



NO. 9. VOL. IV

EDITED AND PUBLISHED BY F. H. RAULEDER

JUNE 1934

vest m
2514



PICTURESQUE INDIA

**66 ILLUSTRATIONS
PRICE RUPEE 1-8**

PRICE: Re. 0-4-6

GODREJ SOAPS

(Cent per cent Swadeshi—The Pride of India)

VOICES OF AUTHORITY

Herr Karl Lusurtze (Well-known German Skin Specialist):—Soaps made of animal fats are very injurious to the human skin. After long personal use and subsequent chemical tests, I unhesitatingly give your vegetable soaps the place of honour as health and beauty soaps.

Dr. Aufrecht (Chemist to the German Public Laboratory for Experimental Chemistry, Microscopy and Bacteriology and to the Berlin Chamber of Commerce):—I have tested Godrej Vegetable Toilet Soaps and in my opinion, they are such as would kill the Sheptococcus and the Staphylococcus germs, the germs of typhoid fever and other resistant diseases. They are excellent disinfectants.

Major Dickinson (Govt. Chemical Analyser):—Godrej Soaps are perfect in all respects.

Dr. M. A. Ansari, M. D. (Ex-President, Indian National Congress):—I have great pleasure in testifying to the most excellent qualities of Godrej Soaps. I have used them now for the last ten years and have found them better than the best soaps manufactured in Europe or for that matter in any other country. I recommend them to the Indian public both from the point of view of their excellence and their being made in India.

Sole Agents for India:

NADIRSHAW PRINTER & CO.
121, Esplanade Road
BOMBAY

362CA

Madras Presidency Agents:

J A Y A B H A R A T H A M C O.
POST BOX 83
MADRAS

R.
m 2, N30
N34.4.9

An Ideal Gift to your Friends

F. H. RAULEDER

PICTURESQUE INDIA WOODCUT ALBUM 16" x 7"

The book contains not less than 66 photographs of South Indian Sceneries and Types and of these 63 are full page illustrations, the actual size of these reproductions being 5" x 3". Price Re. 1/12/- Limp Paper Cover Re. 1/4/- Postage extra.

"... are strikingly beautiful and the production as a whole is a credit to the photographers and the printers as well as to Mr. F. H. Rauleder's selective taste." MADRAS MAIL

"... Indeed the life of India is giving such multitude of picturesque subjects and I appreciate your thoughts in bringing out this book." Prof. NICHOLAS ROERICH

"... This publication is one more proof of the most excellent craftsmanship of the work done in the B.M.PRESS." Dr. RABINDRANATH TAGORE
"This is an excellently printed volume of little known places of India. The majority of them are pictures taken from that part of India the average person hardly ever sees—the daily life of the South Indians, with their medley of strange sounds—the tinkle of the temple bells, and the throb of the drum. There are pictures in the album of the real India that one does not see when travelling by rail or motor car. As the author of the work says "The call of the East" is a call to everyone who has an eye for colour and in whom the spirit of romance is still alive. "Picturesque India" would make an ideal gift for those who would like to know their India better, and more particularly as a gift to friends overseas." THE ILLUSTRATED WEEKLY OF INDIA

12 Woodcuts: Bullock Cart, Temple Entrance, Agra Palms, Kuloor River, Way to Nilgiris, Way to Mysore, Coconut Garden, Temple Street, Jungle Life, Fisherman, The Village Road and Watering Rice Fields. Price Re. 1/12/- Postage extra.

"It would be superfluous for me to utter words of my hearty satisfaction." Prof. K. T. SHAH

"The woodcuts are splendid of Indian Scenes." Dr. LOUIS M. EILSHEMIUS, NEW YORK

PICTURE ALBUM 1, 16" x 12"

12 Pictures: Black and White Price Rs. 3/8/- Postage extra. Hand coloured Price Rs. 6. Postage extra.

"Woodcuts which show an unusual and delightful blending of the Art of East and West are contained in "Picture Album No. 1" which Mr. F. H. Rauleder has published at the Basel Mission Press, Bangalore. There are twelve woodcuts in the Album and they illustrate the various phases of life and scenery chiefly in Southern India. On looking through these woodcuts by Mr. Rauleder one realises what an excellent country India is for the artist in this medium, as the above example shows." THE ILLUSTRATED WEEKLY OF INDIA

PICTURE ALBUM 8 1/2" x 5 1/2"

12 Pictures, as above, in smaller size. Price Rs. 2. Postage extra.

RAULEDER'S PICTURE POST CARDS

12 in a packet. Price As. 8/- Postage extra.

WOODCUT ALBUM 16" x 12"

12 Woodcuts: Agra—Taj Mahal, Sunrise, Nightfall, Coconut Garden, Jungle-way, River-side, Sacred Peepul, Bazaar Street, Channel, Fishing Boat, Rest and The Three Wise Men. Price Rs. 3. Postage extra.

"I am delighted with your drawings." F. E. FRANCIS

"I have absolutely fallen in love with your wonderful Art." G. K. CHETTUR

"It is most attractive and I compliment you upon the excellent quality of work." U. S. ANDERSON, AMERICA

Indian Land and Life Picture Post Cards

"This is a set of 12 postcard pictures which are the reproductions of the original paintings of F. Rauleder. The pictures represent the various activities of Indian rural life and are very interesting in regard to the choice of subjects as well as the multi-colour print. The pictures themselves are very realistic and the colour technique is very good." THE STUDENT, CHINGLEPUT

THE RED-RIPE OF THE HEART

Illustrated by F. H. Rauleder, Text by T. B. Krishnaswami 80 pp. with 9 illustrations, in an attractive cover. Re. 1.

INDIAN PHOTO CALENDAR 1934

With 24 full-page Illustrations size 8x13 inches. Price As. 8.

COLOUR PICTURE CALENDAR

The most brilliant of all Colour Calendars in the market. The Picture is a grand feast of colours. Price As. 4.

INDIAN CALENDAR 1934

Containing 23 Photo Reproductions which can easily be cut into Post Card size with 6 full-page Illustrations free. Price Re. 1.

CHRIST IN 1934 (CALENDAR)

With 21 four-colour illustrations which can be cut into post-cards and Bible text for every day. Price Rs. 2.

FOR SALE AT ALL OUR RAILWAY BOOK-STALLS

HIGGINBOTHAMS MOUNT ROAD MADRAS

486DA

THE ORIENTAL ENGINEERING CO.

MISSION STREET ESTABLISHED: 1928 ☉ TELEGRAMS: "GARAGE" MANGALORE

Ours is the right place for all your Motor Car or Lorry repairs, Spray-painting etc., because

We use the most up-to-date machinery, tools and methods assuring precision in workmanship.

We employ only skilled and able workmen with experience.

We supply only the best and reputed spare parts and accessories.

We charge the lowest possible rates compatible with the high standard of our work.

ALL UNDER EXPERT SUPERVISION

ELECTRICITY IS COME TO SERVE YOU

Your houses, shops or factories will profit by being wired for light, fans and power.

Keep up with the times by having your wiring work done by us.

Please remember we are the one and only PIONEER electricians house in Mangalore. We have done 80% of the private electric installations and deserve your patronage and confidence.

Whatever be your needs in electricity, call on us and we will point out to you the most rational and economical way to solve your problems at minimum cost.

We undertake installation of fans, lights, motors, radios, heating apparatus, refrigerators and every modern electrical aid to the house or factory.

Don't be deceived by cheap contractors—cheap is costly in the long run. Profit by the experience of others.

We are fully equipped to do every kind of Electrical testing and repair work.

ESTIMATES FREE OF COST

979CA

A Step Ahead

"KOPRAN" cleans.
"KOPRAN" sterilises.
"KOPRAN" hardens the gums.
"KOPRAN" tones up the tissues.
"KOPRAN" refreshes.
"KOPRAN" checks mouth diseases.
"KOPRAN" builds Dental health.

.....of all others because "KOPRAN" Tooth Paste incorporates formulae representing the latest discoveries of modern Dental Research.

Dr. Kokatnur, M. Sc., Ph. D. and Dr. Desai, D. D. S., have evolved this superb Dentifrice incorporating the most powerful and yet harmless combination of astringent, antiseptic, anti-acid and cleansing Agents.

"KOPRAN" is unique in that for the first time in Dental history, the active, gum-hardening principles of Babool have been incorporated in it.

Never before has an Indian-made Tooth Paste been sold abroad—yet "KOPRAN" by its intrinsic merit earned the distinction of being a recognised leading dentifrice in America and other countries.

"KOPRAN" is a great step ahead and it will pay you to get in line and start on your way to better, cleaner teeth and healthier gums.

KOPRAN

389 CA

TOOTH PASTE

Manufactured under expert supervision by

KOPRAN CHEMICAL CO., LTD.
12, RAMPART ROW, FORT, BOMBAY



Awarded several GOLD MEDALS in Different Exhibitions

CENTRALCO'S PURE MANGO PULP

Konkan is noted for its delicious, excellent mangoes superior to which are not grown in any other part of the world. Fresh Pulp from choice grafted mangoes is preserved in solderless SANITARY CANS without Sugar so as to retain its original taste and flavour. The product remains excellent for years and yet is free from any chemical or preservative.

Price As. 8/- for 11 oz., As. 13½ for 21 oz., Rs. 1¼/- for 35 oz.

Sample tin containing 7 oz. sent against 7 annas stamps

PURE GHEE AND HONEY ALSO SUPPLIED

Agents wanted everywhere.

481 DA

Manufacturers:

Central Canning Co.

Thalakvadi, BELGAUM

Export Agents:

Krishna Swadeshi Stores

57 Swadeshi Market, BOMBAY 2.

Dr. Harold H. Mann, D. Sc., Ex-Director of Agriculture, Bombay Presidency, says:—

I have examined and tasted the tin of your Mango Pulp (which) on opening, was in perfect condition. It has been shown in the chemical laboratory of the agricultural department to be entirely free from preservatives. Its taste was excellent and it is evidently a product of first class quality.

JUST OUT

KETTLE DRUMS

(A Collection of Short Stories and Miscellany)

By

N. RAMABHADRAN, B. A.

with a Foreword by

R. S. SARMA, Esquire, C. I. E., M. L. A.

SOME OPINIONS:—Our next story "Rounding up of a Robinhood" will be by an Indian author of repute—*Indian India*.

Mr. Hilton Brown, M. A., I. C. S., Collector, Vellore says "I read the book with interest. . . . If any glimpse or vision of true India (as opposed to India of British fiction) is ever to come before European eyes, it must be through the medium of writers such as yourself."

Price Rupee One Nett.]

[Cloth bound.

Copies can be had from all Leading Book-sellers and News Agents and also from the Basel Mission Press, Mangalore.

NOTE:—A Special Leather Bound de-luxe Edition of 100 copies only have been published.

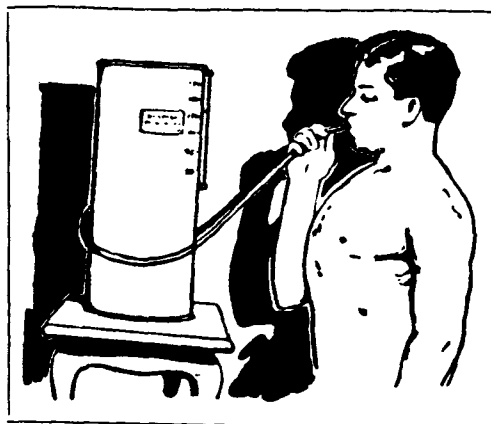
392 CA

Rs. 5/- Nett.

**JUST TEN MINUTES A DAY WITH THIS SIMPLE AND SCIENTIFIC
HEALTH INVENTION WILL GIVE YOU**

Abundant Health and Vitality Supreme

The Pranayama Health-Generator, simple, compact and inexpensive, is acclaimed by doctors as the most practical and beneficial of health-giving devices ever made. In schools and



gymnasiums, it gives the finest possible deep-breathing exercises—to increase physical development, vigour and endurance. And in the home, for young and old, it offers a NATURAL method of keeping fit and free from the lung diseases which destroy so many lives each year. A few minutes a day with this unique health-generator will make a new man of YOU. Hundreds have written to us, telling us how their physique has improved and their general health and vigour become noticeably better. If you value fitness and vitality, write to-day for free booklet, including

testimonials and full details of the Pranayama Health-Generator and many other invaluable devices for physical fitness.

A few of the many Testimonials:

Surgeon-General with the Government of Bombay (now retired):—"I have seen the demonstration of the "Pranayama Health-Generator" and I consider that the device from its simplicity and comparative cheapness is likely to be popular amongst persons suffering from respiratory diseases which should derive benefit from respiratory exercises. Such an arrangement should, I think, form part of the equipment of all up-to-date surgeries."

The Director of Public Instruction, Bombay Presidency (now retired):—"I have seen the Pranayama Health-Generator which is simple and ingenious. It would no doubt afford a useful means of exercise in schools and gymnasias and should serve to develop chest and lungs, thus acting as a protection against consumption and other diseases which affect the lungs."

Major K. G. Gharpure, I. M. S.—"This is a simple form of Pranayama Health-Generator and is an ingenious design to test and develop one's Lung Capacity. This ought to be a great help in preventing respiratory diseases, if properly used. The need for such a developer of lungs in India is great as consumption alone takes such a heavy toll every year. I consider that the use of this apparatus as a developer of Lung Capacity ought to be a part of regular school gymnastics in every school and the simplicity and cheapness of the instrument will make it accessible to every household who have the interest of their children at heart."

Dr. R. H. Bhadkamkar, M. A., M. D., Bombay:—"This Pranayama Health-Generator is ingeniously devised and is free from any defects. It will be of much use to persons suffering from respiratory diseases. Nowadays the tendency for lung affection, especially Tubercular, is rapidly increasing and one of its chief causes is the ill formed chest and shallow breathing. One sees several children like that in any school and it won't be too much to say that side by side with the physical examination of school children, their respiratory capacity should always be measured and whenever it is found to be deficient the use of this apparatus should be enforced. Every household and gymnasium should also possess this instrument as it affords a very convenient method of practising deep-breathing exercises."

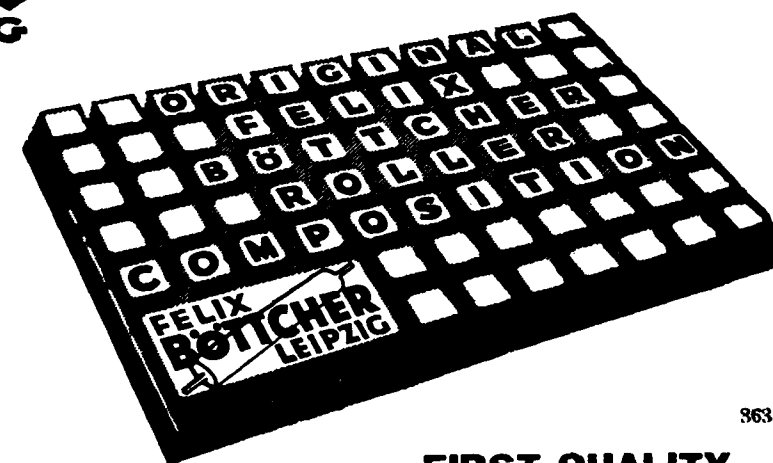
Lokmanya Bal Gangadhar Tilak, Poona:—"This Pranayama Health-Generator is a very useful instrument and what is still more important is that it is at the same time simple and inexpensive. Dr. Godbole deserves to be congratulated upon his ingenious design and I hope the instrument will be welcomed by the public."

Price Rs. 15/- only. Post free to any part of India, Burma and Ceylon
for Rs. 18-8-0 only. Advance of Rs. 5/- essential with each order.

363 CA

DR. GODBOLE, P. B. 19, POONA CITY

**FELIX
BÖTCHER
LEIPZIG**



363 CA

**ALL
ROLLER CASTING
REQUISITES**

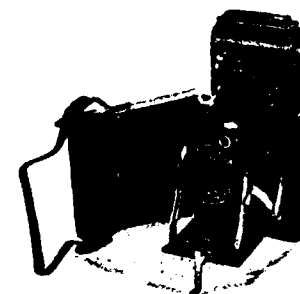
**FIRST QUALITY
FOR ALL CLIMATES**

Sole Agents for Northern India:

Indo-European Machinery Co., Chandni Chowk, Delhi; 22, Elphinstone Circle, Fort-Bombay; 48, Radha Bazar St., Calcutta, 3, Ganpat, Lahore.

Sole Agents for Southern India:

Massey's (1930) Ltd., Main Road, Royapuram, P. O. B. 60, Madras; R. Rustomjee & Co., 200, Grandpass Road, Colombo, (Ceylon).



ESTD. 1890 Telegrams: 'SUCCESS'

M. M. SHANBHOGUE & SON
General Merchants

MARKET ROAD, MANGALORE (S. INDIA)

WIDELY AND POPULARLY KNOWN AS

"MONNA'S SHOP"

THE RELIABLE SHOP FOR YOUR
REQUISITES

AUTHORISED DEALERS:

"HIS MASTER'S VOICE"

GRAMOPHONES,

RECORDS AND ACCESSORIES

KODAK AND VOIGTLANDER CAMERAS

FILMS, PAPERS, CHEMICALS ETC.

COBRA BOOT AND METAL POLISHES

AND PASTES

DIRECT IMPORTERS OF:

GLASSWARE

GLAZEWARE

LAMPWARE

HARDWARE

EARTHENWARE

PERFUMERY

CUTLERY

OILMANSTORES

PATENT MEDICINES ETC. ETC.



AGENTS FOR:

GOODLASS WALL & CO.'S

VARNISHES, PAINTS

ENAMELS ETC.

GOODWIN'S TOILET SOAPS

I. B. P. CANDLES

HARDWARE PENS

PHILIP'S LAMPS

EVERREADY BATTERIES

LICENCE HOLDERS OF DS 2 AND F.L. 17

363 CA

ALL KINDS OF LADIES' AND GENTS' PRESENTATION ARTICLES WE STOCK
STYLISH GIFTS IN SOLID SILVER—TRY FIRST BEFORE YOU PURCHASE ELSEWHERE

TERMS MODERATE

MOTTO SATISFACTION

MOFUSSIL AND FOREIGN ORDERS WILL BE CAREFULLY AND PROMPTLY EXECUTED

SUNDARI SATI BELGAUM GARAGE AND STORES

(BEST TONIC FOR LADIES)

Specially useful in Leucorrhoea manorrhagia, Amenorrhoea, Dismenorrhoea, Metrorrhagia, Cardiac debility, Hysteria and other female complaints.

SOLD EVERYWHERE 804 DA

Mangalore Agents: Messrs. SHAH & CO.

DAVE CHEMICAL WORKS
2/94 CHINA BAZAR ROAD, MADRAS

Khade Bazar - Belgaum

Agents to SHIRGAOKAR IRON WORKS & BHARAT LEATHER GOODS

Ask for Illustrated Catalogues

We deal in all sorts of

Swadeshi Goods.

388 CA



E. KIKABHOY & CO.

No. 22 VITHALDAS ROAD
379 CA BOMBAY, 2.

FOR SALE

6 B. H. P. DEUTZ
KEROSENE
OIL ENGINE
in perfect working
condition

B - M - P R E S S
Mangalore S. K.



460 DA

26

**INDIAN PALM
POSTCARDS**

As. 8

B-M-PRESS MANGALORE

Ask for Circulars of
Wholesale Business in
Provisions and General
Merchandise.

Dinshaw Khodadad & Co.

Crawford Market,

364 CA BOMBAY

WHEN YOU VISIT MADRAS

Don't forget to call on E. D. SMITH.

He is called the Little Whiteley and

can supply you with anything you

need from a pin to an airship.

401 DA

**REVIEW OF
PHILOSOPHY AND RELIGION**

BEING THE

**Journal of the Academy of
Philosophy and Religion**

Published twice a year in March and September

Annual Subscription: — Rs. 4 (Inland); Foreign { 7s. 6d.
2-50 dollars.

Secretary and Editor

Mr. P. K. GODE, M.A., POONA 4, (INDIA)

26

**INDIAN TEMPLE
POSTCARDS**

As. 8

B-M-PRESS MANGALORE

USE ALWAYS

STANDARD INKS

in all colours—for Steel and

FOUNTAIN PENS

Liberal Commission to dealers.

Wanted Selling Agents in

every town.

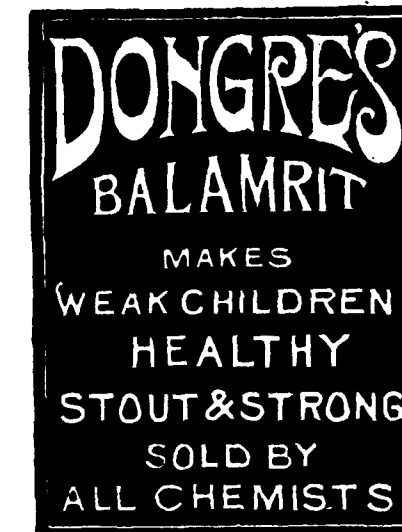
488 DA

Apply to:—

Narasimham & Co., Ltd.

Post Box No. 24, MADRAS

334 CA



**WENKMANN'S
SMALL-POX WYLY**

Ravages by small-pox brought under control by this greatest discovery of the Age. Cent per cent success in the prevention and cure of small-pox, chicken-pox etc. A necessity in every home. Order a bottle to-day for Re. 1 only. Postage extra.

Agents wanted. 316 CA

The **KOPPAL Dispensary**
GULBARGA (Deccan)

26

**INDIAN FOLK
POSTCARDS**

As. 8

B-M-PRESS MANGALORE

Look!

We undertake the sharpening of cutting-machine blades in our newly received "up-to-date" power-fitted Grinding Machine, at a moderate charge.

Save your machine blades
from uneven sharpening.

393 CA

BASEL MISSION PRESS
MANGALORE S. K.

GINGER IN SYRUP!

Ginger Preserve!!

Preserved Ginger!!!

FOR

BEST GINGER PRESERVE

EITHER

409 CDA

IN SYRUP OR CRYSTALLIZED

GO TO

THE MANGALORE HOME INDUSTRIES

MANUFACTURERS OF EXCELLENT PRESERVED PROVISIONS

CHURCH-GATE, HAMPANKATTA 3, MANGALORE, S. K.

Recipients of:—

Certificate of Merit, Madras 1927. Gold Medal, Hubli 1931.

Silver Medal, Trivandram 1931. Gold Medal, Calicut 1932.

Price-list on application from the proprietor.

HATIM BROTHERS

Suppliers of High-Class

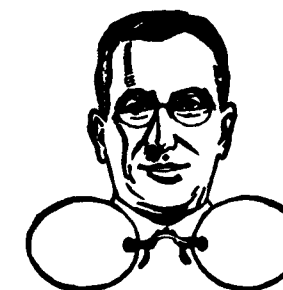
Optical lenses,

Frames, etc.

361 CA

LATEST STYLES

ALWAYS IN STOCK



293, Abdul Rehman Street, BOMBAY

G. R. K. SUNDRAIER, Agent, United India Life Office, Pashpagiri, Trichur, can supply



Wanted Agents for Snuff Boxes.

500 DA

Bell-metal Kujas, Tumblers, Tea and Table Spoons, Rosewood, Elephant and Bison Carvings, Fast coloured Mull Sarrees for ordinary ware of Hindu Ladies. Snuff Boxes made of Ivory, Buffalo Horn, Sandalwood and Rosewood in gross lots (awarded Gold Medal at Kumbakonam Exhibition in 1922).

DRAKSHAMRUTA

THE BEST TONIC OF ITS KIND

Awarded Gold Medal by Pandit Jawaharilal Nehru at the Hubli Exhibition

Praised in India by rich and poor all alike since over 35 years. Scientifically prepared from selected and pure medicinal herbs. Awarded Gold Medals and Certificates of Merit.

A guaranteed remedy and a wonderful tonic (which is a mixture of wine and juices of various medicinal herbs); is a boon to the suffering humanity. It supplies the rich nourishment for the weakened nerves, promotes appetite, enhances digestion and thus rebuilds the body.

A special boon to women and children, and a permanent and positive cure for all sorts of complaints. Try once and you will be convinced. Complete treatment by the use of 3 bottles.

For directions and further particulars please write to

The Manager, DRAKSHAMRUTA DEPOT, POST NIPPANI (BELGAUM)

Available from:—

MANGALORE— The Gajanan Medical Hall.

Messrs. Mijarkar Bros.

UDIPI—

Pai Pharmacy.

K. Sheshagiri Pai, Esq.

COONDAPOOR—K. R. Bhatji, Esq.

KARKAL—

V. V. Shenoy, Esq.

BANTWAL—

B. H. Vasudeva Pai, Esq.

PUTTUR—

Gopal Narayan Pai, Esq.

Pai Pharmacy.

KASARAGOD—

K. Rama Nayak, Esq., Court Road.

AND ALSO FROM ALL CHEMISTS AND DRUGGISTS, AND PATENT MEDICINE DEALERS

488 DA

SHENOY BROS. & CO. MANGALORE S. K.



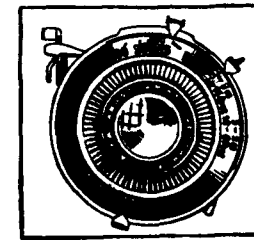
Wholesale dealers in all kinds of Paper, Plates, Maps, Globes, Kindergarten Materials, School Pictures, Coloured Pictures, Stationery and Sports Materials. Book-sellers & Publishers. Trial Orders Solicited

986 CA

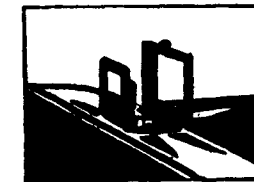
SPECIAL ATTENTION IS TAKEN IN BOOKBINDING

VIII

The NEW *Agfa* SPEEDEX RECORD



Agfa 7-7 Igestar anastigmat lens.



The patented direct view-finder.



506DA

THE New Agfa SPEEDEX RECORD is a Roll Film Camera with which it is practically impossible to take other than perfect snapshots. Its handsome finish is worthy of a camera costing many times its price.

IT COSTS ONLY

Rs. 33-8



Its many patented features include brilliant and frame or direct view-finder and F.7.7 anastigmat lens.

IDEAL PHOTO HOUSE, MANGALORE

Dealers in S. Kanara for the AGFA PHOTO COMPANY

THE RED RIPE OF THE HEART

By T. B. Krishnaswamy, M.A., B.L.

District Educational Officer
SALEM

Opinion:—

Times of India: "Mr. Krishnaswamy's hymn is not poetry in form, but it is so in spirit. One can well believe that it will find echoes in young and happy souls; but those who are fated to keep watch over man's mortality build on that which is more endeavouring than the sheen of new grass and the silkiness to the touch of young limbs."

Price Re. 1/- postage extra.

Can be had from

BASEL MISSION PRESS
MANGALORE S. K.

or

Messrs. HIGGINBOTHAMS, MADRAS
and their Bookstalls

TRY FAMOUS

"BULL"

BRAND

KHUS-KHUS

TOILET SOAP BRAND



Makes the skin soft, smooth and glossy.

Sold everywhere.

487 DA



Presidency Agents:—

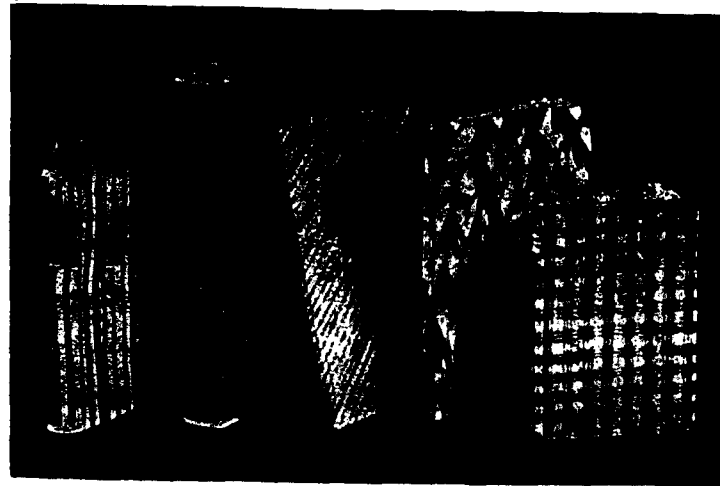
S. VISWANADHAM & Co.

MADRAS AND VIZIANAGRAM

3 BUNDER ST., MADRAS

IX

The Binding gives the First Impression

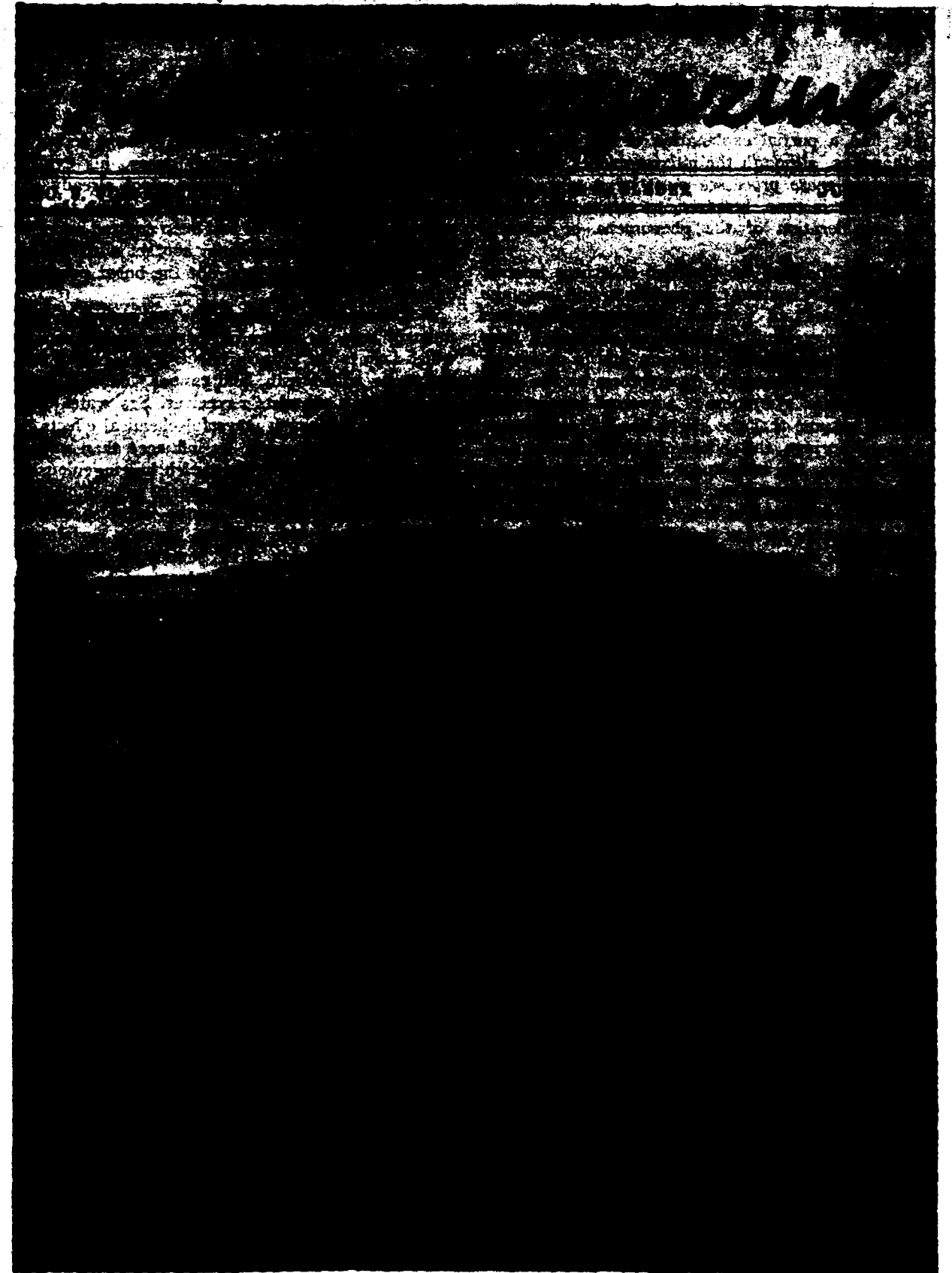


Suitable and attractive binding of all sorts of books for professional, business, school and home use. Constructive service to the publisher is planning, submitting dummies and establishing cost. Reliable aid to the printer in our long experience and ample facilities. Charges in line with current cost. Helpful suggestions offered gladly. Estimates will be given on application.

991 CA

B-M-PRESS MANGALORE S. K. BRITISH INDIA

x



GRAZING

PHOTO: F. H. RAULEDER

EARTHQUAKES AND VOLCANOES

III

IN the series of real processes already enumerated we may find a partial explanation of the phenomena of earthquakes, although the ulterior causes that start and maintain these processes must be sought over a wider field. It is time, however, to return for a little to the consideration of the phenomena of volcanic eruptions.

Such is the force of the tradition of a fiery interior of the earth that it is almost impossible to find language for the description of volcanic phenomena that does not imply in every line the existence of such a fiery core. In watching volcanic eruptions, and in reasoning about them, we instinctively regard them as the mere outward signs and symptoms of a general internal fire. We hastily assume that the slight rise of temperature in mines and borings, the shocks of earthquakes in non-volcanic regions, the tumultuous forms of mountains, and many other appearances, are necessarily connected with the fiery eruptions of the volcano. The question whether the intense heat of the volcano may be a local and superficial product appears to have been rarely considered. But if it be a superficial product the usual reasonings about it are obviously vitiated by a basis of illusion. Supposing that the volcanic gases are combustible gases, and that the liquid material emitted is a combustible material, we have obviously presented to our observation only the products of combustion. We are like the moth who should reason on the nature of a gas flame, maintaining that carbonic acid and water are the only substances emitted, and that these substances being incombustible must be intensely heated in the depths of the gasometer; or like a philosopher from another sphere, standing at the mouth of a furnace, and arguing that as nothing combustible comes out therefore nothing combustible can be within. If combustible gases are emitted in volcanic eruptions it is barely possible that any portion should escape unburnt. If combustible magma is extruded it is barely possible that any portion should escape unoxidised into the air. All evidence regarding the nature of the gases emitted by volcanoes is to the effect that they are precisely what we should find if a mixture of gases resembling the gas of gas-works were burnt in the volcanic crater and in its porous walls. Spectroscopic observations have proved of late years that in volcanic eruptions there really does occur an extensive burning of such gases. "A volcano," says Deville, "is a crater to which converge the products of the combustion of various gaseous compounds. In proportion to the distance from this centre the indications of a decreasingly energetic combustion are met with." Dr. Geikie remarks that "Herr Siemens has been led, from observations made in May, 1878, at Vesuvius, to conclude that vast quantities of hydrogen gas, or combustible

compounds of hydrogen, exist in the earth's interior, and that these, rising and exploding in the funnels of volcanoes, give rise to the detonations and clouds of steam." Herr Siemens being the greatest recent authority on the power of heated gases, his evidence is peculiarly valuable. But ample proof already existed, obtained in the exceptional cases in which the gaseous emanations of volcanoes had been emitted under water, or otherwise preserved from contact with the air, so that the original gas, and not the burnt product, was submitted to analysis.

It is less easy to ascertain the real nature of the fresh unburnt lava, or rather of that mysterious magma of which lava is the burnt product. Emissions of lava are not to be trifled with, and cannot, like the gases, be collected in a chemist's receiver. Sea water exercises on burning lava such powerful chemical effects that it is no less altered under its influence than under that of the atmosphere. Dr. Prestwich has ingeniously suggested that the cold of the glacial period might have produced a temporary lull in the intensity of volcanic action. However this may be, there is certainly more chance that unburnt lava should be preserved unchanged if emitted in the polar regions than in any other climate. In 1870 Professor Nordenskiöld discovered at Ovivak, on the coast of Greenland, large masses of iron, supposed at first to be of meteoric origin. They contained, moreover, between four and five per cent. of carbon and about one per cent. of sulphur. M. Daubree, who has specially devoted himself to the study of meteorites and the testing of theories regarding the nucleus of the earth, writes as follows of this discovery:—"One may consequently admit that the masses of iron which appear to constitute the deeper regions of the terrestrial globe are not wanting in carbon, both combined and free, and that they may thus, in this respect, resemble meteorites, and especially the masses of Ovivak." It is now generally admitted that these masses of Ovivak are not of meteoric origin, but that they had simply fallen out of a neighbouring mass of solidified basaltic lava. This lava has been found not only beside the supposed meteorites, but also at other points of the coast, and it not only contains masses of iron, but is intimately penetrated throughout with metallic iron of the same composition as that of the supposed meteorites. "The conclusion is," says M. Stanislas Mennier, a special authority on this subject, "that the metal proceeds from the deep regions of the globe, and represents consequently a specimen of the metallic nucleus of the earth." The masses of iron found by Pallas in Siberia appear to be of similar origin. "More than one mass of iron regarded as a meteorite," says De Lapparent, "might well, as in the case of the native iron of Ovivak, take its place among bodies of terrestrial origin." In place of founding on this discovery speculations on the nature

of meteorites and the nucleus of the earth, it is certainly allowable to register, as a well-ascertained fact, the conclusion that the commonest form of lava poured from fiery volcanoes is originally a highly combustible substance, capable of emitting, when brought at a moderate temperature in contact with the air, a great amount of heat, owing to the burning of the carbon, sulphur, and iron, which is still intimately mixed with its substance in considerable proportions, even after long exposure to the polar air. When we remember that this material is emitted from volcanoes in admixture with vast quantities of highly combustible gases, we must admit that the superficial burning which actually takes place in volcanic craters and on lava streams may be, for all that we know to the contrary, the main source of the intensity of their temperature.

IV

I write from a Spanish kitchen near the crest of the Pyrenees, beside a fire composed of an entire tree, surrounded by five great dogs whose spiked collars are a formidable protection from the wolves and boars of the surrounding forest. A few days since I crossed the mountains with mules and miners bringing dynamite and boring-tools to open up a new mining region rich in mercury, silver, and copper. To-day the thaw, following an unusually heavy snowstorm, has stopped the work of unearthing the ancient galleries excavated by former local adventures.

Coming here from the plains of France the road is a perpetual ascent. The Pyrenees rise abruptly as an irregular mass, corroded by streams and rain. But on reaching the summit of the range you step suddenly on a boundless plateau, and perceive that what is called the Pyrenean chain is simply the rough, timeworn edge of the vast plateau of Spain. All along the chain this view may be verified as nearly approaching the truth. Usually from the Spanish plateau the surface rises so gradually that no imposing mountains appear to the north, while looking southward from the low French plains a steep rocky wall bounds the horizon with its dark, snow-sprinkled precipices. The form of the Pyrenees, as represented on maps, like a long, sharp roof, suggesting upheaval along the centre, is altogether misleading. It is only of late years that by detailed study and exact representation a correct impression of the great features of the earth's surface is being gradually attained. And these features are being thus recognised as no results of tumultuous outbursts of internal fires, but as the slight inequalities produced by gradual and irregular changes in the rock masses of the earth's crust, due to processes that must be of very various and complex character. On any theory the facts of mountain structure compel the admission that vast pressures are laterally transmitted, producing foldings and contortions of the rocks sufficient to account for many protuberances of the surface; and on any theory it must be admitted that these movements occur as if the external, and therefore most extensive, shell of the globe were in process of sinking down, adapting

itself by squeezing, crushing, and crumpling together, to a smaller shell beneath. But these features obviously admit of various explanations. The same results would follow from an expansion of the earth's outer crust as from a contraction of the nucleus, and the combination of many and various processes tending to produce subsidence would probably, owing to the lateral extension of their effects, yield the same superficial results as would follow from the general contraction of a molten globe. Undoubtedly the latter theory is the simplest, and has enjoyed an extensive popularity; it accounts in a rough fashion for the facts at the price of ulterior difficulties; it is a *deus ex machina* of superabundant power and plastic attributes; but to those who regard modern science as yet in its infancy—as "just beginning to toddle," to quote words from the lips of one of the foremost philosophers of our day—the igneous theory is of that *à priori* character which is unfavourable to the progress of research. It is certainly more useful to investigate and classify the various processes which certainly obtain in the rocks, and to leave the igneous theory for future use when we have clearly ascertained that those processes are inadequate, and that no additional processes of similar character remain to be discovered. In the present state of science it is scarcely possible to affirm the insufficiency of even the chemical and other causes that have been discovered within the last few years. That these causes produce sinking in one district and upheaval in another, and that the very frequent crumpling of the superficial rocks is not produced by mere contraction of the earth's interior, but also in great part by expansion of the outer crust, through gradual oxydation and intrusion of material from below, as suggested by De la Beche, is a view that can be maintained in scientific detail.

The discovery of Sir Humphrey Davy that the earth and alkalies were simply the rust of metals that, in their unoxidised and metallic state, had never yet been seen by human eye, is one of the most brilliant triumphs of the science of the present century. Suddenly, in a moment, that fortunate philosopher, watching in the laboratory of the Royal Institution the metallic button that the application of a powerful electric current to a drop of fused potash produced at the termination of a wire, could affirm that, in all probability, the masses of the Alps and the Himalayas, the plains of the Pampas and the Sahara, all the rocks of the earth that the human race had trodden for six thousand years, were in reality composed of the mere rust of metals soft as lead or brilliant as silver. Naturally he concluded that the interior of our globe was but a mass of these brilliant metals, and that their oxydation, or gradual burning by the slowly penetrating atmosphere and its attendant moisture, was the source of volcanoes and of the internal temperature of mines. With characteristic modesty and the true spirit of research, he examined the phenomena of Vesuvius, and, failing to find the expected results of his theory in the eruption that he was enabled to witness, he occupied himself

no further with the subject. Later observations, under more favourable circumstances, have proved that the evidences sought by Davy, especially the evolution of hydrogen, are really to be found in abundance, as has been mentioned in a preceding page. Even before these evidences had been successfully detected, Daubeny derived from extensive observation of active volcanoes conclusions favourable to the theory of Davy. But all the evidence in favour of this theory is equally favourable to the view that the elements whose oxydation yields the heat to be accounted for are reduced to the unoxysed condition by processes that accompany their accumulation in the rocks. The history of the earth as recorded in geology affords no satisfactory evidence of the progressive changes that would accompany the gradual and constant oxydation of a primitive unoxysed nucleus; all the satisfactory evidence accumulated is in favour of the view that the changes which occur are of cyclical character, the processes that occur to-day being the result of similar process in the past and the sources of similar process in the future. Thus the granitic masses which to-day crumble into clay, sand, and salts are the source of similar granitic masses that must gradually form at the base of the new rocks produced by the accumulation of such detritus. Thus the mountains which to-day yield mud, sand, and dissolved salts to the torrents of their slopes are preparing vast accumulations in the neighbouring seas which in future time may yield rock masses no less formidable than those of the Alps and Himalayas. Thus the metallic veins of the existing mining districts, yielding metallic solutions to the waters of the surface and the interior, afford the constituents which are necessary to the formation of new ribs of metal in later crevices of the rocks. Thus the buried forests and meadows of former soils clothed with vegetation yield to the present atmosphere the carbon necessary to sustain the vegetable life that provides by its accumulations the coal deposits of a future age; and the limestones dissolved in the rivers of our day are carried to the ocean to form the material of the shells that build the limestones of the future. And similarly we may suppose that the organic matter, the carbon, the fuel, necessary to the production of reduced or unoxysed metallic elements, is afforded by the perpetual burying of organic matter, which takes place as a necessary part of the complex process through which rocks are produced by the transport of mud, sand, and salts into the oceans that, in their mobile and varying depths, receive the deposits that will form the plains and mountains of the future. As in the smelter's furnace the action of the fuel extracts the metal from its ore, so in the earth the buried fuel may produce metallic masses in some respects resembling those to which Davy attributed the origin of volcanic and internal heat. The gradual insensible process of reduction throughout long ages in the rocks may yield the same result as the rapid and coarser process of the smelter; and the natural process, like

all the works of nature, is more perfect, with less loss, and therefore requiring a smaller proportion of fuel. And thus we find the ancient granites usually devoid of organic matter, which, on the whole, is less abundant in proportion to the time during which the rocks have been buried under conditions favourable to the employment of their organic impurities in the processes of reduction indicated above.

Such is the rough outline of the chemical theory of volcanoes which may be maintained in the present state of science. But little reading is required to assure any intelligent mind that the process must admit of innumerable local variations in conformity with the infinite complexity of the internal anatomy of our globe.

This chemical view of the origin of volcanic action is favoured at the present day by comparatively few geologists. Dr. Percy, whose lectures on chemical geology form the only compendium of that science contributed by an English author, appears inclined to admit some such explanation of volcanic heat. De Lapparent, whose recent "Manual of Geology" is the work of an uncompromising upholder of the doctrine of a molten interior, admits that the chemical theory "can invoke in its favour the indulgence, perhaps even the favour, of some distinguished scientists." His objections are a fair sample of those usually urged against it. He remarks that some volcanoes "rest on granite—that is to say, a fundamental rock, beneath which there are neither limestones to evolve carbonic acid, nor coalbeds to yield hydrocarbons by distillation, nor salt deposits to furnish salt;" that other volcanoes rest on gneiss and mica-schist, and others on Silurian rocks, which he regards as poor in supplies of fuel; and he asks how it is that volcanic energy can attain its greatest intensity in tropical regions, which are precisely those least adapted to the formation of beds of coal. Such objections are in part mere theoretical consequences of the internal-fire theory, in part mere slips of memory, such as must affect the writing of any work of extensive scope, such as the exhaustive and incomparable manual of De Lapparent. There exists no independent proof that granite is a fundamental rock, and few known granites are of so great an age as those Laurentian strata of America, in which Principal Dawson has detected "immense deposits of graphitised plants," as well as extensive masses of limestone. The granite of the Pyrenees frequently presents interbedded limestones of Silurian, Devonian, or carboniferous age, and there is good evidence that many granitic masses may be only cakes of granite overlying older sedimentary rocks. Petroleum is a constituent of the granite of Broddbo; and other forms of carbon abound, especially in the Pyrenees, in the limestones formerly classed as primitive. Salt has been abundantly detected in the microscopic pores of granite. Petroleum, during the last twenty years, has proved chiefly abundant in the older rocks formerly supposed to be the witnesses of an almost lifeless world. Even Humboldt has mentioned

Continued on page 248

WHAT NEXT, IN STEEL?

It stripes tall buildings with light. It glitters brighter than silver on new automobiles and puts strength into the wings of airplanes. It plates the dies which make the nation's banknotes and coats the pans in innumerable kitchens. It is used for cutlery, golf clubs, fishing rods, spectacles, dairy equipment, gun barrels, beer barrels. Its uses, indeed, are limitless. It is a thing of beauty, a colossus of strength and a bugaboo to rust.

It is stainless steel. Unheard of in 1910, stainless steel is the best known of all the alloy steels now in use. This lustrous, ever-bright metal has wielded a mighty influence in helping to make the 20th century the era of alloy steels. Within recent years, scientific research has given man a greater knowledge of iron and the steels and alloys he derives from it. The scientist has played with iron and steel, worked with them, made new and amazing alloys of them, discovered new ways of working them, smelting them, refining, rolling, moulding and shaping them.

In this era of alloy steels, in this birth of a new industry within the steel industry, the Ludlum Steel Company with its plants at Watervliet and Dunkirk, New York, and with a network of warehouses spreading from coast to coast, has played a conspicuous part. This company spends thousands of dollars monthly in research, numbers on its staff many internationally known metallurgists, is linked with Krupp and other European metallurgists in the exchange of patent rights. Making special alloy steels for special purposes, Ludlum Steel is famous for its tool and valve steels, for its development of Nitralloy and the Nitriding process in this country, and for its pioneer work in stainless steels.

To metallurgists, steel is a form of iron produced in a fluid state, free from slag and containing a certain percentage of carbon. To the steelmaker, it is the teeming white liquid which issues from the furnace. To men in the rolling mill it is the cherry-red ribbon which darts out along the run-out tables. To the engineer it is the material which builds buildings, lays railroads, forges tunnels, spans rivers, traverses mountains. To the machinery builder it is the material which makes the tools that make all steel construction possible. To Wall Street and business men in general, steel is the barometer of industrial activity.

Steel comes from iron. And iron comes from iron ore. Three-fifths of all the iron ore used in the United States is mined in Minnesota, the greater part of it in the open ore pits in the Missabe range. There, in a vast chasm yawning in the earth's surface, dynamite splits the earth away and steam shovels scoop up the red ore and drop it into waiting cars. The cars carry the ore to the docks. Thence, by boat, it is transported across the Great Lakes, eventually arriving at one of the country's steel plants.

Now, iron ore is a compound of iron and oxygen with certain impurities. Raw iron must be extracted from the ore before it, in turn, can be transformed into steel. This is done in the blast furnace. Here, iron ore is smelted with coke and limestone. Heated air, blown into the furnace, passes through the coke, burns it, and creates an intense heat within the furnace. In its molten bath, the iron ore is robbed of its oxygen, its impurities swallowed up by the limestone. Only the raw iron is left. It is known as pig iron because the molten metal used to run out from the furnace through large troughlike molds called "sows," into smaller molds, or "pigs."

The pig iron is taken hot to storage plants and thence to the open hearth furnace. Pig iron itself is soft and malleable. Mated with carbon, 6 per cent. up to 2 per cent., it is malleable, ductile and extremely hard. That is what happens in the open hearth furnace. There, to the molten pig iron, more scrap iron and steel, more limestone, and carbon in the necessary amount, are added. The charging begins. After ten or twelve hours of cooking in intense heat, the mass is converted into steel. It is simple steel. Then, rolled into rails, bars, stocks or billets, it moves out, by train and ship, to span the world with sinewy fingers.

Where Ludlum Enters...

The death of steel is caused by the same thing that gives life to living creatures—oxygen. When the steelmaker has turned iron rust into steel, the steel, invaded by oxygen, immediately begins to turn itself back into rust. It is believed that the waste caused by rust is greater than all other industrial waste combined. A skyscraper is dismantled. Automobiles, railroad cars, plows and tractors, and other things made of steel, pass into disuse. But the steel lives again, in other forms. You can remember that piece of old iron or steel you sold, years ago, to the junk man for a nickel or dime. Worthless, it seemed to you. Yet it passed from his hands through a vast chain-store system and eventually became part of the numberless tons of "scrap steel" which, every year, flow back into the furnace and come out again as new and often extraordinary steels. To-day, the scrap steel industry has assumed gigantic proportions. It is, as any steel man will tell you, a mighty factor in this era of alloy steels.

Ludlum Steel begins its operation with scrap steel. Its process short-cuts several operations and eliminates the necessity of blast furnaces and open hearths. It uses its own scrap steel, buys scrap steel in the open market, and smelts these in the electric furnace. When the cars loaded with scrap steel come into the yards, a giant electric magnet, capable of lifting two tons, slides over on an overhead crane, noses into the car, swiftly picks up the scrap and deposits it in the yards. Inside the building, the company's own scrap steel is

segregated into bins, according to the kind and percentage of alloy which the scrap contains.

Now, as has been said, Ludlum makes special steel alloys for special purposes. Alloy steel, as differentiated from simple steel, contains one or more elements other than carbon in sufficient proportion to modify or improve substantially and positively some of its useful properties. Thus, tungsten may be added to raise the temperature at which steel softens. Chromium and vanadium may be added to give toughness; nickel to increase the elastic limit; cobalt to increase red hardness; titanium, aluminum and other metals to improve quality.

The Electric Furnace.

Scrap steel containing one or more of these elements in known amounts, together with miscellaneous scrap steel, can be smelted with precision in the electric furnace to produce a desired alloy steel. In this squat little oblong-shaped furnace the complete reincarnation of scrap steel takes place. It produces the best steel of all—better than the bessemer and open hearth furnaces—because it can be controlled so accurately. The electric furnaces at Ludlum were designed and patented by Ludlum engineers. The lower part of the furnace has a steel shell, which is lined with shaped magnesite bricks. Over this lining is spread a layer of dead, burned magnesite. Heated, this melts and men work it up from the bottom on to the sides until it is about six inches thick. This material hardens quickly, becomes like solid rock. This practice is called "making bottom" and is preliminary to the "heat." The upper part of the furnace is the dome-shaped, detachable roof made of clay brick. There are spaced openings in the roof through which electrodes, formed of graphite, drop downward. These electrodes are automatically adjusted so that, during the melting of the steel scrap, the lower ends remain at a constant distance above the metal so as to produce a uniform arc. The entire furnace is carried on toothed rockers and tracks and can be tilted to empty its contents.

The "Heat".

When Ludlum is ready to make an alloy steel, and the electric furnace is prepared for the heat, the miscellaneous scrap is brought to the furnace. Then an electric magnet, inside the building, moves along the segregated bins and picks up scrap containing one or more alloys, depending on the alloy steel which is to be fashioned in the melting. Then, to this mixture is added ferro-tungsten, ferro-vanadium, or some other elements, depending again on the alloy steel to be made. Thus fed, the electric furnace is ready to begin its service to mankind. In seeking ingredients for its various "heats," this little furnace gobbles up semi-rare metals from all over the world. Tungsten, from interior China. Chromium from Rhodesia and New Caledonia. Vanadium from the western slopes of the Andes in Peru.

The charging begins. Electric arcs do the work. In temperatures up to 2800 degrees F., the scrap begins

to melt. When it's down to liquid form, a man shoves a long 8-foot ladle spoon into the molten mass, dips out a spoonful and pours it into a small mold. This is taken to the laboratory for analysis. There, chemists, studying it, can tell what should be added or if dilution is necessary. The keeper of the furnace, a veritable steel chef, tends the "heat" with alert eyes. Since human eyes, unprotected, cannot look into the dazzling glare of the furnace, he and his helpers use face-boards in which the eyes are coloured lenses. Through these lenses, the bubbling liquid within looks like a pool of buttermilk, tinted here and there with pink. For two hours or more the peering, watching, mixing, sampling keeps up. From time to time, oxide of lime is thrown into the furnace to form slag which collects the impurities. This slag is drawn off frequently with a long-handled hoe. When, after repeated sampling, the liquid shows that it is up to the standard set by the chemists, it is about ready to be tapped. The attendant ladles out another spoonful. Holding a stop-watch in his hand, he observes the liquid. If it begins to solidify in 30 or 40 seconds, it is done.

Ingots.

The electric current goes off. Some of the roar ceases. Back of the furnace a platform is lifted. A crane swings over, picks up a great ladle and drops it into the empty space. A lever is swung and the furnace rears up on its haunches. The spout is opened and the white-hot teeming liquid, attended by a shower of crackling sparks, pours into the ladle. The crane then picks up the ladle, filled to the brim with its molten burden, and moves it over to a row of ingot molds placed in alignment. These ingot molds are made of cast-iron heated and smoked in advance so that the ingots may be easily removed later. The ladle pauses above one of these ingot molds, a plug at the bottom is opened, and the molten liquid, throwing out another cascade of white sparks, drops downward, hitting the bottom of the mold with a deep, plumping sound. When the mold is full, the ladle moves on to the next mold. The liquid steel in the ingot mold solidifies from the bottom up. A clay hot-top rests on top of the mold and keeps the top portion of the metal fluid until the last and in condition to feed and fill any shrinking cavity below. When the molten metal has been poured into the ingot molds, Ludlum's basic business of making alloy steels is ended. For these are the ingots, and the ingot is to steel what bar gold is to currency—the standard of measurement.

Rolling Mills.

But there is still the matter of fashioning from the ingots the shapes and sizes desired by fabricators. The ingots are stripped of their molds and dispatched to the "soaking" pit. Here, they are heated until they are thoroughly solidified and are of the same temperature throughout. Then begins the journey through blooming and re-blooming, heating and re-heating, rolling and re-rolling, grinding, polishing, finishing.

Looking down the vast room of rolling, cutting, grinding and finishing mills at Ludlum, one sees the

pulsating, rhythmic means by which ingots, now billets, are transformed into size and shape for the fabricator. Here are the rolling mills, in varying sizes. In these, the red-hot slabs of metal pass through one pair of heavy rollers after another, so grooved and spaced that each succeeding pass is smaller and more nearly the required final size. Here are rows of fiery furnaces, re-heating billets. Here is the roar of machinery. Here are men handling levers, men with tongs manipulating, turning, twisting, feeding billets to the rolls. Here is the crash of a billet striking the first rolls, squeezing through and flopping on the run-out table, longer and smaller. Again it's cut into billets, sent to the grinding mills for removal of defects, sent back again to the rolls. Finally, it whips out on the run-out table, like a long, gliding snake. Into the cooling bed it's tossed for cooling and hardening. On then to the shears where it's cut into proper lengths. Next, it's annealed to take out the temper and soften in order to straighten. When it's run through the straightener and inspected, it's ready for shipment. Ludlum's rolling mills turn out alloy steels for fabricators in as many as twenty different shapes—flat, round, square, large, small, octagon, etc. In some instances, the steel, which began as an ingot 25 or 30 inches square, is transformed into wire three-thousandths of an inch in diameter. Fabricated into countless articles, these alloy steels are having far-reaching effect on business and on people.

Ludlum as Pioneer.

With licenses from Krupp in Germany, Ludlum has been making stainless steels since 1919. It has developed stainless steels of its own. All its stainless steels are now known under the name—Silcrome.

One particular grade of Silcrome, specially designed for automobile valves and internal combustion engine valves, has had outstanding success. It is a medium carbon, high silicon, chromium steel, containing more silicon by volume than chromium. Its development was based on the discovery by Ludlum metallurgists that abnormal additions of the relatively cheap silicon could be made to replace part of the more expensive chromium with better effect. At that time, it was generally believed that silicon was a deleterious element when used in quantities exceeding 1 per cent. Ludlum made more than 5,000 experimental heats in perfecting this new alloy steel—a stainless steel which, used as an automobile valve, practically eliminates burning, pitting and warping. Introduced about 1920, this type of Silcrome has enjoyed a rapid rise in use, moving from zero in that year to more than 4,000 tons at its peak. To-day, its sales follow the chart of automobile production. It is used in 90 per cent. of all automobiles, and in airplanes. It was in the plane which transported Lindbergh across the Atlantic in 1927.

Probably the outstanding metallurgical development of recent years, for certain special applications, is that of Nitriding. This new process resulted from a study by the Krupp Research Laboratories in Germany, by

Aubert and Duval Freres in Paris, and by metallurgists of the Ludlum Steel Company. Let us see what the Nitriding process means to makers and users of steel.

Formerly, in case hardening, it had been the practice to pack the finished part, such as an automobile gear, in a carbon compound and heat the mass to a high temperature. The surface or case of the part absorbed carbon and became very hard. The core remained soft. When the part was heat-treated to retain the carbon in the surface, deformation, distortion and some breakage occurred. For years, the goal of both the makers and users of steel had been to overcome this—to produce extreme hardness and wear resistance, combined with toughness and high impact strength, without material deformation.

Nitriding brought the answer. With the evolution of a new series of alloy steels containing aluminum, known by the general name of Nitralloy, and the development of the Nitriding process—practically all the former difficulties were eliminated. To get a clear picture, it must be understood that Nitralloy steels are made by a steel company, such as Ludlum. The Nitriding process is applied by the fabricator. In this process, the metal is heated in relatively low temperatures in an atmosphere of anhydrous ammonia for from two to ninety hours, depending upon the depth of the case. Nitrogen gas from the ammonia penetrates the core and makes it hard. Thus, there is no deformation, distortion or warpage. When ready for use, the metal has a hard core and an extremely hard surface, so hard, in fact, that it will scratch glass with ease.

Naturally, a process of hardening so radically different was slow in gaining recognition. Ludlum not only developed a series of Nitralloy steels but spent much time and effort in educating manufacturers on the value of the Nitriding process. To-day, the list of manufacturers who use Nitralloy reads like a "Who's Who" of American business. In a wide field of industry where the abrasion of friction was a factor limiting production, Nitralloy opened the door to new opportunities. It has meant, or will eventually mean, the end of that undesired compromise with friction in which one hard and one soft metal were used where moving parts come together. The possible application of Nitralloy and the Nitriding process to industry in the future is almost beyond calculation.

What Next, in Alloy Steels?

To-day, Ludlum is very much interested in stainless steel beer barrels. This marks one of the latest uses for this marvellous alloy steel which was born during the years of the World War and has since swept on to seemingly endless uses.

Recently, Ludlum has developed a new type of Silcrome, known as Silcrome RA, made of chromium, silicon and copper. It is this stainless steel which is now being used for stainless steel beer barrels. Ludlum

Continued on page 234

NEW FINISHING PROCESSES FOR COTTON, FLAX, RAYON AND MIXED GOODS

DURING the last few years two important new processes have been put into practice on a large scale, which do away with two of the most prominent and serious drawbacks of goods made of vegetable or artificial fibres or of their mixture. *Creasing* and *Shrinking*. The fault of creasing is well known to have its cause in the want of elasticity of these materials. Wool, in comparison, is much more elastic and so we hear very rarely of complaints in this respect with woollen goods. But the creasing of linen, cotton, rayon and mixed fabrics is a calamity, which everybody knows. This has been overcome, as a result of careful research and numberless experiments, by an invention patented to Messrs. *Tootal Broadhurst Lee Co., Ltd. in Manchester*, which consists in incorporating a semi-condensed resin (made for instance by heating urea with formaldehyde) into the fibre. The fibre has to be in a well-distended, swollen condition (such as is caused by impregnation with caustic soda), in order to take up the resin solution into its interior. The material is then dried and exposed, for a short time, to high temperature, say 150 to 180 degrees Centigrade. The semi-condensed resin thereby becomes completely condensed, it is now insoluble and elastic. The excess of resin is removed by hot soaping and the fabric (woven or knitted) is now creaseproof in quite a wonderful way.

The fault of *Shrinking* by the usual washing and laundering processes is also very well known. Shirts and other articles of underwear, light summerwear cloths etc. lose in length and width in a considerable and often very uncomfortable manner. Conscientious manufacturers of these articles will sometimes shrink the materials before making them into garments, but we don't think that a trade mark with the motto "guaranteed unshrinkable" will be found very often. This, however, is now quite possible, because the new processes of *Cluett, Peabody & Co., Inc., Troy, N. Y. America*, called "Sanforization", and of the *Bradford Dyers' Association, Ltd., Bradford, England*, called the "Rigmel Process," attain the same result by somewhat different means. The object in both processes is, to remove all the latent strains and stresses, which are left in the fabrics after they have been woven or knitted, bleached, dyed and finished. In woven fabrics these stresses are mostly in the warp direction, less in the weft. The principle is, to force these stresses back by compressing the fabric, when in moist condition, in the two dimensions of its surface, that is in warp and weft direction. Fabrics, which would shrink untreated, when laundered, up to 7 or even 10 and more per cent., do not shrink more than fractions of a per cent., after being "Sanforized" or treated by the "Rigmel Process".

Prof. P. Kraus.

WHAT NEXT, IN STEEL? CONTINUED FROM PAGE 233

has been studying barrel proportions for several years in anticipation of prohibition repeal, and its president has made a number of trips to Germany to study the type of barrel produced there by Krupp. In Germany, both beer and milk have for years been pasteurized and transported in stainless steel beer barrels. But the type first used, which was all stainless, was too heavy and too expensive. Breweries and truckmen and roustabouts refused to handle it with care.

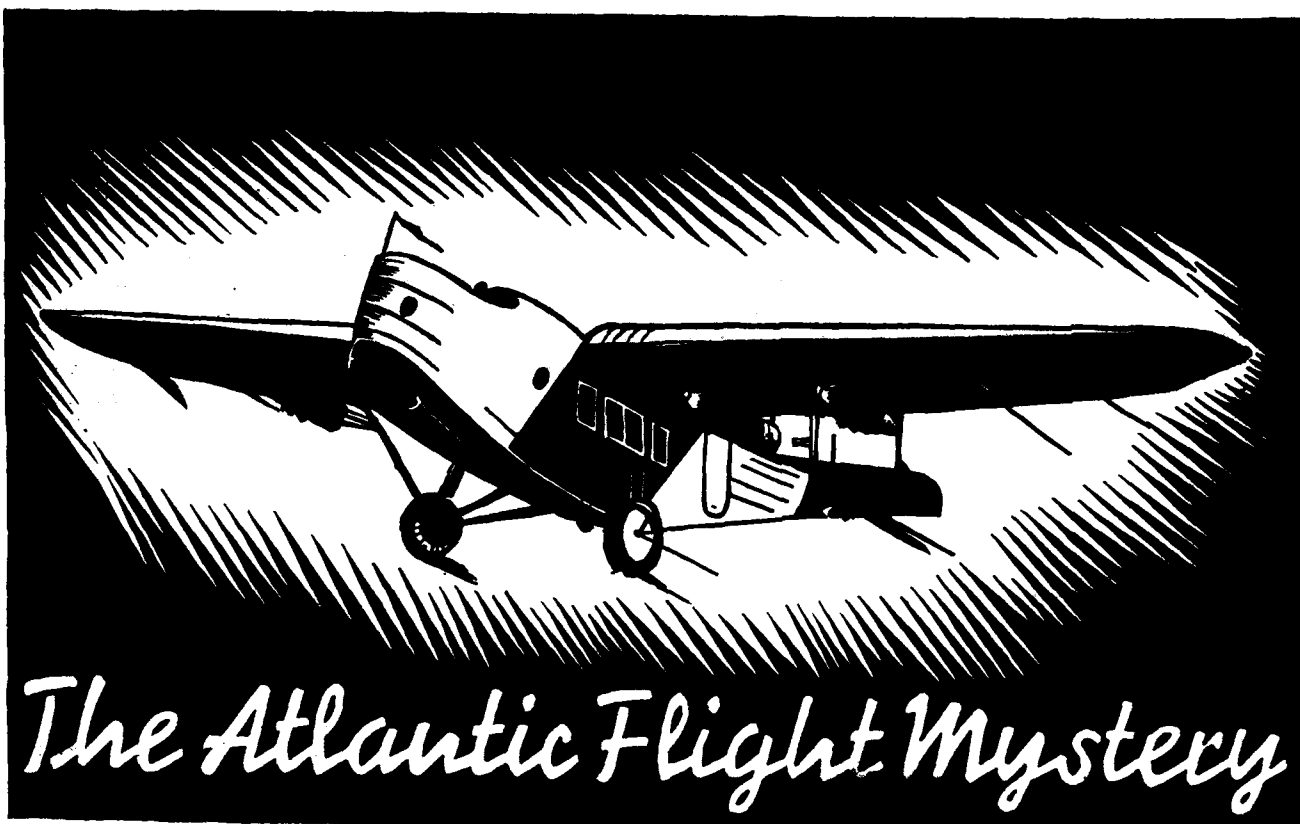
Lately, Krupp has perfected a beer barrel in which stainless steel is confined to the inside, the outer shell being of common steel reinforced so that it will stand rough usage. The barrel is insulated against heat and cold. Through an agreement with Krupp, this revolutionary type of beer barrel is now being produced in this country. Ludlum entered into a contract with the Ingersoll Steel and Disc Division of the Borg-Warner Corporation to produce the barrel—Ludlum supplying the stainless steel, Ingersoll making the barrel. The life of a stainless steel beer barrel is two or three times

that of a wooden barrel. Unlike the oak keg and common steel barrel, which require pitching, after every trip to the consumer, the stainless steel barrel needs no repairs. The beer's natural taste is preserved longer. Hence, it is believed that this type of barrel will eventually supersede the wooden barrel for the transportation and delivery of draught beer.

And so to-day—it is alloy steel for beer barrels. Tomorrow—what? Steel, ever the all-powerful giant of industry, is striding onward to new conquests. In laboratories throughout the world, metallurgists and chemists are still playing with iron and steel, still developing new and amazing alloy steels. Some of these are yet locked in the laboratories. But almost every day an important discovery is announced in alloy steels, in improved or new processes, in the design and construction of equipment. No one can foretell what steel's destiny may be. But Ludlum, celebrating its 75th anniversary as a maker of steel, looks forward to the future with no little zest.

ON THE MOUNTAIN

PHOTO: F. H. BAULEDER



Instalment 8.
Synopsis.

Harvey Greaves, a pilot of some repute, flies home from abroad to find his step-brother Charles in the clutches of Hendrich Baker, a shady character, out to steal aeronautical secrets to sell at a profit. Baker, whose real name is Stefan Marcoski, holds Charles's I. O. U. for gambling debts incurred trying to win money to enable the girl with whom he is in love, Alethea Manders, to follow her flying ambitions. Harvey determines to fight Baker, but is prevented from doing so openly lest Baker takes his step-brother's I. O. U. to their father, Angus Greaves, who sternly disapproves of gambling. Harvey is captivated by Alethea and determines to teach her to fly, hoping she may win the £10,000 prize offered by his father for the most outstanding aeronautical achievement by a woman during the next six months. To this end he at once starts giving her flying lessons, but soon discovers Baker intends to pit against her Constance Carwell, the famous woman pilot. Meanwhile, down in Sussex, Hendrich takes Rosenkrantz, a confederate, to a concealed hut in the grounds of Threeways Manor, and shows him stolen plans. Suddenly they hear a noise outside. Hendrich discovers it is Harvey eavesdropping, but he escapes. A new monoplane is built for Alethea, which she christens Silver Queen. Harvey tests it and crashes; it has been tampered with. Stella Wrenington, a decoy of Baker, taxes Hendrich with sabotage. He admits it, and regrets Harvey was not killed. Stella

demands freedom and letters which he holds, or she will expose him. He tells her to withdraw the threat if she values her life.

Wild Pursuit.

ROSENKRANTZ followed Hendrich out into the night again, both moving stealthily as from long practice. Suddenly all doubt was shattered.

There was a rustling of leaves, which could not be accounted for naturally on such a breathless night as this. Hendrich darted along by the side of the shanty, turned the corner and peered into the darkness, Rosenkrantz following him. For a moment he could see nothing; then, as his eyes became accustomed to their surroundings, he caught a glimpse of what appeared to be the figure of a man fleeing through the foliage towards the distant high wall.

"Rossi—there is someone! Follow close—we'll get him. God knows who it can be!"

Rosenkrantz was secretly perturbed. He had felt something in the air that night and, believing in his own premonitions, he knew there was danger afoot. To his mind Hendrich was far too casual about everything, though it had to be admitted that the super-agent rarely encountered failure, in spite of taking risks that other men would not endure for a moment.

They scuttled through the trees and bracken as swiftly as they could, Hendrich keeping his eye upon the retreating figure.

"He knows he's been spotted," he whispered. "We'll get him at all costs."

"Be careful," pleaded Rosenkrantz. "Don't take any foolish chances."

Hendrich was grasping his revolver tightly. He was in no mood to consider Rosenkrantz's view-point. What he wanted to do was to discover the identity of the intruder—even if it meant taking certain liberties. In the event of his having to go farther than he really wished, Hendrich had already half decided to throw all his other schemes to the wind for the time being, leave the country, and return to carry out his work later on. There was always time, Hendrich considered, but even as he was reflecting on his present position he realised that a certain amount of caution was necessary.

As the thicket grew less dense he increased his speed. The vanishing figure was conscious of pursuit. Hendrich, for once, was in the grip of indecision. He could not make up his mind whether to shoot or not. . . . That his secret recess had been discovered was pretty clear. But how? He could not fathom that.

As he ran, now on open grassland, he saw the intruder reach the high wall. Near by was a tall tree, and to Hendrich's surprise the escaping figure scaled it with remarkable ease, vanishing into the foliage that hung heavily from the boughs. The owner of Threeways had never considered the tree a possible source of danger.

It was on the inside of a wall that was skirted by a small section of a lonely and rarely used lane, but Hendrich had omitted to notice that some of the boughs hung over into the roadway, making it comparatively simple for anyone to enter the grounds by the aid of a ladder or a rope flung over the spreading tree-tops. Had the intruder used the wall itself he would have been betrayed by the indoor signals, which were also connected to the shanty.

The Intruder Identified.

Hendrich paused to get his breath, then made for the tree. Rossi was trembling with excitement.

"You'll never get up there," he said with some agitation, and it certainly appeared as if the pursuer would fail. He did not possess the agility of the figure he pursued. But, after a struggle, he managed to get to the top and sat astride the wall, peering into the lane. A rift in the clouds was his good fortune, the moon suddenly shining through on to the white dusty track.

He saw, then, a touring car that was familiar to him, and a figure scrambling into the seat next to the driver's.

Harvey Greaves!

It was a serious moment for Hendrich when he realised the identity of the intruder. Harvey Greaves must have overheard a good deal of the conversation between Hendrich Baker and Rosenkrantz! And that, from Hendrich's standpoint, was a considerable menace. But, he reflected, he still had the damning I. O. U., and he relied on Harvey's somewhat inexplicable desire to safeguard his step-brother.

The car began to move. Hendrich watched it eagerly as it leapt into speed, throwing up clouds of dust, and in a fit of unusual excitement he sprang to his feet on the top of the wide wall as if to pursue the receding vehicle. He ran perilously for some distance, Rosenkrantz anxiously watching.

Then Rosenkrantz saw something that sent a chill running through his veins. Hendrich, clasp his revolver, fired into the night. In a wave of fury he had aimed wildly at the car—and luck was with him. He had fired merely as a warning, but fate intervened. There was a terrifying crash, a sickening splintering of glass and wood, as Hendrich watched the car topple over on its side.

Rosenkrantz was tremblingly shouting from the ground below:

"You fool! You fool! You'll have all the police of the world on to us now!"

Hendrich looked down at his alarmed companion. He himself was feeling calm again.

"I wish Egmont had been here instead of you," he said bitterly. "Please allow me to know what I'm doing—and keep your stupid tongue still."

"But you're mad, Hendrich! This'll finish everything. You'll have to get away."

"I'm going to do nothing of the kind—my party's due at any minute. We'll get indoors and play. Later on we'll see what the damage is." He came back along the wall and carefully descended to earth again by way of the tree. When he was alongside Rosenkrantz he added: "That was merely a warning. I probably hit a tyre and the car turned over. Next time Mr. Greaves interferes the consequences will be more serious."

"But supposing he's killed," Rosenkrantz cried uneasily.

"Nothing like that will ever kill Greaves. Don't worry. But he must keep his nose out of my business. Let's get the stuff away!"

A Lucky Escape.

It was indeed fortunate for Hendrich Baker that Harvey Greaves and his step-brother Charles suffered no more than a few bruises and a damaged car. If Charles had held his steering better in the emergency the car would not have got ditched and turned over. But, in a couple of hours, they had cleared the damage and were off again to Woodcote, where they arrived in the early hours of the morning.

Harvey would not risk a return to Threeways Manor. He had heard sufficient of the conversation between Hendrich Baker and Rosenkrantz to warrant his holding his hand for the time being, and he knew that Hendrich would immediately clear the shanty of incriminating material lest further investigations were made during his absence from the manor.

For many days Harvey gave considerable thought to the problems arising out of Baker's undesirable presence in England. He was confident that he would get

him in the end, though the end seemed far enough away, thanks to Charles's little passion for gambling for altruistic motives.

Yet, as he had told Alethea, he might never have met the most wonderful girl he had ever known if it had not been for the wayward and romantic Charles. It was Charles who was at the root of both the pleasant and unpleasant aspects of Harvey's complicated life. It was Charles who had brought him both joy and difficulties. It was Charles, simple and gay, who was now fantastically enough a very important cog in the wheel of international life, though it was extremely difficult to make him realise it. Charles's only concern was that Hendrich Baker should not go to his father, and that if possible Alethea should take a little less interest in Harvey and he a little less interest in her.

It was not long before Angus Greaves's munificent offer of ten thousand pounds as a reward for the most outstanding air feat by a woman in a given time became a matter of wide public interest. Constance Carwell had announced her intention of competing. She was, in fact, the first to make her intentions public, and she was sure of the amazing support of the enormous number of people who idolised her.

Hendrich Baker, sitting secretly in the background, rubbed his hands with glee as telegram after telegram came to Miss Carwell wishing her the best fortune in the contest. Alethea was going to have a hard battle to achieve anything that would excel the famous Constance Carwell's performance, behind which would be all the experience of flying that she had gathered in the last four years. Alethea had no idea what she was up against—and Harvey was unaware of the lengths to which Hendrich Baker would go.

A new and special machine was being built for Alethea, and it was to be fitted with engines to Harvey's own design. The two enthusiasts were much concerned with the problem of money, hence efficiency with the least possible cost was the designer's ambition. He had got some backing from his old firm, for whom he had flown years before with considerable success, and this, together with a little aid from Leigh Holworthy, who was not unknown in diplomatic circles, was just about enough to see them through.

Alethea's "Silver Queen".

When the time came for the first test of the new machine, which Alethea had christened "Silver Queen," there was only a small crowd gathered on Bletsworth Aerodrome, Harvey's intentions being to keep the trials as secret as possible.

"I have never before been up at dawn except in hospital," Mrs. Manders was saying to her daughter. "But for this wonderful sight I'm glad I went to all the trouble!" She smiled proudly at Alethea. "D'you know, my dear, it looks absolutely safe."

"It is safe, mother," Alethea replied, as they watched the bird-like craft being hauled on to the grass. It was a monoplane, and its bright wings were tinged with the light of the early morning sun.

Harvey was busying about with the mechanics, but every now and then he looked across at mother and daughter, smiling confidently. There could be no denying that he was intensely thrilled, not because he was testing a new craft, but because of Alethea's association with it. It was her machine—the symbol of what he hoped would be her new-found freedom, for success might come to her—and if it did, he would be happy in that, and go willingly enough then into the net of his father's business. To work, not for himself, but for the woman he loved, was the completest thing in life for him, and for this reason he was enjoying the greatest happiness known to man.

He stood back admiring the machine, and he knew that it was good. Again he looked across at Alethea and smiled. Then he beckoned to her and she went forward with her mother.

"It's just lovely, Harvey!" she exclaimed, enraptured. "Isn't it, mother?"

"Well, it looks very nice to me—and safe, too," replied Mrs. Manders.

"Even Constance Carwell might like it," Harvey remarked with a wink. "I'll just run the engines over again." He climbed into the cockpit. The engines were started, and gradually he opened the throttles till the earth seemed to shake with the steady roar. The Silver Queen was straining at her chooks, like a hound eager to be unleashed and away, and the mechanics were hanging on grimly in the blast of the propeller stream. To Harvey the noise was as a sweet music, and as he closed the throttles he felt completely satisfied.

The noise died down to silence and the pilot sprang out, flushed of face.

"She's going to be fine," he cried. "I'll take off in a minute." He went into the hangar and returned with his leather hat and coat.

"At least you've kept this from Hendrich, or he'd be here right enough," Alethea said.

"That's something to boast about, at any rate," said Harvey easily. "Hendrich, I should say, is too much occupied with Miss Carwell to worry much about us just at present."

"I think he's a most unpleasant man!" observed Mrs. Manders, to the amusement of the pilot.

"He's positively dangerous," remarked Harvey with a smile. "One day, Mrs. Manders, you will know just how dangerous he really is."

Instalment 9. Something Wrong.

The Silver Queen's engines were started up again, and Alethea wondered whether Harvey would allow her to accompany him on the trial flight. She was keenly anxious to go up in the new craft—but Harvey was making no signs for her to fly with him. She knew he disliked taking passengers until he himself was thoroughly satisfied with a machine. So, contenting herself for the time being, she watched Harvey preparing to take off on the initial flight.

The Silver Queen rose with a fine gesture, pulling well and getting her height with ease. Seated at the controls, Harvey knew the elation that comes to all men when the machinery they handle responds to their every touch, but he indulged in no liberties, and merely at first steered in circular flight, occasionally looking down at the few figures dotted on the grass below.

The pilot made for more height, and was soon registering five thousand feet. Here he began to throw the machine about, putting up some pretty flying, to the admiration of the little band of watchers. Alethea grew more and more excited, and in a fever of enthusiasm tightly gripped her mother's arm.

"Oh! isn't it just marvellous—and to think that he's doing all this for me!" she cried.

The Silver Queen continued to drone overhead, and finally turned to dip a salute to those on the ground. The craft came round in a steep bank and straightened out, then the nose fell forward, and she began her dive towards the onlookers.

Alethea watched intently, and then she began to suspect something was wrong. The engine was pulling well, but the star-board wing seemed to be out of line with the rest of the machine.

One of the mechanics suddenly shouted:

• "The 'plane's buckling! Good God! She's for it!"

He began to run on to the aerodrome as if preparing for the crash. Alethea's blood went cold as she watched the opening of the tragedy with stark immobility.

"He'll be killed, he'll be killed!" she cried with anguish. "Oh God, save him!"

Only Mrs. Manders remained mute. She did not understand these things. She waited—and watched.

Then the roar gave place to sudden silence as the engines were switched off. Harvey Greaves had begun to act, but still the starboard wing continued to wobble as if at any moment it would break away completely from the rest of the machine. Under the skilful handling of the pilot the craft swung round on its sound wing. Harvey knew what he was doing—he was taking the strain off the damaged structure and trying to bring his machine down in easy stages.

The Silver Queen sank lower and lower, but the end was drawing closer. It was clear to the mechanic, who had first observed the trouble, that the pilot could not possibly make land with the machine whole. The craft was already out of complete control and was now losing height rapidly. Then she began to slither into a steep sideslip.

Harvey Crashes.

A few seconds later a resounding crash echoed round the countryside as she struck the ground with a deafening thud, cartwheeled over, digging her nose into the earth, and just before the last moment of her flight Harvey knew a swift flash of illumination, his brain repeating over and over again the words "sabotage" and "Hendrich". He saw it all just before the moment of unconsciousness—the craft had been tampered with.

The Silver Queen lay stricken at the north fence of

the aerodrome. The ambulance was already on its way to the fallen machine. From the wreckage there was no sign of movement.

Alethea had left her mother and was running madly across the flying field to where the Silver Queen lay, her heart pounding with anxiety and a thousand fears.

A mechanic came running up behind her and catching her arm, advised her to go back to the sheds.

"It'll do you no good, miss," he pleaded. "Do go back. The ambulance will do all that's necessary."

Alethea could find no words in answer to the man's appeal. She pulled herself away and went running on.

At the north end of the aerodrome the ambulance men were just pulling back some of the wreckage to get at the pilot of the lamented Silver Queen.

Dirty Work.

Hendrich received the report of the accident with some satisfaction. Stella Wrenington motored down to Threeways and took an early paper with her. When she arrived Hendrich was about to take tea in the famous library.

"You'd better join me, Stella. I'm all alone to-day—and Rosenkrantz won't be back for another week yet. You're not looking your usual self, young lady. What's the matter?"

Stella gave him a penetrating glance.

Haven't you heard the news, Hendrich? Harvey Greaves has crashed in the Silver Queen."

"Well—I know that! Heard it on the wireless, but they didn't give many details. Is that a paper you've got there?"

She passed the early edition to him, and he immediately searched for the Stop Press.

"Doesn't say much more here, does it?" he added. "Greaves is going on as well as can be expected. Well, well; wonder it didn't kill him."

"Alethea said that but for a miracle he would have been killed outright."

"So you've seen her?" inquired Hendrich.

"No—but I telephoned, and at last got her when she left the hospital. Mrs. Manders is nursing him."

"Whatever did you want to 'phone for? It's quite unnecessary for you to make inquiries about Mr. Greaves."

"Weren't you anxious, Hendrich?" she asked, meaningly.

"Why should I be?"

"Wait until you see the later papers, Hendrich—the nasty word sabotage is going to be mentioned."

"What do you mean by that—and how do you know?"

"Alethea told me they suspected someone of having tampered with the machine—not only suspected, but could prove it."

"Why didn't they guard it, then?" smiled Hendrich.

"Don't be so foolish, Hendrich. You know they guarded it—and you know that they had a couple of corrupt workmen. It's no use your trying to hide any-

thing from me. There are some things I don't mind, Hendrich, but to try to take the life of an innocent and fine man is going a little bit too far. I'm beginning to think I'm a fool to have anything to do with you. I'm wondering—"

"The less you think and the less you wonder the better for your peace of mind, Stella."

"Well, it'll all have to come out sooner or later. You can be sure the police will be on to it, and then there's a pretty good chance of your little game being found out."

"As if they could suspect me!" Hendrich sneered. "Why, I haven't even seen the machine."

At that moment the daily parlourmaid entered with tea, and the conversation was brought to an abrupt conclusion.

When the maid had gone Stella remarked: "I know you haven't seen the machine, but I also know one of your secret allies has been busy. The whole thing was inspired by you, and there's more behind it than meets the eye. Alethea Manders won't let this business rest. And it's not at all certain they won't put it down to you."

Hendrich Admits His Guilt.

"It seems to me," Hendrich said smoothly, "that you are unduly nervous. If you insist that I had anything to do with the crash, either directly or indirectly, then let me admit it for your peace of mind. But remember also that when Hendrich Baker undertakes anything he is fairly certain of his ground and he is not likely to be found out. His agents never squeal because he has them too tightly bound, and it is his agents who suffer first. What's behind your panic I don't know—unless it's a preliminary to blackmail."

Stella flushed angrily.

"Blackmail!" she cried. "I'd never thought of such a thing. All I want to do is to get free of you—and Hendrich, I'm going to do it. If you don't release me from my promise to bring people here to your wretched gambling parties, I'll do all I can to show you up on the Harvey Greaves crash. You did it because you'd heard that the Silver Queen was a wonderful aeroplane, and you don't want Constance Carwell beaten!"

"Heard!" exclaimed Hendrich derisively. "I knew well enough the Silver Queen was a great machine. Good as Miss Carwell is, we hadn't a 'plane we could put up against the Silver Queen. So the 'plane had to go."

"And the pilot?" asked Stella.

"That was a risk, of course," came the cool answer. "If you had my years behind you, you'd understand that a life here and there is of no great importance."

Stella Wrenington stared hard at Hendrich Baker.

"You have a reason to dislike Harvey Greaves very much, haven't you?" she asked.

"I mean reasons apart from this flying contest."

Hendrich's eyes narrowed dangerously.

"What do you mean?" he said sharply.

"Hasn't Greaves something up against you—

knowledge of plans and secret documents generally, or something of that sort! My dear Hendrich, you must think I'm stupid. Do you think I don't know about The Hut and what it contained?"

Hendrich sprang to his feet, anger flaming in his eyes. The intrusion of Stella Wrenington into his most secret and intimate affairs was not only an unpleasant surprise, but was also something that called for definite action on his part. He could not allow this woman to go on prying into his business, lest she became a dangerous ally of opposing forces.

"It was you, then, who gave it away to Harvey Greaves?" he snapped viciously. "How did you know about The Hut?"

"Simple, my dear Hendrich; I just followed you one night, and as for giving it away to Harvey Greaves, as you put it, I couldn't have done—for that's the night I was here!"

Threat and Counter-Threat.

"But you weren't in the house then" Hendrich declared. "I remember distinctly, because I kept the early part of the evening clear to receive an old friend of mine, Mr. Bryan Smythe."

"Alias Mr. Rosenkrantz. Yes, I know; but I was here just the same. I was hidden in this very room—and all your cunning couldn't keep me out of it, or detect me. That, my dear Hendrich, is how I got to know about The Hut. You'll recall that the party arrived after the shooting episode—"

"Stop that, Stella. There was no shooting episode so far as Threeways Manor is concerned. What happened in the lane outside is another matter altogether, and no concern of mine; I cannot be responsible for that. Anyhow, the fellows had sense enough not to go to the police, so I never heard any more about it."

"But you will, Hendrich, believe me! But, before you do, I want you to hand me the letters you have of mine—I want complete freedom and release so that I can go my way in peace and have nothing further to do with you."

Hendrich Baker moved closer to her, his manner almost threatening.

"This is blackmail," he cried with renewed anger.

"But if you want a little money I'll give it to you."

"I don't want money—only my letters. When they catch you I don't want those letters found in your possession. It'll finish all chances of a reconciliation with Sir Malcolm!"

"Oh! He'll never be reconciled to you—he broke off the engagement once and for all," Hendrich sneered.

"And as for the letters ever being found in my possession, who on earth could find them?"

"The police, you conceited fool. And if you don't give me the letters to-day I'll go to the authorities myself."

"That's a threat, Stella!"

"If you like to put it that way, it is."

"Then, if you value your life, you'll withdraw it before it's too late."

(Copyright Reserved.)

A WONDERFUL RESCUE

WHILE I was at the Victoria gold-fields an incident occurred which attracted much attention even at that period of adventure and excitement. It is now more than thirty years ago, so there can be no harm in mentioning the names, so far as my memory serves, for I have not any written journal of that time.

One Monday morning Dr. Allen had ridden over to a creek some miles from Castlemaine to visit a patient (Mr. Purvis) suffering from brain fever; it was brought on by the combined effects of anxiety of mind and exposure to the sun. The doctor found to his consternation that during the night his patient had escaped from the hut or store where he lay, and had not since been seen or heard of. His delirium had been exceedingly violent, and two men had been employed to watch him, particularly at night. On the previous evening, however, he had seemed much better, spoke rationally, and was so quiet that when he requested to be allowed to put on his clothes and sit up for half an hour his guardians consented, thinking that refusal might irritate him. He dressed, even putting on his boots, and after quietly sitting and conversing some time he lay down on the bed and apparently fell asleep. The watchers were thus thrown off their guard. It is supposed that, with the cunning peculiar to insanity, the sick man was all this time merely acting a part; and at midnight, when one of the men was absent and the other was sitting by the fire, the maniac, taking advantage of the moment when he stooped down to light his pipe, slipped quietly from his bed and succeeded in reaching the door. The keeper heard the rush and sprang forward to intercept him, but too late. In another instant, with a ringing shout of laughter, the man had disappeared in the darkness.

It was impossible to pursue him for more than a very few yards, for the hut stood alone in the centre of a large flat, surrounded on all sides by hundreds upon hundreds of holes, which had been sunk subsequently to its erection, when the ground was found to be auriferous. These had long since been worked out, and the flat was now deserted save by a few puddlers, whose tents and machines were scattered at intervals up and down the bank of the creek which ran along its margin. So close together were these holes that it was only possible to cross the flat by winding along the crest of the now hardened heaps of earth which, sloping inwards like a funnel, surrounded each, and to do this safely required daylight or the aid of a lantern. As the night was intensely dark when the unhappy man escaped, it was only too probable that he had not proceeded far without meeting his fate.

Such at least was the universal opinion entertained by those whom Dr. Allen found looking in the neighbouring holes for the body; and so confident were they that he must have quickly perished that no mes-

sage had as yet been sent to the township for the purpose of organising a wider search. But the doctor was well aware that in certain states of excitement of the brain the senses are often preternaturally acute, and that it was quite probable that the man had crossed the half-mile of holes in safety, and was at that moment wandering far away in the bush. Hastening back, therefore, with the news, the mounted police, aided by numerous volunteers from the towns-people, were soon scouring the country in all directions; but that day passed away, and the next also, without bringing any tidings of the unfortunate man.

It was on Sunday at midnight that he escaped, and on Tuesday, the day the post (which then only ran twice a week) left for Melbourne, a letter was sent to the missing man's brother, who upon receiving the news started immediately on horse-back, and arrived on Thursday morning. More than three days and nights had then passed by and still no tidings had been received of the fugitive.

There happened to be no blacks in the neighbourhood at the time, and when at length some were procured several hours' heavy rain had obliterated all tracks and rendered their aid useless. A more systematic search was, however, now instituted for the body by the miners, and the whole course of the creek and the diggings thoroughly examined under the anxious superintendence of the brother. The bush for miles round had been scoured, and messengers sent along all the lines of road. As he was bare-headed, his hat having been picked up a short distance from the store, and he happened to have on a bright-coloured plaid jumper, these two circumstances would tend to make his appearance sufficiently remarkable had any one caught sight of him. The conviction was general that no one would ever see him again in life.

It was late on the Saturday night following the disappearance of his brother that Mr. Henry Purvis, wearied with his exertions and despondent at his ill success, reached the store and threw himself down on the bed to take a few hours' rest. Several of the party who had joined him in his search yet lingered discussing the event, and these were joined, late as it was, by some of the men inhabiting the neighbouring tents. Mr. Purvis could not sleep, and longed for the dawn to come that he might once more and for the last time devote another day to the search, for in spite of the opinions of all around him he still tenaciously clung to hope. While lying awake his attention was attracted by a conversation between two of the party in the next room, which was divided from where he lay by a calico partition merely.

"Don't you think," said a man living on the flat, but who had been absent from home for some time, having only that day returned, "that he may have

crossed the creek and got among the steep gullies in that direction? Have you looked well there?"

"Why, there's no diggings there for miles and miles," was the reply.

"I know that; but there was a prospecting party working there three seasons ago, just across the steep range, about a mile or less from here in a straight line. Don't you know where I mean?"

"Oh, there; yes. Now I think of it there are a few holes in the first gully you come to. It's an out-of-the-way place, too, though it is so near, for I've been five years on the flat and don't think I've crossed that gully twice. But is it likely," continued the man, "that he would get safe through all these hundreds of holes hereabouts, packed close together as they can stick, and after all fall into one of half a dozen that are scores of yards apart from each other? Why, it's as much as a man can do in daylight, with all his senses about him, to hit the crossing-place at the dam, and if he'd tried to cross the bed of the creek, full as it is of sludge from the machines, he'd have been smothered in a jiffy. Perhaps that's what has happened, for you know there's no place to get over safely for a mile and a half up and down. But it's my belief he's never got farther than a gunshot or so from here, and the body has sunk to the bottom of the water of the hole the poor fellow tumbled into. In the morning we'll drag for it."

Mr. Purvis listened with renewed hope. It was enough for him to know that there still remained a place, however unlikely, unexamined, and he determined to start at once. It was now past midnight, and his companions, who were fatigued with their day's exertions, and had long since lost all hope of finding the unfortunate man living, were desirous of postponing any further search until daylight; but he succeeded in persuading three of them to accompany him, and relighting the lanterns and torches they had formerly used, the party once more sallied forth.

Most of the preceding efforts to find the missing man had been directed to the flat and the continuation of the valley above and below it, as well as the hills and gullies on that side of the creek where the store stood, as not only were the diggings confined to that side, but the fugitive had fled in that direction. A space of about half a mile of worked ground intervened between the store and the creek; and as, guided by one of the puddlers who resided on the bank, the party picked their way along the crests of the now hardened heaps of earth which surrounded the holes which yawned everywhere, it seemed to be indeed impossible that any human being could have passed safely through them in the darkness of midnight. This conviction grew stronger the farther they proceeded, for upon approaching the creek their progress was delayed by the semi-fluid clay mixed with sand, which, flowing from the machines, had, after filling the bed of the creek, flooded the banks in all directions, spreading amongst and filling many of the holes, forming pools

and rivulets of the treacherous solid-looking matter, above which the heaps of earth projected like miniature islands and promontories. For some distance the party had to assist each other in stepping from one to another of these, where to fall in would have been very dangerous. Altogether it was a labyrinth which only the local knowledge of their guide, the proprietor of one of the machines, aided by the possession of lights, could have enabled them to pass through safely; so that when at last the dam (which itself was dangerous to cross at night, being barely a foot broad at top, and having deep water on one side, and the sludge-filled bed of the creek eight feet below on the other) was passed, and the party stood safely on the main road from Castlemaine to the Lodden, which ran along the farther bank, Mr. Purvis was only too much disposed to agree with his guide, who, as he stood shaking off the masses of clay adhering to his feet, remarked,

"If your brother ever got safely over that bit of ground, Mr. Purvis, and on a pitch-dark night, too, all I can say is he ought to be alive yet. But it isn't possible."

"How far are we from the gully you spoke of?" asked Purvis.

"It's only just over t'other side of this high range here in front of us. It never came into my mind to go there to look for him, poor fellow. There's only about half a dozen holes altogether. Those that sunk them got nothing, and so the place has never been worked since."

Leaving the road as he spoke, he led the way up the steep hill-side, and after a few minutes' walk the party descended into the narrow valley or hollow beyond, the bottom and sides of which were rather thickly wooded with small trees and patches of scrub. It was one of those localities which, although so near a main line of road, might yet remain unvisited for days together, except by some one looking for stray horses or bullocks, for no road or path of any kind led to or through it. At intervals, often of many yards, a few holes were scattered up and down, and upon the lantern being lowered down these, they proved to be from thirty-five to forty feet deep, and dry, the hollows being on a sloping and rocky hill. Three of them had been searched in vain, and the light was being lowered down a fourth, when its course was arrested after it had descended about twenty feet. At first it was thought that the sinking had been abandoned at that depth, but on closer inspection they perceived that the downward progress of the lantern had been stopped by a shelf on which it rested. This proved to be a large rock which occupied the whole bottom, and had compelled the diggers to drive into the side of the hole to give themselves room to continue their sinking so as to avoid this obstacle. The light of the lantern, therefore, as it rested on this shelf, only partly revealed the drive or archway over the mouth of this second hole, which continued downwards to an unknown depth.

"If he had happened to fall in here," said the man with the light, "he'd have got smashed on that shelf and stuck there. It's a large quartz boulder apparently," he added, as he swung the lantern about the bottom from side to side, and endeavoured, but in vain, to jerk it into the mouth of the hole below. "Would you like one of us to go down, Mr. Purvis, and take a look from the shelf? I'll go if you like, though, as I said before, I don't think it at all likely the poor fellow would get safe across such a place as the flat just to come over that hill and tumble into one of these holes that any child could steer clear of." And as he spoke he commenced hauling up the lantern and coiling the rope preparatory to proceeding to examine the rest of the gully.

Mr. Purvis afterwards confessed that having now given up all hope, being convinced that the man's surmises were correct, it was possible that he might have been so far influenced by his words as to have left the spot unexplored, at least until it would have been too late. But God in His mercy otherwise ruled it, for as the man was still speaking the words were arrested on his lips, and the whole party electrified with amazement. For as they stood round the edge of the hole a mass of earth and stones, dislodged by the feet of one of their number, fell in, and rolling from the shelf clattered in a shower down into the lower hole; from whence a low cry of pain ascended, followed by a voice, faint but distinct, uttering rapid and incoherent words.

"Merciful God! it is my brother, and alive yet!" said Purvis, falling on his knees by the edge of the hole and bursting into tears.

It was even so. The lost man was found after being six days and nights without food or drink and all the while in darkness, for only a few feeble rays could

reach the spot where he lay. The stones falling on him roused him from this stupor, which must shortly have ended in death.

When brought to the surface it was found that both his legs were broken just above the ankle joint, from which it was surmised that he had not fallen, but, under the influence of some maniacal terror, had leaped into the hole. He was still slightly delirious, but he seemed to recognise his brother, and upon the whole was not so exhausted as might have been expected after sufferings so prolonged and severe. One singular circumstance was that whereas it was known that he had his boots on when he fled, these could not now be found. But a further search next day showed that in his delirium he had taken them off his fractured limbs, and buried them beneath the clay at the bottom of the hole. His words, all incoherent as they were, indicated the intensity of the sufferings he had endured, for we gathered from them that the time had seemed inexpressibly long. "Many months, many months—long, long time down that hole. And they came—day after day, day after day—plenty of people came, one after another, and not one of them would help me!—just sat at the entrance of the drive and looked at me. Not one even would speak or bring me a drink of water, though I begged and prayed;" and then tears rolled down his haggard cheek as he made his pathetic complaint, the effort seeming to bring him some relief.

A sound night's rest, however, wonderfully restored him, as he was quite free from fever when rescued, and in a few days he had quite recovered his senses. The broken limbs were successfully treated. Beyond a vague sense of past suffering, like some indistinctly remembered dream, he had no recollection of any of the circumstances connected with his singular preservation from death.

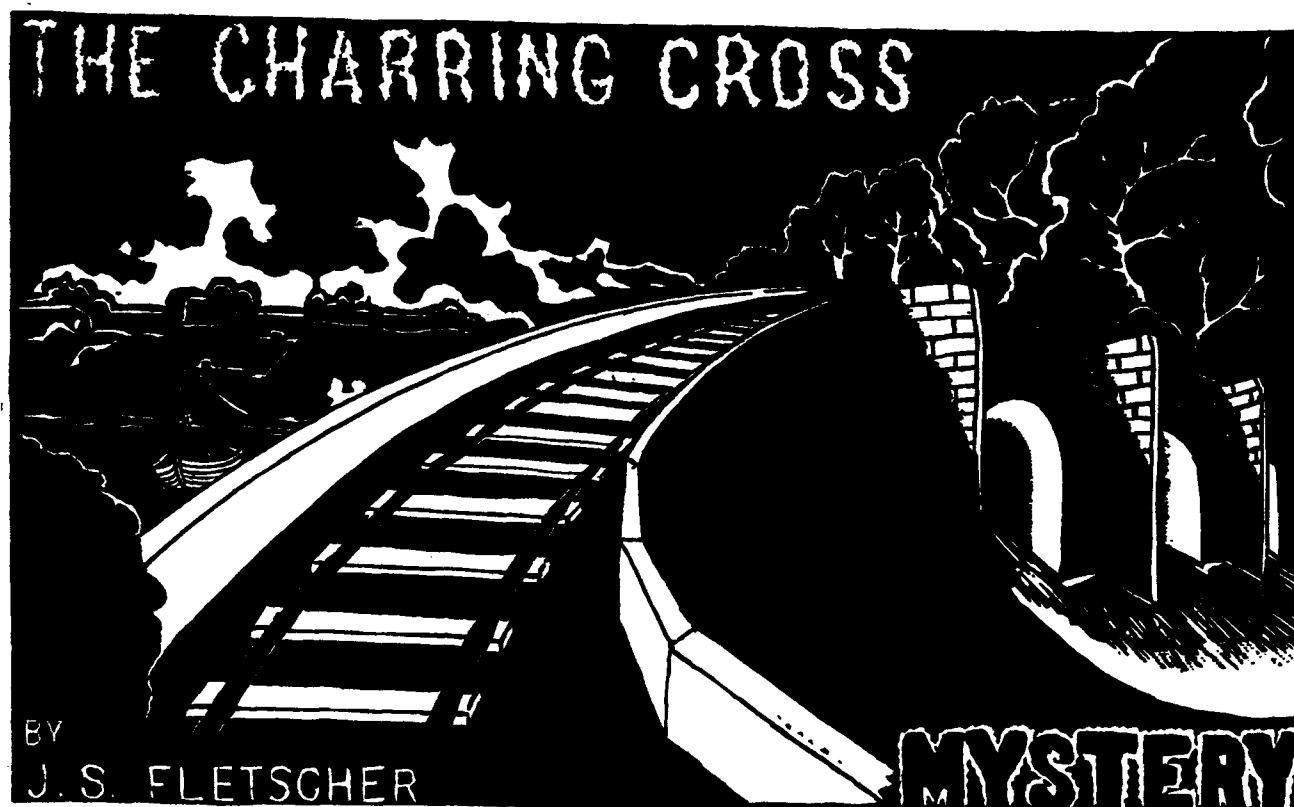
W. B.

EARTHQUAKES AND VOLCANOES CONTINUED FROM PAGE 230

in his travels an oil-spring emanating from mica-slate. Bitumen runs from the kilns where the Silurian limestone of Niagara is burnt for lime. Silurian rocks are very often peculiarly rich in carbon. Few years have elapsed since the discovery of considerable beds of coal in Greenland, under a climate apparently less adapted to its formation than the least favourable regions of the tropics. Scarcely a year passes without the discovery of some new fact of observation tending to remove

some supposed difference between the oldest and the newest deposits. All statements founded upon the absence of evidence are, in the present fragmentary condition of geology, liable to be overthrown to-morrow by the turning of some new page in the immeasurable archives of the earth. The temptation to complete a theory seems, however, irresistible wherever the imperfection and obscurity of the records leave free scope to the imagination.





Chapter 8.

Fligwood's Rents.

HETHERWICK went to the hotel telephone again before he had finished his lunch, and as a result Matherfield was on the platform at Victoria when the two-twenty-four ran in. He showed no surprise at seeing Hetherwick and Rhona together; his manifest concern was to get Hetherwick to himself and away from the station. And Hetherwick, seeing this, said good-bye to Rhona with a whispered word that he would look in at Malter's Hotel before evening; a few minutes later he and Matherfield were in a taxi-cab together, hastening along Buckingham Palace Road.

"Well?" inquired Hetherwick. "This man?"

"I don't think there's any doubt about his being the man you saw with Hannaford," replied Matherfield. "He answers to your description, anyway. But I'll tell you how we came across his track. Last night a man named Appleyard came to me—he's a chap who has a chemist's shop in Horseferry Road, Westminster—a middle-aged, quiet sort of man, who prefaced his remarks by telling us that he very rarely had time to read newspapers or he'd have been round to see us before. But yesterday he happened to pick up a copy of one of last Sunday's papers, and he read an account of the Hannaford affair. Then he remembered something that seemed to him to have a possible connection with it. Some little time ago he advertised for an assistant—a qualified assistant. He'd two or

three applications which weren't exactly satisfactory. Then, one evening—he couldn't give any exact date, but from various things he told us I reckoned up that it must have been on the very evening on which Hannaford met his death—a man came and made a personal application. Appleyard described him—medium-sized, a spare man, sallow-complexioned, thin face and beard, large dark eyes, very intelligent, superior manner, poorly dressed, and evidently in low water—

"That's the man, I'll be bound!" exclaimed Hetherwick. "Did he give this chemist his name?"

"He did—name and address," answered Matherfield. "He said his name was James Granett, and his address Number 8, Fligwood's Rents, Gray's Inn Road—Holborn end. He told Appleyard that he was a qualified chemist, and produced his proofs and some references. He also said that though he'd never had a business of his own he'd been employed, as, indeed, the references showed, by some good provincial firms at one time or another. Lately he'd been in the employ of a firm of manufacturing chemists in East Ham—for some reason or other their trade had fallen off, and they'd had to reduce their staff, and he'd been thrown out of work, and had had the further bad luck to be seriously ill. This, he said, had exhausted his small means, and he was very anxious to get another job—so anxious that he appeared to come to Appleyard on very low terms. Appleyard told him he'd inquire into the references and write to him in a day or two. He did inquire, found the references quite satisfactory, and wrote to Granett engaging him. But Granett never turned up, and Appleyard heard no more of him until

he read this Sunday paper. Then he felt sure Granett was the man, and came to me."

"I shouldn't think there's any doubt in the case," remarked Hetherwick. "But before we go any further, a question. Did Appleyard say what time it was when this man came to him that evening?"

"He did. It was just as he was closing his shop—nine o'clock. Granett stopped talking with him about half an hour. Indeed, Appleyard told me more. After they'd finished their talk, Appleyard, who doesn't live at the shop, locked it up, and he then invited Granett to step across the street with him and have a drink before going home. They had a drink together in a neighbouring saloon bar, and chatted a bit there; it would be nearly ten o'clock, according to Appleyard, when Granett left him. And he remembered that Granett, on leaving him, went round the corner in Victoria Street, on his way, no doubt, to the Underground."

"And in Victoria Street, equally without doubt, he met Hannaford," muttered Hetherwick. "Well, and the rest of it?"

"Well, of course, as soon as I learnt all this, I determined to go myself to Fligwood's Rents," replied Matherfield. "I went, first thing this morning. Fligwood's Rents is a slum street—only a man who is very low down in the world would ever dream of renting a room there. It's a sort of alley or court on the right-hand side of Gray's Inn Road, going up—some half-dozen squalid houses on each side, let off in tenements. Number 8 was a particularly squalid house!—slatternly women and squalling brats about the door and general dirt and shabbiness all round. None of the women about the place knew the name of Granett, but after I'd described the man I wanted they argued that it must be the gentleman on the top back; they added the further information that they hadn't seen him for some days. I went up a filthy stair to the room they indicated; the door was locked and I couldn't get any response to my repeated knockings. So then I set out to discover the landlord, and eventually unearthed a beery individual in a neighbouring low-class tavern. I got out of him that he had a lodger named Granett, who paid him six shillings a week for this top back room, and he suddenly remembered that Granett hadn't paid his last week's rent. That made more impression on him than anything I said, and he went with me to the house. And to cut things short, we forced the door, and found the man dead in his bed!"

"Dead!" exclaimed Hetherwick. "Dead—then?"

"Dead then—yes, and he'd been dead several days, according to the doctors," replied Matherfield grimly. "Dead enough! It was a poor room, but clean—you could see from various little things that the man had been used to a better condition. But as regards himself—he'd evidently gone to bed in the usual way. His clothes were all carefully folded and arranged, and by the side of the bed there was a chair on which was a half-burnt candle and an evening newspaper."

"That would fix the date," suggested Hetherwick.

"Of course, it did—and it was the same date as that on which Hannaford died," answered Matherfield. "I've made a careful note of that circumstance! Everything looked as if the man had gone to bed in just his ordinary way, read the paper a bit, blown out his light, dropped off to sleep, and died in his sleep."

"Yes!—and from what cause, I wonder?" exclaimed Hetherwick.

"Precisely the same idea occurred to me, knowing what I did about Hannaford," said Matherfield. "However, the doctors will tell us more about that. But to wind up—I had a man of mine with me, and I left him in charge while I got further help, and sent for Appleyard. Appleyard identified the dead man at once as the man who had been to see him. Indeed, on opening the door, we found Appleyard's letter, engaging him, lying with one or two others, just inside. So that's about all, except that I now want to know if you can positively identify him as the man you saw with Hannaford, and that I also want to open a locked box that we found in the room, which may contain something that will give us further information. Altogether, it's a step forward."

"Yes," admitted Hetherwick. "It's something. But there's spade-work to be done yet, Matherfield. I don't think there's any doubt, now, that Granett encountered Hannaford after he left Appleyard—and that indicates that Granett and Hannaford were old acquaintances. But, supposing they met at, or soon after, ten o'clock—where did they go, where did they spend their time between that and the time they entered my compartment at St. James's Park?"

"That would be—what?" asked Matherfield.

"It was well after midnight—mine was the last train going east, anyway," said Hetherwick. "I only just caught it at Sloane Square. But we can ascertain the exact time, to a minute. Still, those two, meeting accidentally, as I conclude they did, must have been together two or three hours. Where?—at that time of night. Surely there must be some way of finding that out! Two men, each rather noticeable—somebody must have seen them together, somewhere! It seems impossible that they shouldn't have been seen."

"Aye, but in my experience, Mr. Hetherwick, it's the impossible that happens!" rejoined Matherfield. "In a bee-hive like this, where every man's intent on his own business, ninety-nine men out of a hundred never observe anything unless it's shoved right under their very eyes. Of course, if we could find out if and where Hannaford and Granett were together that night, and where Granett went to after he slipped away at Charing Cross, it would vastly simplify matters. But how are we going to find out? There's been immense publicity given to this case in the papers, you know, Mr. Hetherwick—portraits of Hannaford, and details about the whole affair, and so on, and yet we've had surprisingly little help and less information. I'll tell you what it is,

sir—what we want is that tall, muffled-up chap who met Hannaford at Victoria! Who is he, now?"

"Who, indeed!" assented Hetherwick. "Vanished—without a trace."

"Oh, well!" said Matherfield cheerfully, "you never know when you might light on a trace. But here we are at this unsavoury Fligwood's Rents."

The cab pulled up at the entrance to a dark, high-walled, stone-paved alley, which at that moment appeared to be full of women and children; so, too, did the windows on either side. The whole place was sombre and evil-smelling, and Hetherwick felt a sense of pity for the unfortunate man whose luck had been bad enough to bring him there.

"A murder, a suicide, or a sudden death is as a breath of heaven to these folk!" said Matherfield as they made their way through the ragged and frowsty gathering. "It's an event in uneventful lives. Here's the place," he added, as they came to a doorway whereat a policeman stood on guard. "And here are the stairs—mind you don't slip on 'em, for the wood's broken and the banisters are smashed."

Hetherwick cautiously followed his guide to the top of the house. There at another door stood a second policeman, engaged when they caught sight of him in looking out through the dirt-obsured window of the landing. His bored countenance brightened when he saw Matherfield; stepping back he quietly opened the door at his side. And the two new-comers, silent in view of the task before them, tiptoed into the room beyond.

It was, as Matherfield had remarked, a poor place, but it was clean and orderly, and its occupant had evidently tried to make it as habitable and comfortable as his means would allow. There were one or two good prints on the table; half a dozen books on an old chest of drawers; in a cracked vase on the mantelpiece there were a few flowers, wilted and dead. Hetherwick took in all this at a glance; then he turned to Matherfield, who silently drew aside a sheet from the head and shoulders of the rigid figure on the bed, and looked inquiringly at his companion. And Hetherwick gave the dead man's face one careful inspection and nodded.

"Yes!" he said. "That's the man!"

"Without doubt?" asked Matherfield.

"No doubt at all," affirmed Hetherwick. "That is the man who was with Hannaford in the train. I knew him instantly."

Matherfield replaced the sheet and turned to a small table which stood in the window. On it was a box, a square, old-fashioned thing, clamped at the corners.

"This seems to be the only thing he had that's what you may call private," he observed. "It's locked, but I've got a tool here that'll open it. I want to know what's in it—there may be something that'll give us a clue."

Hetherwick stood by while Matherfield forced open the lock with an instrument which he produced from

his pocket, and began to examine the contents of the box. At first there seemed little that was likely to yield information. There was a complete suit of clothes and an outfit of decent linen; it seemed as if Granett had carefully kept these in view of better days. There were more books, all of a technical nature, relating to chemistry; there was a small case containing chemical apparatus, and another in which lay a pair of scales; in a third they found a microscope.

"He wasn't down to the very end of his resources, or he'd have pawned these things," muttered Matherfield. "They all look good stuff, especially the microscope. But here's more what I want—letters!"

He drew forth two bundles of letters, neatly arranged and tied up with tape. Unloosing the fastenings and rapidly spreading the envelopes out on the table, he suddenly put his finger on an address.

"There you are, Mr. Hetherwick," he exclaimed. "That's just what I expected to find out—though I certainly didn't think we should discover it so quickly. This man has lived at Sellithwaite some time or other. Look there, at this address—Mr. James Granett, 7, Victoria Terrace, Sellithwaite, Yorkshire. Of course!—that's how he came to know and be with Hannaford. They were old acquaintances. See, there are several letters."

Hetherwick took two or three of the envelopes in his hand and looked closely at them. He perceived at once what Matherfield had not noticed.

"Just so!" he said. "But what's of far more importance is the date. Look at this—you see? That shows that Granett was living at Sellithwaite ten years ago—it was of that time that Hannaford was talking to him in the train."

"Oh, we're getting at something!" assented Matherfield. "Now we'll put everything back, and I'll take this box away and examine it thoroughly at leisure." He replaced the various articles, twisted a cord round the box, knotted it, and turned to the dead man's clothes, lying neatly folded on a chair close by. "I haven't had a look at the pockets of those things yet," he continued. "I'll just take a glance—you never know."

Hetherwick again watched in silence. There was little of interest revealed until Matherfield suddenly drew a folded bit of paper from one of the waistcoat pockets. Smoothing it out he uttered a sharp exclamation.

"Good!" he said. "See this? A brand new five pound note! Now, I'll lay anything he hadn't had that on him long! Got it that night, doubtless. And—from whom?"

"I should say Hannaford gave it to him," suggested Hetherwick.

But Matherfield shook his head and put the note in his own pocket.

"That's a definite clue!" he said, with emphasis. "I can trace that!"

(Copyright Reserved).

THE DIAMOND THAT LEFT A TRAIL OF ROYAL BLOOD

THE SINISTER CURSE OF THE KOH-I-NOOR

It is really a very curious coincidence that almost all the famous diamonds of the world—especially Indian—have dark stories of ill-luck, murder and misfortune behind them. In every case the owner of the stone has suffered—along with the loss of the stone. And the gem rolling into fresh hands had caused more misery, more killing and more bad luck. The histories of the "Koh-i-noor", the "Orloff", the "Great Mogul", the "Rose" and a host of other well-known stones are glaring examples of the trail of human blood and tales of woe that they have left behind.

From the days of Pandu.

The Koh-i-noor, the most famous of all the Indian diamonds is legendarily considered to be the heirloom of Indian emperors from the days of Pandavas, the immortal heroes of the epic Mahabharata. But history speaks of it in a different way. It was found by a miner working in the mines of Golconda, in Bijapur. This was in 1656. The largeness of the stone attracted the attention of Mir Jumla, the vizier of Golconda who exercising his authority over the miners obtained possession of it. He, as a token of sovereignty presented it to Shah Jahan, the emperor at Delhi.

After the death of Shah Jahan the Koh-i-noor along with many other precious stones was handed over to Aurangzeb by his daughter. Aurangzeb in turn had it fixed as the eye of the peacock-throne. Even then it was not safe. Once the ambassadors from Persia to the Mogul court secretly carried away the throne with the object of stealing the Koh-i-noor and restoring the throne to its original place. But Aurangzeb was too crafty for them. Knowing their intentions he had substituted an inferior stone in the Koh-i-noor's place.

From India to Persia.

But Nadirshah (it was he who had sent the embassy to Delhi) did not despair of the stone. In 1739 when he sacked Delhi, he carried away the Koh-i-noor along with the other historical treasures—but he could not shake off the curse that was with it. Eight years after he came into its possession he met a brutal death at the hands of an unknown murderer.

Immediately the Koh-i-noor was seized by Shah Rukh, Nadir Shah's grandson. During his reign the fame of the stone spread all over India and Afghanistan. Many were the aspirants for its possession. The foremost of them, Aga Mahamad Khan had a collection of many beautiful gems and he wanted to add Koh-i-noor to it. So he disguised his soldiers as Shia pilgrims and with them marched to a sacred place known as Imam Rizi. Here he and Shah Rukh met. Aga Mahamad Khan then revealed his mission and

ordered Shah Rukh to hand over the diamond. Shah Rukh with all his princely pride refused. Upon which his two eyes were pierced and he himself was made a prisoner. Even then Shah Rukh refused to surrender it. During his imprisonment he never opened his mouth, although he was subjected to the most cruel methods of torture. At last despaired of him Aga Mahamad Khan released him. Shah Rukh, blinded and crippled held the Koh-i-noor till his last days. A few years before his death finding that his successors were too weak to protect such a famous stone, he presented the diamond to Ahmed Shah Durani, the mighty Afghan Monarch. But even Ahmed Shah had to succumb to its curse. A few months after he received it he died an unnatural death.

Hidden in a Wall.

From Ahmed Shah, the stone rolled into the hands of Shah Jaman, his grandson. This made Shah Shuja another grandson of Ahmed Shah, an enemy. Soon both were at war and after being defeated Shah Jaman fled to the Jalalabad valley and sought refuge in a fort called Mulla Ashak. And in an apartment of the house where he had concealed himself he secreted the Koh-i-noor along with some other jewels. It was later on found by a guard when the walls of that house collapsed due to a rain and was promptly given to Shah Shuja. Shah Jaman himself was blinded by a lancet when he was on his way to Kabul and imprisoned—but he was released by his brother after a time.

Into the English Crown.

Shah Shuja was the last Afghan to hold the stone. He was defeated and taken prisoner by Ranjit Singh in the war of 1811. Ranjit Singh proposed a brilliant plan to get hold of the stone. When Shah Shuja was captured the Koh-i-noor was worn in his turban. Ranjit Singh invited him to his durbar. When Shah Shuja came, both the rulers embraced and as to a custom of that day exchanged their turbans. Shah Shuja got an ordinary military turban while Ranjit Singh triumphantly carried off the Koh-i-noor.

Ranjit Singh, during his lifetime had bequeathed the diamond to the Jaganath temple. But his will was never carried out. His successors in turn took hold of it and finally it came to the hands of Dhulip Singh. Dhulip Singh, after his defeat by the British and the annexation of the Punjab surrendered it to the English Government.

Lord Dalhousie, who was then the Governor-General of India, sent it as a present to Queen Victoria with a complete account of the "vicissitudes through which it had passed."

N. N.

EXPLORING THE STRATOSPHERE

Recent record-breaking ascent of Soviet aeronauts into the stratosphere hailed as forward step in exploration of the region above the earth.

A FEW weeks ago, three Soviet aeronauts in an aluminum sphere suspended from a balloon ascended 11.8 miles above the earth, the greatest height ever reached by man. After eight hours and nineteen minutes in the air, they landed their balloon at Kolomna, about sixty miles south-east of Moscow. On their flight, instruments in the gondola registered an outside temperature of 89 degrees below zero, but they suffered from the heat inside, the temperature reaching as high as 86 degrees above zero. These explorers of the stratosphere discovered new scientific facts, the significance of which has not yet been fully disclosed.

The first successful flights into the stratosphere were made by Professor Auguste Piccard, Swiss scientist. On his first ascent, this intrepid scientist climbed 10 miles; on his second he went higher, 10.4 miles. These flights were made in 1931 and 1932. Professor Piccard himself devised the plan for an airtight sphere in which to penetrate the blue spaces above the earth. His sphere was of aluminum construction, measured 7 feet in diameter and dangled from a 100-foot gas bag. The sphere was equipped with oxygen tanks to enable its occupants to breathe.

The oxygen was carried in liquid and compressed form, as in submarines. Both Professor Piccard and his assistant carried parachutes, and the gondola was supplied with a larger parachute, intended to bring the sphere and its delicate instruments safely to earth in case the balloon had to be abandoned. The gondola could be revolved by a rudder. The gas bag was an unusually large one, having a capacity of 400,000 cubic feet.

The size of the turnip-shaped stratostat used by the Soviet aeronauts outstrips that of all other balloons used in ascending to the stratosphere. The fundamental details of construction, however, were the same as in Professor Piccard's balloons; and the same principles utilized in constructing his gondolas, especially the air-tight feature, were incorporated in the Soviet balloon.

What is the Stratosphere?

The stratosphere is that stratum of atmosphere lying roughly between seven and twelve miles above the earth's surface. Scientists have fixed, both by computation and observation, the depth of our atmosphere as somewhat greater than one hundred miles. Men have climbed almost five miles up Mt. Everest. Lieutenant Soucek of the U. S. Navy flew an airplane up to a distance of eight miles. Professor Piccard ascended more than 10 miles, and the Soviet aeronauts climbed almost twelve miles. A German scientist sent a small sounding balloon containing recording instruments up

to just short of 22 miles. Sound waves from gunfire or explosions on the grounds are calculated to reach about 30 miles. The height of the Aurora Borealis has been measured at fifty-six miles.

In the stratosphere the temperature remains constantly at 60 to 70 degrees below zero. Its air is so rare that a man would instantly suffocate if exposed to it. For the same reason, little of the sunlight is diffused as it is on earth; the result being that the heavens are dyed a deep purple, against which sun, moon and stars appear coldly brilliant. Ozone, a thin blue gas, is visible all about. It is this gas that protects us from the injurious violet rays of the naked sun.

Why Explore the Stratosphere?

There are many reasons for exploring the stratosphere. It may, for one thing, have important bearing on our future modes of air-travel. Professor Piccard says, "If a plane rises into the stratosphere, where the air is nine times less dense than at sea level, it could, with the same engine power, travel three times as fast. Due to the rarefied air, a motor in the stratosphere will turn three times faster than below, but the fuel consumption will not be increased. Thus future travellers will speed through the stratosphere, as we might call them, surrounded by an eerie purple darkness, though both the sun and moon are glimmering overhead. They will look down upon the earth as from another planet. Navigation will be easier. Winds will be steady and horizontal, or altogether absent. Constant, perfect visibility will make celestial observations easy. Unvarying speed will make dead reckoning accurate as that computed from the sun or stars."

The weather man has long been interested in the stratosphere, in fact, pioneered in the exploration of the upper regions. He sent up meteorological balloons carrying self-recording instruments attached to a parachute. He sought to know, and still wants to know, more about the temperatures, wind velocities, barometric pressures, and amount of water vapour in the thin upper strata. All these things have a direct bearing on the daily weather.

The scientist is keenly interested in the stratosphere. Professor Piccard, himself a scientist, had a primary purpose in undertaking his ascensions—to study cosmic rays. What are cosmic rays? Let us quote from *Popular Mechanics*: "That question is still practically unanswered, even though we are positive such rays exist, and that they have a power and penetrability that upsets all our old notions. Not even mountains of rocks can stop cosmic rays. They pierce an atmosphere 300 miles thick plus twelve feet of solid lead. And of what earthly use is the cosmic ray to us? 'Cosmic rays may be our energy of the future,' answers Piccard. 'The energy in each cosmic ray is one million times greater than that produced by the most violent reactions between molecules or atoms. Think what this

Continued on Page 258

THINGS OF INTEREST

How Drug for Reducing Weight

Encouraging results with a new weight-reducing drug which enables fat people to lose weight while eating an ordinary diet have been obtained by Professor E. C. Dodds, of the Courtauld Institute, and Dr. J. D. Robertson, of the Middlesex Hospital.

The drug has the chemical name of dinitro-orthocresol. It causes weight reduction by speeding up the rate of metabolism, the process of tissue change constantly going on in the body and embracing the change of food-stuffs and tissue into energy for the body's use.

When metabolism is speeded up to body uses up energy faster, calling on the daily food supply. As a result weight is lost.

Telescope with Lift Inside

The University of Toronto, Canada, is mounting the largest telescope in the British Empire and the second largest in the world. This great 74 in. reflecting telescope was made at Newcastle-upon-Tyne, and is one of the scientific marvels of this age. Some ideas of the magnitude of this great astronomical "eye" can be realised from the fact that part of its equipment includes a lift. The total weight of the telescope is fifty tons.

Practically all the great telescopes of the world are housed in New World observatories, for facilities for astronomical observations are much better on the other side of the Atlantic.

The polar axis of this great instrument is 22 ft. long and weighs nine tons, while the declining axis is of forged steel 13 ft. long and weighing three and a half tons.

With the naked eye one can seldom discover more than between 500 and 2,000 stars, but with these great instruments hundred million stars is only a very moderate estimation of the power of the great "eye."

Zinc: Refined by New Process

A revolutionary new process for producing metallic zinc of unusual purity from the concentrated ore, which is expected to find wide application because of its economies, has been developed by the U. S. Bureau of Mines.

In the new process natural gas, which is plentiful in most of the states where zinc is mined, replaces coal that is expensive because it has to be hauled a great distance.

The chemical reaction that changes the impure zinc oxide to the metal takes place at a much lower temperature than in the old clay retorts, so that plant maintenance expense is greatly reduced. The new process can

also be made continuous whereas the one in practice now is intermittent.

Officials of the Bureau of Mines do not say just how much cheaper the new process will be, but it is obvious that a great saving will be effected.

Camera Helps Industry

A technician in the Western Electric Company's laboratories has perfected a super slow-motion camera which will play a prominent part in revealing industrial secrets and be of inestimable value to manufacturers in perfecting their goods. The new camera is capable of recording 2,000 separate photographs per second. At this speed, equivalent to nearly seven and a quarter million photographs an hour, the flicker of an eyelid appears to take several minutes.

What happens when a driver comes in contact with a golf ball? It is reasonable to suppose that the driver simply hits the ball, but the new super slow-motion camera reveals that the ball is actually deflated to two-thirds of its original size.

The new camera will be able to photograph a high-velocity shell flashing from the mouth of a gun, and it will appear no more startling than an air balloon soaring gently. Already the shattering of an electric light bulb has been depicted as a gentle drifting of snow flakes, whilst a photographic flashlight, such as is used for taking instantaneous photographs, appeared gradually to become brighter and brighter, and then slowly grew dimmer and dimmer again, the whole taking several minutes.

To facilitate research, the camera is coupled with electric clock dials giving the time in minutes, seconds, and hundredths of seconds. These dials are photographed on the film together with the subject being studied.

Good-bye to Boiler Scale

A remarkable new invention for preventing boiler scale, that bugbear of all steam and hot water engineers, is giving striking results. It consists merely of a small hermetically-sealed glass bulb which contains a globule of mercury and is filled with a mixture of three rare gases. This bulb is arranged to float in the feed-water cistern, in the path of the inflowing water. The consequent agitation of the bulb causes tiny electrical discharges to pass through the water. These so affect the physical nature of the dissolved salts that they deposit as a sludge when the water is heated, instead of forming a hard scale. Even scale which has already formed disintegrates and leaves the boiler wall clean. Once installed, this device lasts indefinitely without attention, and the cost of upkeep is nil.



MONTH IN INDIA



The news that the Maharaja of Kashmir is purchasing a Dragon Moth aeroplane of a similar type to those used on the regular service between Calcutta and Decca and by the Indian National Airways, Ltd., has created hopes that it may be the beginning of an eventual air service to Kashmir. It is suggested that the Maharaja wishes to use the plane for urgent journeys in his State and as an experiment in the carrying of mails and passengers between Rawalpindi and Srinagar or Jammu. The purchase of the plane will necessitate the construction of aerodromes, which step is, of course, the foundation of any air service. In Srinagar, at any rate, there are two places which could be used. Next to the Polo ground is a suitable piece of land and another exists some few miles away from the Srinagar City on the Jammu Road.

In the rest of Kashmir and Jammu the problem will not be solved so easily for large flat areas are few and far between in this mountainous and beautiful country. One could well imagine that sea-planes would find good landing, especially in places like the Dal or Wular Lakes, or even on the Jhelum when and where it does not flow too swiftly. The heavy floods to which Kashmir is subject will also be another problem because flat land is then submerged very quickly, and nothing is so disastrous to an aeroplane service as mud. However it is natural to hope that these difficulties will be overcome and that Kashmir which for so long has held out against the inroads of a railway service and has only two good roads leading in from India, will eventually be opened out to trade and tourists through the air. From the visitor's point of view the magnificent views to be obtained when travelling from 'Pindi' to Srinagar would prove a very great attraction. At the same time this type of country would also necessitate one hundred per cent. reliability, for no one would be anxious to make a forced landing on the top of some snowy peak or rugged glacier 12,000 feet high or more.

The Governor of Bombay has set a noble example to other provinces in staying here through hot weather. It was originally arranged that he and Lady Brabourne should enjoy a well-earned brief holiday at Mahabaleshwar about the middle of May. No reason for the cancellation of this arrangement is given; it may be the mill strike or it may be other pressure of business. At all events the Governor and Lady Brabourne are sticking it out until they leave for Poona when the

Government will assemble there during the first week of the month current. His Excellency has made himself extremely popular during his few months of office and Bombay people are learning to admire his youthful enthusiasm no less than his tact and charming personality. Of a Governor's administrative capacity the public generally has not much opportunity of judging, for very rarely do the public know all the facts on administrative questions. But those who are in a position to judge are also impressed by Baron Brabourne's ability in this direction. Both he and the Baroness have been seen resting at Juhu during the hot weather, swimming and surf riding in truly democratic style from the small shack for his scanty leisure.

The Parliamentary Secretary to the Board of Trade confesses that he tried in vain to persuade his wife to allow him to have the map of the world painted all over his bedroom ceiling. Possibly his wife did not wish him to lie abed with thoughts roaming from one country to another. But still it is hoped that there is very much in the idea, even though it does sound as though it belonged to the 'brave new world' and its newer educational methods. Such a map might keep some people awake when they should be asleep. Imperialists might toss and turn in their efforts to find little pieces of red all over the map; internationalists might fret and fume over the presence of so many small nations and so many borders with their martial provocations. But here is some idea for some of the more modern readers—to paint the map of Indian Empire on their bedroom ceilings. It might help to keep in mind vast areas and their greater problems, which people living in Calcutta and Bombay are apt to forget. The real plutocrat might have changing maps according to the season, for instance, just now he could have the Himalayas or even the North Pole above the bed, to induce coolth. In the monsoon he could listen to the rain, look at the Sahara Desert or Baluchistan and think what a good thing it is that nature sends water in such abundance.

Perhaps for the first time in the history of the Madras Central Station a surprise test check was introduced on the morning of the 27th May when 31 members of the travelling staff of the Madras and Southern Maharatta Railway attached to the Deputy Transportation Superintendent's office, relieved the permanent ticket-checking and luggage office staff and took charge of the station.



CURRENT TOPICS



BERLIN

A threat that Germany might be compelled to make a complete reversal of her industrial economy which would "react with tremendous force on the world markets" was made by Herr Schmitt, Minister of National Economy, in a speech at Frankfurt-on-Main. He complained that Nations were excluding German Exports and consequently Germany could buy less and less raw materials and said this was the reason why the debt service could not be continued. If this situation was continued Germany would be forced to rely on her Chemists and Engineers to produce a substitute for raw materials. This would not be a temporary palliative but a permanent transformation.

LONDON

"We say to the British, 'We will give you preference for your goods when you give us preference for ours'," said Mr. Eamon de Valera in a speech to a gathering of 10,000 at Clifden, County Galway.

Mr. de Valera declared that they must fight this fight to a finish. He believed they were going to win through. They were determined not to pay.

MONTREAL

News that the Canadian Pacific steamship Metagama is to be broken up will come to thousands of those who travelled in her as the loss of an old friend.

The Metagama was a ship with a personality. She was launched on the Clydeside in 1915, was put in the Atlantic service, and in the period of immigration following the World War carried so many young women from the United Kingdom to meet their prospective husbands in Canada that she became known as "the bride ship".

For years Sir Malcolm Campbell presented a bouquet to each prospective bride sailing on the Metagama. Officers of the ship, and some faithful and regular patrons, formed themselves into what they called "The Order of Noble Metagamians" with Sir Malcolm as patron.

A sister ship, the Missanabie, was torpedoed and sunk in September 1918 with a loss of 45 of her passengers and crew.

CAIRO

The Imam of Yemen, under pressure of public opinion, has decided not to agree to the peace terms of King Ibn Saud.

The King, on the contrary, has summoned the Saudis to evacuate Hodeida and Tehama. The war will be resumed to-morrow unless the Imam accepts King Ibn Saud's terms.

Reuter.

SIMLA

The Government of India, it is learnt, propose to set up machinery to facilitate the work of Mr. A. M. Livingstone, the marketing expert, on the conclusion of the Crop Planning Conference which meets here on June 8.

The strength of the staff of Mr. Livingstone will be determined by the nature of the recommendations made at the Conference regarding the marketing facilities proposed to be given to the agriculturists.

The idea seems to be to model the Indian Marketing Board on the plan of the British Marketing Board.

The first step proposed to be taken in this direction is a general survey of the position of the staple crops—rice and wheat—and attention gradually will be extended to other crops, fruits and animal husbandry products.

The next important step will be towards the standardisation of crops. Agriculturists will be encouraged to divert their energies to diversified crops for which better marketing facilities, both in India and abroad, will be provided.

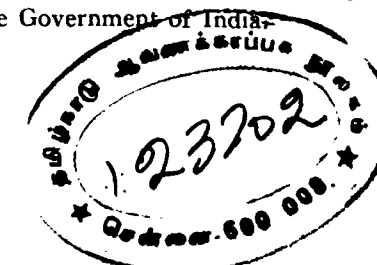
Ground-nuts are cited as a case in point. A few years ago, the Indian peasant did not know that ground-nuts were capable of fetching good value in foreign markets. To-day, quite an extensive volume of trade is being carried on in this particular commodity.

This is advanced by official circles as an argument against the common but mistaken belief that the Indian peasant is not susceptible to changed environments, that he is too deep-rooted in his medieval agricultural traditions, and that he is not intelligent enough to understand his economic self-interest.

Officers of the Government, who will be entrusted with carrying into effect the decisions of the Crop Planning Conference, hope that it will be their earnest endeavour to see that Indian agriculture is wedded to industry as, unless effective steps are taken in that direction, sooner or later, India always will remain the supplier of raw material.

The want in India of magazines or periodicals devoted to purely agricultural problems and information is pointed out by an officer connected with the economic planning of the Government of India.

U. P.



2, N30
N34-409

means for the engineer! The raw materials cost nothing—water, for example. The transformation of the atoms of three drops of water would produce enough cosmic energy to light a city for a night.

"The cosmic rays found on the surface are different from those in the upper spaces, because the radiations are weakened and changed by absorption in the atmosphere. Therefore, it is necessary for men to soar into the stratosphere if they are to discover the real nature of the cosmic radiations.

"Aside from cosmic rays and meteorological studies, Lieut. Commander T. G. W. Settle, navigator of the stratosphere balloon sponsored by A Century of Progress (which ended in failure) wants information on the blanket of ozone, which is believed to absorb a great deal of the sun's ultra-violet energy before it reaches the earth. Not least among the aims of stratospheric flight is the acquisition of more knowledge about the ability of the human system to withstand the rigors of travelling in thin air. Can our body engines adapt themselves to the high altitudes as well as to the high speeds which we contemplate there?

"Engineers are also interested in the effect of stratospheric conditions on various substances like cloth, wood, alloys, and native metals. It is already known that certain metals become brittle when subjected to low temperatures. In some instances it has been found that wood is superior to metal as regards strength. The attempts of the scientists to study variations in the sun's radiation have not met with complete success because of the problems created by the thick atmospheric blanket. Far above the clouds the sun's

intensity must be steady, and the atmospheric explorers will be able to study solar radiation to advantage."

Popular Mechanics goes on to say: "The photographs made by Piccard from an altitude of 50,000 feet made the giant Alps appear like miniature hills intersected by trickles of water. If there were no mist, Piccard might have looked down on a circular area of about 250,000 square miles of the globe's surface. The immediate possibilities of high-altitude photography for community planning, for transcontinental mapping and surveying, for economic planning, for flood control and military operations, are at once apparent.

"The stratosphere pilots must navigate in the midst of an eternal bombardment of meteorites. Whether it is only 5,000,000 or 50,000,000 as some state, the fact remains that the earth is a target for many of the so-called shooting stars. These meteorites expend tremendous energy when they come into contact with the frictional force of the atmosphere. Fortunately for us, most meteorites consume themselves in passing through the dense air blanket. Some fair-sized meteorites which are observable from the earth travel at an average altitude of seventy-three miles. But their speed is phenomenal. Thirty miles per second is quite common; and they have been seen to go as fast as sixty miles per second. Also, the atmosphere probably is freighted with electrical fury, and such disturbances may involve hundreds of millions of volts at one stroke. These are some of the problems awaiting stratospheric explorers. There is reason to believe that other sources of energy and other reactions abound in the great universe once called empty."

CONTENTS

Grazing (Illustration)	227	The Diamond that left a trail of Royal	
Earthquakes and Volcanoes	228	Blood	247
What Next, in Steel?	231	Exploring the Stratosphere	248
New Finishing Processes	234	Things of Interest	249
On the Mountain (Illustration)	235	Month in India	250
The Atlantic Flight Mystery	236	Current Topics	251
A Wonderful Rescue	241	The Tale Spins Page	253
The Charing Cross Mystery	244	Market Report	254

THE TALE SPINS PAGE

"I wonder why Peck always goes to a lady dentist."
"I suppose it seems good to hear a woman tell him to open his mouth instead of to shut it."

In view of the rapid changes of the last six months, Ima Dodo thinks Russia will have more difficulty recognizing Uncle Sam than Uncle Sam will have recognizing Russia.

Minister (calling)—And what does your mother do for you when you've been a good girl?

Margery—She lets me stay home from church.

Professor—Do you know what happened in 1776?
Freshman—1776? Gosh! I can't even remember what happened last night.

"Do your neighbours borrow much from you?"
"Borrow! Why, I feel more at home in their houses than I do in my own."

"Money," said the social reformer, "is the root of all evil; it means trouble."

May be so, but it's the only kind of trouble that's hard to borrow.

He—Does the moon affect the tide?

She—No, only the untied.

"You say he's very sure of himself?"
"Is he? Why, he always does the crossword puzzles with a pen."

First Mosquito—Why are you making such a fuss?
Second Ditto—Whoopee! I passed the screen test.

A woman is never satisfied. If she can't capture a new man she starts to make over the one she has.

Drunk (entering car)—Shay, will you put me off this thing when we get where I'm suppose to get off?
Street Car Conductor—Yes, sir, you get off right here!

Drunk—Gosh, here already! How time dush fly.

"How did you compile your great dictionary?" the lexicographer was asked.

"Oh, it was something like having a quarrel with one's wife—one word led to another."

A little girl was put in an upper berth of a Pullman sleeping-car for the first time. She kept crying until her mother told her not to be afraid, because God

would watch over her. "Mother, you there?" she cried. "Yes." "Father, you there?" "Yes." A fellow passenger lost all patience at this point and shouted: "We're all here! Your father and mother and brothers and sisters and aunts and uncles and cousins. All here; now go to sleep." There was a pause; then, very softly: "Mamma!" "Well?" "Was that God?"

Little Mary—We had the loveliest time playin' letter carrier while you were away, mamma! We delivered letters to all the houses in our street.

Mother—That is nice, dear, but where did you get the letters?

Little Mary—We found them in your old trunk, all tied up with a blue ribbon.

Polly—How do you earn your living?

Molly—I'm a dairy maid in a candy kitchen.

Polly—Dairy maid in a candy kitchen! What do you do?

Molly—Milk chocolates.

Inspector—I thought you said this trunk contained nothing but your husband's wearing apparel. What's this bottle?

Lady from Havana—That's his nightcap.

A college boy is one who knows what he wants when she wants it.

Country Constable—Pardon, Miss, but swimming is not allowed in the lake.

City Flapper—Why didn't you tell me before I undressed?

Country Constable—Well, there ain't no law against undressing.

Small Girl (to customs official searching her mother's case)—Oh, you're getting warm, isn't he, mummy?

"Your boy must be a phenomenally fast runner. I noticed in the morning paper that he burned up the track with his speed. I suppose you saw him do it?"

"No," said the athlete's mother, "but I saw the track this morning, and there was nothing but cinders there."

"Rufus, did you go to your lodge meeting last night?"

"Nah suh. We dun have to pos'pone it."

"How is that?"

"De grand All-Powerful Invincible Most Supreme Unconquerable Potentate dun got beat up by his wife."



MARKET REPORT

Messrs. Peirce, Leslie & Co. Ltd., Cochin, Calicut and Mangalore



Cochin Market as on 22nd May 1934.

COIR AND ROPING YARNS. Since our last report the market has dropped by Rs. 5/- to Rs. 10/- per candy. There is no demand from Europe. Calcutta is also not buying largely. Tendency is slightly easier.

Current Market prices are as follows:—

	Average price Rs.	70/-
SUPERIOR ANJENGO.	"	60/-
ORDY. ANJENGO.	"	55/-
IMIT. ALLAPAT.	"	75/-
REAL ALLAPAT.	"	61/-
ARATORY YARN.	"	60/-
FINE WEAVING YARN.	"	40/-
ROPING YARN.	"	

per candy of 6
cwt. baled wt.
terms.

PEPPER. During the second week of the month there was a strong demand from Calcutta together with a small demand from European Firms which had the effect of raising the market from Rs. 25 1/4/- to Rs. 26/- Since then the market has reacted and closes at Rs. 25 1/4/- steady.

Current quotation:—Rs. 25 1/4/- per cwt. garbled ex godown.

GINGER. As it is approaching the close of the season there is very little stock available for export purposes. In consequence the tendency is upward.

Current quotations are:—

Unbleached ... Rs. 18/- per cwt. garbled ex godown.
Bleached ... Rs. 14 1/8/- do. do.

TURMERIC. The season for these commodities also has closed. The prices are therefore steady with upward tendency.

Current quotations are:—

Finger ... Rs. 10/- per cwt. garbled ex godown.
Bulb. ... Rs. 9/- " "

COCOA NUT OIL. Since our last report the price went up to Rs. 59/- Ready delivery, but owing to no demand for export coupled with the forward sales of Ceylon copra in Cochin made for July shipment the market has fallen to Rs. 54/-

Current quotations are:—

Ready ... Rs. 54/- per candy of 600 D. lbs.
For 1 month delivery ... 54 1/8/-
For 2 months ... 55 1/4/-

COPRA. Tendency is steady. Present quotation Rs. 35 1/8/- per candy of 600 lbs.

Calicut Market as on 24th May 1934.

COIR YARN. On account of fair European demand and poor arrivals the market was firm during the month.

Quilandy Yarn per candy of 700 lbs. Rs. 56/-

On account of poor demand from Europe and India the market is easier at present.

1st Quality Beypore per candy of 700 lbs.	Rs. 52 1/8/-
No. 1 Beypore	do. 47 1/8/-
No. 2	do. 42 1/8/-
No. 3	do. 37 1/8/-
Fine Unsoaked Yarn	do. 33/-
Kallai Unsoaked Yarn	do. 24/-
Parapenangady	do. 16/-

GINGER. Fair Indian demand kept the market steady during the month. Current quotations:—

Bold Chernaad per candy of 700 lbs. Rs. 110/-
Ordinary " Rs. 100/-

PEPPER. On account of continued Indian demand and poor arrivals the market rose during the month and closes steady. There was also European demand.
Price per cwt. F. O. B. Rs. 50/-

Mangalore Market as at date.

PLANTATION COFFEE. Balances of plantation coffee carried over from April, were comparatively small, but demand throughout the month has been poor and prices tended downwards, particularly in respect of ordinary qualities which has been sold during the month at from Rs. 47/- to Rs. 49/- with particularly good lots sold at up to Rs. 51/- per cwt. ex bags Mangalore.

NATIVE COFFEE. Considerable quantities of Native coffee have been offered during the month and prices have tended downwards. Much of the coffee offered has been of inferior quality and prices have varied over a wide range from Rs. 205/- to Rs. 185/- per candy. Lots of rather inferior quality clean garbled have been sold at the latter price during the past few days.

CASHEW NUTS. Quantities of raw cashew-nuts offered during the month have been comparatively small, and prices tended downwards during the earlier part of the month reaching the low point of Rs. 8/- per moora of 65 lbs. During the past few days the tendency has been upwards with up to Rs. 9 1/4/- per moora realised, but buyers are few and business passing small.

TRAIN TIMINGS

Arrival and departure of the principal trains at Central Station (Madras) and the times of arrival and departure of the same trains at termini elsewhere in India:

CALCUTTA MAIL
BOMBAY MAIL
BOMBAY EXPRESS
GRAND TRUNK EXPRESS
BANGALORE MAIL
BANGALORE EXPRESS
BLUE MOUNTAIN EXP.
MALABAR EXPRESS
WALTAIR PASSENGER

DEP:	ARR:	DEP:	ARR:
Cen. Station 8-30 P.M.	Calcutta 10-20 A.M.	Calcutta 7-10 P.M.	Cen. Station 8-35 A.M.
Cen. Station 8-40 P.M.	Bombay 6-00 A.M.	Bombay 10-00 P.M.	Cen. Station 5-55 A.M.
Cen. Station 8-30 A.M.	Bombay 10-15 A.M.	Bombay 1-45 P.M.	Cen. Station 5-00 P.M.
Cen. Station 8-40 A.M.	Delhi 10-00 A.M.	Delhi 4-30 P.M.	Cen. Station 4-35 P.M.
Cen. Station 9-30 P.M.	Bangalore 6-35 A.M.	Bangalore 9-00 P.M.	Cen. Station 6-15 A.M.
Cen. Station 1-00 P.M.	Bangalore 7-40 P.M.	Bangalore 7-40 A.M.	Cen. Station 2-10 P.M.
Cen. Station 9-15 P.M.	Ootacamund 12 NOON	Ootacamund 8-00 P.M.	Cen. Station 6-35 A.M.
Cen. Station 8-05 P.M.	Mangalore 4-20 P.M.	Mangalore 9-55 A.M.	Cen. Station 7-15 A.M.
Cen. Station 7-30 P.M.	Waltair 9-45 P.M.	Waltair 6-25 A.M.	Cen. Station 10-30 A.M.

WHEN IN BOMBAY STAY AT THE MODERN HINDU HOTEL

(Ballard Pier Tram Junc. Fort.)

Situated in a healthy locality and within easy reach of Railway Stations, Docks and all business centres.

Provides at Moderate charges well furnished rooms fitted with Electric lights and fans and excellent vegetarian food, specially suited to South Indians.

Patronised among others, by:

Palace Officers of Mysore.
Sir Vasudeva Raja, Kt. of Kollengode.
Dewan Bahadur Krishnamachariar,
Dewan of Baroda.

Sir K. V. Reddy, Kt., Madras.

Telegraphic Address:—“SOJOURN”

370 CA

HOTEL MINERVA

The Most Comfortable Residential Hotel in Mangalore

Centrally situated near the Maidan in close proximity to Post and Telegraphs, Collectorate, Banks, Port Trust, Customs etc.

Rooms provided with Electricity

A most convenient place for travellers by Sea and Rail

Food prepared to the taste of all

A convincing visit solicited

466 DA



Great Toilet Accessories!

“HOUNSA ANTISEPTIC” Snow not only whitens, softens, smoothen, but also keeps your skin well protected from blemishes and infection. This is a perfect powder base too!

AND

A perfectly pure BRILLIANTINE, entirely free from wax and gum; enriches the natural colour of your hair. “Hounsa Superb” prevents dandruff and keeps your hair neat!

499 DA

HOUNSA

SNOW AND BRILLIANTINE

Manufacturers: C. I. B. HOUNSA, Lalgh Mansions, Harvey Road, BOMBAY 7
Agents: Messrs. KAMATH & CO., Car Street, MANGALORE S. K.



My Scientific System of Graded
Physical Culture

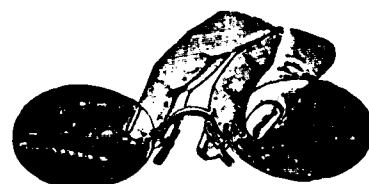
15th Edition, 114th Thousand

IT IS FREE—THIS will show you some of my remarkable achievements in Health-building exercises, many pages with nice photographs of myself and a number of my pupils. All I ask is the price of postage—As. 2. Order for a copy at once.

Prof. M. V. KRISHNA RAO

398 CDA OOTACAMUND - S. INDIA

EASTERN OPTICAL COMPANY (Rgd.)



WHOLESALE OPTICIANS AND DIRECT IMPORTERS

323-325, Abdul Rehman Street

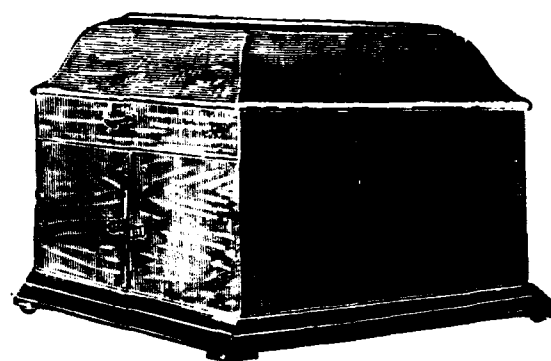
BOMBAY-3

403 CA

Branch

Eastern Optical Co., 306, Bow Bazar, Calcutta

THIS IS WHAT YOU ARE LOOKING FOR



IF YOU ARE IN NEED OF

**Gramophones, Harmoniums, Brass
Flageolets, Violins, Celluloid etc.**

Best Quality Cheapest Rates

Please write to:—

M. NANUBHAI & Co.

422, Kalbadevi Road

BOMBAY 2

N. B.—Please note that we are agents for Broadcast, Columbia, and Odeon Records. 365 CA

A Trial order is solicited.

**Messrs. Shivaji Chemical Works
BELGAUM**

SEND YOUR TRIAL ORDERS FOR

Magic Cure

A wonderful and sure remedy for all Head-aches, Fever, Colds, Body-ache, Rheumatism, Tooth-ache, Female disorders, Hemiparalysis, Influenza and Neuralgia. As. 2 per packet, Re. 1-0-0 per doz.

Worm Powder

One packet for children and two for adults to be taken in sugar without castor oil. 1 anna per packet, Rs. 4-0-0 per 100.

Cough Mixture

is too good for eight annas. One dose will show its efficacy on ordinary Cough, Cold, Hooping Cough, Bronchitis, Pneumonia and Influenza. Rs. 5-4-0 per doz.

Jeevanamruthbindu

Though the price is eight annas per bottle the work it does is splendid. It could be used externally as well as internally for indigestion, stomach-ache, ankle-sprain, body-ache, tooth-ache, cough and cold. Any sick-room could be approached with the help of this smell.

Besides these we manufacture ink powders and all sorts of ointments. We also deal in Nelson's Tea and Eucalyptus Oil from Kotagiri, Nilgiris.

Sole Representatives

406 DA

Messrs. GEORGE & Co.

Agency Contractors

FORT BELGAUM

B. M. PRESS MANGALORE S. K.

Undertakes all sorts of

COPPER, NICKEL AND SILVER PLATING

with excellent results, at moderate charges

FOR PARTICULARS WRITE TO

T H E M A N A G E R

**SADHANA AUSADHALAYA
DACCA (Bengal)**

Adhyaka:—Jogesh Chandra Ghose, M. A. (Ayurved Sastr) Formerly Professor of Chemistry, Bhagalpur College.

MAKARDWAJA:—(Pure with gold) A Wonderful specific for all primary diseases. Rs. 4/- per tola.

SARIBADA SARASA:—A Powerful remedy for all sorts of blood impurities and Urinary troubles. Rs. 3/- per seer.

SUKRA SANJIBAN:—An effective health restorer to all nervous debilities. Rs. 16/- per seer.

ABALA BANDHAB JOG:—A great remedy for common troubles of Women. Rs. 2/- for 16 doses. 979CA

Catalogues & prescription on describing the nature of disease are given gratis.

Carl Hartmann

P. O. B. 569

BREMEN (Germany)

arranges
representations of
German
manufacturers

(No charges)

505 DA

**FREE TRIAL—X RAY
INKOGRAPH**



A transparent Non-self-erasing. Unbreakable American Pen with a hemispherical point that glides over the coarsest paper with the speed of a softest lead pencil.

Its other specialities:—1. Swiftest Writer. 2. Regulated Uniform Flow of ink. 3. Makes 5 to 6 Carbon Copies with original in ink. 4. Greatest Ink Capacity. 5. Draws lines to a ruler.

We refund the full value, if not approved and returned within a week. Orders per V. P. P. only. Price:—X Ray Inkograph Rs. 19 only. Other Self-erasing Styles Rs. 16, Rs. 14 and Rs. 11.

**100 Copies in 10 Minutes!
RAPID Duplicator**



Handwritings! Drawings! Type-writing! Sketches etc. in one or more colours, in one or more languages at a time! Over 10,000 in use all over India, Burma and Ceylon.

No Stencil! No Roller! No Special Pen! Foolscap size Rs. 22/-, Postage Packing Rs. 2/12. Send Rs. 5/- in advance with order.

PHOTO ENLARGEMENTS



Made from any photograph—No Matter how small—old, faded or indistinct. Size 10"X30" artistically finished by experts in BLACK AND WHITE mounted on canvas Rs. 15. For RICH SEPIA Finish Rs. 18. For beautifully finished in WATER COLOURS—a Veritable WORK of ART—Rs. 30. 501 DA Satisfaction guaranteed. Originals returned uninjured. Half charges in Advance.

J. J. SHAH & SONS

Prop:—UNIVERSAL PHOTO ENLARGING Co.
(T. M.) P. O. Box No. 2183, BOMBAY No 2.

ALL KINDS OF BUILDING MATERIALS

such as Mangalore pattern Roof, Ceiling, Flooring, Hourdis, Cement Flooring tiles and Ridge tiles, Glass tiles, Timber in logs and scantlings, Cement, Cuddapah Slabs, REINFORCED CONCRETE MATERIALS, etc., etc., can be supplied at competitive rates.

Agencies for Building Materials on consignment account will be accepted on commission basis. First class references supplied. For particulars please apply to

A. S. GOPALAKRISHNAN

Agent:—The Commonwealth Trust, Ltd. The New Malabar Timber Yards and Saw Mills, Ltd. The Ogale Glass Works, Ltd. The Jupiter General Insurance Co., Ltd. (Fire, Motor and Marine Insurance).

Stockist:—“Anchor” Brand Cement for Trichinopoly, Tanjore, Salem, North Arcot and South Arcot Districts.

Reinforced Cement Concrete Specialist.

478 DA

Tel. Address: “Architect” Trichinopoly.

WEST BOULEVARD ROAD, TRICHINOPOLY

FEAST!



Enjoyment of a Feast is enhanced, when the Savoury Dishes are made flavoury by using our most celebrated Misky

VHR

A S A F O E T I D A

1 lb. pkt. Rs. 1-12-0; 1/2 lb. pkt. Rs. 0-15-0; charges extra. 479 DA

VARJIWANDAS HIRJEE & CO.

194, Govindappanaick Street, MADRAS

INDIAN MAGAZINE

is available for

S A L E

from

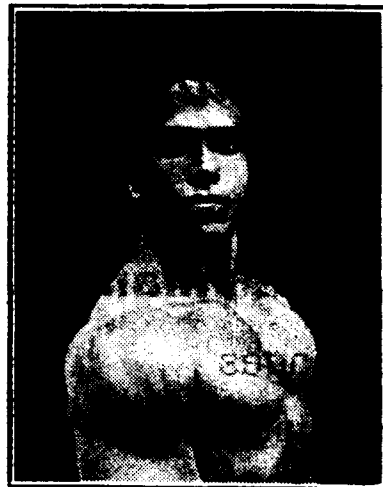
MADRAS:— Messrs. Higginbothams and at all their Railway Stalls.

MYSORE:— The Karnataka News Agency, Lansdowne Buildings, and at all their Mysore Railway Stalls.

RANGOON:— Mahomed Hoosain Aloo, Esq., Books and Newspaper Agent 83, Moghul Street.

A NEW BOOK

(Every physique lover should possess)



Your Physique is an asset to your country

Read my Book

PERFECT PHYSIQUE

a prospectus to MY SYSTEM

My book will tell you how to get Strong and Healthy

Write immediately for my new book "PERFECT PHYSIQUE" containing 64 pages and 40 new MUSCULAR and ARTISTIC poses of myself and my pupils on high class art paper.

Send As. 8 by money order. No stamps received. No V. P. sent.

SURYANAMASKARCHART (on art paper) Send As. 8 by M.O.

P R O F. K. V. I Y E R
PHYSICAL CULTURE CORRESPONDENCE SCHOOL
BANGALORE CITY (SOUTH INDIA)

344 CA

NO ADVERTISING CAMPAIGN

IN SOUTHERN INDIA

is complete without a provision for

The Madras States Directory

the only Exhaustive Pictorial Reference Book of Statistical, Historical and Commercial information, patronised by the five South Indian States of Travancore, Cochin, Pudukottai, Banganapalle and Sandur.

FULL OF PICTURES—WHOS' WHO, A SPECIAL FEATURE

Price Rs. 5.

Postage Extra.

ADVERTISEMENT RATES

	Ordinary	Within Reading Matter
Full Page	Rs. 30	Rs. 35
Half Page	Rs. 15	Rs. 18
Quarter Page	Rs. 8	Rs. 12

Special rates will be quoted for cover pages, insets and other unspecified positions.

Apply to:—

The Manager

350 CA

PEARL PRESS
COCHIN

THE BOMBAY (SWADESHI) LIFE ASSURANCE CO., LTD.

(Estd. 1903)

HEAD OFFICE:

45-47 CHURCH GATE STREET - FORT - BOMBAY

Chairman: Sir Lalubhai Samaldas, Kt., C.I.E., J. P.

Medical Referee: Dr. A. S. Erulkar, M. D. (Lond.)

Consulting Actuary: G. S. Marathe, Esq., M.A. (Bom.) A.I.A. (Lond.)

If you have not insured anywhere yet, or if there is any margin for more, please consult the undersigned AT ONCE either in person or by letter, and go in for a policy with this purely Indian Institution of 25 years' standing, which offers maximum benefits at minimum cost. Excellent opportunities for energetic educated young men by way of agencies in our jurisdiction comprising of Karnatak Districts, Konkan and S. M. States. Commission given on highly liberal basis. Every help and co-operation offered to agents.

For further details apply to:

399 CA

K. P. RAO & SONS

CHIEF AGENTS, COLLEGE ROAD,

BELGAUM

Now offered to the Public at Re. 1/-

premium per share.

PREFERENCE SHARES

of the Syndicate bearing 6% cumulative

dividend free of income-tax.

Application fee as. 8 per application irrespective of

the number of shares applied for.

For particulars please apply to:—

The Canara Industrial and Banking Syndicate, Ltd.,

Udipi

351 CA

or to any of its Branches:

Brahmavar, Kumta, Mangalore, Karwar, Honavar,

Payyanur, Cannanore, Hubli and Bangalore City.

PYORRHEA

That dreaded disease, which usually manifests itself in inflamed gum tissue and in soft, bleeding, spongy, receding gums will be **ARRESTED** and **CHECKED** and **PERMANENTLY CURED**

by

NILPYOR

It keeps the mouth clean, prevents formation of Tartar and decay of the teeth, inflammation and receding of the gums.

Numerous testimonials received of its wonderful curative properties.

Re. 1/- and Rs. 2/4 Bottle

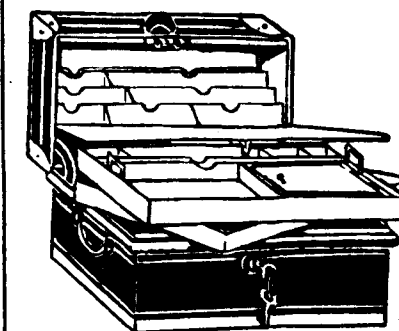
497 DA

WILFRED PEREIRA

Qualified Chemist

MADRAS - KOTAGIRI - COIMBATORE

ECONOMY WITHOUT SACRIFICE KARACHIWALLA'S QUALITY GOODS SOLD ALL OVER INDIA



MADE OF BEST
TINNED STEEL
THE DESPATCH
CASH AND DEED
BOXES,

TRUNKS AND AIR-
TIGHT UNIFORM
BOXES,

REFRIGERATORS, 366 CA
ICE BOXES AND MEAT SAFES ETC.
(SEND FOR PRICE-LIST)

E. H. GOOLAMHUSEIN
KARACHIWALLA
BRUCE STREET, FORT, BOMBAY

TRADE MARK

THE ONLY

QUALITY MISKY

ASAFOETIDA

STANDING FIRST IN THE LIST

SOLD EVERYWHERE

Sole Importers **GOPALJEE & CO.**

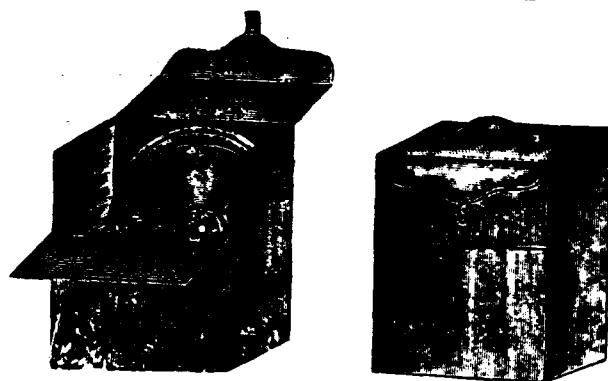
308 GOVINDAPPA NAICK STREET, MADRAS.

BOMBAY, KUMRAKONAM AND MADURA.

490DA

GRAMOPHONE RECORD BOXES

SAFE, STRONG AND CONVENIENT TO HANDLE



DESIGN REGISTERED No. 1650

DUST AND DAMAGE PROOF

Made of Best Steel Plates with soft lining inside to preserve and to prolong the life of the Gramophone Records. Fitted with comfortable Strong Leather Handles to carry. Finished in different fancy colours.

No. 1	To hold about 2 Doz. 10" Records	Rs. 5 0 0	each
" 2	" " 3 " 12" "	" 6 8 0	"
" 3	" " 2 " 12" "	" 6 8 0	"
" 4	" " 3 " 12" "	" 8 8 0	"

The Negapatam Indian Steel Trunk Factory

Holland Road, Opp. to Railway Station,

NEGAPATAM

418 DA

PLEASE APPLY FOR TRADE TERMS

*When in need of High Grade
Homoeopathic and Biochemic
Medicines*

and LITERATURE, it will be to your advantage to write to us. We have specialised ourselves in supplying these requirements for 44 years.

Interesting price-list sent free on request.

ROY & CO.

354 CA

HOMOEOPATHS

Princess Street, BOMBAY

XVI

NILGIRI JOTTINGS

ON

FOOD VALUE OF VEGETABLES

with various recipes

BY

BEATRICE A. VIEYRA

Author of "Housewife's Companion", "Culinary Art Sparklets", "Souvenir of the Silver Jubilee"

Price Re. 1-8-0 Packing and Postage extra.

Available at the

BASEL MISSION PRESS

MANGALORE S. K.

"QUALITY PRINTING"



The value of good Printing

We specialise in high-class Artistic Commercial Printing and Designing of every description and place at the disposal of the general public the benefit of a century's experience with the service of a fully-qualified Staff.

COLOUR PROCESS AND
BLOCK-MAKING A SPECIALITY

BASEL MISSION PRESS

MANGALORE S. K.

Wunder-Farben



HANS WUNDER
DRUCKFARBENFABRIKEN
BERLIN-WILHELMSBERG
ZWEIGFABRIK WIEN A. V.

Roller Composition TO EVERY PRINTER Printing-Varnishes
Do you wish to save time and money, only use our best proved

COLOURS FOR ALL SYSTEMS OF MACHINES

dry as well as inks
for

LETTERPRESS
LITHOGRAPHY

INTAGLIO-PRINTING
OFFSET - PRINTING

REQUISITES FOR EVERY PROCESS OF PRINTING

for Offset: Offsetin and Offset Paste
for Lithography: Gloria Paste
for every process of printing: Rapid-Dryer Secool

FOR ROLLERS' CAST ONLY: ROLLER COMPOSITION "GERMANIA" FOR TROPICAL CLIMATE

transparent elastic durable
SPECIALITIES: BRONZE-PRINTING-INKS GOLD-PREPARATION

Demand samples and prices from our
Indian Representative, Dipl. Ing. Fritz Wolff Calcutta
Stock P. O. Box 2409

HANS WUNDER G. M. B. H.

257 CA

DRY COLOUR AND PRINTING INK WORKS
BERLIN-WILHELMSBERG—Branch-Factory Vienna

XVII

ZANDU'S CHYAVANPRASH (LEHYAM)



Best Body and Brain Bulder—The Ideal Tonic Food for all Ages—Useful for Cold, Cough, Asthma, Phthisis and Hoarseness of Voice

Prices: 5 lbs. jar Rs. 10, 1 lb. Rs. 2-8, ½ lb. Re. 1-5, ¼ lb. As. 13.

1. ZANDU PHARMACEUTICAL WORKS, LTD., BOMBAY
2. Madras Presidency Agents:
Messrs. DAMODER & CO., 78, China Bazaar Road, MADRAS
3. Mangalore Agents:
Messrs. SHAH & COMPANY, Diamond Buildings.

608 DA

Messrs. Stanley, Lionel & Co.
Manufacturers' Representatives
MADRAS

Telegrams:
"NORNEL"

Telephone:
4022

Soothe your nerves
Restore spent energy
Start taking

"CREAMWEAT"

The ideal health beverage

Made from

Wheat and Barley

Full of Vitamins

Recommended by eminent Medical Men.

Dealers in Patent Medicines, Phenyle etc.

The Madras Industrial Bank Ltd.
Second Line Beach
MADRAS

Telegrams:
"INDUSBANK"

Telephone:
4022

BRANCHES:

Bangalore, Ellore, Muslipatam, Vizagapatam,
Madura and Conjeevaram.

Agency Office:—Vizianagaram.

Undertakes Banking business of every description.

Current and Savings Bank Accounts are opened at 2 and 5 per cent interest per annum.

FIXED DEPOSITS at very favourable rates are accepted.

BONDS: Loans under this scheme are advanced up to Rs. 10,000/- repayable at Re. 1/8/- per month for Rs. 100/-

Collections of Debts: All monies due under Mortgages, Pronotes, Bills, Hundies etc. etc. are collected.

602 DA

Terms and particulars can be had on application.

DR. BAILUR'S MEDICINES

AGUE
Fever
Pills

POWDER
FOR
INDIGESTION

Powder
for
Convulsion

Write for Catalogue for other Medicines.

COUGH SYRUP

used for Influenza fever, whooping-cough, etc.

A commission of 12½% for orders more than Rs. 3 worth medicines. Better facilities for merchants.

DR. HARI MAHADEV BAILUR
BELGAUM

349 CA

When in need of High Grade Agastiar's Sidda Medicines and Ayurvedic Specialities and Literature, it will be to your advantage to write to us. Sidda's Specifics are the capital remedies to cure all incurable diseases. We have specialised ourselves in curing obstinate cases of Leprosy, white and black patches, Paralysis, Asthma, Consumption, Rheumatism, etc., etc.

Thousands of Chronic Patients cured and numerous testimonials obtained.

Healing by Post is a Speciality.

486 DA

Interesting price-list sent free on request.

Consult—Dr. Kotah Jayaram Naidu, Vaithyabhupathy

DR. KOTAH'S M. S. MEDICAL HALL

146, BROADWAY, MADRAS

Homoeopathic Poor Dispensary (MANGALORE)

P. O. Kankanady, South India
(Est. 1880)

Importers of: Homoeopathic Medicines,
Schuessler's Tissue Remedies,
Luyties', Walker's and other Specialities.

Medical advice and Prescriptions
given gratis.

Depot for: Fr. Muller's S. B. Specifics
and
Fr. Muller's Biochemic Tonic.

396 CA

Prices Now Reduced. Call for Price-list.

BEWARE OF IMITATIONS!!!

Made to cure, not merely to sell.



A MATCHLESS CURE FOR ALL ACHES AND PAINS

Sold everywhere; Sold by the millions.

Sole agent for Madras Presidency and Mysore:—

A. B. Parekh,

China Bazaar Road, MADRAS.

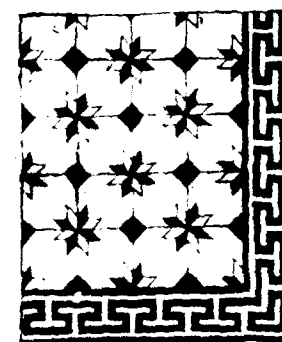
424 DA

AMRUTANJAN DEPOT

BOMBAY, MADRAS AND CALCUTTA

RAVAL TILES

WHEN LAID AND POLISHED, WILL SHINE
LIKE MARBLE



RAVAL TILES

Are made in India under expert European personal supervision.

Stocks at:

RAVAL & Co.

Bank St., Fort, BOMBAY

367 CA

8, Second Line Beach, MADRAS

LILIPUT DOCTOR



Marvellous antiseptic compound and a reliable companion. Purely Swadeshi.

Vaprine (Regd.):—Magically cures cuts, bruises, ringworm, eczema, wounds, itch, psoriasis, burns, insect bites, pimples, piles etc. Instantly stops bleeding.

Available everywhere.

Price: ¼ oz. 4 As. ½ oz. 8 As.

319 CA

Available at:—

THE NATIONAL KANARA NEWS AGENCY,
Phirozsha Metha Road,
BOMBAY

THE LUSTRE MFG. CO.
Chikmagalur (Mysore Province)

XIX



Registered Trade Mark

BLACK AND COLOURED

PRINTING INKS

HIGHLY CONCENTRATED

Specially prepared for Indian climate for Letter-press, Litho, Litho-offset, Tin Plate Printing, etc.

VARNISH-SUNDRIES

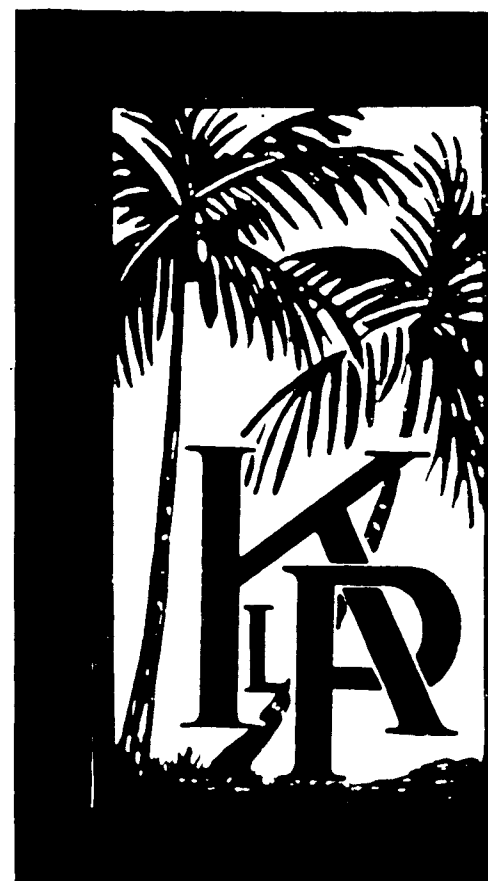
DEUTSCHE DRUCKFARBENFABRIK
ZÜLCH & DR. SCKERL - LEIPZIG N. 21 GERMANY

SOLE AGENT AND STOCKIST:

S. VAJIRAVELU MUDALIAR P. T. MADRAS

310, Wall Tax Road - Post Box No. 520.

966 CA



Klein & Peyerl
PHONE: 3404 - MADRAS - POST BOX No. 348

Successors to Wiele and Klein—Estd. 1882

Portraits and Enlargements—Developing and

Printing of Amateur work—Indian Views

and Postcards, Lantern Slides, Process Blocks

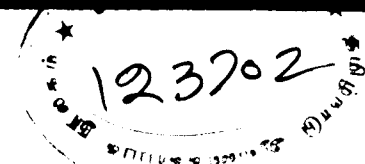
on Copper and Zinc in Halftone and Line.

All our work is made under the personal

supervision of a European expert of 30 years'

experience under up-to-date conditions.

969 CA



22,6130
N34-409

THE LAST ENCHANTMENT

THE
LAST
ENCHANTMENT

G.K. CHETTUR

BY
G.K. CHETTUR



B. M. BOOKSHOP
MANGALORE S. K.

