinese as an anthropological unit do not exist, that they are an amalgamation in which the Tungus left some traces. The Chinese are not at all a pure ethnographic complex and I think that later investigations will show that the Chinese culture includes many non-Chinese elements, some of which are now considered as pure Chinese only because of the absence of adequate investigations. Furthermore, investigations upon the Tungus will help us to discover the real character of the Chinese as an historical factor and will relegate it to its proper place. I could give some other considerations, more doubtful, perhaps, but I hope to do so elsewhere.

Reaching the end of the present article, I would like to express my desire to see the material described worked out, and the written works published, as soon as possible. When I started, some twelve years ago, my study of ethnological material from this part of Asia there were unfortunately very few published works. I knew also that certain part of the material gathered had perished, as for example that of Middendorf and the Rev. Palladiis, or had not yet been worked out. Manuscripts, even the daily journals, and other raw material, cannot include all the observations of an investigator, and usually he keeps always in his memory many unregistered facts together with their explanation and classification. It is certain that some ethnical groups which were visited by us will be absorbed by their neighbours in a short time, so that they will be lost to science,—I, myself, could not find any Tungus of Urulga speaking their mother tongue. Sooner or later the necessity of studying them will arise, and, if the material mentioned in this article has not been published my successors will experience the same regrets that I did at seeing the unworked field, possibly forever lost.

Note.—In the previous half of this paper the following corrections should be made:—

Footnote, page 513, 3rd line: *Hryncewicz* for *Gryncewixz*.

Page 514, 9th line: 1787 for 1807.

Page 521, 28th line: *Chain* for *Chian*.

THE MANUFACTURE OF SULPHURIC ACID BY THE GRILLO-SCHROEDER (CONTACT) PROCESS

BY
GODFREY W. HIMUS.

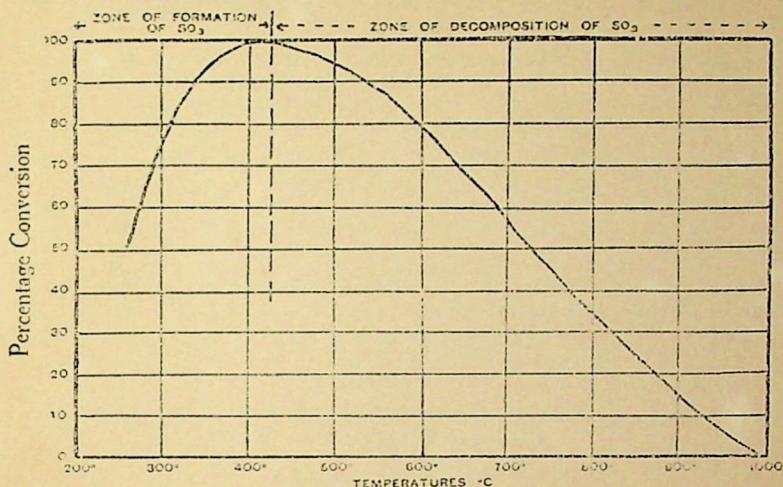
The synthetic dye and explosives industries depend, in a large degree, for their successful prosecution on ample supplies of mixed nitric and sulphuric acids to be used in the production of the nitrated derivatives which form either intermediate or final stages in the process of manufacture, and it is of paramount importance, at any rate in the production of nitrated derivatives of cellulose or of glycerine, which are to be used in the production of propellants such as cordite, that the strengths of the acid mixes used should be accurately to standard, especially as regards water content.

It is customary to bring the spent acid from nitro-cellulose production up to strength again by the addition of carefully calculated quantities of revivifying acid which contains sufficient nitric and sulphuric acids to bring the nitric content of the mix up to, and the water content down to the standard. The spent acids from glycerine nitration are differently treated, being very considerably weaker than those from cellulose nitration. In order to reduce water content of revivifying acids, and also to enable use to be made of the considerable quantities of weak nitric acid which are produced in certain of the processes, it is the practice to add the sulphuric acid in the form of 'oleum' which contains 'free' sulphur trioxide.

In the production of oleum, the chamber process is, of course, inadmissible, so recourse is had to the contact process of manufacture in one form or another. In the present paper it is proposed to deal only with that process covered under the Grillo-Schroeder patents, as the writer has no practical experience of any other.

In the Grillo-Schroeder process, the first step is the production of sulphur dioxide. In the case to be considered, this was effected by burning sulphur which was of a high degree of purity, next the sulphur dioxide, after purification, was converted to trioxide by passage, together with excess air, from the sulphur burners over platinized magnesium sulphate, and finally, the trioxide thus formed was absorbed in 98 per cent. sulphuric acid. It is a singular fact, known to those who have had experience of the sulphuric acid industry, that sulphur trioxide, despite its great affinity for water, when in the form of a fume mixed with air, resists most pertinaciously all attempts to make it dissolve in water. The best solvent is found to be 98 per cent. sulphuric acid, in which it is greedily absorbed. In fact, on one occasion, the writer endeavoured to estimate SO_3 in the gases going to the absorption plant of a Grillo unit in an ordinary Orsat apparatus by means of caustic soda, the SO_3 , however, had other views on the subject and obstinately refused to be absorbed.

THE MANUFACTURE OF SULPHURIC ACID



Percentage Conversion for Gas-Flow of 300 ccs. per Minute Plotted Against Temperature

Burner Gas 20 vols % SO_2
 10 " O_2
 70 " N_2

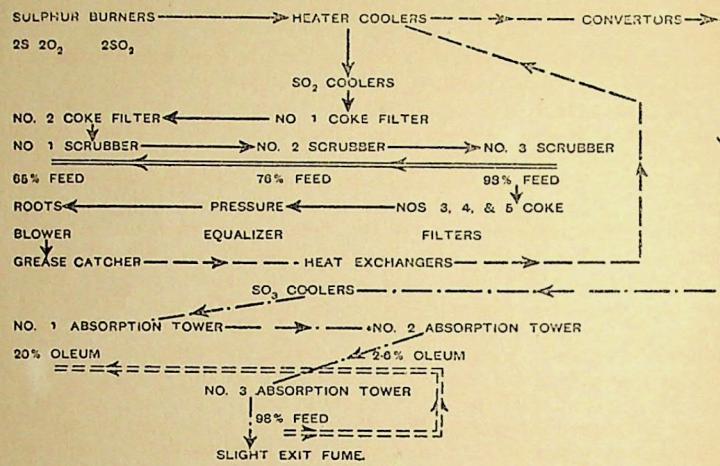
Platinum catalyst.

As seen from the accompanying chart, the percentage of conversion of sulphur dioxide to trioxide in the presence of a platinum catalyst is more nearly complete at a temperature of from 400° to 430° C. Above and below this range of temperature, conversion is much less complete. Above 450° C., the reaction is reversed, and instead of being $2\text{SO}_2 + \text{O}_2 = 2\text{SO}_3$, it becomes $2\text{SO}_3 = 2\text{SO}_2 + \text{O}_2$, and a considerable absorption of heat takes place. It is apparent, therefore, that the temperature at which conversion takes place is a matter of great importance, and it is therefore in the matter of temperature control that the plant is most interesting.

As in most cases of catalytic actions on a large scale, the question of purity of the reacting gases is a matter of great moment, as certain materials such as arsenic, but particularly in the form of arsine, or antimony in less degree, 'poison' the catalyst and inhibit conversion. The presence of moisture in the convertor reduces conversion seriously, and halogens are highly undesirable.

Turning now to an outline description of the plant, reference may be made to the schematic diagram showing the course of the gases throughout the processes.

DIAGRAMMATIC REPRESENTATION OF CYCLE OF OPERATIONS
IN A GRILLO-SCHROEDER OLEUM PLANT.



Sulphur Dioxide before purification. Temperature Falling. ——————

Clean, dry Sulphur Dioxide. Temperature Rising. ——————

Sulphur Trioxide. ——————

Scrubber Acid. ——————

Absorption Acid. ——————

Sulphur is burnt in special burners or kilns built of brickwork, charges of from 50 to 100 pounds of sulphur being fed into two burners simultaneously every ten minutes. The gases leaving the immediate vicinity of the iron pan on which the charge of sulphur is placed are partially burnt to SO_2 , but, by reason of a dearth of air, contain much sulphur vapour, which is converted to SO_2 by the addition of secondary air on passing above a brickwork arch placed over the feed-tray. The sulphur dioxide-air mixture then passes through a brickwork chequer in which more air is added so as to reduce the SO_2 content to about 6.5 per cent. Here the gases from the individual burners become mixed, and thence they pass into the back flue leading from the burners which at the end of the battery divides into two, so that half the SO_2 -air mixture is delivered into each section of a brickwork chamber known as the heater-cooler which contains cast iron U pipes, through which the purified gas passes at a later stage on its way to the convertors. The burner gases are thus cooled from about 570° - 600° C. to 330° C., and the purified gas is at the same time heated from about 200° C. to the neighbourhood of 320° C.

The partially cooled burner gases containing a little moisture (in the form of sulphuric acid) and also, occasionally some volatilised sulphur (if the air-supply has been too small), and any other impurities passes,

THE MANUFACTURE OF SULPHURIC ACID

still in two halves, through two mild steel pipes, each half going to a separate train of leaden pipes arranged in series, twenty in each section, the gases passing alternately up and down consecutive pipes. Here the temperature of the gas is reduced nearly to that of the air. In hot weather, it may be necessary to run cold water over the exterior of the leaden pipes, for which purpose, water sprays are provided.

The gas-mixture, still containing some water vapour, traces of halogen compounds, and also any suspended impurities which may have been volatilised from the sulphur, passes next by means of a leaden pipe through two coke filters contained in leaden chambers which it enters from above, in order to facilitate removal of the dirty layer of coke. In these filters the majority of the suspended dusty impurities are removed, leaving water vapour and other gaseous impurities to be dealt with.

Next follow three coke-filled scrubbing towers made of lead, up which the gas passes, meeting with sulphuric acid which is fed from the top through sprays by means of gravity. In the first scrubber the acid is about 65 per cent. in strength, and this acid serves to remove halogens, and also partially dries the gases. The acid in the second scrubber is about 76 per cent. and in the third, 90 per cent. or over. By the time SO_2 -air mixture has passed the third scrubber, drying is practically complete, any water present in the gas is in combination as acid mist.

As soon as the strength of the acid in the third scrubber falls below 90 per cent. (S. G. 1,820), some is passed to No. 2 scrubber and replaced by fresh 98 per cent. acid from the concentrating plant. Simultaneously some of the acid from the second scrubber is pumped to the first, and a corresponding volume of the weak acid therefrom is blown by means of an acid egg to the Gaillard towers (or cascade concentrator) for concentration.

The gas issuing from the scrubbers is free from objectionable impurities but still contains some acid mist, most of which is removed by passage through three more coke filters, this time entered from below.

Follows, the pressure equaliser, which consists of a steel drum containing perforated baffle plates, whose purpose is to reduce the pulsating effect of the blower, which, if communicated to the lead, would cause it to crystallise with disastrous results.

Up to this point, the gases have been under suction, but they next pass through a Roots blower and enter the pressure side of the plant.

Immediately succeeding the Roots blower comes a large mildsteel boiler shell containing coke, this is called the 'grease catcher,' and its purpose is to retain any foreign matter such as grease or oil which may have been picked up in the blower. Its chief effect, however, is to reduce still further the content of acid mist, which by now should not exceed 5 milligrams per hundred litres of gas, which is the maximum allowable for efficient conversion.

The gas mixture issuing from the grease catcher is dry and of sufficient purity to go to the convertors, the temperature, however, must be raised for conversion to take place, and to bring this about, the heat of reaction of the burning sulphur, and also the heat of reaction in the convertors is made use of.

THE CHINA JOURNAL OF SCIENCE & ARTS

Since $2\text{SO}_2 + \text{O}_2 \rightleftharpoons 2\text{SO}_3 + 22,600$ cals, it is evident that unless some of the heat evolved can be recuperated, there will be a great loss of heat to no purpose at all, and since it is required to heat the gases on their way to the convertors, use may be made of this heat as far as possible. Accordingly, from the grease catcher, the cold gases go to the 'heat exchangers,' being divided into two halves, and each half going to a separate heat exchanger. The SO_2 -containing gas passes through tubes contained in a steel cylinder, and round the outside of the tubes are led the SO_3 -containing gases leaving the convertors. The SO_2 -air mixture is thus heated to about 200° C. or thereabouts, it still remains to heat the mixture to 300° before entering the convertors. The gases issuing from the heat exchangers, united in a single pipe, proceed to the heater-cooler, where they are again split up into two halves, each half passing through half of the cast iron U pipes in the heater cooler, round which passes the burner-gases, by means of which the clean SO_2 -air mixture has its temperature raised to over 300° C.

A single steel pipe next conducts the gases back to the convertor house, where they can either be still further heated by passage through cast iron pipes directly heated by coal fires, or else (which is the general practice, unless the weather be very cold) all or a part can be passed directly to the convertors. It not infrequently happens that, in hot weather, the temperature of the gases leaving the heater-cooler becomes too high, and in such case, the pre-heaters can usefully be used to reduce the temperature to manageable dimensions.

The convertors (of which there are two per Grillo unit) consist of concentric cylindrical steel casings about 14 feet high and 9 feet in diameter. The gases enter the outer casing tangentially from below, and pass spirally upwards round the inner casing which they finally enter from above. The inner shell contains four perforated iron plates, each carrying a layer 14 to 16 inches thick of ignited magnesium sulphate, impregnated with spongy platinum, each layer weighing about 2,500 pounds. In these layers, conversion takes place according to the equation $2\text{SO}_2 + \text{O}_2 \rightleftharpoons 2\text{SO}_3 + 22,600$ cals, the evolution of which heat would raise the temperature sufficiently to cause the point of equilibrium to pass seriously into the region of decomposition of SO_3 , were not measures taken to abstract it as formed. It is found desirable in practice to keep the temperatures of the top and bottom layers of catalyst below 400° C. , in the neighbourhood of 370 - 380° C. , otherwise that of the middle layers rises well above 420° C. In order to abstract the heat, the hot gases passing downwards through each tray of catalyst are compelled to pass outwards and to impinge on the walls of the inner shell of the convertor by means of cast iron plates placed five inches below each of the upper three catalyst trays. By this means, loss of heat by the SO_3 mixture to the incoming SO_2 mixture is facilitated, and at the same time danger of overheating the SO_3 , with consequent decomposition, is minimised. The SO_3 together with the excess of oxygen and nitrogen from the original mixture passes out from the bottom of the convertors, and each half goes to the heat exchanger allotted to its convertor, where, passing round the outside of the tubes, it gives up part of its heat to the incoming clean gas on its way to the convertors.

THE MANUFACTURE OF SULPHURIC ACID

The SO_3 mixture leaving the heat exchangers does so at a temperature of about 230° C. , which is far too high for efficient absorption, which takes place best at about 60° C. Hence, it is necessary to cool the gas by passage through a cooler consisting of mildsteel pipes over which water can be run. There are two of these per Grillo unit, and the absorption system also is made in duplicate, half the gas passing through each half of the remaining plant, so that what applies to one half, applies equally to the other.

The absorption system consists of three mildsteel towers packed with lumps of quartz through which the gas passes in series from below upwards, meeting, descending over the packing, in tower No. 1, practically 20 per cent. oleum, in tower No. 2, 2 per cent.-5 per cent. oleum, and in tower No. 3, feed acid of about 98 per cent. strength or a little over. The acid issuing from below towers No. 1 and 2 is heated by reason of solution of part of the SO_3 , and before being circulated up the tower again is cooled in an acid cooler, of which there is one to each of these two towers.

The process is made continuous as follows "the acid from No. 3 tower is continuously circulated from the circulating tank to the tower top, but whilst this is going on, fresh 98 per cent. feed acid is being continually fed into the circulating tank and the strengthened acid is passed by means of a 3-in. overflow pipe connected to the circulating tank in front of No. 2 tower from which it is circulated by means of a pump. As the acid increases in strength due to absorption of SO_3 , its Specific Gravity also increases and causes the heavier or stronger acid to sink to the bottom of the tank" whilst the incoming weaker acid flows over the top of the stronger acid. The stronger and heavier acid overflows by means of an overflow pipe dipping nearly to the bottom of the tanks at the same rate as the incoming feed acid.

The strong acid from each tank passes forwards from tank and tower No. 3, via No. 2 to No. 1, whence 20 per cent. oleum passes by gravity to the stock tank.

The gases in their passage through the absorption system meet with weaker acid as the SO_3 content is reduced, and finally leave the exit at the top of the third absorption tower practically denuded of sulphur trioxide, the faintest of white plumes at the top of the exit pipe being all that is visible.

In reading such a description as the foregoing, those who have no practical experience of the plant in question may find that in the mass of details given (very much condensed) they have failed to grasp the general principle underlying the various processes, so that a summary of the broad outlines of the subject seems desirable:—

(a) Sulphur is first burned to form a mixture of air and SO_2 containing from 6 to 6.5 per cent. of the latter gas.

(b) This gas mixture is next cooled (a necessary preliminary to the purifying and drying process), and at the same time part of the surplus heat of the burner-gases is given to the clean, dry gases on their way to the convertors.

(c) The cooled gas is next filtered, dried, and again filtered, by which means it is purified sufficiently to go to the convertors.

THE CHINA JOURNAL OF SCIENCE & ARTS

(d) The clean, dry gas is next caused to abstract a portion of the surplus heat from the SO_3 gases leaving the convertors, and also from the hot gases from the burners.

(e) Having attained a suitable temperature, the SO_2 -air mixture enters the convertors where it assists in cooling the gases actually in course of conversion, at the same time being heated further itself.

(f) After being heated to the neighbourhood of $300-325^\circ\text{C}$., the gas enters the conversion zone where the SO_2 becomes SO_3 , and some of the surplus heat is used to bring the entering SO_2 gases up to the correct temperature for conversion.

(g) After leaving the convertor, the SO_3 mixture is partially cooled in the heat exchangers and then finally in the SO_3 coolers.

The cooled SO_3 is then absorbed in sulphuric acid to form the 20 per cent. oleum which is the desired product.

The Grillo-Schroeder process is interesting not only in respect of its being an example of the large-scale application of a well-known catalytic reaction familiar to us from lecture experiments from a very early stage of our chemical training, but also in that it is an instructive illustration of the method of applying such a reaction on a large scale.

To the writer, and probably to others, the fact that SO_3 in the vaporous form is excessively difficult to absorb in water was something of a revelation, as this substance is usually described in the textbooks as consisting of silky crystals which have an intense affinity for water, in which they dissolve with a hissing sound.

The manner in which the various heats of reaction in this process are tamed and made to subserve, instead of obstruct, the courses of the desired reactions is worthy of admiration, although, when one considers the waste of heat which occurs, as for example in the SO_2 and SO_3 and acid coolers, one can but regret that it should be beyond our power profitably to recuperate the low-grade heat here thrown away down the drains.

In conclusion, the writer wishes to acknowledge the assistance derived in the preparation of this paper from letters sent to the various Government Factories in 1917 by Mr. K. B. Quinan, of the Department of Explosives Supply, a portion of one of which is quoted on page 627.

Although, up to the present, sulphuric acid is manufactured in China by means of the Chamber process, there is little doubt that as the vast mineral fields of this country come to be exploited, and as, in consequence, the demand for explosives for blasting purposes increases, there will grow up an explosives industry here, for the purpose of which large supplies of fuming sulphuric acid will be required. If this be the case, and should China enter the field of synthetic dye manufacture—a contingency which may arise from the great potential supplies of coal tar—the contact process in one or other of its forms is likely to become an important field of manufacturing activity in China in the future.

SCIENTIFIC NOTES AND REVIEWS

THE PORT OF SHANGHAI (Third Edition), issued by the Whang-poo Conservancy Board. \$4.00.

This valuable work is divided into five sections (and an Appendix), under the headings (1) Geographical Characteristics, (2) Harbour Accommodation and Connections, (3) Economic and Commercial Activities of the Port, (4) Administration, and (5) Requirements of the Port. Under these a vast amount of useful information is given—far more than might be expected. For instance, under the first heading tides, currents, wind, fog, temperature, humidity, floods, liability to earthquakes, health, and the like are all dealt with in an exhaustive yet concise way. Amongst other things details concerning mineral resources, industries, the junk trade, energy supplies, and trade analyses are included. There is little enough about the Port of Shanghai that is not dealt with, while numerous maps, charts, half-tone illustrations and diagrams go to complete a splendidly got up and well printed work of reference.

THE DISEASES OF THE TEA BUSH, by T. Petch, B.A., B.Sc. Macmillan & Company, Ltd., London, 1923. 20/-.

Intended to enable the planter to recognize the diseases of the tea-bush which have up to the present been recorded, and to take steps to control them when they appear, this book is also a real contribution to science and must prove of considerable interest to botanists, especially in countries where the tea plant flourishes.

In all warm countries plant diseases are extremely prevalent, and a book like the one under review is of value to all who are connected with economic botany, arboriculture, or even agriculture, since, though the diseases dealt with are mostly specifically diseases of the tea plant, yet the recognition of them—especially with illustrations to help—must inevitably assist in the recognition of their congeners which attack other plants, and the methods given of dealing with them point out the way to deal with plant diseases in general.

Tea planting in China, in spite of what one might suppose, is scarcely an industry. Little or no care is taken of the plant, which grows almost wild, and certainly nothing is done to improve the stock, or to eliminate disease. The bushes grow in hilly areas, and are stripped of their leaves once or twice a year, and the latter sold for the best price obtainable.

Thus the book under review, for the present at least, has little interest to those engaged in the tea trade in China—it is really for the Indian tea planter. Nevertheless there is no real reason why tea planting should not be developed in China, in which case the book would become of the greatest value in this country.

All the known diseases to which the tea bush is subject are dealt with in a thoroughly scientific way; numerous illustrations—many in

THE CHINA JOURNAL OF SCIENCE & ARTS

colour—are given, together with the best method of eradicating each disease.

REMARKS ON YELLOW FEVER, by Dr. F. Castillo Najera.

In this little brochure, Dr. Najera, who is a member of the Mexican Board of Public Health, publishes a lecture read by him before "The Faculty Medical Society of the Peking Union Medical College." He gives an interesting and lucid account of the deadly disease known severally as the 'Yellow Fever,' 'Yellow Typhus,' 'Amarilosis' 'Vomito Negro' (Black Hornet), and 'Yellow Jack'.

Indigenous to the countries of Central America and neighbouring islands, the dread disease has been carried to certain ports of the United States of America and Europe, where it has caused serious damage. It has also been carried to both the Atlantic and Pacific coasts of South America; but does not seem to have appeared in Asia, which is fortunate. Should the disease reach, say, South China, it might spread with alarming rapidity, considering the complete lack of any arrangements for the control of the mosquitoes, by a species of which noxious insect it is carried from one victim to another.

The wellknown, but ever interesting, means by which Colonel Gorgas overcame the mosquito in the Panama Zone, and made it possible to complete the great canal, are given, as well as a history of the yellow fever and how its association with the banded mosquito, *Stegomyia fasciata*, was demonstrated.

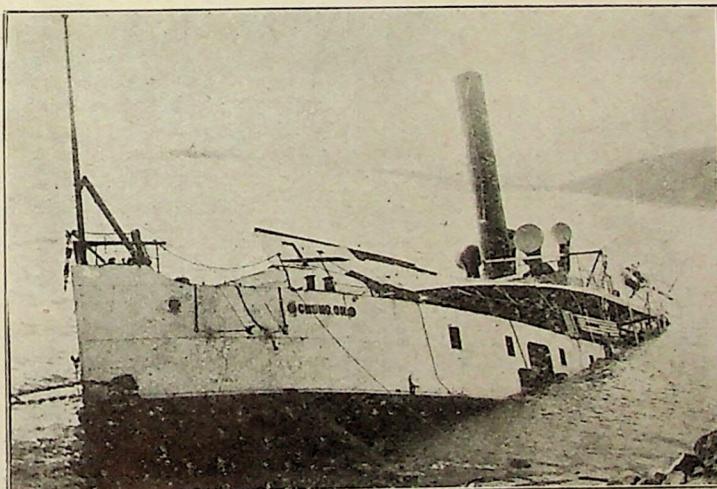
This little booklet should be widely distributed in China, since it carries its lesson in regard to the extermination of the mosquito, which is a terribles pest in the country, where malaria is rampant.

CONFERENCE FOR FIXING SCIENTIFIC TERMS IN CHINESE.—A conference of Chinese scientists was held in Shanghai last July under the auspices of the Kiangsu Educational Association at its headquarters in the native city (West Gate) for the purpose of fixing the Chinese equivalents for scientific terms. It commenced on July 4th, and lasted for about a fortnight. The subjects taken up at this conference were Medicine, Botany, Zoology and Mathematics. Last year a draft of proposed names was made, which had been circulated amongst Chinese scientists and scholars for criticism and suggestion, and these were discussed at the conference, the results of which as far as we have been able to ascertain, have not yet been published. Amongst other important institutions that were strongly represented at the Conference were the Science Society of China, whose headquarters, Museum and Laboratories are at Nanking, and the Chinese Natural History Society, located in Peking.

It is a very important matter, if progress is to be made in science in China, that Chinese renderings of scientific terms should be universally approved and adopted; but the difficulty confronting those employed in the task of fixing just what they should be is enormous. We hope that such terms as have been adopted by the conference will be published, and so made available for general use.

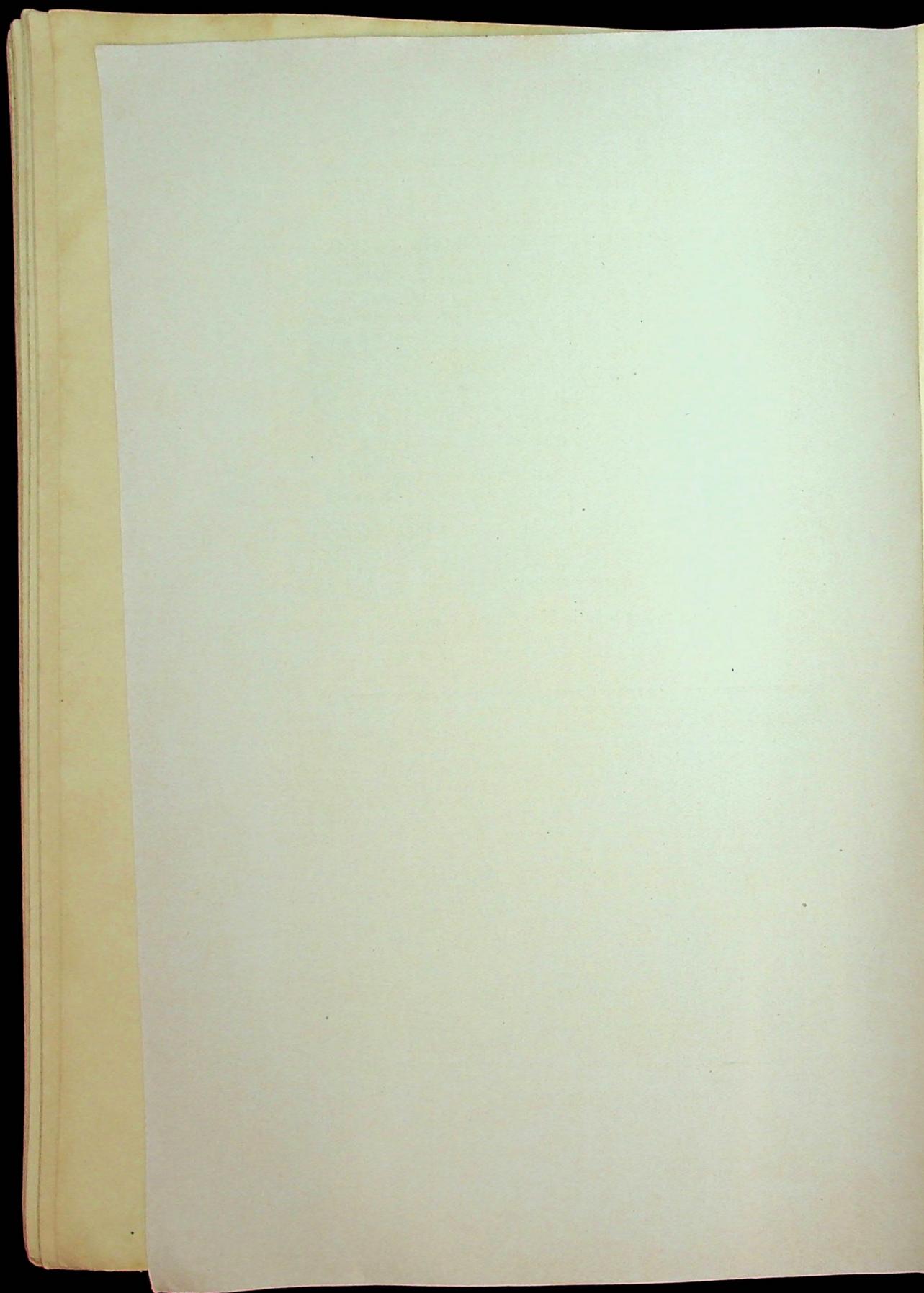


Trees uprooted in the Hongkong Typhoon



The "Chung On," wrecked in the Hongkong Typhoon.

Scenes of wreckage caused by the Typhoon in Hongkong last September when enormous damage was done both in the harbour and ashore resulting in considerable loss of life.



SCIENTIFIC NOTES AND REVIEWS

TYPHOONS.—The past season has been rather a bad one for typhoons, that is to say, the typhoons, which are always with us from June to the beginning of September, instead of keeping to the open sea as they often do, have travelled landward striking the coast in a number of places and doing enormous damage. It happens not infrequently that such typhoons as do reach the China coast do so at some point where little damage can be done, or else their strength is so far spent as to render them comparatively harmless.

But both last year and this have been less fortunate in this respect. Last year a very severe typhoon broke over Swatow, bringing disaster in its train, while parts of the province of Chekiang suffered very badly. This year Hongkong suffered, though not so badly as it did in 1906. It was bad enough, however, and resulted in very considerable loss of life and shipping. Many steamers were wrecked, and considerable havoc was done on shore.

Typhoons, like earthquakes, are amongst the dangers that threaten human life and property that cannot be overcome or averted, though they have an advantage in that warning of them can always be had, thanks to our meteorological observatories, and the indefatigable watchfulness of the men that run them.

Thus warning is sent out of the whereabouts and the direction being taken of each typhoon as it comes into being—usually somewhere in the vicinity of Guam. Its movements are recorded in every customs station and port of the Far East liable to be affected, so that ship owners and masters may do what is possible to eliminate risk of disaster.

From the observations taken it has been found that typhoons are extensive depressions which originate in the warm parts of the Pacific and travel in a north-westerly direction towards the coasts of Eastern Asia. They may take one of two courses after having come within a certain distance of land, namely: a northward course, keeping to the sea until they reach Japan and then turning in a north-easterly direction and dissipating to the east of that country, or by continuing in a north-westerly course, or even a westerly course striking the mainland anywhere from Hongkong to Shantung. The wind is caused by the rush of air that takes place to fill the depression, towards the centre of which it comes from all directions in a sort of rotary motion. Thus it is possible to tell by the direction of the wind just which part of the typhoon the observer is in, and if the general direction of the former is known, it is possible to form some idea of what may be expected and how long it will last.

In spite of all this there is little to be done when a typhoon strikes a harbour, except to make things as snug as possible and trust to Providence.

As to the reasons why depressions that originate in the Guam area should make for the China coast, it has been suggested that the earth's daily motion has something to do with this. This may account for the east to west movement, the northward course taken being explained by the rotary motion of the typhoon itself swinging it away from the equator.

THE CHINA JOURNAL OF SCIENCE & ARTS

THE THIRD ASIATIC EXPEDITION:—The Third Asiatic Expedition of the American Museum of Natural History, which has been carrying out biological and palæontological investigations in the Altai region of Western Mongolia under the leadership of Mr. Roy Chapman Andrews, returned to Peking late in September with a fine collection of fossil remains of prehistoric monsters, notably of some form of Dinosaur. The most interesting discovery made known to the public appears to be some eggs of these gigantic reptiles, together with specimens, more or less complete, of the reptiles themselves in various stages of growth. We understand, however, that there are many more interesting discoveries that have not been published, and which are of very great importance. Professor Henry Fairfield Osborn, President of the American Museum of Natural History, was one of the party, and the discoveries made must be particularly gratifying to this eminent palæontologist, who has written so much upon the ancient faunas of the world. The members of this expedition are to be congratulated on the fine work they have done, and on coming safely through a journey fraught with many dangers in these troublous days. We look forward to a full and authentic statement, on the part of the authorities of the Museum concerned, of the results of the expedition and their bearing upon various problems connected with the origin and spread of the faunas of the different geologic epochs on the earth.

In addition to this palæontological work the members of the expedition appear to have made some exceptionally interesting collections of present-day animals in the regions they visited; while the topographer of the party is reported to be engaged on reconstructing the map of Mongolia, which is very faulty in places.

Professor Osborn and Mr. Andrews passed through Shanghai on October 15th, on their way back to America, where Mr. Andrews will immediately go on a lecture tour with the object of raising another \$250,000 (gold) in order to carry on with the work of the expedition.

Professor Osborn has prepared a paper for this journal upon the expedition. It will appear in the January, 1924, issue.



Photo by courtesy of "The Shanghai Sunday Times"

Eggs supposed to be those of a Dinosaur found by the members of the Third Asiatic Expedition in Mongolia.

SOCIETIES AND INSTITUTIONS

THE TGINANFU INSTITUTE

The traveller through Shantung, who is stopping off at Tsinanfu, even if for a few hours only, will find it very well worth his or her while to visit the "Tsinanfu Institute." It has recently been the writer's privilege to visit this Institute, and so greatly was he impressed, that he feels impelled to attempt, in some measure, to bring this great and absolutely unique work more prominently before the public.

The writing of the following article has been made possible by the courtesy of the Rev. J. S. Whitewright, who devoted not a little time to patiently listening to, and answering the many questions of, the writer regarding details of the founding, aims and methods of carrying on the work of the Institute. The writer was also given copies of the annual reports by Mr. Whitewright, as well as copies of short reports by others, from which extracts will be given below.

Before proceeding to describe the Institute itself, it would be well to quote Mr. Whitewright's own definitions as regards its aims. "The aim of this Institute has been the enlightenment of the Chinese people of all classes, the clearing away of misconceptions and misunderstandings in regard to the civilization of the West, and above all the explanation of the true nature of the Christian faith and its relation to individual and national life and progress."

Elsewhere it is stated: "The work is conducted on three main lines: social, educational and evangelistic. While avoiding controversy, and a merely negative attitude, the attempt has been made through all its agencies to recognize to the full all that is good in Chinese institutions and the Chinese people, and to enlighten in all that makes for the progress and welfare of China, thus assisting to bring East and West together in friendly and helpful understanding."

From the foregoing it will be seen by those who understand China and the Chinese, that the aims are of an ambitious nature, but a visit to the Institute will soon bring the conviction that these aims are actually being carried out in an efficient and unique manner.

The Institute originated in Tsingchowfu in 1887 and was carried on on a much larger scale in the capital of the province in 1905. The founder, the Rev. J. S. Whitewright, landed in China forty-one years ago and soon conceived the idea of forwarding the work, to which he has devoted his life, by appealing to the Chinese in a unique manner through "eye gate" as well as "ear gate."

The original Institute in Tsingchowfu was started under great difficulties, financial and otherwise, and met with a certain amount of opposition, as is the case with most innovations. The originator, undaunted by all difficulties, was firmly convinced of the ultimate success of his scheme, and threw open to the public a small room in which were displayed charts, diagrams and models illustrating the benefits derived from Western civilization, as well as natural history exhibits. So great

THE CHINA JOURNAL OF SCIENCE & ARTS

was the immediate success of the venture that the work had to be extended to much larger premises in the outer court of the Theological School, of which Mr. Whitewright was in charge, and in this connection the Institute was carried on for some 17 years.

It was later felt that this work should be extended to Tsinanfu, the capital of the province, where it was possible to get in touch with greater numbers, and influence a far wider area. Negotiations regarding the purchasing of land and the erecting of buildings were started in 1904, and by the end of 1905 a great part of the present Institute was thrown open to the public, work during the interval being carried on in rented premises. Later, upon the removal of the Schools of the Shantung Christian University to Tsinanfu in 1917, the work of the two institutions was carried on side by side, the original Institute now being known as the "Extension Department" of the University.

The Institute is situated some twenty minutes' ride by ricksha from the commercial Settlement, just inside the South Suburb wall and in close proximity to the Medical School.

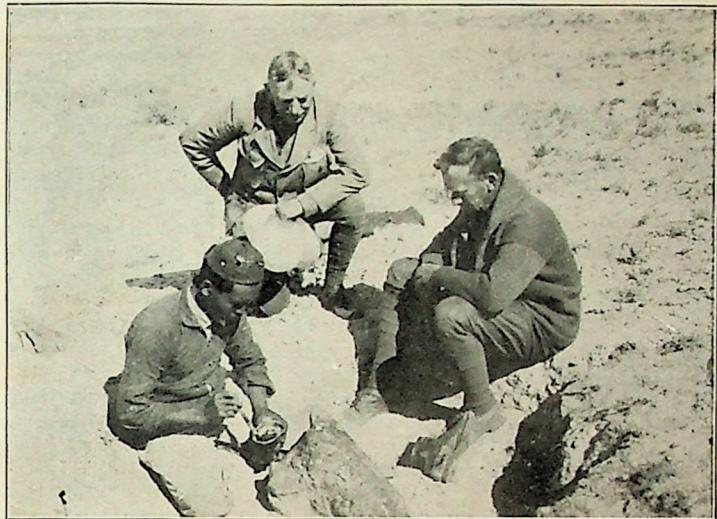
With the idea of conserving all that is good in Chinese life and institutions, the buildings are constructed in Chinese style, with certain modifications, the whole thus being in harmony with the surroundings.

On entering the gateway one approaches the main building by a broad flight of stone steps, flanked on either side by trees, shrubs and flowers, which for the greater part of the year present a pleasing spectacle. On the right of the main gateway is the gatehouse and native staff quarters, and on the left the carpenters' workshops.

Upon entering the main building, one is confronted by a great variety of exhibits. In the different sections are exhibited natural history specimens, geographical globes and models, historical charts and diagrams, models and diagrams giving elementary instruction in physiography, geology and astronomy, models illustrating means of transport and communication, apparatus illustrating practical application of science, specimens of manufactures, models and diagrams on hygiene and prevention of disease—especially those diseases most prevalent in China, illustrations of the various races of mankind, also models and pictures of churches, asylums, hospitals and other institutions. Within the limits of an article such as this it is only possible to touch upon a few of the most outstanding features which impressed themselves upon the writer's memory.

In the main building, on turning to the right, the eye is attracted by an enormous map of the world, no less than 24 feet long. This map still affords great interest, in these semi-enlightened days, but was of still greater value formerly, as, until quite recent years, even "educated" Chinese received a severe shock on learning that China, the "Central Country" occupies, comparatively speaking, a small proportion of the whole world's area. In another part of the building is a terrestrial globe, built in sections of wood, 18 feet in circumference, which also attracts great interest.

On the wall opposite the large map, is depicted the solar system in comparative sizes of Sun, Earth and Planets, the Sun occupying the greater part of the space.



Professor Osborn and Dr. Granger watching one of their native assistants remove the skull of a *Titanotherium*



Photos by courtesy of "The Shanghai Sunday Times"

Camp in Mongolia

was the immediate success of the venture that the work had to be extended to much larger premises in the outer court of the Theological School, of which Mr. Whitewright was in charge, and in this connection the Institute was carried on for some 17 years.

It was later felt that this work should be extended to Tsinanfu, the capital of the province, where it was possible to get in touch with greater numbers, and influence a far wider area. Negotiations regarding the purchasing of land and the erecting of buildings were started in 1904, and by the end of 1905 a great part of the present Institute was thrown open to the public, work during the interval being carried on in rented premises. Later, upon the removal of the Schools of the Shantung Christian University to Tsinanfu in 1917, the work of the two institutions was carried on side by side, the original Institute now being known as the "Extension Department" of the University.

The Institute is situated some twenty minutes' ride by ricksha from the commercial Settlement, just inside the South Suburb wall and in close proximity to the Medical School.

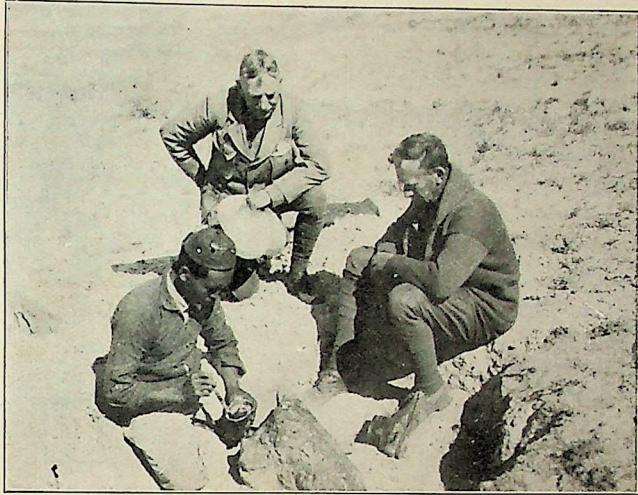
With the idea of conserving all that is good in Chinese life and institutions, the buildings are constructed in Chinese style, with certain modifications, the whole thus being in harmony with the surroundings.

On entering the gateway one approaches the main building by a broad flight of stone steps, flanked on either side by trees, shrubs and flowers, which for the greater part of the year present a pleasing spectacle. On the right of the main gateway is the gatehouse and native staff quarters, and on the left the carpenters' workshops.

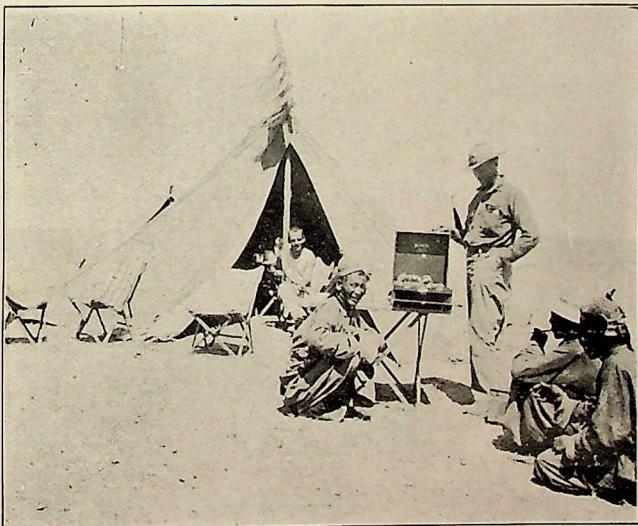
Upon entering the main building, one is confronted by a great variety of exhibits. In the different sections are exhibited natural history specimens, geographical globes and models, historical charts and diagrams, models and diagrams giving elementary instruction in physiography, geology and astronomy, models illustrating means of transport and communication, apparatus illustrating practical application of science, specimens of manufactures, models and diagrams on hygiene and prevention of disease—especially those diseases most prevalent in China, illustrations of the various races of mankind, also models and pictures of churches, asylums, hospitals and other institutions. Within the limits of an article such as this it is only possible to touch upon a few of the most outstanding features which impressed themselves upon the writer's memory.

In the main building, on turning to the right, the eye is attracted by an enormous map of the world, no less than 24 feet long. This map still affords great interest, in these semi-enlightened days, but was of still greater value formerly, as, until quite recent years, even "educated" Chinese received a severe shock on learning that China, the "Central Country" occupies, comparatively speaking, a small proportion of the whole world's area. In another part of the building is a terrestrial globe, built in sections of wood, 18 feet in circumference, which also attracts great interest.

On the wall opposite the large map, is depicted the solar system in comparative sizes of Sun, Earth and Planets, the Sun occupying the greater part of the space.

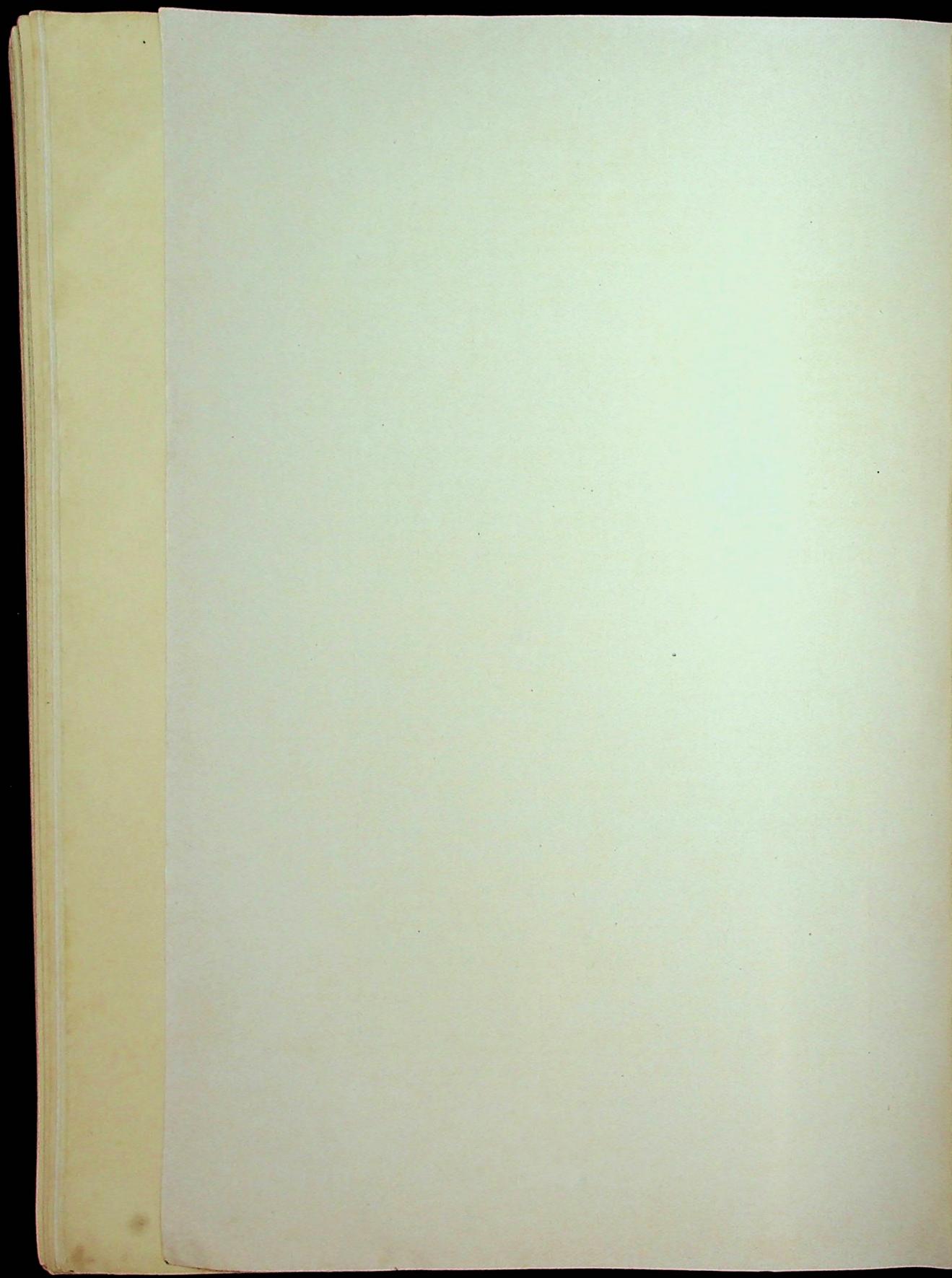


Professor Osborn and Dr. Granger watching one of their native assistants remove the skull of a Titanotherium



Photos by courtesy of "The Shanghai Sunday Times"

Camp in Mongolia



SOCIETIES AND INSTITUTIONS

Around the walls, between the various showcases, are diagrams, illustrating by means of colour strips, many interesting statistics, two of the most striking showing on the one hand the coal areas of the world, on the other, the coal output. In the former, China leads very prominently, but in the latter she is represented at the foot by a very thin line. In connection with these diagrams, there is, in one of the articles referred to above, an anecdote, amusing yet illustrating the striking and clear manner in which these diagrams show the undeveloped potentialities of China. Quoting from Dr. Arthur Smith :—

“A young man, by no means distinguished for the humility or accuracy of his ideas, was helped, by a careful study of some of these diagrams, to a more healthy state of mind. He was represented as going to his uncle at that time acting Governor of the province, and stating with emphasis that, after all, China was really ahead of the other countries in one thing only, and that was population, and that she was behind in everything else.”

A very telling diagram consists of a large map of Shantung province and England and Wales on the same scale, showing the railways of each district in the same area, that of Shantung being only about 700 miles long, those of England and Wales being over 15,000 miles in length. This readily teaches what China so sorely needs to open up the country to commerce.

Quoting from one of the reports before us :—

“Other diagrams, ten feet long by six and a half high give elementary instruction in physiography, explaining natural phenomena such as the formation of clouds, rain, snow, hail, the rainbow, causes of air currents, etc. etc. This simple explanation of natural phenomena, without directly attacking Chinese superstitions, or indeed mentioning them at all, tends, needless to say, to undermine the superstitions that do so much to hinder the development of China. It helps also to free men's minds from an intellectual and moral slavery of the worst kind.”

Above these diagrams are large pictures, we should judge about 9 feet long by about 5 or 6 high, showing some of the famous architectural and engineering feats of world. The astonishing feature of these pictures is the fact that they were all enlarged in colour, by artists trained by Mr. Whitewright, from photographs and illustrations, many no larger than a postcard.

Above these pictures are quotations in English and Chinese from Confucius and Mencius, germane to the work of such an Institute.

Before proceeding to describe some of the exhibits it might be mentioned that in this building, as well as in the student department, there is a reading room which is well used.

The western end of the main hall is devoted to natural history exhibits, mostly representing the fauna of Shantung, the local specimens being all mounted by a taxidermist also trained by the founder of the Institute.

In the centre of the hall, are models, too numerous to describe, illustrating the evils of deforestation and the benefits of afforestation,

and to those who know North China there is no need to point out the great value of these exhibits. Of the many other models, two stand out prominently in the writer's memory. The first is a model of a great local engineering achievement, the Yellow River bridge near Tsinanfu, the model itself being quite a feat of ingenuity. The model, on the scale of 1 to 100, not only shows the superstructure, but by an ingenious cutting away of the river bed at the sides, shows the whole work, down to the deepest ends of the concrete piles.

The other model referred to illustrates the advantages of properly constructed highways. Side by side are two roads during rainy weather the one a modern metallized road, the section at one end showing the method of metallizing; the other, the type of highway to be found all over North China. The native road is typically uneven, cut into by deep cart ruts and full of water and mud holes. Along this are struggling men (6-in. high) on foot, rickshas, Peking carts, etc., plastered with mud, the vehicles in some cases sunk up to the axles; in a word, a typical road after rain. Running parallel is the modern road. The surface is damp, but men walk without inconvenience, and carts, barrows and motors pass freely up and down.

In the centre of the hall is a doorway leading into a small lecture hall, with a seating capacity of 200. Here, between 10 a.m. and 4 p.m. daily, are given short lectures and evangelistic addresses once every hour. In all there are five entrances to this lecture hall, all of which are constantly open, no one, however, being pressed to listen.

Before passing on, there is another exhibit worthy of special note, this being a model of all the main buildings of the Shantung Christian University, to scale of 1 to 100. This was constructed by trained men in the workshops of the Institute. Letter-press briefly describes the history and work of the University and also states that the cost of the model was defrayed by H.E. T'ien, Provincial Governor.

At the eastern end of the main building is the commercial section, upon entering which one is confronted by the following statement in English and Chinese:—

“The dignity of commerce consists in its being of value to the whole community and in its wider aspects in its service to all mankind.

“Its highest aim is not the amassing of wealth by the few but the betterment of all.

“By the exchanges of commerce the spirit of mutual help and co-operation is promoted and the nations of the world are brought into friendly contact and receive moral as well as material advantage.”

In this section are to be found models and exhibits subscribed for, or presented by a number of the leading local foreign firms.

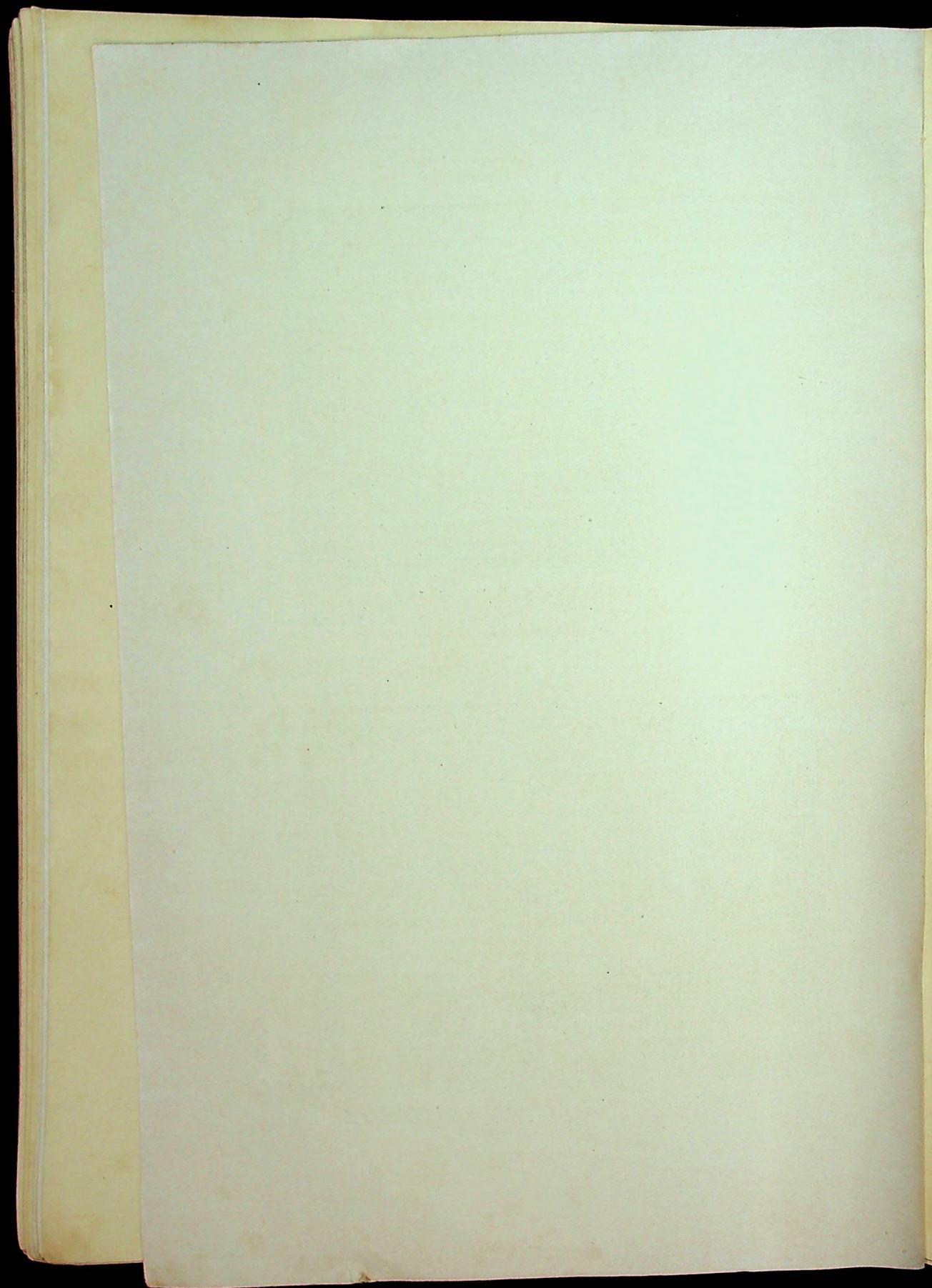
The Asiatic Petroleum Company Ltd., have an extremely interesting case, which is not only instructive but forms an excellent advertisement for this firm. In this case are models illustrating the uses of oil and bye-products. The models were all made in the Institute at the request of the Asiatic Petroleum Co., Ltd., and range from oil tanks to Chinese shops in which are men (5-in. high) selling oil, candles, etc.; from aero-



The Interior of the Main Building of the Tsing-nan-fu Institute, showing the numerous exhibits, wall-charts and the like that attract large crowds of native visitors



Historical Section of the Tsing-nan-fu Institute, showing Models of Ancient and Historical Buildings



SOCIETIES AND INSTITUTIONS

planes (using "Shell" petrol) to wheelbarrows transporting cases of oil in the Interior.

Messrs. Lever Bros. also have an excellent case in which are models showing the making and distribution of soap. Messrs. Sutton, Messrs. Dunlop and others also have exhibits. The British Mercantile Marine is represented by a large model presented by the P. & O. S. S. Company of one of their liners.

Around the walls are pictures, diagrams and maps pertaining to commerce. In passing, as a business man and from a purely business point of view, the writer is convinced that here is an unequalled opportunity for many commercial houses to bring their products very effectively before the Chinese public. (See below the numbers of visitors).

In the room adjoining the commercial section, is a striking set of models illustrating the work of the Chinese Labour Corps during the Great War. Starting with the recruiting stations, one follows the coolie through all the stages of enlisting, equipping, etc., to France where he is shown working on roads, railways, docks, etc. etc. In connection with the recruiting station is shown a paying-out centre where wives and parents are seen collecting their monthly allotments. In order to save repetition, the writer would state that this, and all other models, diagrams, charts, etc., were made by specially trained carpenters, modellers and artists in the Institute workshops.

Further on one comes to a reception room (connecting with the private office) in which special visitors are received.

Retracing our steps, we now enter, through the small lecture hall mentioned above, the historical section.

Here, by means of models, charts, maps, etc., is illustrated the growth of civilization. Down the centre of the long hall are models of many famous buildings of the world; the Coliseum, Pantheon, Parthenon, Temple of Heaven (Peking), several churches, the Capitol (Washington, U. S. A.), etc. etc. An extremely interesting case contains a model of the whole length of Whiteladies Road, Bristol, the striking feature being the great number of public buildings on the one street (Churches, Libraries, Schools, Museums, etc.) Another case contains a model of the celebrated orphanage "Quarriers Homes" near Glasgow.

The two most striking exhibits, however, are, first a set of models showing the work of the Red Cross in war-time. At one end of the case we see a battlefield with wounded men. Further along is a first aid station in a dugout and from here wounded are transported by stretcher and motor ambulance to dressing stations, and so on until at the further end of the case one comes to the Convalescent Home. As well as the stretcher and ambulance mentioned above, there are models showing every method of conveying wounded on the different fronts in the Great War, from stretchers on camels to stretchers on sleighs pulled by dogs. In this one case there are 200 figures of persons, as well as other models.

The other exhibit referred to is a set of models illustrating the work done by British women during the Great War. Even to those who saw some of them at work, this case with its W.A.A.C.s, W.R.N.S.s, censors, munition workers, landgirls, police, etc. etc., brings very clearly

THE CHINA JOURNAL OF SCIENCE & ARTS

to one's mind what we owe to our women folk. This being so how much greater must the object lesson of self-sacrifice and unselfishness be to the Chinese, who, it may be mentioned, show the keenest interest in these, as well as the Red Cross models.

Around the walls of the historical section are numerous pictures and maps of historical interest and above these are quotations, as in the main building (see above) but in this case from One greater than Confucius and Mencius.

This section is connected with the main building by the small lecture hall and also by a room which is devoted to ethnology. Here we have cases round the walls in which are models (12-in. high) of the races of the earth in their national costumes. On the walls are pictures pertaining to the subject and down the centre of the room is a case containing models showing various methods of transport, from a London motor-bus to camels in Outer Mongolia.

Facing the ethnological section, on the other side of the historical section is a room in which are exhibited bibles in many different tongues, and adjoining this is a room devoted to architecture, where we find models and several hundred photographs and illustrations of many of the most famous buildings of the world.

From the historical section we enter the hygienic section. It would be impossible to pick on any one section and say "this is the most valuable and instructive" but undoubtedly there is no department of more value than this in the whole Institute.

Here, again by means of charts, diagrams and models are shown, side by side, the causes and the method of prevention of many of the most prevalent diseases in China.

It would not seem possible to make any impression along these lines on the masses in China, and yet this section is extremely popular with all classes. That some impression has been made is shown by the following story:—

One of the sets of models shows a street vendor of melons, his wares spread out in slices on a table. As may be seen at any street corner during the summer, these slices are covered with flies. By means of models of sick people and detailed letter-press, the almost inevitable results of eating these tainted goods are shown. A simple remedy is then given in the form of a wire netting cover, placed over the melons, which effectively keeps flies and insects off. Quite recently a foreigner passing through a certain street in Tsinanfu overheard the following conversation between a melon vendor and a would-be purchaser.

The vendor was evidently asking a slightly higher price than others for his melons which the other man was disputing in no uncertain terms. The reason given for asking a higher sum was that the melons were protected by wire netting cages, and that if the purchaser cared to go to the Institute he would soon see the advantages of paying a little more and getting protected goods.

Other pictures and models show methods of administering first aid in cases of drowning, fainting, various forms of poisoning, bites from dogs suspected of suffering from rabies, etc. etc., while others show the evils

SOCIETIES AND INSTITUTIONS

of lack of ventilation, improper drainage, the danger of open charcoal stoves, in fact very many of the most common errors of the Chinese (and others) in regulating their lives are illustrated in an easily understood and effective manner side by side with simple remedies.

The hygienic section leads into the large lecture hall. This building seats 500 very comfortably, but on many occasions the audiences reach double this number, as many people standing as sitting.

Numerous lectures and addresses are given on such subjects as hygiene and the prevention of disease, afforestation, education, etc. etc., political subjects only being avoided. Recently a lecture was given to an audience of 500, the greater part being of the student class on the "Progress of Industry," this lecture being illustrated by a cinema film lent by Messrs. Lever Bros., showing Port Sunlight and soap manufacture. Similar films have been lent by several firms. These are not merely shown, but an introductory address is first given and the film explained while being shown.

On another occasion, at the special request of the General in Command, seventeen lectures were given, with cinema, to a military division, the men coming in parties with their officers, a distance of 12 li to attend. By direction of the Chief of Police, the police of the city and suburbs came in three parties, the subject on this occasion being hygiene and the methods whereby the police might enforce cleanliness and measures for the prevention of disease. In these and similar lectures, various members of the Medical School, both foreign and Chinese, took active part. It might also be mentioned that Professors of the University, both foreign and Chinese, also give valuable service in this direction.

Beyond the large lecture hall are the recreation rooms, these latter being reserved for the student classes, and here at all times of the day may be found boys and young men playing billiards, chess, draughts, etc. Needless to say no gambling is permitted. This department renders a valuable service inasmuch as it fills a want for many a young man, who is thus enabled to spend some of his spare time in healthful amusement.

This department, as do all the others, suffers from a lack of funds to enlarge. Particularly is this the case with the lecture department, which it is impossible to develop to the full value on account of the inadequacy of funds. The present accommodation is far too limited, a hall capable of seating at least 1,500 being required, as on many occasions lectures are given to audiences of about 500 sitting and the same number standing, while many more are turned away.

In fact, the whole Institute could be used far more than it is, but for the fact that funds are not sufficient to allow for extra lighting in the evenings and the extra assistants who would be required.

A sum is annually granted by the English Baptist Missionary Society, but this is barely sufficient to cover current expenses. All additions to exhibits come from subscriptions from foreign and Chinese friends.

The proof of the popularity of the Institute is shown by the numbers of visitors, the numbers being registered by a mechanical turnstile and not merely computed approximately. The numbers of visitors increase year by year, and it must be realized that this is without any advertisement

THE CHINA JOURNAL OF SCIENCE & ARTS

whatever. In 1922 over 443,000 passed through the recording turnstile, while over 52,000 entered by the lecture hall and student department entrances, totalling over 495,000 for the year. We very much doubt if many public institutions in Europe or America can equal these figures, with the exception, of course, of the great national institutions. Since the opening of the Institute in 1905 the attendances have been over five million (not including attendances at special lectures, etc.), all classes being represented from all over the eighteen provinces of China. Parties from schools, not only local, but from considerable distances, also pay visits. For foreigners, a "Visitors' Book" is kept, and in this are to be found the signatures of representatives of fifteen different nationalities.

Each Monday the Institute is reserved for women, but recently parties of girl students from Government Schools have commenced coming on other days as well. The number of visitors on Mondays vary very considerably; the first months of the Chinese year apparently being the special holiday time for women. On one occasion, about two years ago, a Monday happened to fall on the 5th of the 1st Moon and on this day 8,346 women visitors were counted by the recording turnstile, but so great were the crowds that other emergency entrances had to be thrown open, the total attendances, therefore, being considerably over this figure.

As before stated, it would be impossible to describe all the departments and agencies of the Institute within the limits of an article such as this, but there is one more which deserves special mention, i.e., the work of a Circulating Library. Assistants from the Institute pay frequent visits to schools, colleges, shops, places of business, taking with them books on a variety of subjects which are left for a time, and then changed for a fresh supply.

On reading over these notes, the writer feels that he has been unable to do full justice to the splendid work which is being done, and the great influence which is being exercised by the Institute, and to give more force to his attempts to describe these, would quote from a few articles written by well-known men.

Dr. Robert E. Speer, the well-known writer, says:—

"Just beside the Medical College is the Institute, developed by the genius of Mr. Whitewright of the English Baptist Mission, which is now incorporated in the University scheme and which is *the most effective piece of university extension work which is to be found in Asia, if not in the world.*"

Dr. John Mott in referring to a sentence in one of his own books "we should seek to multiply points of contact" said:—

"I see more points of contact in this institution than any other I have visited in the world."

Dr. Arthur Smith, the well-known writer of many brilliant books on China, writes:—

"To make a thorough study (of the various exhibits) . . . is an education in itself. It is not every provincial capital, nor even every strategic city that could produce a Tsimanfu Institute, or could conduct

SOCIETIES AND INSTITUTIONS

were produced. This complex of educational activities from its inception has been in an important sense an *inspirational* *m.* The need for others of a similar type is deep as the needs of nature, the opportunity wide as the dominions of China. But to the potential actual requires vision, supervision, and a liberal of hard cash."

Wu Lien-teh, in various articles, also speaks very highly of the *ee*, and emphasizes the need of many more such in China. *work* must also be a matter of great encouragement to those engaged *work* of the Institute to have the cordial approval of such distinguished visitors as Sir John Jordan, Sir Beilby Alston and others, but *xx* of the whole matter has been indicated by Dr. Arthur Smith in six words of the article quoted above.

ee work of the Institute is greatly handicapped by lack of funds *elosing* the writer would put forward a suggestion for the serious *eration* of those concerned.

There has been considerable discussion recently as to the best ways in the Boxer Indemnity can be used for the benefit of the Chinese

Surely an Institute of this nature, founded and built by British and doing the work which it has done for so long, deserves general financial assistance to enable it to carry out to the fullest extent *ed* agencies for the enlightenment of the people of China and the *gg* of East and West to a better understanding and closer relation-

ANON.

THE CHINA SOCIETY OF SCIENCE AND ARTS

OFFICERS AND COMMITTEE.—The ballot for officers and committee above Society has resulted as follows :

President: Arthur de C. Sowerby.

First Vice-President (Arts): John C. Ferguson, PH. D.

Second Vice-President (Science): Herbert Chatley, D. SC.

Committee: Mary A. Mullikin (Miss); Wu Lien Teh, M.D.; J. G. Son, PH. D.; George D. Wilder (Rev.); C. R. Kellogg (Prof.)

It is felt that many more subscribers to "The China Journal of and Arts" would like to become members of the Society. This is done by signifying their desire to the head office of the journal, 26 Ben Building, Shanghai.

BIOLOGICAL SECTION OF THE CHINA SOCIETY OF SCIENCE AND
Professor C. R. Kellogg of the Fukien Christian University, *now*, has very kindly undertaken to act as secretary while the *al* section of the Society is in the process of formation. All *ers* of the Society or readers of this journal who wish to join this *are* asked to send in their names to him as early as possible.

BOOKS AND PERIODICALS RECEIVED

We have to acknowledge the receipt of the following publications:—

Las Artes Populares en Mexico, Vols. I & II: Publicaciones de Lasria de Industria y Comercio.

Paleopathology: an Introduction to the Study of Ancient Evidences of Disease, by Roy L. Moodie, PH. D., University of Illinois Press.

Chu Hsi and His Masters, by J. P. Bruce. Probsthain & Co., London, W. C.

The Great River, by Gretchen Mae Fitkin. North-China Daily News & Herald, Ltd., Kelly & Walsh, Ltd., Shanghai, 1922.

Bulletin of the Geological Society of China: Vol. II, Nos. 1 & 2, 1923.

An Early Chinese Culture, by J. G. Andersson. Reprint from the Bull. Geol. Soc. China. No. 5, 1923.

Essay on the Cenozoic of Northern China, by J. G. Andersson; Mem. Geol. Surv. China. Ser. A, No. 3, 1923.

Palaentologia Sinica. (Geol. Surv. China) Ser. D, Vol. I, Fasic. 1, 1923.

Report on the Working of the Chinese Post Office. Ministry of Communications. 1923.

The Annals and Magazine of Natural History, Ser. 9, Vol. XI, No. 66, June, Vol. XII, Nos. 67 and 68, July and August.

The Lingnaam Agricultural Review, Vol. I, No. 1, December, 1922. College of Agriculture, Canton Christian College Press.

The Philippine Journal of Science, Vol. XXIII, Nos. 1, 2 & 3, July, August and September, 1923.

Journal of the North-China Branch of the Royal Asiatic Society, Vol. LIV, 1923.

The American Journal of Science, Vol. VI, Nos. 31-33, July-Sept. 1923.

CHINA MOTORS

Agents for the Leading American and
British Automobile Manufacturers

Operating :

**THE STAR GARAGE, 125 Bubbling Well Road,
Shanghai**

**THE EASTERN GARAGE, 4 Soochow Road,
Shanghai**

THE YIH CHONG GARAGE, Peking

*Clean and Comfortable
Passenger Cars for Hire*

Main Office and Showroom;

125 Bubbling Well Road, Shanghai

Cable Address:
"MECHANIC"

Codes Used:
Bentley's
A.B.C. 5th Edition

whatever. In 1922 over 443,000 passed through the recording turnstile, while over 52,000 entered by the lecture hall and student department entrances, totalling over 495,000 for the year. We very much doubt if many public institutions in Europe or America can equal these figures, with the exception, of course, of the great national institutions. Since the opening of the Institute in 1905 the attendances have been over five million (not including attendances at special lectures, etc.), all classes being represented from all over the eighteen provinces of China. Parties from schools, not only local, but from considerable distances, also pay visits. For foreigners, a "Visitors' Book" is kept, and in this are to be found the signatures of representatives of fifteen different nationalities.

Each Monday the Institute is reserved for women, but recently parties of girl students from Government Schools have commenced coming on other days as well. The number of visitors on Mondays vary very considerably; the first months of the Chinese year apparently being the special holiday time for women. On one occasion, about two years ago, a Monday happened to fall on the 5th of the 1st Moon and on this day 8,346 women visitors were counted by the recording turnstile, but so great were the crowds that other emergency entrances had to be thrown open, the total attendances, therefore, being considerably over this figure.

As before stated, it would be impossible to describe all the departments and agencies of the Institute within the limits of an article such as this, but there is one more which deserves special mention, i.e., the work of a Circulating Library. Assistants from the Institute pay frequent visits to schools, colleges, shops, places of business, taking with them books on a variety of subjects which are left for a time, and then changed for a fresh supply.

On reading over these notes, the writer feels that he has been unable to do full justice to the splendid work which is being done, and the great influence which is being exercised by the Institute, and to give more force to his attempts to describe these, would quote from a few articles written by well-known men.

Dr. Robert E. Speer, the well-known writer, says:—

"Just beside the Medical College is the Institute, developed by the genius of Mr. Whitewright of the English Baptist Mission, which is now incorporated in the University scheme and which is *the most effective piece of university extension work which is to be found in Asia, if not in the world.*"

Dr. John Mott in referring to a sentence in one of his own books "we should seek to multiply points of contact" said:—

"I see more points of contact in this institution than any other I have visited in the world."

Dr. Arthur Smith, the well-known writer of many brilliant books on China, writes:—

"To make a thorough study (of the various exhibits) . . . is an education in itself. It is not every provincial capital, nor even every strategic city that could produce a Tsinanfu Institute, or could conduct

SOCIETIES AND INSTITUTIONS

it if it were produced. This complex of educational activities from its original inception has been in an important sense an *inspirational evolution*. The need for others of a similar type is deep as the needs of human nature, the opportunity wide as the dominions of China. But to make the potential actual requires vision, supervision, and a liberal supply of hard cash."

Dr. Wu Lien-teh, in various articles, also speaks very highly of the Institute, and emphasizes the need of many more such in China.

It must also be a matter of great encouragement to those engaged in the work of the Institute to have the cordial approval of such distinguished visitors as Sir John Jordan, Sir Beilby Alston and others, but the crux of the whole matter has been indicated by Dr. Arthur Smith in the last six words of the article quoted above.

The work of the Institute is greatly handicapped by lack of funds and in closing the writer would put forward a suggestion for the serious consideration of those concerned.

There has been considerable discussion recently as to the best ways in which the Boxer Indemnity can be used for the benefit of the Chinese people. Surely an Institute of this nature, founded and built by British support and doing the work which it has done for so long, deserves generous financial assistance to enable it to carry out to the fullest extent its varied agencies for the enlightenment of the people of China and the bringing of East and West to a better understanding and closer relationship.

ANON.

THE CHINA SOCIETY OF SCIENCE AND ARTS

OFFICERS AND COMMITTEE.—The ballot for officers and committee of the above Society has resulted as follows :

President: Arthur de C. Sowerby.

Vice-President (Arts): John C. Ferguson, PH. D.

Vice-President (Science): Herbert Chatley, D. SC.

Committee: Mary A. Mullikin (Miss); Wu Lien Teh, M.D.; J. G. Andersson, PH. D.; George D. Wilder (Rev.); C. R. Kellogg (Prof.)

It is felt that many more subscribers to "The China Journal of Science and Arts" would like to become members of the Society. This can be done by signifying their desire to the head office of the journal, 102, The Ben Building, Shanghai.

BIOLOGICAL SECTION OF THE CHINA SOCIETY OF SCIENCE AND ARTS.—Professor C. R. Kellogg of the Fukien Christian University, Foochow, has very kindly undertaken to act as secretary while the biological section of the Society is in the process of formation. All members of the Society or readers of this journal who wish to join this section are asked to send in their names to him as early as possible.

BOOKS AND PERIODICALS RECEIVED

We have to acknowledge the receipt of the following publications:—
Las Artes Populares en Mexico, Vols. I & II: Publicaciones de
Lasria de Industria y Comercio.

Paleopathology: an Introduction to the Study of Ancient Evidences
of Disease, by Roy L. Moodie, PH. D., University of Illinois
Press.

Chu Hsi and His Masters, by J. P. Bruce. Probsthain & Co., London,
W. C.

The Great River, by Gretchen Mae Fitkin, North-China Daily
News & Herald, Ltd., Kelly & Walsh, Ltd., Shanghai, 1922.

Bulletin of the Geological Society of China: Vol. II, Nos. 1 & 2,
1923.

An Early Chinese Culture, by J. G. Andersson. Reprint from the
Bull. Geol. Soc. China. No. 5, 1923.

Essay on the Cenozoic of Northern China, by J. G. Andersson, Mem.
Geol. Surv. China. Ser. A, No. 3, 1923.

Palaeontologia Sinica. (Geol. Surv. China) Ser. D, Vol. I, Fasic. 1,
1923.

Report on the Working of the Chinese Post Office. Ministry of
Communications. 1923.

The Annals and Magazine of Natural History, Ser. 9, Vol. XI, No.
66, June, Vol. XII, Nos. 67 and 68, July and August.

The Lingnaam Agricultural Review, Vol. I, No. 1, December, 1922.
College of Agriculture, Canton Christian College Press.

The Philippine Journal of Science, Vol. XXIII, Nos. 1, 2 & 3,
July, August and September, 1923.

Journal of the North-China Branch of the Royal Asiatic Society,
Vol. LIV, 1923.

The American Journal of Science, Vol. VI, Nos. 31-33, July-Sept.
1923.

CHINA MOTORS

Agents for the Leading American and
British Automobile Manufacturers

Operating :

**THE STAR GARAGE, 125 Bubbling Well Road,
Shanghai**

**THE EASTERN GARAGE, 4 Soochow Road,
Shanghai**

THE YIH CHONG GARAGE, Peking

*Clean and Comfortable
Passenger Cars for Hire*

Main Office and Showroom:

125 Bubbling Well Road, Shanghai

Cable Address:

“MECHANIC”

Codes Used:

Bentley's

A.B.C. 5th Edition

Beautiful Hair

It is the ambition of everyone to have beautiful hair. Under right treatment it is easily acquired. Brushing and scalp massage are helpful, but do not remove the cause of poor, thin unbecoming, lifeless and sheenless hair. Germs are the real cause of the trouble, and these can only be removed by special treatment.

After years of patient investigation the proprietors of 'GERMOL' who are Hair Specialists—discovered germicides which quickly kill the germs of Dandruff and Scalp Diseases which are the direct cause of thin, straggling, lifeless and sheenless hair. These germs are the cause of baldness, and premature greyness. A few applications of 'GERMOL' will make a wonderful difference to the appearance of the hair. Its feeding and stimulating properties promote a rich growth of new hair, restoring the natural waves or curls, and giving one that youthful appearance which is a characteristic of perfectly healthy hair.

For Prickley Heat of the scalp, and Irritation, 'GERMOL' gives immediate relief. Scalp irritation should be prevented at all cost, as it sets up inflammation in the root areas and causes the root sheath to lose its grip of the hair.

One bottle of 'GERMOL' is sufficient to protect the hair against germs for three months.

All dispensaries sell

GERMOL

FOR THE HAIR

Sole Selling Agents :

YOUNG LEE CO.

25 JINKEE ROAD, SHANGHAI

SASSO OLIVE OIL AND MEDICINAL OIL



The highest in quality, the lowest in price. Sold all over the world in original packing 1, $\frac{1}{2}$ and $\frac{1}{4}$ gall. tins.

Sole Agents for China :
CLERICI, BEDONI & CO.
IMPORT DEPT., SHANGHAI
17 Museum Road Tel. C. 4707

TRAVEL IN COMFORT

We can plan your trip—locally or to foreign lands—make your steamer, railway and hotel reservations and save you all the annoyances of travel.

*Railway and Steamship Tickets at Tariff Rates
Hotel Reservations made without Charge*

AMERICAN EXPRESS

At your service in
YOKOHAMA—PEKING—TIENTSIN—SHANGHAI—
HONGKONG—MANILA—CALCUTTA—BOMBAY
and all Parts of the World.

Asthmolysin

(Registered as a Trademark)

An unusually effective remedy for the treatment of acute attacks
of Bronchial-Asthma

A cardiac—and a foremost vaso-motor Tonic

Subnormal bloodpressure:

Pulmonary oedema

Haemorrhages—hard to control—

Sudden weakness of the heart

Angina pectoris

Severe fainting spells

Asphyxia

Sold in boxes containing 10 Ampoules to be administered
by physicians or in glass tubes of 20 tablets.

Sole Agents for China:

SIBER HEGNER & CO., Shanghai

REPRODUCTIONS OF FAMOUS PAINTINGS

KNOWN FROM THE TANG AND SUNG
DYNASTIES

1. Portraits of Ancient Chinese Emperors and Kings

Price \$1.50

1. A Collection of Famous Pictures in the Sung Dynasty

Price \$3.00

Suitable Christmas Presents for Your Friends at Home or
Abroad. Other Assortments May Be Seen at

COMMERCIAL PRESS, LIMITED

C453 Honan Road, Shanghai, China

SIMS & Co.
House Furnishers

140 VICTORIA ROAD

TIENTSIN

Undertake to manufacture
artistic furniture that will
stand the extreme climate
of North China.

*Designs and Estimates submitted
upon receipt of particulars.*

Antiques faithfully reproduced.

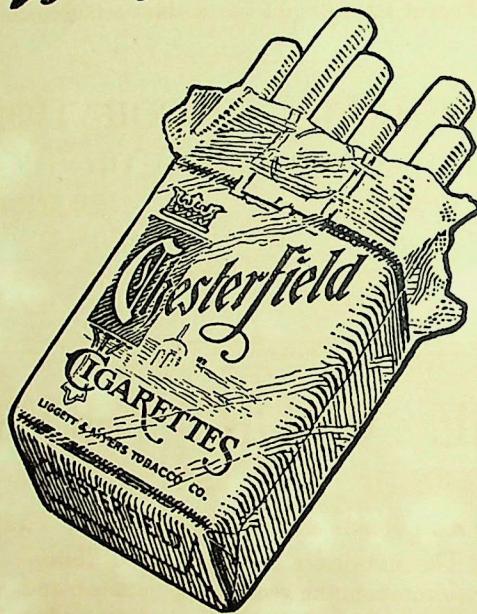
THE SIGN OF QUALITY

THE
CHINA ILLUSTRATED REVIEW

Meets a long-felt need on the part of those interested in events and politics in the Far East. Edited and printed in the same offices as the PEKING and TIENTSIN TIMES, it gives a more comprehensive and reliable survey of events in the Far East than any other paper. The illustrations deal chiefly with events in the Far East, and picturesque scenery in China and Japan.

Proprietors:
TIENTSIN PRESS, LIMITED,
VICTORIA ROAD,
TIENTSIN, NORTH CHINA

They Satisfy



Chesterfield
CIGARETTES

LIGGETT & MYERS TOBACCO CO.

FU CHUNG
HONAN ANTHRACITE COAL

Smokeless—Odorless—Clean—Economical
Ideal for

Stoves, Open Grates and Central Heating
System. Hand-picked and graded into
different sizes to suit particulars requirements

FUCHUNG CORPORATION

4 Avenue Edward VII.

Tel. C. 1371

SHANGHAI

THE COURT HOTEL
TIENTSIN

The most unique and up-to-date hotel in Tientsin

The unusual scheme of applied Chinese
decoration, the general appointments and
the exclusive atmosphere distinguishes
this Hotel from all others in CHINA
and the private control is such that will
appeal to the most discerning visitor
being unexcelled in service, cuisine and
appointments. Single, Double, Twin
Bed-rooms and Suites. No Public
entertainments

Motor Omnibus meets all trains and steamers

Telegrams : COURT, TIENTSIN

KELLY & WALSH, LIMITED

SHANGHAI, HONGKONG, SINGAPORE AND HANKOW.

The True Gift Book is always welcome—the kind we mean, that not only is a thing of beauty but stands before all others in its field as well—is

GEMS OF CHINESE LITERATURE (PROSE AND VERSE)

BY HERBERT A. GILES, LL.D.

*Professor of Chinese in the University of Cambridge, Gold Medalist,
Royal Asiatic Society*

“GEMS” has been received with praise from every side. A gift which will be cherished, read and re-read as it is one of the pre-eminent books on China.

TWO VOLUMES IN A HANDSOME GIFT BOX

\$10.00

PRAISE FROM EVERY SIDE:—

R. F. Johnston, M.A., C.B.E., Tutor to the Ex-Emperor of China. Author of “Buddhist China,” etc., writes:— . . . the well-chosen extracts contained in this charming and admirably-produced volume will doubtless be a permanent source of delight to all who are interested in the literary side of Chinese culture.

Dr. John C. Ferguson considers Dr. Giles's translations of Chinese Poetry “of a high order”:—

“Giles introduced a new light touch and with his usual brilliance improved upon the work of his contemporaries . . . The charm of his work and the permanency of its value lie in his imaginative conception of the beauty of Chinese verse which remained in concealment from English readers.”—*N. C. B. R. A. S. Journal, Vol. LIII, pp. 75-76.*

N.-C. Daily News:—

“Here in brief is a very adequate index to the Chinese mind . . . The collection is most representative and of exceeding interest.”

The Times Literary Supplement:—

“ . . . We have the feeling that Dr. Giles has succeeded in getting more completely into the skin of the Chinese sages than any of his competitors.”

New China Review:—

“A Series of ‘Gems’ from Chinese Literature that Sparkle and Gleam . . . A kind of Source-book of Chinese Literature . . . This beautifully printed and artistically bound volume.”

The Japan Advertiser:—

“Dr. Giles has made a collection of extracts from Chinese Literature that fulfils the primary purpose of all such efforts—the portrayal of the national life of a people through that people's Literature . . . It is a fine edition for a gift.”

The Literary Digest—International Book Review:—

“Even the critic who complained of a lack of humour in Dr. Giles's book admits that as a survey of a nation's literary activities it is almost unique.”

PEKING AND TIENTSIN 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.

Proprietors :

TIENTSIN PRESS, LTD.

VICTORIA ROAD
TIENTSIN, NORTH CHINA

CHINA NORTH AND SOUTH

(SECOND AND REVISED EDITION)

Contains 30 selected photos from some of our former albums.

They are pleasing pictures of China from Foo-chow to Peking.

*An attractive gift souvenir of
China for friends at home*

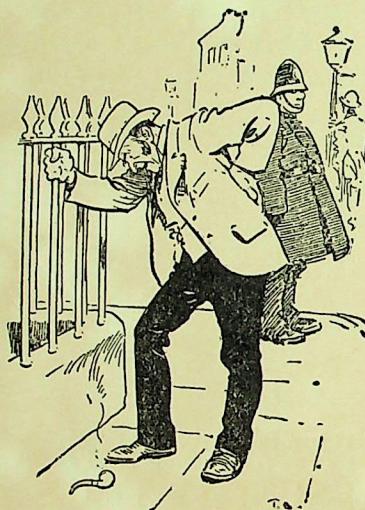
Price \$7.50

A. S. WATSON & CO.

(The Shanghai Pharmacy, Ltd.)
16 NANKING ROAD

DOAN'S

Backache Kidney Pills.



Never neglect weak kidneys. Give them the help they need at the first sign of trouble.

Doan's Backache Kidney Pills are solely for the kidneys and bladder, and if taken in time will soothe and heal the delicate kidney membranes, cleanse the urinary system and enable the kidneys to resume activity, and to rid the body of the poisons which have caused so much distress.

兜安氏秘
製保腎丸
專治內腎
膀胱虛弱
發爲背痛
風濕水腫
腎筋痛腦
系痛小便
不利等症
有藥到病
除之奇功

DOAN'S
Backache Kidney
PILLS.





The Brightest Sunday Paper

THE SHANGHAI SUNDAY TIMES

and the Newsiest Daily Paper

THE SHANGHAI TIMES

Delivered to your address for \$20.00 a year

(Postage to Outports EXTRA)

THE SHANGHAI TIMES

21 MUSEUM ROAD, SHANGHAI

Telephones:

Editorial Offices:
Central 227

Business & Printing Offices:
Central 225

THE
CHINA YEAR BOOK
1923

An Encyclopaedia of information on
present-day China

Prices { \$12.50, Cloth bound
 \$15.00, Half-leather

*Order from your Bookseller or from the
Publishers:*

THE TIENTSIN PRESS, LTD.,
181 VICTORIA ROAD,
TIENTSIN

INSURE TO-DAY

Favourable Rates for Insurance in
respect of—

LIFE
FIRE
ACCIDENT
SICKNESS
MOTOR CAR
BURGLARY
PLATE GLASS
MARINE
FIDELITY

Can be obtained from

ALEXANDER RAMSAY

40 TENG SHIH K'OU,
PEKING

TELEPHONE Nos. E. 950 AND 2290

A NEW
No Change in Price for **CORONA**



With the following
 improvements—

1. Automatic Ribbon Reverse
2. Longer space bar and shift keys on both sides
3. 10 inch carriage
4. Combination carriage return and line space lever

*Write for particulars
 of our*

Instalment Plan

M.\$22.50 places it
 in your hands and
 the balance in easy
 payments.

General Agents for China:

DODGE & SEYMOUR (CHINA), LTD.
 18 Museum Road, Shanghai.

TOYO MURAKAMI

OBJETS D'ART AND CURIOS

Japanese and Chinese

Kimonos of all kinds	Tea, Coffee and Dinner Services
Satsuma Ware	Vases, etc.
Bronze Statues, Vases and Jar-dinieres	Shanghai Postals
Silk Embroidered and Painted Screens	Stockings and Socks
Pictures in Cut-velvet, Water Colour, Embroidered and Oil Paintings	Scarfs and Underwears
Lacquered Cups, Finger-Bowls, Plates and Trays	Hand Bags in Beaded, Leather and Silk
Silk Quilted Dressing Gowns and Jackets	Artificial Pearl Necklaces and Culture Pearls
Tortoise-shell Combs and Pins	Cloisonne Ware and Silver Ware
Lamps and Shades	Damascene Ware, Cigarette Cases, Cuff Links and Brooches
Shirts and Ties	Dinner Cards
China Ware	Ivory Carvings
	Cut Glass Ware
	Table Glasses

TOYO MURAKAMI

Phone
 Central 2319

Palace Hotel Building
 SHANGHAI

Cable Add. :
 Murakamito

Gibb, Livingston & Co., Ltd.

MERCHANTS

2 YUEN-MING-YUEN ROAD, SHANGHAI

記 仁

號二第牌門記道仁海上

務航理兼品貨口入出辦代

AGENCIES:

“BEN” Line of Steamers

Lloyd's London and United States “Lloyd's”

The London, Liverpool and Glasgow Salvage Associations

Motor Union Insurance Company, London

National Benefit Life and Property Associations Company, Ltd

Maritime Insurance Company, Limited

Comite des Assureurs Maritimes de Bordeaux

China Fire Insurance Company, Limited

Queensland Insurance Company, Limited

The Red Hand Compositions Limited, etc., etc.

USE

“CROWN” TOILET DAINTIES

On Sale at all Leading Stores

Tooth Paste: Tooth Powder: Shaving Sticks:

Vanishing Cream: Complexion Powder: Hair

Cream, etc. etc.

THE CHINA SOAP & CANDLE CO., LTD.

7 HANKOW ROAD

SHANGHAI

REISS & CO.

(REISS BROS. LTD.)

SHANGHAI

DYES & CHEMICAL DEPARTMENT

Sole Agents for—

Joseph Crosfield & Sons, Limited,
WARRINGTON (ENGLAND)

Chemical Manufacturers

(PYRAMID BRAND)

Pure and Industrial Glycerine S.G. 1260, Silicate
of Soda, Solid and Powdered Caustic Soda,
Carbosil, Water Glass (for Egg Preserving),
etc. etc. etc.

SANDOZ CHEMICAL WORKS,

Basle, Switzerland.

Manufacturers of

Aniline Dyes for Cotton, Wool, Silk, Paper, etc.

Large Stocks Carried

ALSO

ENGINEERS AND
MACHINERY IMPORTERS.

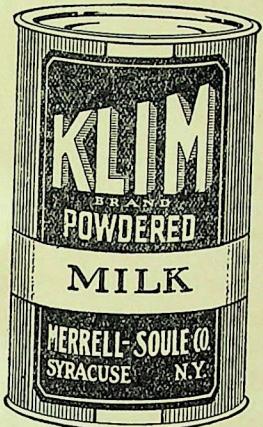
COTTON SPINNING AND TEXTILE
MACHINERY.

POWER AND LIGHTING PLANTS,
LOCOMOTIVES, BOILERS,
MACHINE SHOP EQUIPMENT.

BRANCHES *also at:* Canton, Chefoo, Hankow,
Hongkong, Peking and Tientsin.

KLIM POWDERED MILK, A GUARANTEED PRODUCT

Is rich, pure pasteurized milk, reduced to a powder by a process in which *excessive heat is not employed*.



One pound of
klim will make nine
pints of liquid milk.
To make liquid milk
pour klim on top of
the water, according
to directions on each
tin, and beat for one
minute.

KLIM—THE IDEAL MILK FOR BABIES

A proper and safe food for baby is a mother's first concern. For many reasons KLIM is the ideal milk for babies. 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. OF THE ORIENT, LTD.

Shanghai Distributors—Write for Descriptive Booklet.

MAFEL & CO.

ESTABLISHED 1892

FURNISHERS,
DECORATORS,
IMPORTERS,
CONTRACTORS.

*Designs and Quotations
FREE on application*

P.193 NANKING ROAD,

SHANGHAI

PHONE CENTRAL 600

CIRCULATION

is the best index of a newspaper's Standing and Influence.

The China Press

PAID CIRCULATION

was audited about a year ago by one of the principal firms of chartered accountants in Shanghai, showing that the average daily paid circulation was

5,269

No other Shanghai newspaper has since published any returns of paid circulation.

Let *The China Press* carry your advertisement to the bureaus, offices, institutions, colleges and homes of Shanghai and near-by cities, to the outports and to the interior. The Result is Sure.

“Demand a Certified Circulation Statement”

Write to the Advertising Manager for rates.

Are you a subscriber to

THE CHINA PRESS?

“Impartial and Progressive”

All the news of the day.

\$23.00 per annum; outport and foreign postage extra.

THE CHINA PRESS

41 Canton Road, Shanghai.

Sample Copies Free upon Request

THE ADMIRAL LINE

Agents :

UNITED STATES GOVERNMENT SHIPS

A New, Fast and Comfortable

AMERICAN

TRANS-PACIFIC PASSENGER SERVICE

STEAMSHIPS:

President Madison—President Grant—President Jefferson—President McKinley—President Jackson

SAILING EVERY TWELVE DAYS

THE SHORT ROUTE

SEATTLE AND VICTORIA

AND

HONGKONG AND MANILA

For Information and Rates apply to

THE ADMIRAL LINE

ADMIRAL ORIENTAL LINE

Agencies :

YOKOHAMA
KOBE

SHANGHAI
HONGKONG

MANILA
SINGAPORE

Messrs. JONES & MURPHY

Representing the

UNITED GLASS BOTTLE MANUFACTURERS, LIMITED

Comprising:

CANNINGTON, SHAW & CO., LTD.
NUTTALL & CO. (ST. HELEN'S), LTD.
E. BREFFIT & CO., LTD.
ALFRED ALEXANDER & CO., LTD.
ROBERT CANDLISH & SON, LTD.
UNITED GLASS BOTTLE MFTRS.
(CHARLTON), LTD.

We can supply you with
CANNONS, $\frac{1}{2}$ -oz. and 1 oz. ESSENCES. WINCHESTERS.
PANELS. MEDICALS.

CLEAR, BRIGHT, STRONG.

OUR Bottles are of the highest standard manufactured by semi-automatic and automatic machinery. They are correct in corkage and capacity, and the strongest, due to superior glass distribution and scientific annealing.

GET IN TOUCH WITH US

Head Offices:

UNITED GLASS BOTTLE MANUFACTURERS, LTD.,
40/43 NORFOLK STREET, STRAND, LONDON, W.C. 2.

Works: CHARLTON, LONDON; ST. HELEN'S, LANCS.; HUNSLET, LEEDS;
SEAHAM HARBOUR, DURHAM; CASTLEFORD, YORKS.

China Agents:

Messrs. JONES & MURPHY

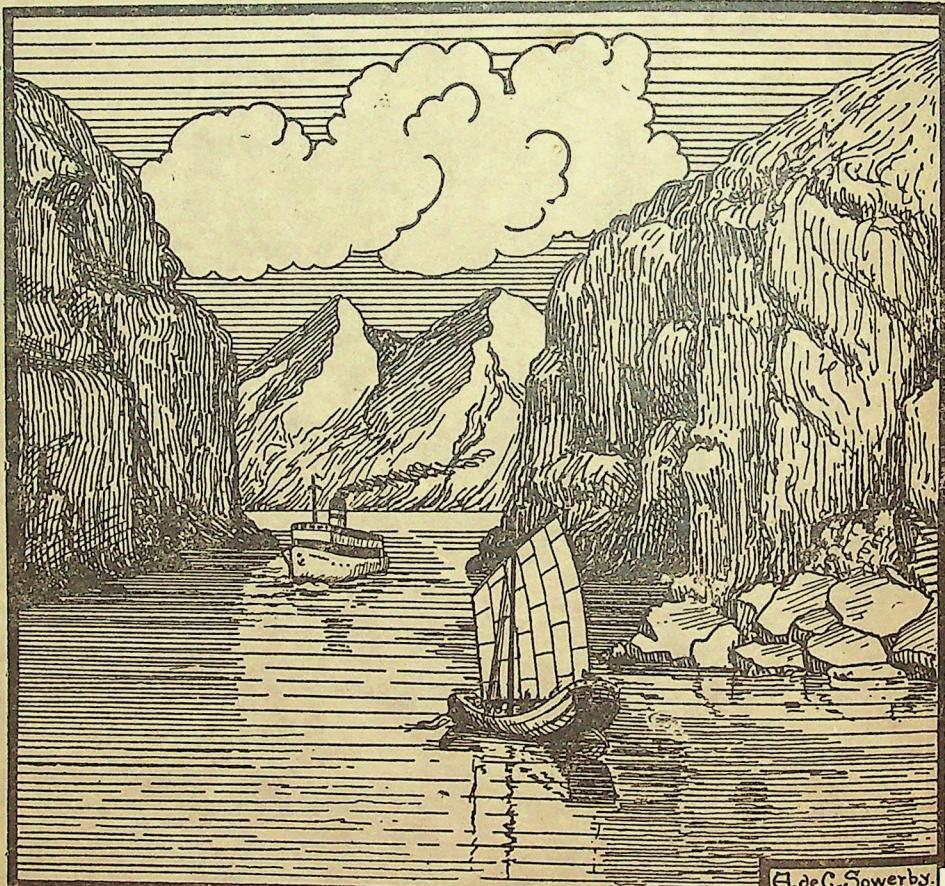
432 KIUKIANG ROAD, SHANGHAI

Cable: "CAXTON" Shanghai

Telephone No. C. 308

MACKENZIE & CO., LTD.

Through the Yangtsze Gorges
TRAVEL IN LUXURY AND COMFORT BY



H. de C. Sowerby.

S.S. "LOONGMOW."

The "LOONGMOW" maintains a regular eight days service during the season between Ichang and Chungking. Connection is made at Ichang from Shanghai and Hankow by the steamers of Messrs. Mackenzie & Co. Ltd's S/S. "SHUTUNG," and at Chungking for Suifu by Messrs. Mackenzie & Co. Ltd's S/S. "SHUTUNG."

Superior saloon passenger accommodation. Electric light and fans fitted in all state-rooms. Large sun deck and spacious observation deck aft. Excellent cuisine and services.

For further particulars apply to:—

The Owners: Messrs. Mackenzie & Co. Ltd., Shanghai, Hankow, Tientsin, Chungking, Ichang.

The Agents: Butterfield & Swire, at all ports. Messrs. Thos. Cook & Son.