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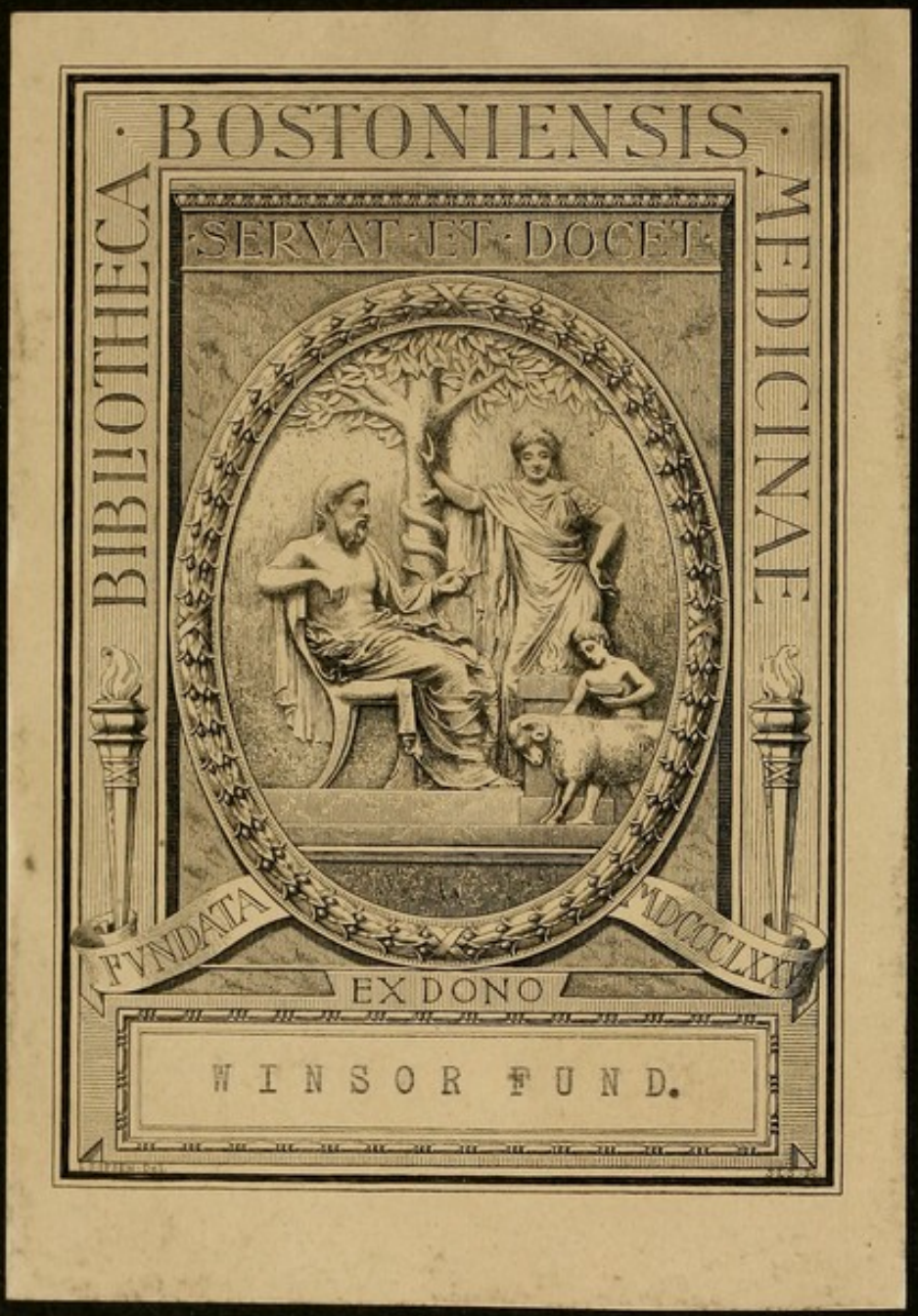
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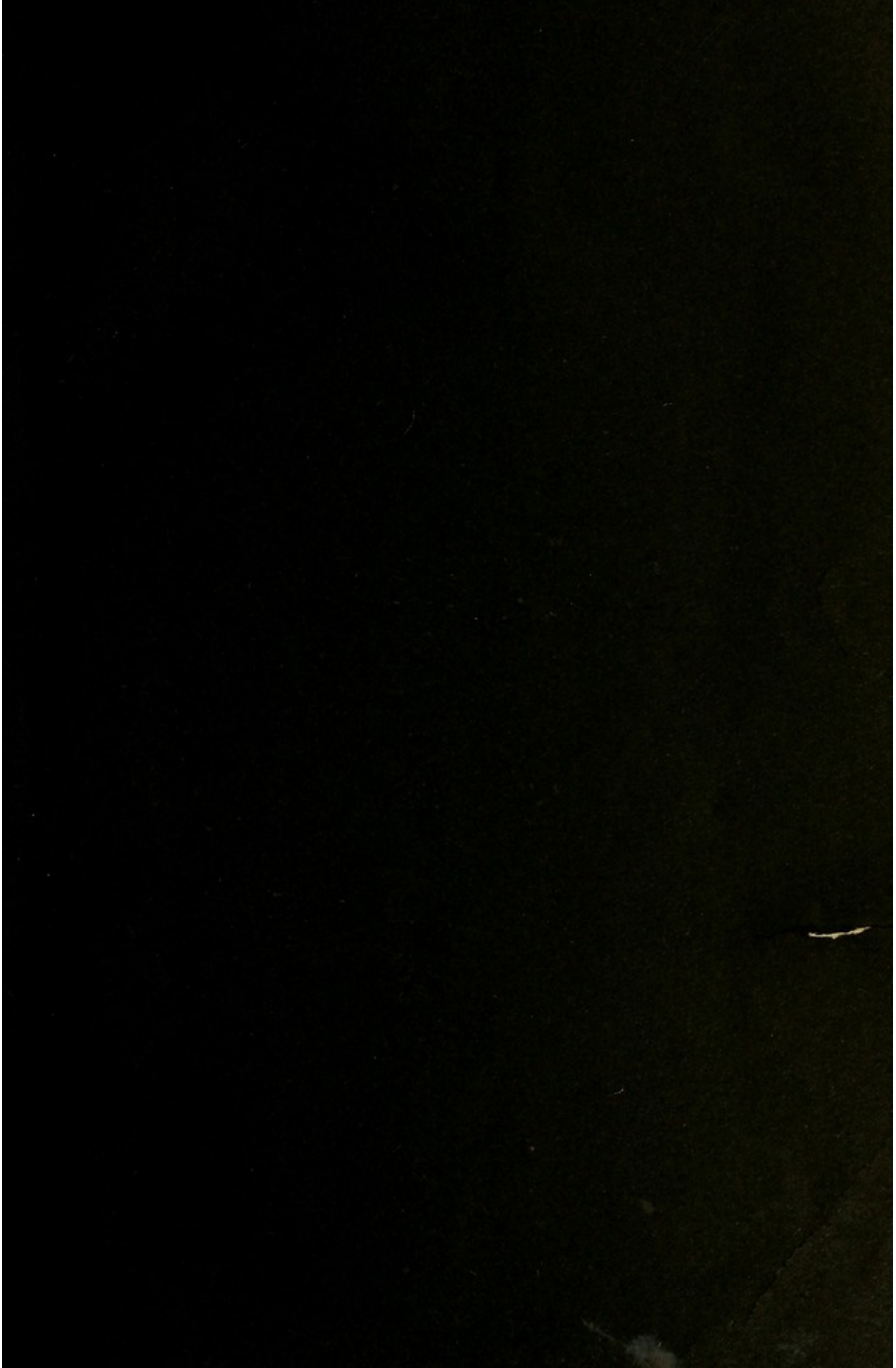
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Sanatoria for Consumptives

F. R. Walters, M.D.


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SANATORIA FOR CONSUMPTIVES

NOTE.

In order to convert the metrical measures referred to in descriptions of Sanatoria into British measures, the following data may be useful :—

100 metres	= ca. 328 feet.
100 sq. metres	= ca. 1076 sq. feet.
100 cub. metres	= ca. 3530 cub. feet.

First Edition, *January*, 1899; Second Edition, *July*, 1901; Third Edition, *May*, 1905.

SANATORIA FOR CONSUMPTIVES

A CRITICAL AND DETAILED DESCRIPTION

TOGETHER WITH AN EXPOSITION OF

THE OPEN-AIR OR HYGIENIC TREATMENT OF PHTHISIS

BY

F. RUFENACHT WALTERS, M.D., M.R.C.P.

FELLOW OF THE ROYAL COLLEGE OF SURGEONS; LATE PHYSICIAN TO THE MOUNT VERNON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST

THIRD  *EDITION*

LONDON

SWAN SONNENSCHEIN & CO., LIM.

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1905

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SOME OPINIONS OF THE PRESS ON THE FIRST EDITION.

"This book represents the result of a most painstaking inquiry on the part of the author into the institutions for the treatment of consumptive patients. The various sanatoria are described with a great amount of detail, more especially with regard to situation, charges, access, etc. . . . The book is intended for the professional and lay reader—both these may confidently rely upon getting much information from it. . . . It will probably also have a very wide sphere of usefulness in showing the physician where he can have his patient healed at most moderate cost in the most enlightened manner. By indicating the relative merits of such institutions, Dr. Walters has performed a service for which the medical profession ought to be grateful."—**Nature,** 6*th July*, 1899.

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"We can heartily recommend Dr. Walters' work to the careful study of our readers."—**The British Physician,** 15*th August*, 1899.

"A most laborious and generally admirable treatise."—**Spectator,** 28*th January*, 1899.



PREFACE TO THE THIRD EDITION.

THIS volume is intended as an unofficial Directory of existing Sanatoria for Consumptives, giving a brief reference to all but the smallest, and as far as possible a more detailed description of the more important, together with an epitome of the principles of sanatorium treatment. It is based upon original information obtained from medical officers and others attached to these institutions, which has been carefully compared with published descriptions, and in many cases checked by personal visits.

Since the publication of the first edition of this book in 1899, a great change has taken place in public opinion as to the utility of Sanatoria for Consumptives, and the treatment adopted therein. A much more hopeful feeling exists as to the curability of consumption under favourable circumstances; and it is recognised that rational hygienic and medicinal treatment, which gives by far the best prospect of recovery, is most conveniently and most economically carried out in a special institution in a suitable neighbourhood under the immediate personal control of the physician.

Owing to the large number of such sanatoria which have been erected during the last few years, it has been extremely difficult to obtain complete and reliable information, and for all omissions and inaccuracies I must crave indulgence. The number of my informants is so great that I cannot give separate acknowledgment to each; but I wish

to express my thanks for their kind co-operation, which alone has made it possible for me to write this book.

The portion bearing upon methods of treatment has been purposely made brief. A complete presentment of such methods would leave no room for the descriptive portions ; but an epitome will, it is hoped, be useful to those who have to choose from amongst existing sanatoria, or to add to their number. It has been objected that the description of a sanatorium is of no value, because its usefulness depends upon the personality of the medical director. Without denying the paramount importance of the latter, it must be obvious that a description of the buildings and appliances at his disposal is also of use, just as are descriptions of clinical laboratories or hospitals.

There is an impression in some quarters that none but hygienic methods should be adopted in a sanatorium. This also is a mistake ; for surely all remedies known by experience to be of value should be freely adopted there, whether they consist of drugs, or foods, or hygienic rules.

CONTENTS.

PART I.—GENERAL.

SECTION I.—INTRODUCTORY.

CHAPTER I. INTRODUCTORY.

Definition and Objects of Sanatoria for Consumptives—Difference from Chest Hospitals, Nursing Homes, Convalescent Homes, Hydropathic Establishments and General Health Resorts . . . . . *page* 3

SECTION II.—SITE AND CLIMATE.

CHAPTER II. CLIMATES FOR CONSUMPTIVES.

A Variety Required—Advantages of Cool Bracing Climates—Essential Climatic Factors—Artificial Shelters and Accessories—Advantages and Disadvantages of Alpine Climates . . . . . *page* 5

CHAPTER III. TREATMENT IN HOME CLIMATES.

Often Advisable—Journey Abroad often Dangerous—Drawbacks of a Sea Voyage—Importance of Accommodation, Diet and Manner of Life—Medical Supervision Essential—Drawbacks of Treatment Abroad . . . . . *page* 9

CHAPTER IV. SITES FOR SANATORIA.

Altitude—Seaside or Inland Sites—Not near Towns, High Roads, Factories, Railways—Soil—Aspect—Shelter—Isolation . . . . . *page* 12

CHAPTER V. THE SANATORIUM GROUNDS.

Extent and Nature—Should be on a Slope—Sunny Situation—Graduated Walks—Position of Out-buildings . . . . . *page* 16

SECTION III.—THE BUILDINGS.

CHAPTER VI. CONSTRUCTION, DECORATION AND FURNITURE.

Essential Points—Two Extreme Groups—Separate Chalets—Cottage Sanatoria—The Hospital or Hotel Sanatorium—Number of Stories—Number of Patients per Room—Materials—General Plan—Ventilation—Verandahs, Balconies and Liegehallen—Heating and Lighting—Absence of Dust-traps—Furniture . . . *page* 18

Chapter VII. Sanatoria for Special Classes.

Sanatoria for the Poorer Classes—Separation of the Sexes—Class Distinctions—Sanatoria for Children—Surgical Tuberculosis . . . . . *page* 28

Chapter VIII. Size, Staff and Management.

Best Size for a Sanatorium—Nursing and Medical Staff—Administration—Financial Considerations . . . . . *page* 32

SECTION IV.—TREATMENT AND RESULTS.

Chapter IX. Outlines of Sanatorium Treatment.

Regulation of Hygienic and Medical Details of Daily Life—Open Air—Ventilation and Heating of Rooms—Rest and Exercise—Diet—Precautions against Infection—Avoidance of Dust . . . . . *page* 34

Chapter X. The Fresh-Air Treatment.

Protection against Wind, Extreme Cold, Extreme Sun Heat, Heavy Rain—How to Keep Warm—Wet Weather—Hydrotherapy—Clothing . . . *page* 36

Chapter XI. Rest and Exercise.

Chief Indications — Graduated Exercise — Occupation — Amusements — Respiratory Exercises—Mental Repose—Temperature Indications—The Patient's Day *page* 41

Chapter XII. Diet in the Sanatorium.

Modifying Circumstances — Proportion of Food Stuffs — Milk Supply — Fruit and Vegetables—Preparation of Food—Number of Meals—National Tastes and Customs—Forcible Feeding—Alcohol—Idiosyncrasy—Dyspepsia and other Complications . . . . . *page* 46

Chapter XIII. Precautions against Infection.

Cleansing and Disinfection of Linen and Rooms—Reception and Disinfection of Sputa—Disposal of Sewage . . . . . *page* 50

Chapter XIV. The Results of Sanatorium Treatment.

Fallacies Underlying Statistics—Various Classifications . . . . *page* 54

Chapter XV. Objections Answered.

Sentimental and Ethical Objections—Danger of Infection Insignificant—Evidence from Chest Hospitals and Sanatoria—Harmlessness of such Institutions—Open Health Resorts . . . . . *page* 58

PART II.—DESCRIPTIVE.

SECTION I.—AMERICA, UNITED STATES.

CHAPTER XVI. AMERICA—UNITED STATES.

Table of American Sanatoria—Sanatoria for the Insane—Dispensaries and Clinics—Societies—Treatment . . . . . *page* 67

CHAPTER XVII. ALABAMA, COLORADO, CONNECTICUT, FLORIDA.

Alabama: The Hygeia. Colorado: The Agnes Memorial Sanitarium—The Colorado Sanatorium — Nordrach Ranch — Resthaven — The Glöckner Sanitarium — The Home, Denver—Industrial Sanitarium—Y.M.C.A. Health Farm. Connecticut: New Haven County Sanitarium—New Canaan Sanitarium. Florida: Experimental Camp . . . . . *page* 73

CHAPTER XVIII. ILLINOIS, INDIANA, MARYLAND, MASSACHUSETTS.

Maryland: The Eudowood Sanitarium. Massachusetts: State Sanitarium — Sharon Sanitarium—Free Home for Consumptives—Dr. Butler's Sanitarium *page* 81

CHAPTER XIX. NEW JERSEY, NEW MEXICO, NEW YORK.

New Mexico: United States Sailors' Sanitarium — Las Vegas Sanitarium — Chico Springs Sanitarium. New York: Adirondack Cottage Sanitarium — Gabriel's Sanitarium—Loomis Sanitarium—New York Hospital and Dispensary for Consumption—Montefiore Home Country Sanitarium—Montefiore Home—Pasteur Sanitarium—De Peyster Hospital for Children—House of Rest—Brooklyn Home —St. Joseph's Hospital—Seton Hospital . . . . . *page* 86

CHAPTER XX. NORTH CAROLINA, PENNSYLVANIA, RHODE ISLAND, TEXAS.

North Carolina: The Winyah Sanitarium—The Asheville Sanitarium. Pennsylvania: Philadelphia Hospital for Diseases of the Lungs—The Rush Hospital. Texas: White Gables Sanitarium . . . . . *page* 102

Addendum: California: Idylwild Sanitarium—Pottenger Sanitarium—Ballard Pulmonary Sanitarium. New Hampshire: Pembroke Sanitarium *page* 108

SECTION II.—SOUTH AMERICA AND AMERICAN ISLANDS.

CHAPTER XXI. ARGENTINE REPUBLIC—BRAZIL—CUBA—URUGUAY.

Argentine Republic: Public Measures. Brazil: Projected Sanatoria. Cuba: Projected Sanatoria. Uruguay: League and Dispensary . . . . . *page* 109

SECTION III.—AUSTRIA-HUNGARY AND THE BALKAN PROVINCES.

CHAPTER XXII. AUSTRIA-HUNGARY.

Table of Sanatoria—The Alland Sanatorium—The Queen Elisabeth Sanatorium—The Tannwald Sanatorium—The Gries Sanatorium—St. Pancratius in Arco—Zakopane Sanatorium—The Sanatorium of Marilla-Völgy—The Sanatorium of Uj-Tatra-Füred—Keresztenysziget—Meran . . . . . *page* 111

CHAPTER XXIII. THE BALKAN PROVINCES.

Bulgaria: Projected Sanatorium at Tscham-Koria. Roumania: Projected Sanatorium and Hospital . . . . . *page* 122

SECTION IV.—BELGIUM.

CHAPTER XXIV. BELGIUM.

Tuberculosis Dispensaries—Convalescent Homes—Societies—Hospitals—Table of Sanatoria—The Borgoumont Sanatorium—The Popular Sanatorium for Brussels—The Bruggmann Sanatorium—The Mont sur Meuse Sanatorium—Bockryck Sanatorium . . . . . *page* 123

SECTION V.—THE BRITISH ISLES.

CHAPTER XXV. THE BRITISH ISLES.

General Summary . . . . . *page* 129

CHAPTER XXVI. THE NORTHERN COUNTIES.

Table of Sanatoria—Cheshire — Cumberland—Durham — Bellevue Sanatorium — The Durham County Sanatorium — Lancashire — The Liverpool Sanatorium — The Liverpool Parochial Sanatorium—The Manchester Sanatorium—The Delamere Sanatorium—The Northumberland Sanatorium—The Westmorland Sanatorium —Yorkshire—The Bradford Union Sanatorium—The Leeds Tuberculosis Association—Hospital for Consumptives—Sanatorium—The Hull and East Riding Convalescent Home . . . . . *page* 130

CHAPTER XXVII. THE MIDLAND COUNTIES.

Table of Sanatoria—Leicestershire—Northamptonshire—Nottinghamshire Sanatorium —Staffordshire—Warwickshire—Worcestershire—The Midland Open-Air Sanatorium—The Worcestershire Sanatorium . . . . . *page* 141

CHAPTER XXVIII. THE EASTERN COUNTIES.

Table of Sanatoria—Bedfordshire—Essex—Norfolk—The Mundesley Sanatorium—Kelling Sanatorium—The Beeches—Suffolk—The East Anglian Sanatorium *page* 146

CHAPTER XXIX. THE SOUTH-EASTERN COUNTIES.

Table of Sanatoria—Berkshire—The London Open-Air Sanatorium—Hampshire—The National Sanatorium at Bournemouth—Overton Hall—Firs Home—Hahnemann Home—St. Joseph's Home—Linford Sanatorium—Moorcote—The Isle of Wight—The Royal National Hospital for Consumption—St. Catherine's Home—The Channel Islands—Kent—The Royal Sea-bathing Hospital—Oxfordshire—Hailey Open-Air Sanatorium—Kingwood—The Maitland Cottage Sanatorium—Surrey—Crooksbury Sanatorium—Whitmead Hill Sanatorium—Heatherside—Ockley Sanatorium—Woodhurst Sanatorium—Sussex—Eversfield Hospital—King Edward VII. Sanatorium—Rudgwick Sanatorium—The Winter Home for Consumptive Girls—The Richmond House Convalescent Home . . *page* 151

CHAPTER XXX. MIDDLESEX AND THE METROPOLITAN AREA.

London Chest Hospitals—Infirmaries—Projected Sanatoria—Homes for Consumptives—The Royal Hospital for Diseases of the Chest—The Brompton Hospital for Consumption—The City of London Hospital for Diseases of the Chest—The Mount Vernon Hospital for Consumption—The Mount Vernon Country Branch Hospital . . . . . *page* 170

CHAPTER XXXI. THE SOUTH-WESTERN COUNTIES.

Table of Sanatoria—Cornwall—Joint Sanatorium—Devonshire—The Dartmoor Sanatorium—Dunstone Park Sanatorium—The Devon and Cornwall Sanatorium—The Western Hospital for Incipient Consumption—The Mildmay Consumptive Home—Dorsetshire—Alderney Manor Sanatorium—Gloucestershire—The Cotswold Sanatorium—Painswick Sanatorium—Somerset—Nordrach-upon-Mendip—The Mendip Hills Sanatorium—Luftkur Sanatorium—St. Michael's Home—The Engel Home—Wiltshire—The Royal Victoria Memorial Sanatorium *page* 175

CHAPTER XXXII. WALES.

Existing and Projected Sanatoria—Nordrach in Wales—The Vale of Clwyd Sanatorium *page* 185

CHAPTER XXXIII. SCOTCH SANATORIA.

Table of Sanatoria — Northern Scotland—Aberdeenshire — Inverness-shire — The Grampian Sanatorium . . . . . *page* 188

CHAPTER XXXIV. CENTRAL SCOTLAND.

Forfarshire—The Sidlaw Sanatorium—Kincardineshire—The Banchory Sanatorium—Kinross-shire—The Ochil Hills Sanatorium—Perthshire—The Hillside Home Consumptive Hospital—Ellerslie . . . . . *page* 191

CHAPTER XXXV. SOUTHERN SCOTLAND.

Ayrshire—Lanfine Cottage Home for Consumptives—Edinburgh—The Royal Victoria Hospital for Consumption—Leith Poorhouses—Woodburn Sanatorium—Peeblesshire—The Caverhill Sanatorium—Lanarkshire—The Bellefield Sanatorium—Renfrewshire—The Bridge of Weir Consumption Sanatorium . *page* 195

CHAPTER XXXVI. IRELAND.

Table of Sanatoria—Irish Chest Hospitals—Projected Sanatoria—The Royal National Hospital for Consumption in Ireland—The Forster Green Hospital for Consumption—Rostrevor Sanatorium—Altadore Sanatorium . . . . . *page* 200

SECTION VI.—THE BRITISH COLONIES.

CHAPTER XXXVII. AUSTRALIA AND NEW ZEALAND.

Table of Australasian Sanatoria—The Victoria Sanatorium for Consumptives—The Austin Hospital for Incurables—The Queen Victoria Homes for Consumptives—The Wentworth Falls Sanatorium—The James Brown Sanatorium—Nunyara Sanatorium—The Dalby Sanatorium—New Zealand—The Cambridge Sanatorium *page* 205

Chapter XXXVIII. The Dominion of Canada.

Table of Canadian Sanatoria—The Muskoka Cottage Sanitarium—The Muskoka Free Sanitarium—The Laurentian Sanitarium—The Kentville Sanitarium—The Calgary Sanitarium—British Columbia . . . . . *page* 210

Chapter XXXIX. South Africa and India.

Cape Colony—Natal—India . . . . . *page* 213

SECTION VII.—DENMARK.

Chapter XL. Denmark.

Seaside Homes for Scrofulous Children—Finsen Light Institute—Societies—Table of Sanatoria—Refsnaes Sanatorium—Juelsminde Sanatorium . . *page* 215

Chapter XLI. Danish Sanatoria for Adults.

Vejlefjord Sanatorium—Boserup Sanatorium—Fredensborg Sanatorium—Silkeborg Sanatorium—Haslev Sanatorium—Ry Sanatorium . . . . *page* 218

SECTION VIII.—EGYPT.

Chapter XLII. Egyptian Sanatoria.

Hotels for Invalids—Al Hayat Sanatorium—The Tewfik Palace Hotel—The Cataract Hotel . . . . . *page* 222

SECTION IX.—FRANCE.

Chapter XLIII. French Sanatoria.

Societies—Chest Hospitals—Homes and Sanatoria—Treatment . . *page* 224

Chapter XLIV. French Sanatoria for the People.

Table of Sanatoria—Projected Sanatoria—The Angicourt Sanatorium—Hauteville Sanatorium—The Orleans Sanatorium—The Lay St. Christophe Sanatorium—The Bligny Sanatorium . . . . . *page* 227

Chapter XLV. French Sanatoria for Paying Patients.

Table of Sanatoria—The Canigou Sanatorium—The Durtol Sanatorium—The Trespoey Sanatorium—The Gorbio Sanatorium—Sanatorium des Pins—The Meung-sur-Loire Sanatorium—The Algiers Sanatorium—The Aubrac Sanatorium — The Mont-des-Oiseaux Sanatorium—Other Sanatoria and Climatic Stations *page* 232

Chapter XLVI. French Sanatoria for Children and Adolescents.

Table of Sanatoria—L'Œuvre des Enfants Tuberculeux—The Ormesson Hospital—The Villiers-sur-Marne Hospital—Agricultural Colonies—The Villepinte Sanatorium—Marine Sanatoria — Mountain Sanatoria — Holiday Homes — Mineral Water and Thermic Stations—The Sanatorium of San Salvadour *page* 240

SECTION X.—GERMANY.

Chapter XLVII. German Sanatoria.

The Cost of German Sanatoria—Day-Sanatoria—Methods of Treatment—Seaside Sanatoria for Children . . . . . *page* 247

CHAPTER XLVIII.—SANATORIA IN EASTERN GERMANY.

Table of Sanatoria—The Brehmer Sanatorium—Dr. Römpler's Sanatorium—Dr. Weicker's Sanatorium—Dr. Weicker's Krankenheim—The Loslau Sanatorium—Niederschreiberau Sanatorium . . . . . *page* 250

CHAPTER XLIX. SANATORIA IN NORTH GERMANY.

Table of Sanatoria—The Beelitz Sanatorium—The Belzig Sanatoria—The Kirchenforst Sanatorium — The Bleichröder Sanatorium—The Children's Sanatorium — The Blankenfelde Sanatorium—The Grabowsee Sanatorium—The Malchow Home for Consumptives—Kottbus Sanatorium . . . . . *page* 260

CHAPTER L. SANATORIA IN CENTRAL GERMANY.

Table of Sanatoria—The Rehburg Sanatoria—Dr. Michaelis' Sanatorium—Dr. Lehrecke's Sanatorium—The Bremen Sanatorium—Edmundsthal Sanatorium—The Minden Sanatorium—The St. Andreasberg Sanatoria—The Oderberg Sanatorium —The Genesungshaus Andreasheim (Felixstift)—The Königsberg Convalescent Home—The Erbprinzentanne Sanatorium—Schwarzenbach Sanatorium—The Stubeckshorn Farm Colony—The Stiege Sanatorium—The Marienheim—The Sorge Sanatorium—The Sülzhayn Sanatoria—The Sülzhayn People's Sanatorium —The Fernsicht Sanatorium—Sülzhayn Village Sanatoria—The Altenbrak Sanatorium — Vogelsang Sanatorium—The Lostau Sanatorium — Sophienheilstätte—The Rheiboldsgrün Sanatorium—The Albertsberg Sanatorium—Carolagrün Sanatorium—The Jonsdorf Convalescent Home . . . . . *page* 269

CHAPTER LI. SANATORIA IN WESTERN GERMANY.

Table of Sanatoria—The Altena Sanatorium—The Hohenhonnef Sanatorium—Waldhof-Elgershausen Sanatorium—Holsterhausen Sanatorium—Ronsdorf Sanatorium —Auguste-Viktoria Stiftung—Waldbreitbach Sanatorium—Braunfels Sanatorium—The Falkenstein Sanatorium—The Ruppertshain Sanatorium—Oberkaufungen Sanatorium—The Ernst-Ludwig Sanatorium . . . . . *page* 295

CHAPTER LII. SANATORIA IN SOUTH GERMANY.

Table of Sanatoria—The Nordrach Colonie—Dr. Hettinger's Sanatorium—Friedrichsheim Sanatorium—Dr. Sander's Sanatorium—The Wehrawald Sanatorium—The Arlen Sanatorium—The Schömberg Sanatorium—The Schömberg People's Sanatorium—The New Sanatorium, Schömberg—Wilhelmsheim Sanatorium—Böblingen Sanatorium—Tannenberg Sanatorium—The Dannenfels Sanatorium—The Luitpoldheim—The Krailling Sanatorium—The Harlaching Sanatorium—Engelthal Sanatorium . . . . . *page* 310

SECTION XI.—HOLLAND.

CHAPTER LIII. HOLLAND.

Table of Sanatoria—The Sanatorium of Putten op de Veluwe—Oranje Nassaus Oord-Hellendoorn Sanatorium . . . . . *page* 329

SECTION XII.—ITALY, JAPAN, MONACO.

CHAPTER LIV. ITALY, JAPAN, MONACO.

Projected Sanatoria—The Villa Quisisana—The Russian Sanatorium—The Sondrio Sanatorium—The Sanatorium Umberta I.—The Istituto Cervello—The Palermo Sanatorium—Japan—Monaco—The New Hospital at Monaco . *page* 332

SECTION XIII.—NORWAY AND SWEDEN.

CHAPTER LV. NORWAY AND SWEDEN.

Homes for Advanced Cases—Sea Hospices for Scrofulous Children—Table of Sanatoria—Grefsen Sanatorium — Tonsaassen Sanatorium — Reknaes Sanatorium — Lyster Sanatorium—Swedish Jubilee Sanatoria—The St. Göran Home for Consumptives . . . . . *page* 337

SECTION XIV.—PORTUGAL AND MADEIRA.

CHAPTER LVI. PORTUGAL AND MADEIRA.

Societies—Dispensaries—Sanatoria—Special Hospitals and Infirmaries . *page* 343

SECTION XV.—RUSSIA.

CHAPTER LVII. RUSSIAN SANATORIA.

Table of Sanatoria—Various Projected and Existing Sanatoria—The Sanatoria at Halila—The Alexander Sanatorium—The Maria Sanatorium—The Nikolaj Sanatorium—The Taitzi Sanatorium—Gastria Sanatorium—Pitkäjärvi Sanatorium—The Massandra Sanatorium—Nummela Sanatorium—Takaharju Sanatorium—The Gagry Sanatorium—Gelendschik Sanatorium—Balaclava Sanatorium—Quisisana *page* 345

SECTION XVI.—SPAIN AND THE CANARY ISLANDS.

CHAPTER LVIII. SPAIN AND THE CANARY ISLANDS.

Spanish Sanatoria—Dispensaries—Instituto Rachitico—Potta Colti Sanatorium—The Canary Islands—The Santa Catalina Sanatorium—The Guimar Sanatorium *page* 355

SECTION XVII.—SWITZERLAND.

CHAPTER LIX. SWISS SANATORIA.

Table of Sanatoria and Hotel Sanatoria—General Remarks . . . *page* 358

CHAPTER LX. EASTERN SWITZERLAND.

The Arosa Sanatorium—Davos—Dr. Turban's Sanatorium—The New Davos Sanatorium—The Davos Dorf Sanatorium—The Schatzalp Sanatorium—The Clavadel Sanatorium—The Sanatorium "In der Stille"—The Dutch Sanatorium—The German Sanatorium—The Alexanderhaus—The St. Joseph's Haus—The Alexandra Sanatorium—The Braunwald Sanatorium—Wald Sanatorium *page* 360

CHAPTER LXI. CENTRAL AND WESTERN SWITZERLAND.

The Leysin Sanatoria—The Sanatorium Grand Hotel—The Sanatorium du Mont Blanc—The Hotel de Chamossaire—The Leysin Sanatoria for the People—Dr. Stephanis' Sanatorium—The Beauregard Sanatorium—The Genevese Sanatorium for the People—The Heiligenschwendi Sanatorium—The Rigi Colony—The Erzenberg Sanatorium . . . . . *page* 369

INDEX . . . . . *page* 375

LIST OF ILLUSTRATIONS.

FIG.		PAGE
1.	The Home, Denver	78
2.	The Massachusetts State Sanitarium	82
3.	Las Vegas Sanitarium	87
4.	Adirondack Cottage Sanitarium	92
5-6.	Loomis Sanitarium	94
7-12.	Alland Sanatorium	113
13.	Bellevue Sanatorium	131
14.	The Durham County Sanatorium	132
15.	The Westmorland Sanatorium	137
16-17.	Mundesley Sanatorium	147
18-19.	The East Anglian Sanatorium	149
20-21.	The London Open-Air Sanatorium	152
22-23.	Linford Sanatorium	155
24.	The Royal National Hospital for Consumption, Ventnor	156
25-26.	Hailey Sanatorium	159
27-30.	Crooksbury Sanatorium	162
31.	Whitmead Hill Sanatorium	164
32-35.	Heatherside (Brompton Hospital Sanatorium)	165
36-37.	Mount Vernon Hospitals for Consumption	172
38.	Dartmoor Sanatorium	176
39.	Alderney Manor Sanatorium	178
40-41.	The Cotswold Sanatorium	179
42-44.	Nordrach-upon-Mendip	181
45.	Pendyffryn Hall	186
46.	The Vale of Clwyd Sanatorium	187
47.	The Grampian Sanatorium	189
48.	Sidlaw Sanatorium	191
49-51.	Banchory Sanatorium	192
52.	The Royal Victoria Hospital for Consumption	196
53.	Woodburn Sanatorium	197
54.	The Bridge of Weir Sanatorium	199
55.	Rostrevor Sanatorium	203
56.	The Durtol Sanatorium	234
57.	The Ormesson Hospital for Tuberculous Children	241
58-59.	Villiers-sur-Marne Hospital for Tuberculous Children	242
60.	The Brehmer Sanatorium, Görbersdorf	251

FIG.		PAGE
61.	The Römpler Sanatorium, Görbersdorf	254
62-63.	The Oderberg Sanatorium	276
64.	Fernsicht Sanatorium, Sülzhayn	289
65.	Albertsberg Sanatorium	293
66-67.	Hohenhonnef Sanatorium	297
68.	Falkenstein Sanatorium	304
69-71.	Ruppertshain Sanatorium	307
72.	Nordrach Colonie: The Anstalt	312
73.	Dannenfels Sanatorium	324
74.	Krailling Sanatorium	325
75.	Tonsaassen Sanatorium	339
76.	The Arosa Sanatorium	360
77.	Dr. Turban's Sanatorium, Davos	362
78-79.	The Basel Sanatorium, Davos	365
80.	The Sanatorium du Mont Blanc, Leysin	369
81.	Montana Sanatorium	370
82.	Heiligenschwendi Sanatorium	372

PART I.

GENERAL.

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Section I.—INTRODUCTORY.

CHAPTER I.

INTRODUCTORY.

Sanatoria for consumptives are establishments for the open-air treatment of presumably curable cases of consumption under medical direction, mainly by hygienic and educational measures. They are not intended for patients whose prospects of recovery are small; nor are they intended for non-tuberculous cases, or for those who are merely out of health. Consumptive patients who are seriously ill are better treated in the first instance in a hospital or nursing home, or in their own homes, if these are suitable. Their treatment is quite as much a question of medicine and of nursing as of hygienic measures; and to send them to a sanatorium is to fill up beds which might be more usefully employed in other ways. For the same reason it is inadvisable for a sanatorium to receive people who are merely in need of change of air, as a less expensive health resort, without the special arrangements of a sanatorium, is quite sufficient to restore them to health. Such visitors are only admissible to minister to the comfort or happiness of other patients, or where they have themselves a tendency to pulmonary tuberculosis.

Owing to the necessity of being near centres of population most hospitals—even most consumption hospitals—have been erected in situations which are by no means the best for the hygienic treatment of consumptives. Perhaps if they were to be built at the present day, many would be placed in more suitable neighbourhoods. Some convalescent homes and hydropathic establishments are quite suitably placed for the open-air treatment of phthisis, and might with a little modification be adapted to this purpose. But

the class of visitors which they receive, and in some cases the inadequate provision of shelter against wind and weather, would make it difficult to satisfactorily treat consumptives there. Many of those who go to a convalescent home do not need the special arrangements of a sanatorium. Hydropathic establishments, too, are intended for a widely different class of visitors, whose dietary is often by no means the best for the average consumptive; and in a different way this is also true of hotels and boarding houses in health resorts. Such establishments are primarily intended for the reception of pleasure seekers, whose predominating presence is a serious hindrance to the systematic treatment of phthisical visitors. In a sanatorium the main object is the recovery of health; and for consumptive patients and their advisers this is a sufficiently difficult task, to which everything else must be subordinated.

Section II.—SITE AND CLIMATE.

CHAPTER II.

CLIMATES FOR CONSUMPTIVES.

In his book on *The Consumptive and his Treatment*,[1] Dr. Léon Petit says: "We are nowadays convinced that there is no climate, however favoured, which alone can cure consumption". I may add that there is no climate which is equally suited to every case of consumption. People in health differ greatly in their powers of reaction, so that the same climate may be bracing to one which is depressingly cold to another. Amongst consumptives there is even greater difference to be found. At certain stages, and in some cases, a mild equable climate is essential; whereas for most of the more hopeful cases, a cool bracing climate will be best, although this must be associated with plenty of shelter against wind and weather. It is a mistake to suppose that consumptives generally do best in warm climates. Pulmonary phthisis runs a relatively rapid course in warm climates; and patients who have gained weight in winter often lose it when the warmer weather sets in. In this respect England compares favourably with Italy and the south of France. Consumptive patients from the cooler parts of Germany are said to do badly at the Riviera; and the same thing has been observed of those who go there from the north of France. Some years ago a number of selected cases were sent from the Brompton Hospital to Madeira; but most of them were no better for their change of climate. A similar result is said to have followed in the case of some hospital patients sent from Manchester to Bournemouth. The health resorts which have been most successful in the treatment of consumptives are almost without exception places

[1] *Le Phtisique et son Traitement Hygiénique*, Paris, 1895, p. 49.

which are cold, or at all events cool, during some part of the twenty-four hours. This is true of Alpine health resorts, elevated table-lands in various parts of the world, German hill sanatoria, and many places with marine or semi-marine climates. Confining our attention to the localities which benefit the more curable cases, we find they possess certain common features which we are justified in regarding as essential. (1) They have a pure air, free from dust and smoke and the impurities which are inseparable from a dense population ; (2) they are fresh and bracing, but well protected against cold or stormy winds ; (3) they have sufficient fine weather, or sufficient artificial shelter, to render an out-of-door life attractive ; and (4) they have a dry, warm, well-drained soil. Wherever these four conditions are found, and suitable arrangements can be made, it should be possible to treat consumptives with success. Neither high altitude, dry atmosphere, fine weather, equable temperature, nor abundant sunshine is essential to success, however useful they may be, or desirable in particular cases. Were high altitude an essential, we should not hear of recoveries on the ocean, or in low-lying health resorts. Were fine weather a *sine quâ non*, the remarkable success of the sanatoria in the Black Forest and other parts of Germany would never have been chronicled. Many of these have a moist and chilly climate during part of the year ; but patients do just as well at such seasons as during finer weather. Indeed the results are if anything better in winter, and Dr. Dettweiler, Dr. Walther, and other competent observers regard the weather as of little importance. Moist still air is soothing to irritable air passages ; intense cold, mountain fogs, snowstorms and the like, need not interfere with treatment if reasonable precautions are taken. The health resorts which enjoy the best climates do not usually possess the greatest amount of shelter from bad weather ; but rather those with a variable and indifferent climate. Visitors have been half-frozen in Italy and Georgia, and chilled with cold winds at the Riviera. Of greater importance than the climate is the use which is made of it ; and with the help of artificial shelters this may be independent of continued bad weather. Consumptives have been cured in the most unlikely climates ; and many things point to the conclusion that it is fresh air and medical supervision rather than a fine climate which are needed for success.

This statement is not intended to imply that other climatic

characters are of no value; but rather that they are not of paramount importance in most consumptive cases. Alpine climates, for example, are unrivalled in their beneficial influence over certain forms of the disease; but they are by no means universally applicable, and other climates can often with advantage be substituted for a shorter or longer time. The value of Alpine health resorts depends partly on characters which are common to some other stations. Their power in expanding healthy parts of the lungs is greater than that of places lower down; but their tonic influence, their cool air with a warm sun, their atmospheric dryness and purity, their absence of dust, their freedom from strong wind, are possessed in various degrees by places at lower levels. It is probably easier in Alpine climates to prevent the growth or continued vitality of the tubercle bacillus outside the body, partly because of the large amount of sunshine, partly owing to the atmospheric dryness and the winter coat of snow; but if the sputa are properly disposed of in every case, this becomes of little importance. It is most unwise to indiscriminately recommend the Alps to every consumptive patient. To obtain benefit from such a climate a certain degree of reactive power is essential; and just as many people cannot without previous training get a proper reaction after a cold bath, so it is with an Alpine climate. Douglas Powell indeed has said: "Notwithstanding the enthusiasm with which cold mountain climates have been of late years advocated for the treatment of consumption, it remains certain that those resorts are not adapted for the majority of patients, as they come before us, suffering from this disease; and perhaps it might with truth be said that a large number of the very cases that do well aloft do equally well in the plains".[1] "In order to reap the benefit of high altitudes, patients must be free from pyrexia, and possess sufficient lung surface to carry on adequately the process of respiration in the attenuated atmosphere."[2] Those who are markedly febrile, who have feeble circulation, damaged kidneys, double cavities or extensive lung disease, rapidly advancing lung destruction, laryngeal complications, or irritable nervous systems, do badly at Alpine resorts. Even at Reiboldsgrün, which has not an Alpine climate, being only 700 metres above the sea-level, it has been found that some patients do not progress so well

[1] *Diseases of the Lungs*, 4th ed., 1893, p. 513.
[2] C. Theodore Williams, *Practitioner*, June, 1898, p. 627.

as at lower levels, and Dr. Wolff-Immermann is in the habit of sending away such as do not show decided improvement within the first fortnight. Most of the existing sanatoria are not placed at high altitudes, as will be seen from the tables given at pp. 112, 130, 141, 146, 151, 175, 186, 188, 200, 205, 210, 232, 250, 260, 269, 295, 310, 338 and 358.

In comparison with Davos and the German hill sanatoria, many health resorts at lower levels are at a disadvantage, owing to the absence of proper provision for the hygienic treatment of consumptives. When this defect has been remedied, it will probably be found that they too, as well as others yet untried, have an important part to play in the battle against tuberculosis. The warm low level health resorts of the Riviera have no longer the reputation they formerly had in this respect; and many think that the climates of some parts of the British Isles would be more useful for our countrymen. "There are many places in this country where, on a dry soil and in a sunny sheltered part, on the southern slope of some upland, most of the conditions can be obtained which are now dearly bought and far sought, and often not obtained, in distant parts of the world".[1]

[1] A. Ransome, *The Treatment of Phthisis*, London, 1896, p. 138.

CHAPTER III.

TREATMENT IN HOME CLIMATES.

THERE are some very strong reasons for the treatment of consumptives in their own country.

Many patients are quite unfit to take a long journey; and this is very often true of quite early stages of the disease. So long as there is well-marked fever, or fatigue after slight exertion, or a tendency to free perspiration, a long journey must be full of risk. The presence of inflammatory complications is also a contra-indication, or persistent or recent and copious hæmoptysis. To those patients who cannot afford to travel comfortably, a long journey will always be undesirable. In a long land journey the intermediate halting places will often be of a most unsuitable kind. Average hotel accommodation is far from ideal for a consumptive or delicate patient. The larger rooms in even good hotels are frequently left to ventilate themselves; the bedrooms may have been previously occupied by visitors suffering from influenza or other infectious complaints. Even hotels which have been specially built for the reception of delicate persons or invalids often leave much to be desired. "It is not too much to say that they are most unsuitable places in which to make an extended sojourn."[1] For dyspeptic consumptives, dietetic treatment is of great importance: but a suitable diet is often difficult to obtain during a journey.

In a sea journey passengers are greatly at the mercy of the weather. The average cabin is too small and ill-ventilated to be suitable for a consumptive patient, who may in stormy weather be much worse off than at home. There is often great danger of chill in passing from the sheltered to the more exposed parts of the vessel in windy weather. In traversing the tropics the extreme

[1] "The Climate of the Dwelling-house," by G. Vivian Poore, *Journal of Balneology and Climatology*, October, 1897.

heat is ill borne by delicate passengers. The fare on board ship is often very good for healthy people; but for many invalids it is by no means suitable; while the monotony of the voyage and the absence of effective medical supervision lead some to spend an undesirable proportion of their time in drinking and smoking in ill-ventilated saloons. Before we recommend a consumptive patient to take a long voyage, we must take into account his purse, tastes and inclinations, his seafaring capacity, the probability of good weather or the reverse, and his ability and willingness to conform to the necessary hygienic rules.

When the patient reaches his journey's end, it will make a great difference whether he goes to a medically supervised sanatorium or is left to the tender mercies of chance and his own medical skill. To send a feeble patient to rough it in the colonies is obviously wrong. Equally so would it be to expose him, even in the best of climates, to the temptations of sight-seeing and the injudicious pursuit of pleasure. In either case he would have been far better in his native country. Climate is but one factor in treatment, and accommodation, diet, and above all the use which the patient makes of his time, are at least of equal importance. Without systematic medical supervision, the sojourn in a foreign health resort is nearly always a mistake for a consumptive patient. Dr. Knopf states that in the beautiful climate of Colorado there is an enormous difference in the mortality among consumptives under systematic medical treatment, as compared with those who merely consult a physician when they think it necessary; and the same is borne out by Dr. Solly's statistics.[1] But even if the patient can safely travel, and is under medical care, there are still some arguments in favour of treatment in home climates. As a rule (although there are exceptions) it is more expensive to go abroad for treatment; and many patients may consequently have to curtail the time of systematic treatment. National tastes, and even national prejudices, have also to be considered, and the depression which arises when the average patient is separated from his friends and relatives. A more important argument is drawn from the liability to relapse which is shown amongst patients who return to a damp and variable climate from sunnier lands. Many of the foremost physicians abroad are

[1] *Medical Climatology*, London, 1897, pp. 133-141; Knopf, *Les Sanatoria pour la Phtisie Pulmonaire*, Paris, 1895.

agreed as to the desirability of attempting the cure of consumptive patients in their own country. This is the opinion of Prof. v. Leyden, Prof. v. Ziemssen, Prof. Naunyn, Prof. Senator, Dr. Dettweiler, Dr. Gerhardt, Dr. Fränkel, Dr. Knopf, of New York, and others.

When the fund was started for the erection of a sanatorium at Davos for German consumptives of the poorer classes, Germany had no Alpine sanatoria, while it was known that the sanatorium would be supervised by a German doctor ; yet an influential protest was raised on medical grounds against its erection, lest it should lead to neglect of the sanatoria in Germany itself, which it was felt were of greater importance.[1]

[1] *Heilstätten-Correspondenz*, Berlin, Dec., 1897 ; Jan. and Feb., 1898.

CHAPTER IV.

SITES FOR SANATORIA.

A SANATORIUM for consumptives should be placed on dry soil, in a sheltered situation, with pure fresh bracing air. The best soil is sand or rock, as with a proper fall these are not retentive of moisture, and are consequently soon dry after rain and are warm to the feet. Rising ground should be chosen ; with a southerly aspect, and good shelter from hills or woodland against cold or boisterous winds. The question of altitude has already been considered (see Chap. II.). Various elevations according to geographical position have been recommended by Liebermeister, Brehmer, Weber and others. As, however, their reasoning is partly based upon theoretical considerations, it is not necessary to reproduce their figures here. Moreover, as we have already said, many different elevations would probably be needed to suit various degrees of reactive power and lung capacity.

Existing British sanatoria vary in altitude from just above the sea-level to nearly 275 metres (900 ft.). Those in Germany from a low level to about 790 metres (2,600 ft.) ; while most of the Swiss and American sanatoria are between 600 and 2,000 metres altitude (2,000 and 7,000 ft.). Where a high hill is available, it by no means follows that the top is the best place to choose. A slightly lower situation is often both more sheltered and less rainy. Cornet of Reichenhall pointed out[1] that there were often strong winds at the top and at the foot of a mountain ; and to a smaller extent this may be true of lesser elevations. Blumenfeld recommends for North Germany the south side of a hill 400 metres (1,300 ft.) high. The local configuration of the land, as well as the geographical position, have a great influence over climate. A small hill in the plains may be more breezy than a high one amongst the mountains.

[1] Buda-Pest International Congress of Hygiene and Demography.

Nearly all the British health resorts which have a reputation for the treatment of consumptives are on or near the coast. A great advantage of the seaside, also shared by hilly inland country, consists in the recurring breezes which purify the air and increase the bracing effect. Local tuberculoses do exceedingly well on the seashore ; but for pulmonary phthisis the immediate and unprotected sea-front is not the best. Dr. Ransome has written in strong terms about the danger of such a situation ; and other older authorities—Walshe, Beneke, Fodéré—were equally emphatic. Where the bracing qualities of seaside air are combined with sufficient wind-shelter, consumptives will probably do well during part of the year ; but places of this kind are quite exceptional, so that most of the existing British, German and American sanatoria have been placed inland.

Purity of the air is of paramount importance. For this reason the neighbourhood of a large town or factory is inadmissible, or the presence of organic refuse near by. One of the drawbacks to the treatment of consumptives in popular health resorts is the increasing contamination of the air from growth of population. As Léon Petit says : "We are nowadays convinced that there is no climate, however favoured, which alone can cure consumption. The places which are free from tuberculosis are those where the scanty population lives constantly in an atmosphere which has not yet been polluted. They attract invalids, and when they become fashionable they have long since lost the qualities which gave them renown."[2]

No sanatorium should be near a high road ; in dry weather the dust is sure to fly up and increase the tendency to useless cough. A large extent of grass or heather land round the sanatorium is an advantage in preventing dust from rising.

High chalk downs have been recommended by some for the treatment of consumptives. They are, however, open to two important objections. In dry weather the short grass of such land is insufficient to prevent the dust from flying up ; while in wet weather the soil remains cold and damp, and the air above it is apt to be foggy. Where such hills are covered with a thick layer of sand or gravel they may be suitable for the open-air treatment, provided the area of pervious soil is sufficiently extensive to influence the atmospheric condition. A gravel patch near a marsh or in an ill-drained depression would be unsuitable. The character of the

[2] *Loc. cit.*, pp. 49, 50.

vegetation is a useful guide to the underlying soil. Where pine trees abound the soil is usually sandy and dry; and these trees are useful in other ways, as they give more permanent shelter against wind and rain, and are active producers of ozone. Some people also believe that their terebinthinate secretions are curative; although this is not quite so well established. Dr. C. T. Williams has pointed out that where gorse and heather and short springy turf abound, the locality is usually suitable for consumptives, whereas long rank grass should be avoided. It must be remembered that an underlying stratum of clay may render a sandy soil unsuitable for consumptives. Soil and shelter are the two most important points in choosing the site for a country sanatorium.

But if a country place is the most suitable, it must be reasonably accessible to prevent the need for a long journey. The sanatorium should however not be close to a railway.

The *aspect* of the sanatorium is chiefly of importance in providing shelter against strong wind. In a sheltered spot the aspect matters nothing to the patient who only occupies his bedroom at night. To one who cannot be moved the early morning sun is grateful, while the low rays of the setting sun in summer may be trying. For this reason a S.S.E. aspect may be best for a large block. In the case of chalets and cottages with windows on all sides it is of little importance. One of the American sanatoria is to have no bedrooms, only dressing-rooms surrounded on all sides by deep verandahs in which the beds will be placed. Walther of Nordrach declares that patients make as good progress in rooms of one aspect as in those of another; he has however adopted a S.S.E. aspect for his "Anstalt". Consequently the afternoon sun falls aslant along the roof in summer, but shines into the bedrooms in winter.

The aspect of a verandah or shelter may be of more importance than that of a bedroom. Feverish patients must be kept in a cool place during the heat of a summer day; otherwise they do not make good progress. Chilly bed patients during the colder months require all the sunshine that is available.

The *position* of the sanatorium should be such as to be well sheltered against cold or violent winds. It is of the first importance that patients should be able to get sheltered walks in windy weather; and some of these walks must be fairly level.

On the other hand, unless the building is sufficiently raised to command a view, it will be unnecessarily depressing to its bed-patients. Moreover, part way up the side of a hill is drier than the base, and less exposed than the top.

A treeless site is under great disadvantages for sanatorium purposes; but the trees must not be crowded round the building in such a way as to prevent free ventilation.

There must be a sufficient fall from the sanatorium to a suitable spot for disposing of the waste water, and of the sewage if water borne. It will be exceptional to have a main drain in the neighbourhood. The water supply must be pure and abundant.

Sanatoria in isolated situations possess great advantages in the treatment of consumptives, who are apt with the best intentions to do most unwise actions, and to be led astray by the example of visitors of a different kind. The ordinary amusements of a health resort—theatres, concert-rooms, skating-rinks, casinos and even public-houses—may present fatal temptations to the phthisical. There are also great advantages in treating a number of consumptives in the same sanatorium, provided they be judiciously chosen; for the arrangements necessary for two or three will often suffice for a much larger number, and a corresponding saving of time, trouble and expense is thus effected. Nearly all the new sanatoria for consumptives erected in Germany are exclusively reserved for such patients.

CHAPTER V.

THE SANATORIUM GROUNDS.

THE acreage required for the grounds of a sanatorium will depend somewhat upon the amount of open public land in the neighbourhood. The grounds of the Brehmer Sanatorium at Görbersdorf amount to about three hundred acres; and some of the American sanatoria have very extensive grounds. Land is, however, too expensive in this country for such luxurious proportions: and a much smaller area will suffice if it is of the right kind, and not surrounded with houses. Brehmer laid stress on the importance of carefully graduated walking exercise to strengthen the heart of the consumptive; and his results to a large extent justify his contentions. For such a purpose it is necessary to have a reasonable length of level paths, and a number of others at various easy gradients, so arranged that the patient can take walks, increasing in length and in difficulty, if possible returning down hill to the sanatorium. Gradients of more than 1 in 8 or 10 are too steep for most patients. Since Dettweiler's powerful advocacy of the treatment of consumptives by rest in the open air, the need for systematic exercise out of doors has been somewhat under-rated in many quarters; but there is no doubt that facilities should be provided for both.

At certain stages, absolute rest in the open is necessary; later on, graduated exercise, which should be taken preferably along a footpath, as the public roads may in some states of the weather be unfit for consumptives. The paths should be marked out in distances of about fifty yards near the building; and groups of alternative walks varying in length and difficulty prepared in the neighbourhood. The grounds should be freely provided with seats and shelters, and covered walks for exercise in rainy weather are also useful. In the Brehmer Sanatorium there are seven kilometres

(four and a half miles) of walks, and a seat every twenty paces, besides large winter gardens and shelters for wet weather. Trees and bushes—preferably evergreen—should be so arranged as to give shelter against wind while they permit the free access of sunshine and air. In these comparatively sunless islands, every ray of sunshine should be utilised to the utmost: for if it be not essential to recovery, it is always grateful to chilly subjects, and the best of Nature's disinfectants. In a country sanatorium, stables and other outbuildings are a necessity. Where the ground permits, the stables and farm buildings should be placed together with the irrigation patch in an adjacent valley, on the side least required for patients' walks. The engine-house may be grouped with the pumping station, laundry, destructor and workshop. If steam heating is adopted, the most economical plan is to place the furnace at a lower level than the sanatorium, so that the hot water may return down hill to the furnace.[1] An isolation block will be required in a large sanatorium, with a separate observation ward for cases of suspected infection. Also a mortuary and laboratories; and all these are best at a distance from the patients' quarters.

[1] See Hohenhonnef Sanatorium, p. 297.

Section III.—THE BUILDINGS.

CHAPTER VI.

CONSTRUCTION, DECORATION AND FURNITURE.

Every part of a sanatorium should have abundant independent ventilation, and be readily cleansable without raising dust. The patients' quarters should be easily accessible from the grounds, and freely open to the sunshine while sheltered from wind.

The earliest sanatoria were either transformed cottages, or transformed hotels or mansions. Where the latter were unsuitable for patients' use, separate chalets or cottages were sometimes added, which might be of wood or of more solid materials. The influence of this mode of origin is still to be traced in the plans of the newer sanatoria, some of which are of the chalet or cottage type, while others approximate to the hospital or hotel. Each type has its own advantages and disadvantages, so that many intermediate forms have been devised by way of compromise. In the chalet or cottage sanatorium the administrative portions are necessarily distinct from the patients' quarters, whereas in the hospital or hotel sanatorium they may be in one and the same building. The chief differences, however, are in the patients' quarters.

Separate Chalets have great advantages as regards quiet, privacy, amount of sunshine received, and ease of ventilation, since windows can be placed on four sides, and cross ventilation easily secured in all states of wind and weather. Moreover, it is easy to classify patients in a chalet sanatorium, and to isolate such as have developed any infectious ailment. On the other hand, the administration of such a sanatorium is inconvenient, and on a large scale scarcely practicable, owing to the much larger staff required, and the difficulties of supervision. The more scattered the rooms, the

longer it takes for medical officers, matron and nurses to visit them. More dirt is introduced because of the numerous entrances; the staff is more exposed to weather; the bathrooms and sanitary pavilions are less accessible; and considerable difficulties arise in providing bed patients with warm and appetising food, and in adequately heating the rooms at a reasonable cost.

A Cottage Sanatorium, in which a few patients are quartered in each cottage, is open to somewhat similar drawbacks, but to a lesser degree. Cross ventilation may be secured by making incomplete partitions between the rooms (see p. 92); and a sanitary pavilion and a nurse's kitchen may be attached to each cottage. One great advantage of such a sanatorium is that the conditions of life approximate to that in a village, which is the healthiest place for a patient after recovery. But there will still be administrative difficulties, even if the cottages are close together, and are connected by covered ways.

The Hospital or Hotel Sanatorium consists of one large building to accommodate the patients with or without separate blocks for administration. Its chief advantages are as regards distribution of food, heating and medical supervision. Moreover, there is usually a smaller building area; the building gives more shelter against wind; and the upper rooms may command a finer view. Fewer entrances, cloakrooms and the like, are required, and proportionately less dust is introduced from without. On the other hand, such a building is necessarily noisy, as the connecting corridors and staircases (which must be somewhat bare) conduct the sound freely; and a coughing patient is more likely to disturb his neighbours, because the rooms are nearer together. The grounds, too, are less accessible from the upper floors, unless lifts are freely used, or unless the site is so sloping as to allow of level approaches to each floor.

Number of Stories.—High buildings have been objected to because the lower rooms are said to ventilate into the upper. With freely open windows, however, and suitable planning, it is extremely doubtful whether this really happens. A more important objection is the difficulty in getting feeble patients from the upper rooms into the grounds. A sanatorium of more than one story will require a balcony for each upper floor proportioned to the number of patients. High buildings will also need a passenger lift. As much more exertion is required to walk up stairs than to walk along level

ground, the *régime* for patients on upper floors will have to be correspondingly altered. As a general rule, sanatoria should not have more than two or at most three stories.

Number of Patients per Room.—There are great advantages in giving each patient a separate bedroom. To reduce the fever strict isolation is sometimes necessary ; and where several patients occupy the same room or ward there is sure to be more talking at times than is advisable. It is often stated that patients of the working classes prefer wards to separate bedrooms. This, however, should not outweigh the medical advantages. To reduce the cost of building, a few wards with two to four beds apiece might perhaps be permitted in addition to single bedrooms, and even larger wards for convalescents.

Materials.—Where building regulations permit of the erection of wooden chalets or cottages this is an inexpensive and medically satisfactory plan. Larger pavilions to accommodate six or more patients are often used ; there is however more danger in case of fire ; and the plan is only permissible for one-story pavilions. If made of creosoted wood, such pavilions need not be much more expensive to maintain than more solid structures, and are more quickly habitable. That they are warmer in summer and colder in winter is of less importance than as regards ordinary houses not intended for open-air treatment. Patients in bed can easily be kept warm by coverings and hot bottles even in cold weather in unwarmed rooms or chalets. Brick or stone walls are much more liable to "sweat" in very damp weather than wooden ones. They also take longer to dry after erection.

General Plan.—The arrangements of the patients' quarters will depend largely upon the site—whether flat or hilly, exposed or well sheltered. The great majority of modern sanatoria are built with bedrooms in a single row, the building line forming either a straight line, one or more obtuse angles or a concavity.[1]

The Massachusetts State Sanitarium has blocks radiating from a convex corridor.[2] In a well-wooded situation it is not advisable to have more than a dozen rooms side by side without a break. There is no objection to ground-floor bedrooms, provided that the foundations are properly concreted, an efficient damp-proof course is put

[1] See pp. 113, 149, 297, 304, 308, 365, 372.
[2] See p. 82.

in, and the floors are raised a reasonable distance from the ground and properly ventilated. Admitting that a warm building acts on the soil like a cupping-glass, air will enter more readily by open windows than through the floor. Ground-floor bedrooms, moreover, are more convenient for wheeling a patient in bed into the grounds. To devote the whole of the ground floor to common rooms is both wasteful and apt to encourage patients to stay too much indoors.

The kitchens should be placed at a distance from the haunts of the patients, to prevent loss of appetite from the smell of cooking. Where this is not possible, they must be cut off by ventilating lobbies and corridors. The kitchens must, however, be sufficiently near the bedrooms to allow of food being carried across in an appetising condition.[1] Every outer door should have a porch. Cloakrooms and lavatories should be readily accessible on the way from the grounds to the dining saloon and bedrooms, and the cloakrooms should have hot pipes or drying cupboards for damp clothes. A sufficient number of suitable closets, bathrooms and lavatories is essential. One of each to every five or six patients is a liberal allowance. The provision of bathrooms is usually inadequate in foreign sanatoria. On the other hand, complete hydropathic installations are more common abroad than in English sanatoria. Lavatories, bathrooms and closets should be placed in built-out pavilions with disconnecting lobbies. If there are several stories to these pavilions, there should be a freely ventilated space between the ceiling of one and the floor of the other.

As quiet and restfulness are most important in sanatorium treatment, all noisy administrative portions should be at a distance from the bedrooms. There is no advantage in extra thick walls to the bedrooms. Windows being always open, the sound will travel through these to the adjoining rooms. Special care should be taken with all fittings to prevent their rattling when the wind blows. Doors should be heavy, or specially contrived to prevent the noise of slamming. A large building with long corridors is in any case difficult to keep quiet; heavy curtains being inadmissable, and doors across interfering with ventilation. A well-ventilated, bayonet-shaped corridor presents some advantages in this respect. Double doors to sanatorium bedrooms should be regarded with suspicion.

But few common rooms need be provided in a sanatorium, as

[1] See pp. 149, 293, 297.

they tempt patients to stay indoors. There should, however, be a number of open-air shelters for rest or recreation.

Suitable day rooms and consulting rooms will be required. Rooms for hydrotherapy, throat examination, photography and radiography are common in the larger modern sanatoria. A ward kitchen will be required to about every dozen bedrooms.

The *ventilation* of rooms should be as perfect as possible. It is quite impossible to rival the open air in its purity, but as near an approach should be made as is practicable. The ordinary allowance of 85 cubic metres (3,000 cub. ft.) of air per head per hour is often regarded as a "counsel of perfection"; but for open-air treatment this is not sufficient. With open windows and open chimneys or ventilating shafts, more than this can be provided even in winter as soon as patients have learned to stand a very moderate degree of cold. Dr. Ransome states that at the Manchester Consumption Hospital as much as 500 cubic metres (18,000 cub. ft.) per head per hour was often provided;[1] and with the help of special arrangements there should be no difficulty in improving upon the ordinary standards of indoor ventilation, high as these are above those observed in most of our private houses and hotels. In all good sanatoria the windows are kept open in all weathers and seasons for the whole twenty-four hours. Where the climate is variable, special shutters may be provided (as at Ruppertshain Sanatorium) which let in air while they exclude rain. Small glass screens might be arranged for the same purpose. Double windows are unnecessary and may be mischievous: even in Alpine sanatoria it is doubtful whether they are necessary.

The cubic space is of less importance than the size and position of the ventilating openings, although, of course, within certain limits the larger the rooms are made the better. The large dormitory at the Villiers Sanatorium for Children (p. 242) contains over 119 cubic metres per head. At Hohenhonnef none of the patients' rooms are smaller than 69 cubic metres. At Nordrach, where very good results are obtained, they average 42 cubic metres. At Albertsberg and Oderberg (both for the artisan class) from 34 to 39 has been allowed. Patients in sanatoria spend most of their time out of doors, so that with adequate ventilation 28 to 42 cubic metres should suffice, with a minimum of 11 to 14 square metres (120 to

[1] Weber-Parkes Prize Essay, London, 1898, p. 73.

150 sq. ft.) of area in the bedrooms. Cross ventilation is most important in a sanatorium. Every room should have inlets and outlets on opposite sides leading to the open air. It is a great advantage if the room can be ventilated from more than one quarter, according to the direction of the wind. The access of fresh air should be direct. This is the chief reason why the bedrooms of all good sanatoria are arranged in a single row, with an airy corridor behind. The windows of the corridor should be opposite the doors of the bedrooms. If there is no fanlight or ventilating shaft on the inner wall of the bedroom, the door will often have to be kept more or less open, even in winter. With the bed in a sheltered position it is quite safe to leave both door and window open. For the sake of privacy, and to check the too rapid passage of air, skeleton doors with permeable centres may be substituted for solid ones. In very windy weather screens may be required; but windows should never be closed excepting for ablutions and the like; and not always then. Draughts are often increased by partly shutting the window.

The dining saloon should be capable of abundant ventilation on three or four sides. Several of its walls may consist entirely of window space, with casement, or entirely removable, windows.

Verandahs, Balconies and Liegehallen.—Verandahs are an immense convenience in a sanatorium, enabling the patient to remain in the fresh air without exposure to rain or sun. They should not, however, in this climate be placed on the south side of the bedroom, lest they interfere with the light and ventilation of the latter. Placed in front of a vestibule or staircase, or at the end of a block, and adequately ventilated, they are useful without being mischievous. A bedroom provided with a deep south verandah should only be used as a dressing box. In such a position awnings that can be furled or removed are preferable. Wide southerly balconies on the floor above are also apt to darken the room below. These remarks are less applicable to climates with more intense sunlight than our own. Even here in summer time a south verandah may be too hot for proper treatment of febrile patients, so that a northerly or easterly one will be useful.

A tiled terrace in front of a ground-floor bedroom is invaluable, as the bed can be brought out into the open on still days. Such a terrace should not be used as a promenade. In continental sana-

toria where the site slopes rapidly, such terraces are usually placed in front of the basement or of ground-floor common rooms.

Covered shelters are an almost universal feature of continental sanatoria, under the name of *Liegehallen.* They are strongly objected to at Nordrach Colonie, on the ground that they foster gossip at a time when there should be absolute rest. Much, however, depends on the kind of patient who uses them, and on the doctor.

Heating and Lighting.—Heating in the Continental and American sanatoria is usually by low pressure steam, which is probably the cheapest method and one of the most easily regulated. Charring of dust particles by contact with the heated pipes may usually be prevented by reasonable care. Hot-water pipes are, however, more commonly employed in British sanatoria. In either case it is important to use soft water, and to avoid overheating. The temperature of the wards in some of our chest hospitals is often too high for consumptives, however suitable for some cases of bronchitis. There should not be more than 5° or 10° F. between the temperature of a sanatorium room and that of the outside air. Closed stoves if carefully made are less objectionable than in ordinary rooms, as in a sanatorium the ventilation is (or should be) sufficiently perfect to carry off the noxious fumes without delay. Open fires are most admirable ventilating contrivances. They are, however, relatively expensive: they demand more attention from servants, and they are apt to be dusty at times. In a large sanatorium this method of heating is impracticable, excepting for common rooms. Electrical heaters are at present too expensive to be much used. It is not advisable in this climate to warm the incoming air, as its tonic effects are thereby impaired (see p. 199).

Abundant light should be admitted into all the rooms of a sanatorium; and all those used by patients should admit the sun's rays during part of the day. According to Trelat (Buda Pest International Congress) the light on a dull day indoors in a sanatorium should be at least equal to that of ten metre candles. At least half of one side of each room should consist of window space. Some people cannot sleep unless the bedroom be darkened. This should be effected by outside louvred shutters or by glazed blinds, rather than by thick curtains, which are apt to hold the dust.

Artificial lighting should be by electricity as other methods add to atmospheric impurity.

Absence of Dust Traps.—To prevent accumulation of dust and to facilitate cleansing, re-entering angles and ledges should be entirely avoided in a sanatorium. Corners should be rounded, walls, floors and ceilings all made with a washable surface, and all unnecessary carpets, curtains and the like dispensed with. Floors may be made of narrow waxed boards, preferably of teak, grooved and tongued; or in bathrooms and corridors, of cement or artificial stone (such as papyrolith or terrazzo) or tiled.[1] All these materials make a somewhat noisy floor, so that here and there it may be necessary to use strips of carpet, or insist on the wearing of felt slippers. If linoleum is used, it should be in one piece, with the edges protected by a fillet.[2] It is apt to cause dry rot if glued down. Cork carpet is less noisy than linoleum, but is porous and soon becomes shabby unless it is well beeswaxed. Solid rubber floors are excellent but expensive. Polished floors answer well; varnished floors are soon shabby. For corridors, special combinations have been invented containing cement with wood shavings, etc.[3]

Walls may be lime- or colour-washed, or panelled with wood and varnished, oiled or painted; or covered with lincrusta or washable paper. Panelled walls are apt to crack, and must be frequently revarnished, which is unpleasant to some people. Cracks may be filled in with a mixture of paper, paste and glue. Ordinary paper is used as a wall cover in some sanatoria, and renewed whenever a patient leaves. A better plan is to use a washable distemper (such as Duresco or Hall's), or to have well-painted cement walls. The curve of the junction of wall and floor may have a radius of $2\frac{1}{4}$ in.; next the ceiling one of 3 in. The former is best made of hard wood or *torgament* or similar material; the latter of cement. The ceilings should also be washable, or else be frequently whitewashed; and must be free from mouldings. The staircases should have rounded angles. The London Open-air Sanatorium has staircases of hard wood without risers; the idea being that the dust falls through on to the ground. This, however, is an unnecessary waste of space. As polished stairs are slippery, a strip of hard wood, rubber or metal should be placed near the edge of each step, with horizontal

[1] See Sülzhayn, p 287. [2] See p. 147. [3] See *Torgament*, p. 287.

shallow grooves ending a few inches from either side. There should be no skirting board on the free side of the staircase. The stairs may be made with solid steps, as at the Brompton Hospital Sanatorium.

The *furniture* of the sanatorium should be light and free from unnecessary ornamentation or dead space; the heavier articles readily movable for cleaning purposes and capable of being cleaned all over, as well as the floor on which they stand. If stuffed furniture is used, the stuffings should be removable, or else kept covered with washable covers. Leather-covered lounge chairs would, however, be unobjectionable; but saddlebag or velvet covering is unsuitable. Bentwood cane chairs are good. For the open verandahs and summer houses the most convenient couches are adjustable cane or iron ones, which may be convertible into chairs by removal of the foot piece. There is no reason why they should not be provided with comfortable cushions, provided these have washable covers. Tuberculosis is not like scarlatina in its infectious properties. It has been suggested that the furniture should be capable of being "stoved" *en masse;* but this would necessitate a very expensive method of construction, or a great lack of comfort, and seems quite unnecessary. Carpets, mats, curtains and other hangings should be only sparingly used. The carpets should be in movable strips, with a free margin of floor around the room. Hairy mats and long-pile carpets are not advisable. Skins are also best avoided, as leather is not easy to disinfect by heat without damage. Screens and hangings need not, however, be entirely banished, as they are useful in preventing draught and noise, and if of washable materials are otherwise unobjectionable.

Plain iron bedsteads are the best kind for a sanatorium. Bedding should have double washable covers. At Sülzhayn the horsehair in mattresses is mixed with one-third sissal fibre, which is springy and clean, and considerably cheaper than horsehair. The pedestals are often made of open japanned ironwork with a glass top, which is better than the usual wooden kind. As it is undesirable to have bags and boxes in the bedrooms, cupboards or wardrobes of some kind are necessary. In some sanatoria these are placed outside in the corridors. Cupboards encroach less upon the cubic space of the room than wardrobes.[1] Their floors should not

[1] See Crooksbury Sanatorium, p. 162.

be sunk below the floor of the room, and the interior should be made as carefully as that of the room itself. The chief objection to their presence is that they may escape the daily cleaning which is so important for every part of the room. Boots and shoes (beyond those actually in use) and outdoor clothing are best kept in a special well-ventilated and warmed cloakroom. For washstands, a choice may be made from several of the ordinary types of marble-topped or japanned iron ones.[1] In many of the sanatoria for the poorer classes personal ablutions are done in separate lavatories or bath-rooms. Elaborate picture frames and intricate ornaments are, of course, unsuitable for a sanatorium ; but the simpler kinds may quite safely be admitted under good management, although they add to the work of the establishment.

[1] See Crooksbury Sanatorium, p. 162.

CHAPTER VII.

SANATORIA FOR SPECIAL CLASSES.

THERE are on the Continent and in America sanatoria for every grade of society, from those who pay nothing to those who pay from £4 to £7 per week. They are divisible into three classes, according as they are intended for those with means, those of moderate incomes, and the poor. Some of the cheaper sanatoria are for the "working-classes," while others are for the poorer members of the middle classes, including teachers, clerks, struggling professional men of various kinds, and the like. These are really even worse off than the working classes; for their incomes are dependent on their own exertions and on their keeping up appearances, so that their net income is often lower than that of the workman. Moreover, they are not rightly eligible for hospital treatment or for many of the convalescent homes, while their own domestic surroundings are as little suited to hygienic treatment as those of the mechanic.

Sanatoria intended for the *poorer classes* are usually somewhat different from those where higher charges are expected. Their rooms are less luxuriously furnished; the food is somewhat plainer and less *recherché;* several patients are often put into the same bedroom; and a certain amount of the lighter work is expected to be done by those patients who are fit for it.

At German sanatoria for the poorer classes, from one to four patients are usually put into each bedroom. At Ruppertshain as many as six are put into some of the rooms; and at Albertsberg there are dormitories for ten together. This is not a good plan, and should not be encouraged. It is much more difficult to resist the overcrowding of rooms with several beds than of those with one. The larger bedrooms at Ruppertshain were originally intended for

five beds, but owing to the numerous applications for admission, an extra bed was put into each. Consumptive patients, whether rich or poor, should have each his own bedroom, just as they do at Ventnor.[1]

No more than the absolutely necessary furniture should be allowed in each room. Each patient usually has his own compartment of a large movable cupboard, for clothes and other small articles. This should have no back, and may be placed in the corridor, so as not to encroach on the cubic space of the bedroom. Cupboards in the corridors should not be too high to easily see and cleanse the top, which should be sloping. If lavatories are placed near the bedrooms, as is often done abroad, this will further diminish the necessary bedroom furniture. Enamelled iron utensils should as far as possible be used instead of crockery. There should be a large room near the matron's room for linen and glass, of which a double or treble supply should be provided. All boxes and trunks should be kept in a box-room, outdoor clothes in a cloak-room, and boots not actually in use in a boot-room; and all these may be placed in one of the less valuable parts of the building—basement or north side, according to the particular plan adopted. At Oderberg the dining tables are covered with American cloth fastened with a fillet of wood, as this greatly aids in keeping the tables clean. The fillets should, however, be placed on the under side of the table top, which has not been done there.

It is a disputed point whether consumptive patients should do any work or not in the sanatorium. Léon Petit is of opinion that they should not do so; Penzoldt was of opinion that they might safely do light work under medical supervision; and as a matter of fact in most German sanatoria of this class they are expected to make their beds, keep their rooms tidy, open their windows, clean their own boots, and see to the removal of closet pails where the dry system is in force. At Oderberg Sanatorium each section of the house chooses an oversman who is responsible for the performance of these lighter tasks, and for the keeping of various rules. At the Basel Sanatorium at Davos the patients are only too glad to help in the household work; the women help to prepare vegetables for the dinner and the like; but it has been found more difficult to obtain suitable employment for the men, who have consequently required

[1] See p. 156.

more entertainment in the shape of games. Penzoldt sent some patients to the Reiboldsgrün Sanatorium, who were received free of charge on condition that they did light out-of-door work. They are said to have greatly improved in health; and there was no evidence that their work did them any harm.[1] There are, of course, times when absolute rest is required; but at other stages light out-of-door work may very well take the place of some of the graduated exercises, and would be better for the patients than indoor work or than idleness and *ennui*. Convalescent patients who had been unsuitably employed before admission might very well devote the last few weeks of their stay to the acquisition of a more suitable employment; and even if this necessitated the presence of technical instructors it would be a most remunerative outlay in the long run.[2] It is right to regard such matters from a public as well as an individual standpoint; every man saved from becoming a pauper or from sinking to a state of invalidism is a gain to the State.

Separation of the Sexes.—Most of the large continental sanatoria for the poorer classes are arranged for one sex alone. This renders administration easier, and removes one source of emotional disturbance. In full-price sanatoria it is usual to receive both sexes, the dining-room and the grounds being used in common, with separate bedrooms, lavatories, day rooms and shelters for each sex.

Class Distinctions.—No serious attempt has been made in Germany to provide for rich and poor together in the same sanatorium. In Switzerland, several of the popular sanatoria receive patients of all ranks into the same institution. There are, however, one or two for the poor alone; and it is reasonable to suppose that the wealthier patients go to full-price sanatoria at Davos rather than to the popular sanatoria. In England there is a strong feeling against sending to the same institution the working classes and those who are supported by the guardians of the poor. It is probably equally unwise to attempt to provide for educated and uneducated together, or for full-price and half-price patients, although this is apparently contemplated for the King's Sanatorium.

Sanatoria for Children also require special organisation, as

[1] Penzoldt, "Behandlung der Lungentuberculose," in *Handbuch der speciellen Therapie der inneren Krankheiten.*

[2] See also p. 258.

their inmates need more supervision, and are with greater difficulty kept quiet, unless they are gravely affected. Moreover, systematic schooling is in their case essential. The French sanatoria at Ormesson and Villiers-sur-Marne (pp. 241, 242) and the German children's sanatorium at Belzig (p. 263) are worthy models for imitation.

Surgical Tuberculosis.—In dealing with patients who suffer from tuberculosis of the skin, bones, or joints, a much more bracing and exposed situation may be advantageous. In this country, many of such cases are treated at our seaside convalescent homes and hospitals (*e.g.*, Margate Sea-bathing Hospital) with the best results, whereas these institutions, with present arrangements, are at certain times and seasons unsuitable for ordinary consumptives. The medical and surgical requirements in the two sets of cases are also usually different.

CHAPTER VIII.

SIZE, STAFF AND MANAGEMENT.

THE size of the sanatorium depends partly on the number which can be properly supervised by one medical officer, partly on financial considerations. A small sanatorium is relatively expensive to erect and maintain, as the administrative parts for a dozen patients would almost suffice for three dozen, and the expenses per head rapidly diminish with increase in numbers. A small sanatorium is also apt to be dull, as there is less probability of patients finding congenial companions, as well as for other reasons.

On the other hand, no medical officer can properly manage more than thirty or forty patients unaided, so that with two medical officers, sixty or eighty is probably the best number, as recommended by Léon Petit. Some of the foreign sanatoria far surpass this modest number. The Brehmer Sanatorium at Görbersdorf has now over three hundred beds with eight physicians. Most of the newer sanatoria for the working classes in Germany have been built with ninety or a hundred beds. The nursing staff in most of the foreign sanatoria is very meagre according to English notions, even taking into account the stage for which the sanatorium is designed. Probably a good proportion is one nurse for every eight or ten patients. Sanatoria for paying patients naturally have a larger staff than those for the poor. Hohenhonnef with ninety beds, and a staff of seventy-nine, has probably the largest staff of any in comparison with the number of its patients. At Oderberg (120 beds), an institution for the working classes, there are (including outside hands) twenty-five servants and nurses. At the King's Sanatorium, provision has been made for thirteen nurses and nineteen maids for 100 beds.

As in a hospital, the administrative work of a sanatorium should

be in the hands of a layman, manager, steward or managing director, or in a small sanatorium, a matron or housekeeper; but it is essential that he or she should be subordinated to the chief medical officer, with an appeal, if necessary, to the managing board or committee. In one respect, the management will have to be different from that of a hospital: the power and responsibility must be in the hands of the resident medical officer, not the visiting physician, unless the latter is prepared to spend a large part of several days a week in the work of supervision. For this reason, the resident medical officer will have to be something more than a recently qualified student, however promising; and it will be a great gain if the conditions can be made sufficiently tempting to prevent frequent changes.

Sanatoria being expensive to establish, a large proportion of our own and of foreign sanatoria have been, and will be, founded by syndicates or companies. For the remainder we must look chiefly to the philanthropists who may be willing to devote a large sum of money to their erection and endowment. In every case, however, the medical element should be largely represented on the managing body, as a safeguard against slipshod medical management, which the general public cannot be expected to control. In the long run, no sanatorium which is merely managed for the sake of profits will be successful.

Section IV.—TREATMENT AND RESULTS.

CHAPTER IX.

OUTLINES OF SANATORIUM TREATMENT.

Sanatorium treatment is based on a careful regulation of each patient's daily life in all its hygienic and medical details. He is quickly trained to stand a life in the fresh air in all weathers, while his tendency to chill is removed by simple hydropathic applications and other common-sense precautions. The nature and amount of his daily exercise are regulated according to his momentary state of health, in an ascending scale, beginning with absolute rest in bed. His food ranges from fever diet to a rich and varied though digestible dietary. Strict precautions are taken to prevent all risk of infection, while the training he receives is useful not only to himself but to the whole community after his departure from the sanatorium. The resident medical and nursing staff assist him in carrying out these daily measures, and are immediately available in case of hæmoptysis, night sweats, catarrhal and other complications. Not that this constitutes the whole duty of the medical and nursing staff. They have to prevent imprudences in some cases, to encourage to perseverance in others; to strictly enforce all essential rules, while they allow sufficient personal liberty in less important matters to prevent the irksomeness of restraint; to suggest harmless and beneficial forms of recreation, while they discourage all those which are likely to do mischief. Mind has a great influence over bodily health, and the stimulus of hope and the encouragement which results from steady progress and sympathetic attention will count for much in curing the patient.

Those who try to live in the open air in a climate like our own will meet with many difficulties, owing to the absence of special

shelters and contrivances for warding off rain and wind while admitting fresh air, and still more to the obstacles put in their way by their friends and relatives, by lodging-house keepers and others. The ventilation of rooms even in good-class houses is seldom satisfactory; and it is quite exceptional to find an adequate provision of verandahs and covered walks for use in wet weather. Such arrangements may not be needed in very favoured climates, but they are a great help in an uncertain or a rainy one. At Nordrach, it is true, rain is absolutely disregarded; and some British sanatoria model their treatment strictly upon that of Nordrach. But in the writer's opinion this leads at times to unnecessary discomfort. Consumptives are very apt to over-heat and under-ventilate their rooms, forgetful or ignorant of the dangers which they thus incur. Graduated and increasing exercise is essential in quiescent phthisis, provided that it is not allowed to excite dyspnœa or greatly accelerate the heart action. But in febrile or dyspeptic patients who are losing weight, all unnecessary exertion is mischievous, and rest in the open air the only permissible method of treatment. The sanatorium and its grounds have therefore to be arranged with a view to both of these contingencies, and paths provided with every variety of gradient as well as sheltered resting places. Dust and organic effluvia are most injurious to phthisical patients. The former excites useless cough and irritates the air passages, while the latter lower constitutional vitality and foster the growth of tubercle bacilli. To banish dust and dirt, special methods of furnishing and decoration, and still more, special methods of cleansing, are necessary, which are scarcely if ever found in ordinary households. Each of these points is more fully dealt with in other chapters.

CHAPTER X.

THE FRESH-AIR TREATMENT.

AN open-air life is the key-note of sanatorium treatment. The patient, instead of being kept in a carefully warmed room ventilated from other parts of the house, according to the popular notions of old, lives in the open air day and night, at all seasons and in all weathers. Lack of fresh air is the greatest predisposing cause of consumption; fresh air is the most potent means of restoring him to health.

Now this prescription may be more pleasant to carry out in dry climates such as those of Egypt, the Alpine health resorts, South Africa or Colorado; but it is really just as easily applied in a relatively damp or rainy one such as ours or that of Germany. The credit of showing how this may be accomplished belongs mainly to Brehmer, Dettweiler and their followers. The open-air method may perfectly well be carried out in any climate which is healthy for those who are not consumptive. As Léon Petit observes: "Here the climate may help the cure, . . . there it may hinder it; but it only exerts a secondary influence on the treatment".[1] Moreover, just as the pleasantest climates are not always those which are best for healthy people,[2] so it may be that the most pleasant climates for an out-of-door life—where the air is warm and dry, and little rain falls—are not the best for those consumptives who have later on to return to a less favoured place. It is bracing climates rather than warm and equable ones which have the greatest influence in restoring the consumptive to health, in all but exceptional cases.

For the open-air treatment, a fourfold shelter should be provided against wind, excessive cold, extreme sun heat, and heavy

[1] *Loc. cit.*, p. 49.

[2] Hermann Weber and Michael G. Foster, article in *Allbutt's Syst. of Med.*, on "Climate in the Treatment of Disease".

rain. Wind raises dust, increases cough and dyspnœa in consumptives, and intensifies the chilling effects of cold. The foreign sanatoria with few exceptions have both natural and artificial shelter against wind. Cold within certain limits is useful to the consumptive; but it should be a windless cold, and suited to the individual power of reaction. As damp intensifies the climatic effect of both heat and cold, the chilly consumptive will be abler to withstand a lower temperature in a dry than in a humid climate. Protection against rain and snow will seem to most people an obvious necessity, although at Nordrach rain is disregarded. It is not enough to provide resting places in the sanatorium which are protected against rain. At certain stages exercise is imperative, and sheltered paths and open covered corridors are a great boon for exercise in stormy weather.

In places where the sun's rays are very powerful, as at Canigou in the Pyrenees, direct exposure to the sun is found to increase the tendency to fever. Even at Hohenhonnef on the Rhine, which is not far south, a large verandah has been provided which in hot weather can be artificially cooled by a stream of water. In our own climate in summer, warm corners where the air does not freely circulate are bad for the consumptive, diminishing the appetite and increasing the fever. Protection against wind and weather is afforded in most sanatoria by large verandahs, which may be fitted with movable glass screens, as at the Adirondack Cottage Sanitarium. In our own climate the verandah may be supplied with hot pipes, as cold and damp can be much more easily borne if the feet are kept warm.[1] Other simpler ways are the provision of hot bottles and warm clothing. Recumbency also helps a chilly patient to keep warm, the blood circulating with less cardiac effort in this position. According to Dr. Weicker and Dr. Jacoby the recumbent position also favours the flow of blood to the apices of the lungs. In most sanatoria summer-houses or sun-boxes are also provided; some of these can be rotated according to the direction of the wind. Dr. Burton-Fanning, in his experimental sanatorium near Cromer, modified the well-known shelters of our sea-side resorts by providing them with reversible glass screens (see *Practitioner*, June, 1898, and *Lancet*, March, 1898).

Patients who begin their open-air treatment in wintry weather

[1] See p. 38.

usually need a short period of acclimatisation, during which the time and extent of exposure are gradually increased. Evening air is not found to be injurious to the large majority of consumptive patients, and they should be provided with artificial light so as to be able to sit out after dark and read their books and papers, even where the climate is moderately humid. Rest out of doors in the verandahs is practised in all but the coldest, wildest weather. Thus at Falkenstein, patients have been able to stay out of doors even during thick fog, during snowstorms, and when the temperature was 10° or 12° C. below freezing. As many as 40 per cent. were able to stay out seven hours or more; and 6 per cent. could stay out ten or eleven hours a day.[1] Blumenfeld, at the same sanatorium, made an elaborate investigation of the number of patients confined to their bedrooms under various meteorological conditions, and could find no noticeable difference, except during the prevalence of north-east winds.[2] This is somewhat remarkable when it is remembered how readily invalids become chilled. It is no doubt in part attributable to the still air usually prevailing at Falkenstein, but chiefly to attention to details. A patient who is properly wrapped up with his feet off the ground does not usually feel cold in winter, provided that he is screened from strong wind. In British sanatoria it is the staff rather than the patients who suffer in cold weather. Patients should be encouraged to stay out of doors all day. Even the best-ventilated room is inferior to the atmosphere of a garden. Air circulates less freely near to or inside a house, so that wherever possible, resting-chairs should be placed at a little distance, on a lawn or amongst the trees and flowers. Even in wet weather a delicate or febrile patient may remain out with advantage, provided that he keeps warm. With an umbrella and a thick rug most of our rainy days may be defied. In sanatoria modelled upon that of Nordrach it is not considered necessary to change wet clothes on entering the house. So long as the under garments remain dry and the patient feels warm there is no reason to be anxious. Even if drenched to the skin, it may be sufficient to cover oneself with a thick rug. In this way the wet clothes are the equivalent of a wet pack; and

[1] P. Dettweiler, *Die Behandlung der Lungenschwindsucht in geschlossenen Heilanstalten.* Second edition. Berlin, 1884.

[2] F. Blumenfeld, *Ueber den Einfluss meteorologischer Vorgänge auf den Verlauf der bacillären Lungenschwindsucht.*

drying slowly will not harm the patient. On the other hand, those with feeble reactive powers would do wisely to change their wet garments on coming in, with the least possible exertion.

In many German sanatoria there is a systematic application of a simple kind of *hydrotherapy*, which trains the skin to withstand changes of temperature. At first, patients are rubbed with a dry sheet; then with spirit; then with spirit and water; in the next stage a wet sheet is used; and in those who are sufficiently prepared cold sponging and douching. A divided cold douche acts as a powerful stimulant to the skin, and through it to the rest of the body, increasing the tissue changes, improving circulation and digestion, as well as the tone of the skin itself. Its stimulating properties depend within certain limits on its coldness, and the force and subdivision of the stream. A pressure of one atmosphere, and a temperature of 10° to 14° C. are best for the purpose. The cold douche was formerly much used in sanatoria for consumptives, but owing to some bad results in a few cases, has been less and less employed, being only occasionally used in some sanatoria and not at all in others. If used at all, it should only be applied for a very few seconds. The other simpler applications are not open to the same dangers, and, although less powerful, are probably sufficient in most cases. There is a strong objection at Falkenstein to the use of hot baths, which are only occasionally permitted, and never very hot or for more than a few minutes. The contention is that such baths relax the skin and debilitate the patient. But the experience of very hot baths in Japan and elsewhere would seem to prove that they may have stimulating effects. The matter is one which should be decided by individual experience rather than by *a priori* reasoning. At Nordrach, afebrile cases are allowed to freely douche themselves with water of any comfortable temperature; but are enjoined not to actively dry themselves; and experience shows this to be quite safe.

The *clothing* of consumptive patients should be no thicker than is necessary to keep them warm. More than this relaxes the skin, and increases the tendency both to profuse perspiration and to catching cold. The clothing should be evenly distributed, and not too heavy. It should not hamper the movements of the chest. Woollen garments are usually recommended next the skin, mainly because they absorb a large amount of moisture, and dry slowly.

Dr. Walther, however, prefers a less irritating material for underclothing; and there is something to be said for his contention. Waterproof garments and goloshes are not to be recommended, as they hinder evaporation. In many sanatoria the use of corsets is prohibited. Garments which hinder chest expansion or press on the abdominal organs are mischievous. Hats are not found to be necessary as a rule. They are more needed indoors than out: and in the same way, overcoats should rather be put on while resting than when the patient is taking exercise.

CHAPTER XI.

REST AND EXERCISE.

If the fresh-air treatment merely consisted in letting every patient rest in the open air, or follow his own inclinations as to the amount of exercise, it would be an exceedingly simple matter, scarcely requiring medical supervision. But the essence of Brehmer's and Dettweiler's methods is the elimination of haphazard treatment and the prescription of absolute repose or of various degrees of exercise according to definite medical indications. Patients who are febrile must be kept at rest; if persistently febrile or with high temperatures at night, absolute rest in bed is needed, windows being kept open, or the bed wheeled on to the balcony according to weather and season and other indications. Where there is only moderate pyrexia during part of the twenty-four hours, they may be allowed to come on to the verandah and rest there on reclining chairs. In this way the fever is usually reduced, and the appetite and other symptoms improve. Another class of patients who are best kept at rest are the decidedly dyspeptic, and those who are rapidly losing weight. If the nutritional income is less than the expenditure, the latter must be as far as possible reduced. The same is true of those who are very anæmic or very feeble. Rest is also needful during and after hæmoptysis.

In all other cases exercise is needful, according to an ascending scale. We may begin with passive motion, or very gentle massage, followed by resisted movements in the recumbent position. After this, very gentle walking exercise may be tried, at first restricted to a few yards at a time on level ground. As the invalid gets stronger the length of his walk is gradually increased; he then attempts a gentle uphill walk; and in time he is able to take long walks up even steep hills with advantage. He is, however, never

allowed to walk quickly; about two miles an hour is a very good regulation pace for most. He must never put himself out of breath by his exertion, and should stop directly he begins to feel fatigued. Prolonged fatigue, profuse perspiration from the walk, a decidedly raised pulse rate (much over 100) or respiratory rate show that the exercise has been too much. If patients come in chilled from their walk, brisk friction with a warm towel, applied by the nurse, or a little digestible warm food, will often set them right. With few exceptions patients should rest for an hour before every important meal and for half an hour after. The former is the more important. As a rule the most active exercise is best taken in the morning.

The same rules must guide us as regards the occupation of the patients. Sedentary occupations which contract the chest are usually forbidden: in German sanatoria knitting and sewing are not allowed, for this and other reasons. Indoor occupations must be restricted as much as possible; but with a little management many things usually done indoors may be carried out in the open air. Thus periodical concerts, recitations, tableaux vivants, and amateur theatricals may take place out of doors during a great part of the year. At some sanatoria there are fortnightly social evenings; at others, various societies for reading, music, draughts and other quiet games, or for botany, photography, and other scientific or artistic pursuits, are formed amongst the patients. Nearly all the continental sanatoria have well-stocked libraries; and as verandahs and summer-houses are lighted up after dark patients can read out of doors until bed time. Fairly robust patients may be allowed to indulge in outdoor games. Croquet is often permitted; tennis and ping-pong are not to be recommended, as it is seldom advisable, until convalescence is far advanced, to exert the arms too freely, owing to their close connection with the chest. Damaged parts of the lung should as far as possible be kept quiet, although it is useful to freely expand the sound parts when the disease is quiescent. Sledging is a recognised amusement at the Alpine sanatoria; but this, and still more skating, are somewhat risky for most patients. Gentle cycling on level ground involves far less exertion, and may more often be permitted. Golf in the form of putting is fairly safe for the majority of afebrile patients with quiescent disease. It must be remembered that every sport is more tiring to the novice than to the one accustomed to it. Quiet drives are also often per-

missible. Walking, however, is the most universally applicable form of exercise, as soon as there is no more fever.

When the disease is quiescent many authorities lay stress on the value of respiratory exercises, which consist mainly in methodical deep inspirations together with simple arm exercises calculated to expand the chest. Waldenburg's pneumatic cabinet is occasionally employed for similar purposes. At the Colorado Sanitarium systematic gymnastics are a recognised method of treatment for convalescent consumptives. Without careful supervision, however, these methods might easily do more harm than good.

In the earlier stages of treatment rest is far more important than exercise; and this should include mental as well as physical repose. Mental activity necessarily involves expenditure of energy which is needed for the repair of damaged lung tissue and the restoration of constitutional strength. Those who are familiar with the Weir-Mitchell method of treatment will know the importance of economising strength in feeble patients by the avoidance of emotion and of active exertion of all kinds. For this reason it is better to abstain from all business, especially of a worrying nature. At Reiboldsgrün exciting books are marked with a star and forbidden to febrile patients. At Nordrach mental repose is persistently aimed at, the visits of friends and relatives being discouraged. As soon as fever has completely disappeared the patients take walking exercise regardless of rainy weather; but are only allowed to go in small parties of not more than three or four. Judging by personal experience, much depends on the kind of patient and of visitor. Some patients would move and make but slow progress if deprived of visitors, whereas others become excited and feverish unless left absolutely quiet. Again, a judicious visitor may do good, while another may do incalculable harm. The only safe rule is for the physician to judge, reserving the right of excluding visitors if necessary.

Temperature Indications.—It is found by experience that none but rectal temperatures are reliable in an open-air sanatorium. Mouth temperatures approximate to those of the axilla and outside skin, both of which may differ to a variable extent from those *per rectum.* The latter also are far more sensitive indices of the effects of exercise, and less influenced by food, cold air, coughing, or carelessness in placing the thermometer. The thermometer should be

introduced about an inch, and kept in for five minutes. It is advisable for the first few days to take temperatures every hour or two, in order to discover the hours of maxima and minima. After this, it is usual to take the temperatures four times a day, *i.e.*, before breakfast, after the morning walk, late in the afternoon and at bedtime. In general terms, the morning temperature shows whether any exercise can safely be taken; while those after exercise show whether this has been excessive. Until for a week there have been morning temperatures of 97° to 98·6°, and evening temperatures below 99·5°, rest in bed is advisable. A rise of temperature to 101° after exercise does not contra-indicate exercise, if within half an hour it has dropped to 99·5°. Very little exercise is permissible where the evening temperature rises to 100·4: at most 100 yards on level ground, usually less; and none at all if the maximum at rest is over 101°. If the temperature rises immediately after the midday meal and remains high all the afternoon, exercise must only be taken sparingly in the morning, and none after midday. When the afternoon rise is not great and ceases by 6 P.M., a stroll after evening dinner is permissible, and helps digestion. When rises of temperature appear as the result of complications rather than of the lung disease, the amount of exercise should be determined more by the former if the lung trouble is quiescent; for instance, if due to a simple sore throat or a dyspeptic attack, a little more exercise may be allowed than if the rise of temperature were caused by the lung trouble. Occasionally it happens that the temperatures fluctuate between 99° and 100° for some weeks without showing signs of abating, but promptly fall if a very little exercise is permitted during the least febrile part of the day. The effect of over-exertion will usually show itself a few days later than the exciting cause. For this reason, increased exercise should at first be for one day at a time. Temperatures which show a progressive (even if very slight) daily rise, call for prompt attention. Unless due to some trivial complication, under such circumstances the patient should be kept at rest. Relapses require, *cæteris paribus*, more cautious treatment than early attacks. Temperatures are often raised by the exertion of coughing. Here the physician must judge whether the cough is necessary and not excessive.

The Patient's Day.—An average patient who is taking exercise would begin the day by taking his temperature. He would break-

fast at 8 or 8.30, spend the morning in rest and exercise, according to the doctor's directions, returning at 11.30 or 11.45, when his pulse rate and temperature would again be taken. An hour's rest before lunch of three or more courses; in the afternoon rest and exercise, with a little time for recreation or the pursuit of some outdoor hobby; afternoon tea (an unimportant meal for most); temperature is again taken on return from the last walk; an hour's rest before dinner at 7 P.M. (four or more courses); in many cases a stroll before bedtime (9.30), or rest out of doors, with music or quiet games to relieve the monotony. The doctor would see him as a rule three times a day, and be also present at all the important meals. The life is necessarily a quiet uneventful one; but need not be dull.

CHAPTER XII.

DIET IN THE SANATORIUM.

THE food of consumptive patients must conform to the ordinary rules of dietetics. It must be of a mixed character, containing representatives of the different classes of food stuffs ; it must be digestible, appetising and varied ; it must be sufficient to nourish without overloading the stomach ; and it must bear some relation to the loss of tissue and energy resulting from exercise and other circumstances. It must also to a certain extent be suited to the national and individual tastes and customs, and be directed by the results of experience, both of the physician and the patient.

All these matters should be taken into consideration by the medical director of a sanatorium, who should settle the daily *menu* in consultation with cook or housekeeper, take his chief meals with his patients and notice how they fare, and introduce suitable modifications to suit individual requirements.

The proportions of food stuffs advisable for the majority of early consumptives who are not dyspeptic do not greatly differ from those required in health. As, however, there is a tendency to rapid loss of weight, and the need for rapid constructive metabolism, there should be a relatively large proportion of easily digestible nitrogenous food and fat. Milk, butter and cream are convenient for such purposes, and figure largely in the dietaries of sanatoria abroad. The milk should be obtained from tuberculin-tested cows, as a large proportion of our milch cows are affected with tubercle, and in some cases yield contaminated milk. Where the supply cannot be controlled, the milk should be boiled or Pasteurised before being used ; but it is believed by some authorities that it thereby loses some of its useful properties. However, at Oderberg none but boiled milk is given, although it comes from carefully tested cows, on the

ground that the patients are more likely to continue the precaution after their return home. Consumptives in an early stage are very subject to constipation. For this and other reasons, ripe fruit and vegetables should figure largely in their daily diet. Consumptive patients are apt to be fastidious, and often suffer from loss of appetite, so that the food must be supplied in a palatable and appetising form, sufficiently flavoured and sufficiently varied to tempt the palate without offending the eye or upsetting the digestion. Many common dishes—such as suet puddings—are digestible or otherwise according to the way in which they are prepared, so that a good cook is of the greatest importance to a sanatorium.

The quantity taken at one meal, and the number of meals, should vary in inverse proportion. A patient who can only eat a small amount at a time must have frequent meals, while the patient with a robuster appetite may content himself with three a day. At Mundesley Sanatorium a point is made of weighing all the food eaten and prescribing the amount of the different food stuffs according to the condition of the patient and the exercise he takes. In other British sanatoria it is usually stated that the dietary is modelled on that of Nordrach; but four or five meals are not uncommon. The meals taken abroad depend so largely upon national tastes and customs that it is difficult to draw useful conclusions from them. In France, two substantial meals—or even one—are the rule among healthy people; in Germany, three or four are usual; while in the mode of preparing the food the greatest differences exist, even between different parts of the same country; and what pleases one patient will disgust another who comes from a different locality. In some places, cooking is largely done with olive or poppy oil; in others with butter or various kinds of fat. The garlic which pleases the Spaniard would nauseate the average Englishman, who also usually detests the sauerkraut and vinegar which the German delights in. At some of the sanatoria—as at Reiboldsgrün—the bulk of the patients come from the same part of the continent; but in others, as at Falkenstein, the company is cosmopolitan, so that an attempt is made to suit diverging tastes by different national *menus* on different days. In most of the German sanatoria two breakfasts are provided; a midday dinner of three or four courses; afternoon tea

or coffee with milk ; and an early supper of three or four courses, besides in some cases milk or soup on rising and at bed time. This is more than is required by most patients, who would find three abundant meals quite enough. Evening dinner may with advantage be made a little less substantial than breakfast and lunch. Debove and others have obtained very striking results by forcible feeding of consumptives with concentrated foods ; there is, however, some danger in this way of unduly increasing the intake of uric acid and its allies.

Physicians are not agreed as regards the use of alcohol. Whereas Dettweiler recommended full quantities of brandy, often in a concentrated form, others (such as Liebe at Waldhof-Elgershausen) give none at all excepting in emergencies. It appears to me that of the two this is the more useful course, as there is less risk of inducing undesirable habits ; but I see no reason why alcoholic drinks should not be used medicinally or dietetically, in reasonable quantities and properly diluted, to improve digestion or for other definite purposes.

A great authority used to teach his students that we should treat the sick man rather than the disease ; and in no department of medical treatment is it more important to take into account individual tastes and peculiarities than in dieting consumptive patients. Many of these will of course take almost anything put before them, but a large minority are exceedingly dainty and capricious ; and at critical stages will have to be greatly humoured in the choice of food in order to induce them to take sufficient for their needs. Sabourin[1] mentions a patient who for a time would scarcely touch any food but eggs, but partook freely of these in increasing numbers until he was taking from eighteen to twenty-four per day ; and this strange diet sustained him through a critical period of his illness until he could digest a little bread. Another patient who could not take milk was able to digest large quantities of raw meat and alcohol, and made a good recovery. It is of course most important to attend to the digestive functions both medicinally and dietetically—as indeed to the state of all the mucous membranes—but it is unnecessary to enlarge here upon this topic. Large quantities of whey seem useful in certain cases in assisting renal excretion (see p. 270). Febrile patients will

[1] *Traitement Rationnel de la Phtisie*, p. 93. Paris, 1896.

need a simple and digestible diet; but it is a mistake to avoid solids, as many febrile tuberculous patients can quite well digest well cooked ordinary fare. In diarrhœa all laxative articles of food must be omitted, and farinaceous milk foods given together with astringents and intestinal antiseptics Where digestion is feeble, predigested foods will often be useful. Plasmon, casumen, somatose, pancreatic emulsion and similar preparations may be needful in turn. The diet in a sanatorium in fact will have to range from the "fever diet" of a hospital to the elaborate dietary of a high-class hotel.

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CHAPTER XIII.

PRECAUTIONS AGAINST INFECTION.

ALTHOUGH tuberculosis belongs to the infectious diseases, it is probably the easiest to prevent from spreading. Simple cleanliness alone will go a long way to prevent its extension to other people; so that many were doubtful whether it was really infectious, until Koch and others proved it to be so. The consumptive in all but the earliest stage is, however, a source of danger to those around him, unless he adopts certain simple precautions. The danger lies not so much in his breath, as in what he coughs up. It has been calculated by Hiller that there may be as many as 300,000,000 tubercle bacilli in each expectorated morsel of 3 c.cm. Were these sputa to be allowed to dry and mingle with the dust, they would constitute a serious danger for every susceptible person who happened to inhale them. Nor does the danger stop here; for Ransome has shown that the bacilli are capable of growing in ordinary temperatures on damp wall-paper, especially in presence of organic effluvia from the breath or the soil. Fortunately, sunlight and fresh air are most efficient disinfectants; and if the sputa are received into suitable receptacles and destroyed before they dry, there can be very little danger. From recent investigations by Flügge and others it appears that in advanced stages tubercle bacilli may be scattered as much as a yard from the patient during coughing, and even (it is stated) by the effort of speaking, being floated up by little bubbles of air. To prevent mischief in this way, something should be held before the mouth during coughing and similar efforts. Susceptible nurses and relatives should not be allowed to nurse such cases; and great care should be taken to preserve the health of those engaged about the patient. In most sanatoria Dettweiler's portable spitting flasks are used by the patients; various kinds of

spittoons are also employed indoors, and at Falkenstein are placed about the grounds. This latter plan is, however, likely to defeat its own ends. Dettweiler's flask has done most important services, but is too complicated to be perfect, and is rather expensive. Spitting flasks with one opening should have it large enough to admit of proper cleansing by mechanical means as well as by boiling. They should be free from corners and angles and cracks, preferably of one material throughout the interior, so that no junctions exist in which dirt might accumulate. They may with advantage be opaque or semi-opaque. They should be readily opened, but not liable to leak; and should be of a convenient shape and size for the pocket. Spitcups for the bedside or shelf should not be readily upset. They might with advantage be made with hingeless automatically closing lids. Flies are not common in a well-managed sanatorium unless it is near a road or stable, still it is advisable to avoid smearing the sputum on the lid of the spitcup. Spittoons for the floor should never be used in a sanatorium. In some continental establishments elegant vases of coloured glass are placed instead of spitcups on shelves in the reception rooms, and on the pedestals in the bedrooms. Another method, adopted in some American and German sanatoria, as well as in England, is to use cuspidores with paper linings, which can afterwards be burnt.

Handkerchiefs of the ordinary kind are banished from most sanatoria. They may, however, be safely used if not kept long and invariably steam-cleaned or destroyed after use. They should be carried in india-rubber pouches or in pockets with detachable linings. It is often difficult to induce patients to use spitting flasks; and in any case, it may be necessary to have something for wiping the mouth. For such purposes Japanese paper handkerchiefs are convenient, as they are cheap and tough, and can be readily burnt. They may also be used instead of napkins at dinner time. For those who dislike the feel of paper, butter muslin is a useful substitute. At Falkenstein each patient has his own linen napkin at table, in a linen pouch marked with his number: but the other plan is preferable. Bedridden patients should not be allowed to keep handkerchiefs under their pillows or under the sheets, but in some cleansable receptacle outside the bed. Whatever method is adopted, it is most essential that the sputa should be exclusively received into proper receptacles and kept moist until they are

destroyed. In all the foreign sanatoria there is a strict rule against promiscuous spitting. In Germany this is enforced on pain of expulsion. At Heiligenschwendi, in Switzerland, a small fine is substituted; but this appears to me to be mistaken policy. To keep the sputa moist plain water may be used, or carbolic solution (5 per cent.), perchloride of mercury (1 in 1,000), or lysol. At Hohenhonnef a solution of lysol and soft soap is used, as this makes the sputa less repulsive to look at. The most efficient methods of sterilisation are burning or boiling, although in some places disinfectants are depended upon. At Oderberg and elsewhere the sputa are mixed with peat mould or sawdust and burnt, the receptacle being boiled. To disinfect sputa by boiling, this must continue not less than five minutes.[1] In some establishments (Oderberg, Sülzhayn) there are special rooms near the W.C.s for cleansing the spitcups with a steam jet. In some sanatoria no special disinfection is attempted, the sputa being merely washed down the W.C. This is not a good plan. Bedpans and chamber utensils may also be cleansed with a steam jet.

Linen used by a patient should be disinfected by steam or by boiling. Some sanatoria have steam laundries of their own. It has been suggested to me by Sir J. Crichton-Browne that the drying-rooms might usefully be made with blue-glass roofs, through which the chemical rays of the sun would penetrate. Covers to furniture and similar articles should undergo regular disinfection. The rooms and corridors should be daily cleaned by means of damp cloths, which could afterwards be boiled. The ordinary methods of broom and duster are not permissible, as they merely distribute the dust through the air. It is usual on the departure of a patient to disinfect the room he has occupied. The walls, if covered with ordinary paper, may be rubbed down with bread, which is afterwards burnt. Dr. Bowditch at Sharon Sanitarium has the paper stripped and replaced. Colour-washed walls may be rewashed. It is best, however, to have the wall surface of washable materials which can be cleaned with soap and water. In France and in some parts of Germany it is usual to employ a spray (such as Geneste and Herscher's) with solution of corrosive sublimate (1 in 1,000). To be efficacious this must be freely applied, as organic matter reduces the mercurial salt. Another useful disinfectant which may

[1] Schill and Fischer, *Mitth. a. d. K. Gesundheitsamt*, Bd. ii., 1884, p. 133.

sometimes be used is 1 per cent. chlorinated lime solution. In some sanatoria formalin vapours are employed. In this case the surfaces to be disinfected must be previously moistened. Soap and water have been found quite sufficient for the disinfection of rooms in our own consumption hospitals and in some of the foreign sanatoria. Bedding of all kinds should be steam disinfected after a patient leaves the building. No precautions are usually taken concerning the sewage or bedroom slops in sanatoria of this kind. Every patient is instructed for his own sake not to swallow the sputa; and grave cases are not usually admitted. Still it appears that tubercle bacilli may be often present in the urine, even without tuberculosis of the renal organs. There is no certain evidence as to the fate of the tubercle bacilli in sewage. So long as they remain moist there would be no danger, and their vitality would probably be exhausted before they could do any harm. Where the dry-earth system is adopted the product may with advantage be mixed with chloride of lime, which does not interfere with nitrification and the production of humus. Most other disinfectants should for this purpose be avoided. The place which is used for disposal of excreta should be protected against wind. Water-borne sewage should be passed through a septic tank.

The reasons in favour of one or other method of sewage disposal are not altered by the fact of a sanatorium being inhabited by consumptives. In some places the water-carriage system would be best; in others dry systems are preferable. In country places the water-carriage system would require a larger area of land; but the waste water from kitchens, etc., would in any case be applied to the land in some way.

Spoons and forks should be cleaned with boiling water or steam; they may be dried in a hot-air steriliser. Knives and forks are best made entirely of metal each in one piece. In a large establishment cups and saucers, plates and dishes, as well as the above, could be dried in the hot-air steriliser.

A relatively large supply of table utensils will be needed, so that there may be time to sterilise each set.

CHAPTER XIV.

THE RESULTS OF SANATORIUM TREATMENT.

THE statistics which have been published concerning the results of treatment in sanatoria for consumptives are in one sense eminently satisfactory, as they show a very large proportion of apparent recoveries. It must, however, be remembered that such statistics are often misleading, owing to want of uniformity in the patients received, in the methods of treatment, and in the assessment of results. Some sanatoria accept consumptives in all stages, and only exclude the obviously dying. Most, however, only receive such as are deemed likely to be benefited; and the standard will necessarily vary according to the views of the medical officers.

At Reiboldsgrün, patients are dismissed after a fortnight if they have not by then shown signs of improvement. Such a rule would exclude many who eventually recover in our sanatoria; for time is needed to turn the tide of disease, and improvement often only begins after several weeks or months. The results will also depend on the social class and antecedents of the patients. In America it is stated that the poor apply in an earlier and more curable stage than their wealthier brethren; probably in England the reverse is true. The wealthy classes, however, are apt to waste valuable time in trying sea voyages or haphazard treatment at home, or else go to a foreign sanatorium or health resort. Comparing those equally affected, one would expect more striking improvement in the poor than in the rich, because for the poor there is a greater difference between home conditions and those in the sanatorium, and the worst cases still gravitate to the infirmaries. Solly believes that his statistics prove that the intelligent and well-educated improve more readily than the ignorant or careless; which is extremely probable.

In the next place, the treatment at sanatoria, being made up of a number of separate factors, necessarily varies in different establishments, greater prominence being given to individual factors in one place than in another.

In Germany hydropathy is much resorted to; in some American sanatoria it is not used at all. In some places patients take exercise even if they are slightly feverish; in others they are kept at absolute rest not only in case of fever, but for a variety of other reasons. In some sanatoria patients are carefully kept under medical supervision; whereas in others much more liberty is allowed, which is not always wisely used. Treatment again is more difficult and less satisfactory in places receiving a mixed class—asthmatics, bronchitic subjects, and those with heart disease—as well as consumptives. Sanatorium treatment is further complicated by questions of climate and altitude, which of themselves are already sufficiently complex. The duration of treatment is also most variable: in some cases averaging two or three months or less, whilst in others it lasts for eight or nine months or more.

Finally, the personal equation is again involved in the statement of results, which are differently classified in different places, while the true results can only be obtained by special inquiries instituted some time after the departure of the patient. Satisfactory statistics can only be obtained from detailed reports of large numbers of patients. A very complete system of classification has been adopted by the Hanseatic Sickness and Old Age Insurance Co., in which the results are classified mainly under three heads, according to the local signs, the general condition, and the capacity for work. The tables are too elaborate to reproduce in detail; but they are most valuable for reference and comparison. Another classification which has been widely adopted abroad is that of Dr. Turban of Davos.

It is to be hoped that some such system will be universally adopted in all chest hospitals and sanatoria. The German law of compulsory insurance against sickness has led to the almost universal employment of sanatoria for consumption in Germany. The insurance companies concerned found that it cost less to pay for the treatment of their policy holders in sanatoria than to pay the sickness allowance without such treatment; and being permitted by law to establish sanatoria of their own, have in many instances found it to their advantage to do so. It has been stated in some

quarters that less money was now being spent in Germany in founding sanatoria than a year or two ago; and the erroneous conclusion has been drawn that sanatoria were after all not found to be successful. The fact, however, is that the insurance companies having a sufficient number of beds in sanatoria for their needs, are going on to fill up other gaps in the programme, by relieving and maintaining the families of patients under treatment, by instituting health colonies and suburban gardens, by providing asylums for those in advanced stages of consumption, etc. It is abundantly clear that sanatorium treatment is successful in restoring a majority of early cases to health and working capacity, and that notwithstanding the often unsatisfactory conditions of life at home or at work, many of these cases retain their health. Manasse[1] has published the results of 5,032 patients from 1876 to 1884 inclusive, at the Brehmer Sanatorium at Görbersdorf (see p. 251).

Stage of the Disease.	No. Per Cent.	Cured. Per Cent.	Nearly Cured. Per Cent.	Total Improvement. Per Cent.
I.	1390=27·6	387=27·8	430=31	817=58·8
II.	2225=44·2	152= 6·8	325=14·6	477=21·4
III.	1417=28·2	12= 0·8	33= 2·3	45= 3·1
	5032	551=11	788=15·6	1339=26·6

Solly[2] discusses the statistics from various parts of the world, and concludes that the percentage of improvement is as follows:—

	All Stages.	First Stage.	Second and Third Stages.
Lowland Climates	58	71	28
Sanatoria	63	95	58
Highland Climate	76	89	63

As the statistics of sanatorium cases were exclusively from those in non-Alpine climates, this is striking testimony to the value of sanatorium treatment. Generally speaking, one may say that from one-fourth to one-third of the patients treated in sanatoria are practically cured, or a still greater proportion if they are treated in

[1] *Die Heilung der Lungentub. in Anstalten, etc.*, Berlin, 1891.
[2] *Medical Climatology*, London, 1897.

an early stage. Probably systematic and prolonged treatment from an early stage would restore to health from one-half to two-thirds of our consumptive patients, even without the advantages of an Alpine or other high altitude station. Unfortunately, it is quite out of the question to expect patients to submit to more than a few month's treatment in a sanatorium, so that we must trust to the educational influence of the sanatorium to complete the recovery of those treated in it. Improvement frequently, perhaps usually, continues after the patients have left the sanatorium, if only the conditions of life are fairly satisfactory.

CHAPTER XV.

OBJECTIONS ANSWERED.

TREATMENT of consumptives in sanatoria might conceivably be opposed on sentimental, ethical, or medical grounds. It is sometimes said that such treatment must be sad for the patients, as well as for those who see them, and that the deprivation of all the delights of home life must render them unhappy. But there is not really much force in these objections. I can testify that, as Léon Petit and others have also remarked, the patients at these sanatoria seem to be by no means unhappy, but rather rejoice in the greater comfort and more steady progress towards recovery which are possible in such establishments. Much time and trouble are expended by the medical officers and others to keep the patients free from *ennui*; and enough is going on as a rule to make this an easier task than would perhaps be imagined. The average patient in a sanatorium sees more of what is going on than a patient in bed in apartments. As for deprivation of home comforts, this depends largely upon the particular institution. In some sanatoria, where a very strict rule is observed respecting visitors and companions, and where the manners and customs are foreign, an English patient might very possibly feel the loss of home comforts; but this is certainly not, and need not be, the case everywhere. At Reiboldsgrün a special house has been built in the sanatorium grounds for the reception of friends and relatives of patients, and for convalescents who wish to revisit the place. In this, or some similar way, there should be no difficulty in the patient keeping in touch with his relatives and friends, provided always that these are discreet and do not interfere with the treatment. Aggregation of patients there must be to a certain extent, in order to obtain the benefits of co-operation; but isolation

is seldom required—far less than during the course of other febrile complaints, as the isolation (so far as it is needed) is for the sake of the patient rather than in order to prevent infection, which is with reasonable precautions quite unlikely to happen. As a matter of fact, life in a properly managed sanatorium is far more pleasant than in an ordinary health resort for consumptives, where all kinds of cases and all stages of phthisis are received, and medical supervision is necessarily less effective.

It might be argued that the establishment of sanatoria for consumptives damages the prospects of the ordinary medical adviser. I have never yet heard so selfish and short-sighted an argument; for the medical profession is ever ready to take a wide and enlightened view of whatever concerns the good of its patients, and (as the achievements in sanitary matters amply testify) often promotes measures which are intended to prevent disease. As a matter of fact, sanatoria not merely benefit consumptives, but also benefit their family advisers, inasmuch as the patients' lives are prolonged, while medical and hygienic advice will be needed for some time after leaving the sanatorium. Treatment in such an establishment is of strictly limited duration; and is intended, not to cure the patient during the time of his stay—for this is often impossible—but rather to put him on the road to recovery. The good obtained in the sanatorium is often very striking; but the promise of future improvement is even more important. It is only where a patient would have to go to an utterly unsuitable neighbourhood or mode of life that the period of treatment would have to be considerably prolonged; and in this case a kind of hygienic colony would best meet the difficulty. In any case, the treatment at a sanatorium will only continue until the patient can safely go home with a prospect of further improvement.

There are no purely medical arguments against sanatorium treatment which will bear examination. The danger of infection is far greater in an open health resort. The experience of chest hospitals and sanatoria, both here and abroad, shows that there is absolutely no danger if simple precautions are observed. At the Brompton Hospital careful inquiries, extending over a period of thirty-seven years, were made by the late Dr. Cotton and Dr. Theodore Williams as to possible infection from patients. The old building was very badly ventilated; but although the foul air from

phthisical patients produced attacks of sore throat and erysipelas, it did not lead to spread of tuberculous disease amongst the healthy attendants. None of the resident medical officers, matrons, gallery maids, porters or secretaries and clerks became phthisical, although most of these were brought into frequent contact with the patients. Out of about 150 house physicians only one appeared to have contracted the disease in hospital; out of 101 nurses three died of consumption after leaving the institution, but in only one did the disease show itself while in hospital. Of twenty-two dispensers three died of phthisis, one while in the building: and two of the dispensers held office for twenty years.[1] Similar investigations by Heron at the City of London Hospital for Diseases of the Chest also failed to prove infection among the attendants.[2] No case has ever been reported from any modern chest hospital which takes even elementary precautions concerning the sputa. Aufrecht states that at the hospital of Magdeburg-Altstadt 34,560 patients were received during a period of seventeen and a quarter years, of whom 3,820 were phthisical, mostly in an advanced stage; but none of the other patients, and none of the large nursing staff, became consumptive. Two tabetic patients and four with multiple sclerosis remained from three to eight years side by side with consumptives, and another with adherent pericardium became intimate with his phthisical neighbour, without any becoming infected.[3] At the meeting of the American Climatological Association, in May, 1896, Dr. V. Y. Bowditch, of Boston, said: "I wish to refute the statements that properly regulated consumptives' hospitals are a source of danger to the community, when I believe them to be exactly the opposite, as shown by statistics". This opinion will be accepted by all practical physicians; but in view of the scare which appears to be arising among certain sections of the laity the matter needs to be called attention to.

Dr. I. H. Hance, assistant to Dr. Trudeau at the Adirondack Cottage Sanitarium, proved by the inoculation of guinea pigs that sixteen out of seventeen cottages inhabited there by consumptives

[1] See Pollock, *Practitioner*, June, 1898; Wilson Fox, *Diseases of the Lungs and Pleura*, London, 1891.

[2] *Lancet*, 6th Jan., 1894.

[3] *Zur Verhütung und Heilung der chronischen Lungentuberkulose*, Vienna, 1898, quoted by Römpler, *Deutsche Medizinal Zeitung*, 1898, No. 35.

for so long a period as ten years were absolutely free from infectious material. In the exceptional cottage the patient had disobeyed instructions and expectorated wherever convenient. In a further investigation Dr. Hance took dust from tenement houses containing consumptives. Where instructions had been followed no guinea pigs suffered ; while in the dirtier tenements two out of three were found infected. In street cars one out of every five were found to be dangerous. In the two hospitals, Bellevue and Charity, no infectious dust was discovered, excepting in the out-patient room at Bellevue. In the Winyah Sanitarium none was found.[1]

Römpler investigated the mortality from consumption from 1790 to 1889 in the village of Görbersdorf, which is close to several large sanatoria, with an aggregate of 500 to 600 beds. Before the establishment of the oldest sanatorium the deaths from consumption in the village were at the rate of 0·83 per annum ; whereas since that time the rate was 0·47 ; and yet the population had doubled in twenty-five years, and in forty years some 25,000 consumptives had been treated in the different sanatoria.[2] Nahm, who made similar investigations in the village of Falkenstein, obtained corresponding results. During the twenty years preceding the establishment of Dettweiler's institution an average of 4 per 1,000 of the inhabitants died annually of consumption. After the sanatorium was opened the average annual mortality from this disease fell to 2·4 per 1,000.[3] Dr. Römpler had had five servants for twenty-three years at his large sanatorium, and seven more than five years, out of twenty-three in his staff at the time of writing ; not one of these twenty-three were consumptive, nor any whom he could trace who had been in his employ, although they necessarily came freely into contact with the patients.[4] The late Dr. Achtermann, for many years connected with the Brehmer Sanatorium, stated that he was for years in the habit of testing by inoculation the dust from the corridors, saloons, W.C.s, and patients' rooms. Only once did he find evidence of the existence of tubercle bacilli, on a washing board where a spitcup had stood.[5] Ransome states that sputum, which retained its viru-

[1] *N. Y. Med. Rec.*, 28th Dec., 1895.

[2] *Beiträge zur Lehre von der chronischen Lungenschwindsucht*, Berlin, 1892. See also Knopf, *loc. cit.*

[3] *Münch. Med. Wochenschr.*, 1895, No 40.

[4] *Deutsche Medizinal Zeitung*, 1898, No. 35.

[5] Prospectus of Laubbach Sanatorium.

lence for several months in a poor cottage in Ancoats, entirely lost its power of communicating the disease to guinea pigs by inoculation when freely exposed to the air and light in a consumption hospital, and in a well-lighted, well-ventilated, and well-drained house.[1] Moreover, in another series of experiments, sputa as well as pure cultivations lost their power for evil on exposure to air and light for two days, or to bright sunshine for one hour.[2]

Even in open health resorts there is very little danger of infection excepting in crowded towns and cities, or where ordinary hygienic precautions are neglected. It is true that at the Riviera the deaths from consumption amongst the native inhabitants are said to have increased; but this is not quite certain, and is in any case capable of explanation in other ways. It is quite possible that the hotter climate may encourage the saprophytic existence of the tubercle bacillus. But the conditions of life in a densely crowded town are very different from those in a scattered village; and if the facts are correct, they point to the need of more reasonable methods of building, better ventilation, and less overcrowding, together with more systematic precautions concerning cleanliness, disposal of the sputa, and the like. Consumptives should not live in towns, or if compelled to do so should inhabit dry and well-ventilated rooms. If they do so, and refrain from random spitting and other uncleanly ways, they will never be a serious danger to their companions. Ransome states[3] that he has never seen a case of infection in an ordinarily well-ventilated house, and gross neglect of ordinary rules would probably be needful to cause tuberculous infection in such a house. Haupt made a careful investigation at Soden, and found that there were fifty-two people between seventy and ninety years old who had lived in thirty-one different houses which they let out in summer to consumptives. Half of them also waited on the invalids, but none became phthisical. Michaelis has practised over thirty years in Bad Rehburg. This bathing resort has existed for over fifty years, and is annually visited by about 500 consumptives. There are at present about 350 inhabitants in sixty-five to seventy houses; and only three consumptives were found amongst them

[1] Ransome, *The Treatment of Phthisis*, London, 1896, p. 37; Ransome and Dreschfeld, *Proc. R. Soc.*, xlix., 66.

[2] Ransome, *ibid.*; Ransome and Delépine, *Proc. R. Soc.*, lvi., May, 1894.

[3] Ransome, *ibid*, London, 1896.

who had been born there, while these had acquired the disease elsewhere.[1] Even amongst married couples, where one is phthisical it is exceptional to find the other affected. Leudet found only seven out of 112 such cases, and Haupt only 7 per cent. out of 1,061 married couples.[2]

It is perfectly certain that under ordinary hygienic conditions the danger of infection from a phthisical patient is purely imaginary. But this should not blind us to the very real danger which exists where hygienic rules are disregarded, and this is in fact a strong argument in favour of hygienic training of consumptives in a sanatorium.

It may be argued that since many patients recover from consumption without being treated in a sanatorium, this is unnecessary. It is perfectly true that such recoveries take place, but they can only be expected in selected cases; and as Prof. v. Ziemssen has said: "The possibility of treatment outside a sanatorium with equally good results cannot be denied, but it requires much more prolonged rest, and much more time on the part of the physician, and has by no means so certain a result".[3]

It is a financial impossibility to provide one or two patients at home at reasonable cost with the systematic treatment they would obtain in sanatoria, and although patients may be able occasionally to do without these aids to recovery, there are stages and forms of the disease in which it would be most unwise to discard them, if they could be found within a reasonable distance from home. Even ordinary treatment at home, if properly carried out, is more expensive than is usually realised; and this is without any special shelters or conveniences for exercise in the open air; often without skilled nursing in case of feverish attacks, night sweats, or sudden hæmoptysis; and without systematic training or graduated exercise, which indeed can scarcely be carried out under the circumstances. Once it is admitted that these measures are of value in restoring the consumptive to health—and this can scarcely be disputed—it follows that special institutions are needed to put them within the reach of those who cannot afford a special establishment of their own.

[1] *Monats. f. prakt. Balneol.*, 1897, No. 1; quoted by Unterberger, *St. Pet. M. Woch.*, 1897, n. F. xiv., No. 29.

[2] Unterberger, *loc. cit.*

[3] *Ueber den gegenwärtigen Stand der Behandlung Tuberculöser*, Berlin, 1897, pp. 22, 23.

PART II.

DESCRIPTIVE.

Section I.—AMERICA, UNITED STATES.

CHAPTER XVI.

AMERICA—UNITED STATES.

State and Name.	Locality.	Beds.	Director or Matron.
Alabama—			
Hygeia	Citronelle	65	Dr. J. G. Michael
Convict Camp	—	—	—
Arizona—			
Mercy Hospital	Phoenix	—	—
Hospital and Sanitarium of the Sisters of Mercy	Tucson	—	—
California—			
Dr. Barlow's Sanitarium	Los Angeles	—	Dr. W. J. Barlow
Idylwild Sanitarium	,,	51+	Dr. Walter Lindley
Esperanza Sanitarium	Altadena	—	Dr. F. C Melton
Mr. Nelson's Ranch	Indio	—	Mr. N. O. Nelson
Pottenger Sanitarium	Monrovia	46	Dr. F. M. Pottenger
Trinity Settlement	Redlands	—	—
Ballard Pulm. Sanitarium	Pasadena	25	Dr. W. H. Ballard
Colorado—			
Glockner Sanitarium	Colorado Springs	80	Sisters of Charity
Home for Consumptives	Denver	150	Rev. F. W. Oakes
Colorado Sanitarium	Boulder	200	Dr. H. F. Rand
Nordrach Ranch	Colorado Springs	50	Dr. J. E. White
Nat. Jewish Hospital for Consumptives	Denver	90	Dr. Moses Collins
Y.M.C.A. Health Farm	,,	—	—
Agnes Memorial Sanit.	,,	150	G. W. Holden, Sec.
Resthaven	,,	50	Dr. I. S. Garthwaite, Pres.
Foxhall	,,	—	Dr. W. N. Beggs
Colorado Tent Colony	Bennett	100	Dr. W. K. Robinson
Mrs. Lare's Sanitarium	Denver	—	Mrs. Lare
Rocky Mt. Industrial San.	Wellington Lake, Denver	—	Dr. A. M. Holmes; being built
Ballard Sanitarium	Pueblo	40	Mrs. L. B. Wright
Connecticut—			
Wallingford Sanitarium	Wallingford	—	—
New Canaan Pulm. San.	New Canaan	30	Dr. M. J. Brooks
State Hospital for Cons.	Hartford	—	—

State and Name.	Locality.	Beds.	Director or Matron.
DELAWARE—			
State Hosp. for the Insane	Farnhurst	—	Dr. W. H. Hancker
State Sanitarium	—	—	Projected (*Brit. Med. J.*, 31st Jan., 1903).
FLORIDA—			
Tuberculosis Camp	Pensacola	—	Experimental
ILLINOIS—			
Alexian Bros. Hospital	Chicago	—	A general hospital
St. Ann's Sanitarium	,,	125[1]	Dr. A. F. Kramps
Chicago San. for Tuberc.	—	—	Dr. J. A. Robison
Cook County Hospital for Consumptives	Dunning	380	—
Illinois Camp for Tuberc.	Ottawa	—	Dr. J. W. Pettit
State Sanitarium	—	—	Projected
St. Elizabeth's Hospital	Chicago	400	Being constructed
INDIANA—			
St. Rochus' Hospital for Consumptives.	Fort Wayne	—	—
Flower Mission Pavilion, City Hospital	Indianapolis	—	—
A Private Sanitarium	New Albany	—	—
State Sanitarium	—	—	Projected
IOWA—			
Boulder Lodge Sanit.	Fort Dodge	20	Dr. J. W. Kime
LOUISIANA—			
Dr. Tolson's Sanitarium	Covington	16	Dr. G. R. Tolson
State Sanitarium	—	—	Projected
MAINE—			
Oxford Sanitarium	Hebron	—	—
State Sanitarium	—	—	Projected
MARYLAND—			
Maryland Hosp. for Cons.	Towson	—	—
Eudowood Sanitarium	Blue Ridges Mts.	31	Dr. F. R. Rich
Bay View Asylum Hosp.	Baltimore	250	Dr. W. H. Smith
MASSACHUSETTS—			
Almshouse Hosp. (Long Island)	Boston	—	For advanced pauper cases
Channing Home	,,	17	Miss E. P. Fennel, Supt.
House of the Good Samaritan	,,	28	Mrs. F. A. Jack, Supt.
Cullis Home for Cons.	Dorchester	44	Rev. E. D. Mallony, Sec.
Corney Hospital	Boston	—	Special wards for consumptives
Free Home for Cons.	Dorchester	125 (30)	Jeanette Campbell, Supt.
Sharon Sanitarium	Sharon	21	Dr. V. Y. Bowditch
Millet Sanitarium	E. Bridgewater	20	Dr. C. S. Millet (full price)
Mass. State Sanitarium	Rutland	250	Dr. W. J. Barclay, Supt.
Dr. Butler's Sanitarium	,,	80	Dr. D. P. Butler
State Hospital	Tewkesbury	1,500	Dr. J. H. Nichols, Supt. (special wards)
Holy Ghost Hosp. for Inc.	Cambridge	75	Sister A. M. Purcell
Open Air Colony	Plymouth	—	See *Med. News*, 7th Dec., 1901
MICHIGAN—			
County Hospital	Eloise	—	—
State Hospital	—	—	Projected
MINNESOTA—			
Luther Hospital	St. Paul	100	Dr. H. G. Steeb

[1] According to *Tuberculosis*, Oct., 1903, there are 300 beds; it was opened May, 1903, and cost $175,000.

State and Name.	Locality.	Beds.	Director or Matron.
MINNESOTA (*cont.*)—			
State Sanit. for Cons.	Walker, Cass. Co.	—	—
Wards for Tuberculous Prisoners	Minneapolis	—	—
MISSISSIPPI—			
Hosp. for Tuberc. Insane	Jackson	—	Dr. T. J. Mitchell, Supt.
MISSOURI—			
Mt. St. Rose Hospital	St. Louis	100	Dr. Wm. Porter (for the tuberculous insane)
NEW HAMPSHIRE—			
Pembroke San. for Cons.	Pembroke	35	Dr. H. T. Fontaine
White Mtn. Tuberc. San.	N. Conway	50	Dr. S. D. Snow
NEW JERSEY—			
Memorial Hospital	Orange	85	Mary I. Chambers, Supt.
State Sanitarium	Glen Gardner	—	—
NEW MEXICO—			
St. Joseph's Sanitarium	Albuquerque	100	Sisters of Charity
Chico Springs Sanit.	Chico Springs	25	Dr. H. B. Masten
St. Anthony's Sanit.	E. Las Vegas	32	Sisters of Charity (R. C.)
St. Vincent's Sanitarium	Santa Fé	28	,,
Sun Mount Tent City	,,	—	Dr. W. M. Popplewell
St. Joseph Sanitarium	Silver City	—	—
Pines Cottages	,,	—	T. S. Parker, Propr.
General Hosp. for Soldiers	Fort Bayard	300	Lieut.-Col. E. T. Comegys
U.S. Marine Hosp. San.	Fort Stanton	105	—
Las Vegas Sanitarium	Las Vegas	350	Dr. Bailey
NEW YORK—			
Adirondack Cottage San.	Saranac Lake	100	Dr. E. L. Trudeau
Loomis Sanitarium	Liberty	100	Dr. H. M. King
,, Hosp. and Disp.	New York City	20	Dr. Quimby
Montefiore Country San.	Bedford	160	Dr. L. Rosenberg
,, Home	New York City	102	Dr. Wachsmann
Gabriels Sanitarium	Gabriels	100	Sister Mary of Mercy
Stony Wold Sanitarium	Lake Kushaqua	—	Dr. J. E. Newcomb (for working girls)
The Edgemont	Liberty	—	—
State Hosp. for Incipient Tuberculosis	Raybrook	200	Dr. J. H. Pryor
Pasteur Sanitarium	Suffern	30	Dr. Gibier
Buffalo State Hospital	Buffalo	1,630	Dr. A. W. Hurd
Erie County Hospital	,,	400	Dr. E. J. Gilray
De Peyster Hospital	Verbank	40	Deaconesses (for children)
Seton Hospital	Spuyton Duyvil	250	Dr. B. B. Steedly
St. Joseph's Hospital for Consumptives	New York City	350	Dr. C. M. Cauldwell
St. Luke's Hospital	,,	62	A general hospital
St. Catherine's Hospital	,,	—	,,
House of Rest for Cons.	,,	30	George Sauer, Supt.
Home for Incurables	,,	275	Dr. Israel C. Jones
King's County Hospital Infirmary	,,	50	—
Riverside Sanitarium	North Brother Isl.	440	Dr. G. L. Nichols
Lincoln Hosp. and Home	New York City	40	Amzi Lake, Supt.
Manhattan State Hosp., East	Ward's Island	40	Dr. A. E. Macdonald
Phthisis Infirmary	Blackwell's Island	—	Advanced cases
Seaside Tent Sanitarium	Seabreeze	—	For children
County Hospital	Yonkers	—	—
Brooklyn Home for Cons.	Brooklyn	120	Dr. E. Reynolds
St. Peter's Hospital	,,	—	A general hospital

State and Name.	Locality.	Beds.	Director or Matron.
NEW YORK (*cont.*)—			
Wards for Prisoners State Hospital	Dannemora	—	Dr. J. B. Ransom
NORTH CAROLINA—			
Winyah Sanitarium	Asheville	70	Dr. Karl von Ruck
Asheville Sanitarium	,,	75	Dr. S. W. Battle and Dr. Ross
Southern Pines Sanat.	Southern Pines	30	Dr. Edwin Gladmon
Pineshire Sanitarium	,,	25	Dr. L. F. High
Franklin Humanitarian Home	Black Mountain	—	—
St. Joseph's Sanitarium	Asheville	—	Sisters of Mercy
The Pigbone Sanitarium	—	—	For coloured consumptives
NORTH DAKOTA—			
Oak Park Sanitarium	Minot	25	Dr. V. Mohn
OHIO—			
Cincinnati Br. Hosp. for Consumptives	Cincinnati	—	—
Munic. Tuberc. Sanat.	Cleveland	75	F. C. Emde, Supt.
Miami Valley Hospital	Dayton	180	Ella P. Crandall, Supt.
OREGON—			
State Sanitarium	—	—	Projected
PENNSYLVANIA—			
Lakewood Sanitarium	Scranton	—	—
W. Mountain Cons. Hosp.	,,	—	—
S. Mountain Camp Sanat.	Mt. Alto	—	—
Bide-awhile Sanitarium	Perkiomenville	—	—
Sunny Rest Sanitarium	White Haven	25	Drs. Flick, Walsh and Stanton
White Haven Sanitarium	,,	125	Drs. Shoemaker and Heller
Kane Summit Hospital	Kane	50	Dr. Mary J. Hayes
Chestnut Hill Hospital	Philadelphia	65	Drs. Angney and Bacon
House of Mercy	,,	12	Rev. H. L. Duhring, Supt.
Philadelphia Hospital	,,	—	A general hospital
Rush Hospital for Cons.	,,	60	Eliz. M. Brophy, Supt.
Henry Phipps Institute	,,	52	Dr. L. F. Flick
Nott Home of Jewish Hosp.	,,	—	—
RHODE ISLAND—			
St. Joseph's Hospital	Providence	200	Sisters of Mercy
Pine Ridge Camp for Consumptives	Foster	—	—
State Sanitarium	Burrillsville	—	—
State Hospital	Howard	—	Being built
SOUTH CAROLINA—			
Aiken Cottage Sanit.	Aiken	15	Dr. C. F. McGahan
TEXAS—			
Camp Reliance	Comfort	—	—
Agric. Colony for Tuberc. Prisoners	Huntsville	—	—
White Gables Sanitarium	Boerne	25	Dr. A. H. Davidson
Dr. L. W. Cook's Sanit.	,,	—	Dr. L. W. Cook
Brigg's Sanitarium	Dallas	60	Dr. J. R. Briggs
VERMONT—			
Champlain Sanitarium	South Hero	18	Dr. H. E. Lewis
WASHINGTON—			
King's County Hospital	Seattle	—	—
WISCONSIN—			
Evergreen Park Cottage Sanitarium	Lake Nebagamon	—	Dr. W. B. Hopkins

Great activity has been shown in the United States during the last few years in the erection of sanatoria and other special institutions for consumptives, as well as in general preventive legislation.

For the appended list of sanatoria, etc., I am largely indebted to Dr. S. A. Knopf.

Sanatoria for the tuberculous insane exist in Delaware, Mississippi, and New York; an agricultural colony for tuberculous prisoners in Texas. Special wards for the same in Minnesota, Dannemora (New York). Tuberculosis camps have been started in several states, *e.g.*, Massachusetts, Pennsylvania, New York. There are dispensaries and clinics for pulmonary tuberculosis in the following States:—

Connecticut: New Haven Dispensary. Massachusetts: Boston Dispensary (Bennet and Ash Stations) and the City Hospital, Worcester. Minnesota: Hamline University Free Dispensary. Minneapolis: State University Free Dispensary. New York: Gouverneur Hospital Dispensary; Clinic of the Health Department; Vanderbilt Clinic and Bellevue Hospital; New York Postgraduate Hospital Dispensary. Pennsylvania: Tuberculosis Dispensary of the Scranton Soc. Prev. Cons.; Henry Phipps Institute Dispensary (Phila.). Rhode Island: Out Patient Department of the Rhode Island Hospital (Providence).

Over thirty societies for the prevention and cure of tuberculosis are in existence: the most important being the National Association for the Study and Prevention of Tuberculosis (Sec. Dr. H. Barton Jacobs, 11 Mount Vernon Place, Baltimore).

Treatment in American Sanatoria.

The methods of treatment appear to be more elastic in American sanatoria than in Germany, more being left to the patient's own judgment. At the Adirondack and Loomis Sanatoria there are three *meals* a day. At the Glockner, in addition to the above they give "milk, meat-juice and eggs as requested between meals". At the Las Vegas, in addition to three chief meals, an early breakfast and two lunches (at 11 A.M. and 4 P.M.) are provided.

For *disinfection* of linen, steam is usual: at the Montefiore home dry hot air is used. Rooms are mostly disinfected with formaline vapour. At the Adirondack, soap and water are depended upon.

Sputa are usually received into paper cuspidores and afterwards burnt; at the Hygeia, the enamelled spitcups are cleansed with perchloride solution, and the use of ordinary handkerchiefs prohibited. At the Home (Denver) the cuspidores are said to be cleansed four or five times daily with perchloride solution. At the Las Vegas Sanitarium a more elaborate process is adopted (see p. 88).

CHAPTER XVII.

ALABAMA—COLORADO—CONNECTICUT—FLORIDA.[1]

Alabama.

THE HYGEIA

was founded in 1897 by Dr. A. C. Klebs, son of Prof. Edwin Klebs, of Chicago, but is now under the management of Dr. J. G. Michael, with a house physician. It is situated one mile from Citronelle, Alabama, a town of about 3,000 inhabitants, free from factories, on the Mobile and Ohio railroad, and has a special station of its own. It is surrounded by rolling pine-clad country, and stands in 260 acres of land, part of which is laid out as a park, with walks and roads, croquet grounds, golf links and tennis court. Shooting and (at a distance) fishing can also be obtained in the neighbourhood.

Climate: Sub-tropical, equable owing to the proximity of the Gulf Stream, yet free from extreme humidity and fogs, and mild in winter without being oppressive. There is usually very little rain, excepting for a short time in January.

The sanatorium, which is only open in winter, is on sandy soil, 110 metres above sea-level, and is sheltered from winds by the extensive pine woods to north, east and west. It consists of three large buildings and five cottages, all of them wooden-frame houses with wide porches, and balconies or verandahs on every floor. The main building, which was built in 1889, consists of a dining-room, parlours and reading-room, the office and a certain number of bedrooms; while an annexe contains the kitchen and pantry, bathrooms and barber's shop. Another building contains a billiard-room and a bowling alley, also a drug store, newspapers, books, etc. There is a separate building for consulting rooms and inhalation-

[1] For Californian Sanatoria see p. 108.

room, with arrangements for inhalation of medicated vapours and compressed air. The bedrooms average 4·6 × 4·6 metres, some at a lower price being 3·6 × 2·4 metres; all are to the south in the cottages, those in the main building having various aspects. The walls are oil-painted or calcimined, the angles being partially rounded, and no prominent decorations being added. The heating is by open fireplaces; the lighting will probably be by electricity, but it is at present by oil.

The sanatorium is intended for consumptives of both sexes in presumably curable stages. Only paying patients are received, but some are admitted at reduced rates into one of the buildings. At the most two patients are allowed to sleep in one room. The average length of treatment is about 130 days, the longest stay having been 240 days. Patients are not advised to leave before three months in any case.

There are three consulting medical officers, including Dr. Edwin Klebs, of Chicago; also a general manager and a staff of three nurses, others being obtained if necessary.

Terms: $15 to $30 per week.

Colorado.

THE AGNES MEMORIAL SANITARIUM

for the poorer middle classes was built with the help of a gift of $500,000 from Mr. L. C. Phipps, of Denver, nephew of Mr. Henry Phipps. Land was acquired (160 acres) on which buildings were erected for 150 patients of both sexes, including a three-story administration block, and two-story sleeping pavilions. *Charges:* $7 a week, the deficiency being met by an endowment.

THE COLORADO SANITARIUM

is a branch of the Battle Creek Sanitarium in Michigan, founded in 1893 on the western outskirts of Boulder, twenty-nine miles northwest of Denver, on a branch of the Union Pacific Railway. Boulder is an incorporated city of 8,000 inhabitants, without any factories, and is the seat of the University of Colorado. It is placed at the entrance of three beautiful cañons to the east of the Rocky Mountains, 1,615 metres, above sea-level, being also protected by mountain spurs to the north. It enjoys a very fine *climate* through-

out the year, having about 340 sunny days, a cool and pleasant summer, with the temperature of the North American lakes, and a mild and genial winter. The air is exceedingly dry and bracing.

The sanatorium stands about sixty metres above the city, close to the foothills of the Rocky Mountains, and overlooks to the east and south a land of fertile prairies which grow corn and fruits in great variety. The city of Denver can just be seen from its upper floors, as well as a number of small towns and villages in the distance. To the west of the sanatorium are the snow-clad peaks of the Rockies. The prevailing winds are from the west, and no towns or villages of any size exist on this side for 300 miles. In some parts of Colorado the wind is sometimes unpleasantly strong, but at the Boulder Sanitarium strong winds are not common, and come chiefly in early spring and late autumn. The soil of the district is of sandy loam and clay. *Grounds:* Ninety acres, consisting partly of foothills, partly of more level ground, and laid out in drives, walks and paths. There is a lawn in front of the sanatorium with flower-beds, fountains and shady trees.

The building consists of a main structure, with three smaller ones, all brick built, faced with red stone, heated by steam, and supplied with lifts, electric bells and lighting. The main block, which faces east, measures 33 × 20 metres with a large wing in the rear, and has four floors and a few attic rooms. The kitchen and dining-saloon are on the fourth floor, the latter being provided with numerous large windows, with a fine view over the prairies. The three lower floors have large balconies or verandahs, the two lower running the whole length of the building on the east and south sides. The patients' rooms average 14 sq. metres × 3 metres high, and are mostly to the south or east. They are all single-bedded, with independent ventilation, and a separate air shaft to each. In addition to these there are various parlours and common rooms, and two large suites of rooms for treatment, including inhalation rooms, bath and douche rooms for ladies and gentlemen, and a gymnasium. The decorations and furniture are simple and cleansable, with no unnecessary hangings or carpets. The engines and machinery for heating and lighting are in a separate building. The water supply, which is from melted snow, comes in closed pipes for ten or fifteen miles down the mountain side. The sewerage is said to be good.

The institution is conducted by an association, controlled by a board of seven, of which the president is Dr. W. H. Riley, Professor of Diseases of the Mind and Nervous System in the University of Colorado, who was for fifteen years attached to the Battle Creek Sanitarium. With him are three other physicians, and a staff of trained nurses and attendants. The institution is not a money-making concern, and declares no dividends. Those connected with it receive only nominal salaries, or none at all.

Patients with all kinds of ailments are admitted, of both sexes. *Fees:* $13 to $35 per week. Some are received free of charge. The poorer patients lodge in the cottages, where the expenses are lower. Of consumptive patients all stages are admitted so long as there is a reasonable chance of cure; others being advised to return home. The average length of stay is about three months. Treatment is said to be very systematic and includes massage, electricity, Swedish movements, breathing exercises, inhalations of medicated vapours from a nebuliser under compressed air, and hydrotherapy of various kinds. There is systematic instruction in mountain climbing by a trained attendant for those in suitable condition.

Nordrach Ranch,

near Colorado Springs (ca. 1,830 metres above sea-level), was opened in November, 1901, on the south side of Austin Bluffs close to Palmer Park. It consists of a central building of red stone, provided with day rooms, verandahs, patient's bedrooms and the administrative quarters; and of a tent colony with nurse's tent. Each tent is octagonal, with oiled floor and strong frame of wood and iron, and ventilating openings above and below. It is furnished like a room, with the usual bedroom furniture, a closed stove, doors, etc. Fires are built up morning and evening in winter. Three chief meals are provided; also milk and eggs three times a day. Temperatures are taken afternoon and evening; the doctor is consulted if necessary morning and evening. Careful precautions are taken with regard to sputa and the disinfection of the tents, etc. Only early cases are admitted. *Terms:* $50 to $60 per month in tents; $75 to $150 in the rooms. If patients are confined to bed, there is an extra charge of $15 per month; for a special nurse $25 per month.

RESTHAVEN IN THE PINES,

or the Lillian Garthwaite-Wylie memorial, is a home for convalescent young men and women in an early stage of tuberculosis, situated at Sunrise Mountain Park about 1,770 metres above sea-level. It is five miles by stage coach from Morrison on the Colorado and Southern Railroad, and consists of a number of tents and wooden chalets, the latter bearing the names of the States of the donors. Up to the present it has only been open from 1st May to 1st November. The heating is at present by stoves, the lighting by oil lamps. *Terms:* $25 per month, including medical attendance in emergencies. *Applications:* During the season to the Home; at other times to the secretary, 322 Temple Court Buildings, Denver.

THE GLOCKNER SANITARIUM

at Colorado Springs is situated at an altitude of 1,828 metres on a plateau at the northern end of the city, and two miles from its centre, being easily accessible by electric cars. The surrounding country is mountainous to the west and north, with plains to the east and south. The soil consists of gravel and sand, seventy feet thick, lying on a clay bed which slopes to the south. The Rocky Mountains and foothills surround the city on all sides and protect it against wind. The sanatorium, which was specially built for invalids by Mrs. Glockner in memory of her husband, Mr. Albert Glockner, stands in a garden 400 feet square, and has accommodation for about forty patients, consumptives in all stages being admitted as well as other patients. It is managed by sisters of charity and has trained nurses but no regular medical staff, the patients calling in whatever doctor they please. The building is of brick, with a southerly aspect, and is so constructed that every room receives the sun, and every part is readily cleansed. It is said to have every modern convenience and appliance, with porches and covered balconies on every story, some enclosed by glass. It is heated by steam, the assembly rooms and some of the bedrooms being provided with chimneys. The assembly rooms are $16 \times 4{\cdot}8$ metres; the bedrooms averaging $3{\cdot}6 \times 5{\cdot}5$ metres. The place is lighted by electricity. *Fees:* $8 to $15 per week; medical treatment extra.

THE HOME, DENVER, COLORADO,

was founded in 1895 by the Council of the Episcopal Church of Colorado, with the help of subscriptions from wealthy people in

New York and elsewhere. The object was to establish a home for consumptive Christian ladies and gentlemen of limited means, mainly of the professional classes. A reference is required as to character before admission. The sanatorium is chiefly intended for early and presumably curable cases, but every stage is received, and provision is made for nursing those who require it.

The home is under the superintendence of the Rev. F. W. Oakes, with the help of a manager who has had long experience in both hotels and hospitals. There is a Board of Management consisting of the Rev. F. W. Oakes, Dr. Samuel A. Fisk and Rev. David H. Moffat, under the presidency of the Rt. Rev. Dr. Spalding. There is no medical resident, but each patient selects his own medical adviser from Denver or elsewhere.

The home is about ten minutes' ride by cab or tramcar from the post office at Denver on an elevation commanding an extensive view over the city, the Rocky Mountains for about 150 miles and the plains to the east for several hundred miles. An uninterrupted view may be had from the porches of Pike's Peak, Mount Evans and Long's Peak. The sanatorium stands 1,900 metres above sea-level on three or four acres of ground which slope to the south and east. The Rocky Mountains protect it to the west.

There are no trees within 150 metres of the building. The soil is very porous and sandy. The sanatorium consists of four separate buildings (fig. 1), united by a roomy, well-lighted corridor, which itself forms a sort of elongated sitting-room, and the roof of which is used as an open-air lounge. One building (" St. Andrew's House ") is for men ; another (" Grace House ") is for husband and wife, or mother and son ; next in order is the " Emily House " for women ; and next to this " Heartsease," for those in need of nursing. The three former consist of two floors and an attic floor. There are sitting-rooms in every house and covered porches front and back surmounted by large balconies with awnings ; also a music-room ; a library with 2,000 volumes ; a gymnasium with billiard tables, dumb-bells, etc. ; a large dining-saloon ; and an abundance of bath-rooms, lavatories and closets. The place is most luxuriously furnished and decorated with valuable pictures, rich carpets, and all the comforts and conveniences of a well-appointed home. All walls are painted in oil, the angles being square. Floors are all varnished, the rooms are all sunny and of good size, none less than

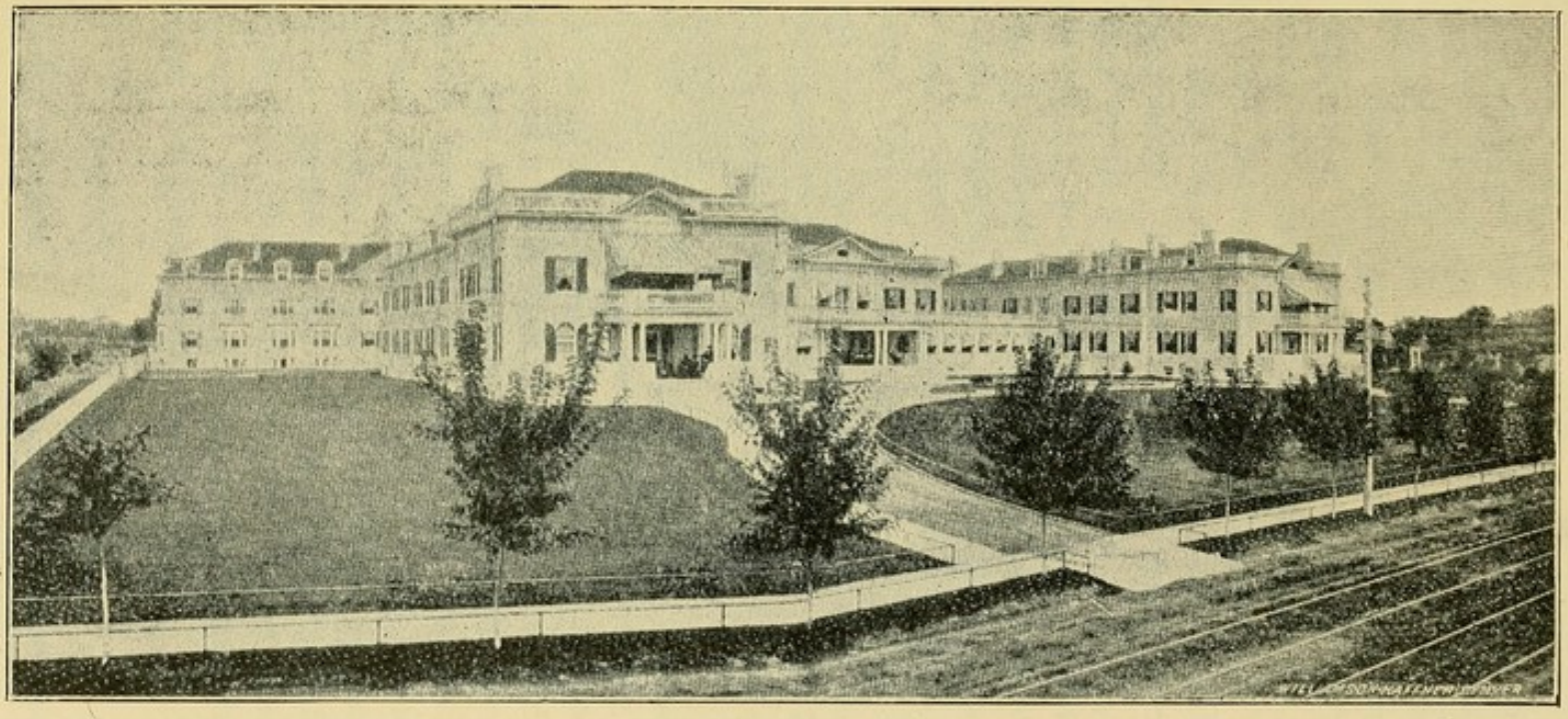


FIG. 1.—THE HOME, DENVER.

[*Face page* 78.

4·2 × 4·5 metres, some are 5·5 × 6·0 and 3·5 high. Every room, including bedrooms, is furnished with a fireplace and chimney, and separated from the next by a brick wall. "Heartsease," which was built in 1897, is connected with the rest of the establishment by a covered corridor with tiled floor. It is a four-story building. The basement, which is partly above ground, contains kitchen, pantry, and servants' quarters; the ground floor has a large and beautiful sitting-room with large bow windows and window seats; a dining-room, diet kitchen, bath-rooms and seven large bedrooms; the upper floors contain more patients' rooms, of which there are twenty-two in all. Every partition consists of a thick brick wall, which is practically sound-proof. Rooms are single bedded, the walls and furniture being of much the same character as in other parts of the establishment. There is a diet kitchen on each floor where light cooking is done by electricity. This kitchen is connected with the main kitchen by a dumb-waiter. Each room has its separate silver service, linen and china, and each floor is in charge of trained nurses, of whom there are one to every six patients, besides the superintendent nurse. Every floor has its own baths, etc., with tile, marble and porcelain fittings. There is a lift to every floor, and a well-stocked drug-room. The whole house is in charge of a skilled and trained nurse matron.

The home is heated by indirect central steam heating, and lighted by electricity. The sanitary arrangements are said to be very good. Ventilation is by the fan system. There are two large fans in the basement forcing fresh air into every room and replacing the air twelve times per hour. Windows are kept open whenever it seems advisable. From the above description it would appear that hygienic treatment is subordinated to comfort and luxury.

The *charges* are $9 to $25 per week, including nursing; medical fees extra. These charges, which only pay about half the expenses, are supplemented by subscriptions. There is one endowed room for a male visitor. A chapel is soon to be built, which will be lighted at night and always kept open.

Industrial Sanitarium.

An association of medical practitioners and others was started in Denver during 1901 to establish this sanatorium in the Rocky Mountains twenty miles from the city. The institution is purely

philanthropic, no dividends being declarable, the net profits being set aside for the improvement of the place. It was started on the "cottage endowment plan," and the labour of patients is as far as possible utilised in developing and maintaining the place.[1]

Y.M.C.A. Health Farm.

This was started in 1902 for persons convalescent from consumption, in co-operation with the Denver National Hospital for Consumptives which is a Jewish non-sectarian institution.[2]

Connecticut.

The New Haven County Sanitarium

at Wallingford, founded 1903, is on the cottage system, with a central administrative building for the office, kitchen, dining-room, etc., and small detached buildings each for three or four patients. It is purely charitable, and no official receives a salary excepting the medical superintendent.

New Canaan Sanitarium

formerly known as the Stamford Pulmonary Sanitarium, and opened in 1897, stands in the open country, about forty miles from New York, on the New York, New Haven and Hartford Railway, in twelve acres of ground, part of which is woodland.

The house is situated upon an elevated ridge facing the south-east, and is built of wood in Dutch colonial style, with three stories and an attic. A spacious verandah surrounds the house on three sides. Patients sleep in single-bedded rooms on either side of the roomy corridors. The place is stated to be completely equipped with hardwood floors, electric light and bells, pure water, porcelain baths, well-equipped laboratory, inhalation rooms, etc. The treatment is stated to be somewhat heroic, lasting twelve weeks. Only early cases as a rule are accepted.

Terms: $25 to $35 per week.

Florida.

An experimental tuberculosis camp was started in 1904 at Pensacola Navy Yard, patients being quartered in tents. Other places were to be tried with the same object, after which an appropriation from the State was to be applied for to erect and maintain an open-air hospital. (*British Med. Jour.*, 23rd Jan., 1904.)

[1] *British Medical Journal*, 25th May, 1901. [2] *Ibid.*, 6th Sept., 1902.

CHAPTER XVIII.

ILLINOIS—INDIANA—MARYLAND—MASSACHUSETTS.

Illinois.

In addition to the institutions mentioned in the table, there is a Rockefeller Institute for medical research. (*Lancet*, 28th Feb., 1903; *Tuberculosis*, March, 1903.)

Indiana.

A State Sanitarium is said to have been founded in 1902, consisting of a number of single-room houses entirely open on one side, with a short strip of canvas as an awning. Tents or open porches were also to be erected for winter time. (*Lancet*, 6th Dec., 1902.)

Maryland.

THE EUDOWOOD SANITARIUM,

in the Blue Ridges Mountains, is connected with the Towson Hospital for Consumptives of Maryland. A small farm has been rented for administration, patients sleeping in tents. Altitude 150 metres. *Terms:* Poor patients are admitted free; there are a few private rooms at $5 to $10 per week.

As a sequel to the Baltimore Tuberculosis Exhibition, Mr. Henry Phipps has given £4,000 to establish a separate out-patient department for tuberculosis at the *Johns Hopkins Hospital*. (*Brit. Med. Jour.*, 12th Mar., 1904; *Zeitsch. f. Tuberk.*, July, 1904.)

Massachusetts.

MASSACHUSETTS STATE SANITARIUM

for consumptives and tuberculous patients, founded in 1898, stands in the open country about one and a half miles from a small village

one hour and three-quarters journey by rail from Boston, and one hour by rail from Worcester. The place is just sufficiently near the coast to have "a suspicion of sea-air" after several days of east wind; but otherwise it has an inland hill climate. The soil is sandy and rocky and contains much mica schist. *Grounds:* 200 acres comprising the greater part of a hill with a southerly aspect and extending eastwards to a lake a mile long, from which comes the water supply. A hill rises to the north-west, behind the institution, about thirty metres higher than that building, which is further sheltered to the north by a grove of pine-trees. Another 130 acres of farmland are to be acquired.

The sanatorium consists of a number of one-story pavilions radiating from the convex side of a semicircular corridor (fig 2). Behind the centre of this is the kitchen block, with servants' dining-room, and in front of it the nurses' dining-room. Behind the kitchen block are the laundry and disinfector, and still farther back the dynamo and engine room. The western pavilions are for men and the eastern for women; and the latter also have separate dining-rooms. The pavilions are alternately long and short, the former having dining-rooms attached to them behind the circular corridor. The part of the pavilion immediately in front of the latter consists on one side of private wards, and on the other of bath-rooms, lavatories and a nurses' room. Then come in succession a large ward for eight beds, a circular ward with from four to six beds, and another ward with eight beds, terminating in a sun-room and a piazza. The shorter pavilions have only one large ward instead of two, and no circular ward. Alternating with the above-mentioned pavilions, but radiating northwards from the circular corridor, are two pavilions on either side, each consisting of small wards, nurses' room, bath-rooms, etc. Some distance in front of the centre of the semicircle is an administrative block with offices and separate kitchen. The nurses sleep in another block at the north-eastern corner of the ground; a corresponding block to the north-west consists of a mortuary, stables and coach-house. The wards have large windows and have an air space of over thirty-four cubic metres per head. Every room has an inlet for warm air and an outlet for foul air, the former being supplied by four fans and engines in the basement. Ventilation is, however, mainly effected by open windows. These are only shut when patients are getting

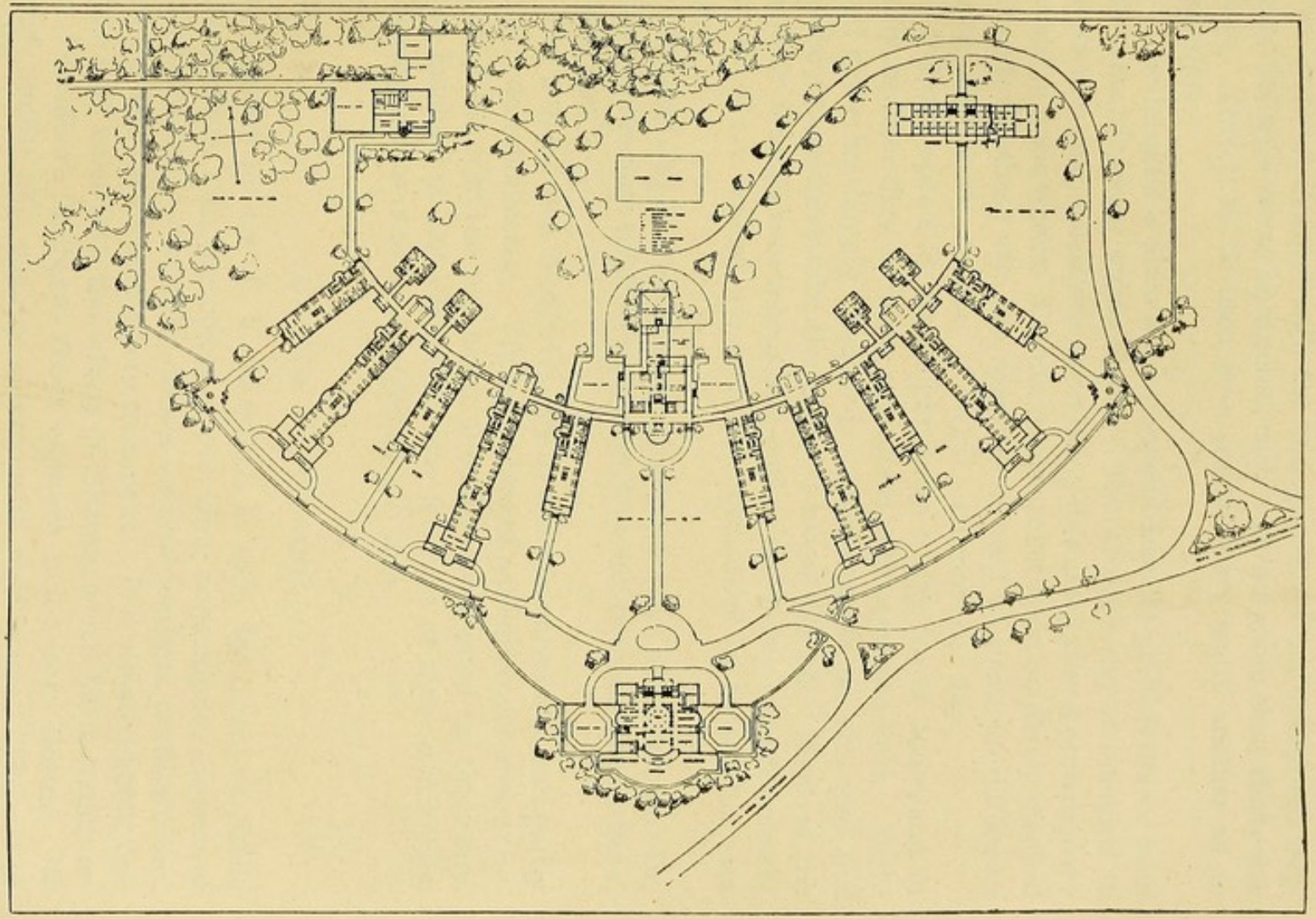


FIG. 2.—THE MASSACHUSETTS SANATORIUM. [*Face page* 82.

up or going to bed. The walls of the rooms are finished in hard plaster, all corners being rounded. The outer walls are rough cast. The roofs are finished with tar and gravel. Four additional two-story cottages are to be erected, each with not more than thirty-five beds. One is to be used as a probationary ward, another as an infirmary.

The hospital is intended for hopeful cases of phthisis drawn from the class of poorer wage-earners. The average stay is intended to be about a year, unsuitable cases being dismissed after a probationary period of a few weeks. Private wards are set apart on purely medical grounds for those who are specially in need of them, no difference being made in the charge. *Charges:* 50 cents per day.

Patients spend at least eight hours a day out of doors, and in rainy weather they sit in the sun-rooms with open windows. Daily cold baths are largely employed. Disinfectants are not used and sanitary cuspidores take the place of handkerchiefs. Most of the patients make their own beds and walk to the dining-room for meals; but there are trained nurses in the institution for those who need them.

Medical Staff: Two visiting physicians (Dr. Bowditch and Dr. Clapp), a resident medical superintendent and two resident assistant physicians.

The hospital was founded partly by a State subvention and partly by private munificence. The payments of patients cover about one-third of the cost, the rest being annually made good by the State. I am indebted to Dr. Walter Barclay for most of these particulars. The sanatorium is to be enlarged to 400 beds.

Sharon Sanitarium

was founded by Dr. V. Y. Bowditch in 1896, by means of public subscriptions, with the object of providing consumptive women of the refined but not wealthy classes—school-teachers, needlewomen, and the like—with sanatorium treatment. It is situated about one and a half miles from the village of Sharon, which has a station on the Providence Railway, about eighteen miles from Boston. It stands amidst hilly country covered with pine woods. The soil of the district is gravel and sand to a depth of thirty feet; the climate is moist and variable. The sanatorium is on the southern slope of a

hill, in about 130 acres of woodland, protected by hills to the north east and west, and by thick pine woods in the immediate neighbourhood, and has a large extent of open land to the south.

The original building, which has been considerably added to, is a square two-story structure with accommodation for nine patients, with numerous windows, and open fire-places in every room.

Two more pavilions have since been added, forming altogether two wings and a connecting centre portion, the eastern on a lower level than the western. A broad balcony connects the first floor of one wing with the ground floor of the other. Each patient has her own bed-room, the size averaging 3 × 3·6 metres in the old building.

In addition to the main building, there is now a cottage for the matron, connected with it by a subway, and further on a small infirmary block.

The buildings are simply but practically finished. The walls are painted, the floors of hard wood, the corners rounded in the newer parts. Rugs are used instead of fixed carpets, and no dusting or sweeping is done, the rooms being cleansed with damp cloths, which are afterwards boiled or burnt. The heating is by a hot-air furnace, with hot water supply in the bath-rooms. There is a good supply of pure spring water. The sewerage runs into a cesspool with an overflow 180 metres from the house.

Only cases in an early stage are admitted. The place is managed by a matron who is a trained nurse, other nurses being obtained if necessary. Dr. Bowditch's assistant comes out from Boston every day to visit the sanatorium. Considering that the place has no special advantages in respect of climate, the results of treatment have been extremely good.

Terms: $5 per week.

The Free Home for Consumptives in the City of Boston

at Dorchester, was founded in 1892 by the Young Ladies' Charitable Association of Boston, who secured for the purpose a large country mansion which has been subsequently added to. It now consists of an administrative building, with accommodation for nurses and staff, and a main block containing the wards and day rooms.

Both blocks are of wood, and have two stories and attics. They stand back forty-five metres from the street, from which they are separated by a garden. Behind the administration block is a large field for recreation. The main block has four eight-bed wards on either side of a recreation hall, from which they are separated by sliding doors, two six-bed wards at the western, and the isolation block with small wards at the eastern end. These are all on the south side of the main corridor, and have in front of them a wide piazza. The recreation hall extends upwards to the third floor, and is used for concerts and the like. On the north side of the main corridor at the western end is the main entrance, which opens into a large central hall, panelled in oak, with a large open fireplace and a wide staircase. Grouped on either side are the reception-room, matron's room, nurses' parlour, throat and consulting rooms, next to the administration block; and further east the linen-rooms, bath-rooms and lavatories, patients' entrance, dining-hall, sewing-room and reading-rooms. In the basement are the laundry, drying-room, inhalation-room, disinfector, kitchen, etc. The upper floor is like the ground floor, but has two additional small wards and a small chapel.

As a protection against fire, brick walls have been introduced every fifty feet running through the building, and provided with fireproof doors along the corridor. Heating and ventilation are according to the plenum system, air being introduced centrally, and heated to 60° to 70° by coils, after which they are forced to flues with each a supplementary heating coil. This ventilation is applied to every part of the building, including the basement, and supplies two cubic metres of air per minute for each bed and for each of four additional occupants. Unfortunately there are insufficient funds to keep open more than twenty to thirty beds.

The medical staff includes three visiting physicians and ten consulting physicians.[1]

Dr. Butler's Sanitarium,

at Rutland, is on gravel soil, 350 metres above sea-level, and consists of cottages with each six to eight beds. Heating is by steam pipes. *Terms:* $25 per week.

[1] Plan and Description in Knopf's *Pulmonary Tuberculosis*, Phila., 1899, pp. 170-172

CHAPTER XIX.

NEW JERSEY—NEW MEXICO—NEW YORK.[1]

New Jersey.

A BILL was introduced in 1903 into the State Legislature by Senator Hutchinson asking for an appropriation of $50,000 for a sanatorium. Part of this was expended in purchasing a site. Plans were drawn for the erection of plain two-story pavilions for 125 men and 125 women, if possible to be housed in single-bedded rooms, and for separate buildings for administration, dining-rooms, recreation-rooms, kitchen, laundry, power-house and rest-cure shelters. The scheme was estimated to require in all $300,000.[2] Considerable progress has already been made.

New Mexico.

THE UNITED STATES SAILOR'S SANITARIUM.

An abandoned military post, Fort Stanton, near the Rocky Mountains in Lincoln Co., with over 10,000 acres of land, has been set aside as a sanatorium for consumptive sailors from the marine hospitals. The soil consists of new red sandstone and magnesian limestone covered by black alluvial deposit, with a subsoil of gravel and volcanic stone. The elevation is 1,830 metres. The river Bonito runs through the estate, from which rolling hilly ground covered with grass extends to the mountains. Higher up is a belt of trees, mostly pines and cottonwood. A deep artesian well supplies abundant water. The buildings are heated by wood in closed stoves and open fires. Patients are encouraged to settle in the district, and devote themselves to sheep and cattle farming, light gardening and agriculture. Coal is available six miles off.[3]

[1] For New Hampshire, see p. 108.

[2] *Brit. Med. Jour.*, 14th March, 9th May, 1903.

[3] *Ibid.*, July, 1904.

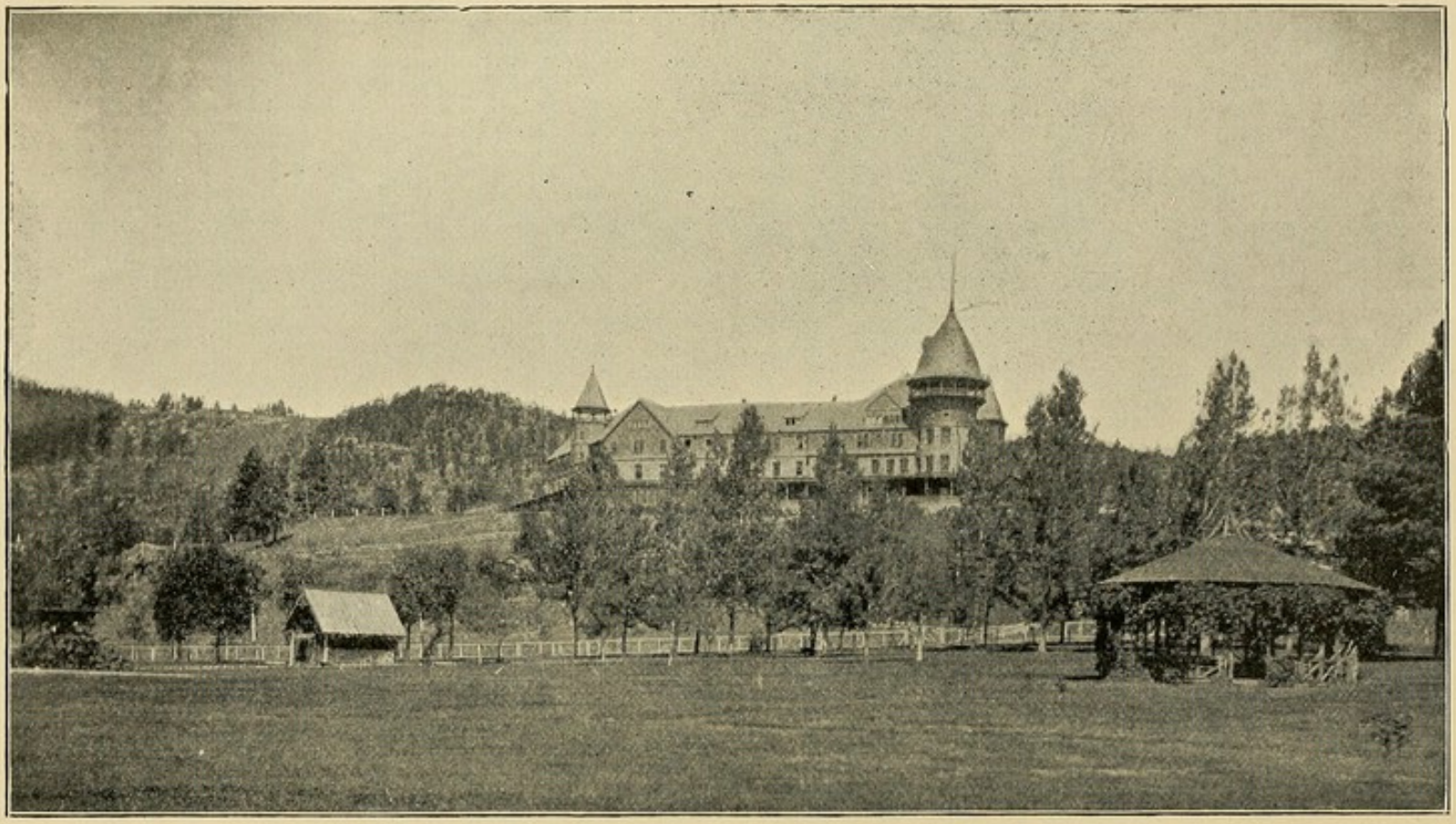


FIG. 3.—LAS VEGAS SANITARIUM. [*Face page* 87.

Las Vegas Sanitarium

is situated at Las Vegas Hot Springs in the northern portion of New Mexico six miles from Las Vegas, on a branch of the Santa Fé Railway, which has five trains each way per diem. It is under the control of the railway company, and forms a village entirely devoted to the needs of visitors and invalids, and specially laid out with a view to hygienic requirements. The position and climate are unusually good. Standing in the same latitude as the African Sahara, it is at a considerable elevation, so that hot weather is unknown. Blankets are required every night of the year, and the summers are delightfully cool. During the two summers of 1896 and 1897 the temperature never rose to 90°, and in 1897 it did not reach 80°. In winter there is sometimes snowy weather, but as the place shares in the dryness characteristic of the Rocky Mountain region, the cold is beneficial to tuberculous conditions without being disagreeable. The average winter sun temperature is 76°. The daily average is said to be 20° higher in winter than at Denver, and 20° lower in summer. The average annual rainfall is 12·7 in. From September to June the average is considerably less than 1 in. The average number of sunny days is 326. The sanatorium stands on granite and sandstone, 2,060 metres above sea-level at the entrance of a cañon of the Rocky Mountains, in the Canadian valley (fig. 3). Neighbouring peaks of the true Rocky Mountain range to the west rise to heights of 3,000 and 4,250 metres; north and south are spurs from the same range, and all round, forming four-fifths of a circle, are the foothills. There is consequently very complete protection against wind, and sand-storms are said not to occur there. Owing to the dryness of the air, it is quite possible for invalids to remain out of doors day and night; but the precipitation is just sufficient to ensure the growth of vegetation in the neighbourhood. Over 500 acres of land belong to the place, through which runs the Gallinas river. There are about thirty hot springs in the place, ranging in temperature as high as 144° F., and varying in chemical constitution from saline to lithia, iron and sulphur springs. Some of these are conveyed by pipes to the sanatorium. The mountains around are covered with pine trees, cotton woods, cedars, and the like. The sanatorium consists of one large (fig. 3) and several smaller buildings grouped

round a central park of fifty acres. The main building (the "Montezuma,") accommodates 250 visitors; another ("Mountain House,") will hold sixty; and forty or fifty more can be lodged in cottages and at the bath establishment. There is a dining-saloon to seat 250 people, and a lecture hall for 500. The main building is of stone, and consists of an irregular oblong mass, with a round tower at one end furnished with a spire and with a circular sun gallery just under the roof. At the foot of the building is a wide verandah, 166 metres long, protected by twenty-one metres of glass in case of bad weather. The bedrooms average 4 × 4·5 and 4 metres high, but some are much larger. The whole establishment, including the cottages, is heated by steam pipes, and lighted by electricity. There are no stoves or chimneys. Pipes convey fresh air into each room, and independent flues carry out the foul air through the roof. The sewerage is according to the Bertin system. A huge reservoir high above the sanatorium hewn out of the solid rock is filled with water pumped out of the stream, and flushes the sewers. These are carried down one mile away to a farm of fifty acres and purified by irrigation. The drinking water is abundant and entirely from natural springs. Three chief *meals* and three smaller ones are provided. The supplies come partly from the farm and from hot-houses belonging to the establishment. A herd of goats is also kept. A bath-house forty-two metres long provides swimming and various hydropathic appliances. In another house peat baths are provided. There is a hospital with all modern appliances facing the park some distance from the main building. Attached to this are trained nurses and a training school. Other buildings connected with the sanatorium are a casino, post office, station house, power house, school house, barn with stables, telegraph and telephone office, open day and night, as well as express and money order office. The sanatorium is officially recognised as a meteorological station. Altogether $1\frac{1}{4}$ million dollars have been spent upon the place to render it as perfect as possible for both invalids and pleasure-seekers. No advanced cases of phthisis are received, nor any infectious or otherwise obnoxious or incurable cases. Indiscriminate spitting is strictly forbidden, and great care is taken to disinfect the sputa, which are received into cuspidores half full of water, collected twice daily, no handkerchiefs being permitted for this purpose. The cuspidores are disinfected by carbonate of soda,

followed by steam, then by pure carbolic acid, again by steam, and finally washed with hot water, and left half full of water.

Staff: The sanatorium is under medical control and management. Two medical officers; also a consulting board of three and an advising board of seven, who are non-resident.

Consumptive patients are kept out of doors as much as possible. For those who are fit for it there is plenty of amusement in the shape of riding, driving, mountain climbing, hunting, fishing, and out-door sports generally, besides entertainments in the lecture hall.

Opened 1897, in 1898 there were 195 patients received, with four times as many guests and friends accompanying them. No charity cases are received. The length of stay is most variable.

Terms: $12·50 upwards without medical attendance; $16 upwards inclusive.

Chico Springs Sanitarium

was originally a ranch belonging to Ex-Senator Dorcey.

New York.

There are now a number of sanatoria and other institutions for the tuberculous in this State.

Stony Wold Sanitarium for poor women and children was founded in 1901 by Mrs. George H. Shrady and other New York ladies. Only early cases are admitted.[1] In 1902 a building on *Blackwells Island* in New York Harbour was devoted by the municipality to the treatment of advanced cases of consumption.[2]

The following year Dr. Loomis advocated the erection of a special hospital on the island, with a country branch on the pavilion plan for hopeful early cases.[3] At the *Manhattan State Hospital* for the insane in East Ward's Island, New York city, a tuberculosis camp was inaugurated for the treatment of the tuberculous inmates, resulting in a large reduction in mortality. Two large tents were erected each 4·3 metres high, capable of receiving twenty beds with an average area of 3·7 sq. metres per bed. The ground was cleared of vegetation, and a boarded floor constructed eighteen inches above ground, made in sections to take up. Large ventilators were

[1] *Lancet*, 1st June, 1903.
[2] *Ibid.*, 10th May, 1902.
[3] *Ibid.*, 28th Feb., 1903.

placed at either end of the tent. Smaller auxiliary tents were used as dining-rooms, for clothing, and for the attendants.[1]

Early in 1903 the New York City Board of Health recommended the establishment of a *Tuberculosis Camp* on high land about fifty miles from the city in a spot remote from villages. Substantial but comparatively inexpensive tents were to be set up, each for two or three people. The cost per tent was estimated at about £20.[2]

The *New York Charity Organisation Society* also endeavoured in 1903 to arrange for the erection of a sanatorium in the Adirondacks.

Plans were submitted to the Commissioner of Health for New York city for a sanatorium for 480 patients, similar to the King's Sanatorium in England but with the additional feature of auxiliary tents with wooden floors.[3]

A home for consumptives is also being projected by the *New York Arbeiter Ring*, consisting of members of trades unions and social clubs.[4]

During this year an Act was passed through the New York Legislature empowering the Health Department to acquire land in any part of the State for the erection of sanatoria for tuberculosis.[5] This, however, appears to have since been repealed.[6] In addition to the dispensary connected with the Loomis Sanitarium for Consumptives, a *dispensary* is to be erected by the Commissioner for Health for the city. A *society* has been formed *for improving the condition of the poor* in New York; a sum of £3,000 has been set aside by it for the maintenance at the seaside of fifty children suffering from non-pulmonary tuberculosis. There are eight homes and hospitals in New York and Brooklyn which admit consumptive patients: St. Joseph's, St. Luke's and St. Catherine's Hospitals, the Montefiore Home and the Loomis Hospital in New York; St. Peter's Hospital at Brooklyn and the Brooklyn Home for Consumptives; and the Seton Hospital at Spuyton Duyvil; also a special hospital at Buffalo. A number of private sanatoria for paying patients (mostly without resident medical officers) exist in the Adirondacks.

A *Riverside Tent Sanitarium* was established at New York in

[1] *British Medical Journal*, 17th Jan., 1903.
[2] *Ibid.*, 7th Mar., 1903.
[3] *Ibid.*, 4th April, 1903.
[4] *Ibid.*, 4th April, 1903.
[5] *Ibid.*
[6] *Lancet*, 9th Jan., 1904.

1902, which in Aug., 1903, accommodated 440 patients of both sexes; eight large tents to house 110 patients in all have been erected which will be used through the winter. This is intended more especially for such cases as cannot be admitted into one of the other sanatoria.[1]

There is a *Rockefeller Institute* for medical research being built in New York.

According to Knopf (*American Medical Journal*, 22nd and 29th Nov., 1902), there were at this date 432 beds per annum at the disposal of the public charities of New York city at eighty cents per day in the Seton and St. Joseph's Hospitals, and the Brooklyn Home for Consumptives, as well as 465 beds set aside for similar cases in the department of public charities in King's County Hospital, the Almshouse, and the Metropolitan Hospital.

The Adirondack Cottage Sanitarium

is intended to place within the reach of working men and women the advantages of climatic and sanatorium treatment at as moderate a cost as possible.

It is situated one and a half miles from the village of Saranac Lake, in the Adirondack Mountains, New York State, on sandy soil resting on primary rocks. *Grounds:* About forty-five acres, surrounded on most sides by densely wooded heights covered with evergreen trees, which protect the place against wind. The sanatorium itself is several hundred feet above the Saranac river valley, on a protected shelf-like plateau on a hillside which slopes to the east and south-east. The prevailing winds are west and south. The *climate* in winter is cold, with many windless snowy days. Snow lasts from the middle of November to the middle of March or April. Rain and snowstorms are frequent; and cloudy weather preponderates at all seasons, especially in winter. In February, 1894, the mean temperature was 13°, the minimum – 31° F. In July, 1894, the mean was 66°, the maximum 91°. Generally speaking, the climate may be characterised as cold and moist, but in winter cold and dry.[2]

The sanatorium consists of twenty-two different buildings, from

[1] *Lancet*, 31st Oct., 1903.

[2] Solly, *Medical Climatology*, London, 1897, pp. 210-214.

23 to 30 metres apart, grouped around a large main structure on three floors. This contains the executive department, dining-room, offices, kitchen, baths, closets, nurses' and doctors' rooms, together with a few large rooms for a limited number of patients (fig. 4). The general sitting-room is 9 × 12 metres, the common dining-room, 12 × 15. One of the buildings, enclosed by glass, is used as a recreation pavilion. Two of its sides (to the windward) are kept closed, the others being always open. Another building is used as an "infirmary," for the care of those who require to be kept in bed. The cottages are small one-story buildings for from two to nine patients, the majority accommodating four or five. Each patient has his own bedroom, opening into a central sitting-room. The bedrooms average 3 × 4·3 metres, the sitting rooms 5·5 × 7·6. The partitions between the rooms are of solid masonry, but those between the bedrooms and the central sitting-room are only seven feet high, so as to give a larger ventilating space; moreover, the inner doors do not touch the floor. Ventilation is by means of open fireplaces in the central sitting-rooms, and by transoms over the verandahs and small openings over the windows of the bedrooms. The main building is ventilated by open fireplaces and ventilators in the ceiling, which lead by tin pipes to the chimneys. It is also heated by hot water. The cottages are heated by hot water, stoves and fireplaces. The whole sanatorium is lighted by electricity. The buildings are all constructed of hard wood and masonry, with as few angles as possible; the walls being of smooth varnished wood, without curtains or hangings, and the floors of hard-wood, without carpets and with as few rugs as possible. Verandahs are placed outside the cottages, with glass partitions on the windy side. The water supply is from the village waterworks, about two miles distant, and has a pressure of 90 lb. The drinking water comes through iron pipes from a spring above the sanatorium, at a point higher than any human habitation. The sewage is discharged into the river far below the bluff on which the sanatorium is built.

The sanatorium is under private management, State aid having been refused. It is directed by its founder, Dr. E. L. Trudeau, and a board of trustees, with the help of two resident physicians, examining physicians in New York and other large cities, and trained nurses in the "infirmary". The *charges* are $5 per week; the deficiency (about $2) being covered by subscriptions and con-

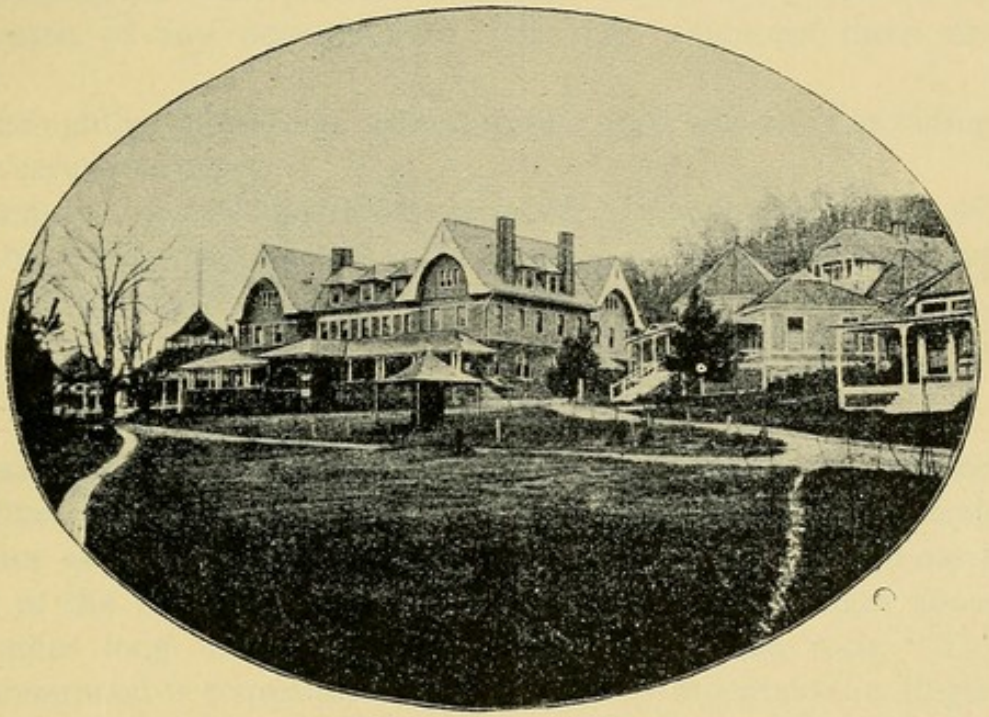


FIG. 4.—THE ADIRONDACK COTTAGE SANITARIUM.

[*Face page* 92.

tributions. A small additional charge is made for nursing in the infirmary. Medicines are charged at cost price.

The average length of stay is six months; one year is the limit; but in exceptional cases when necessary this rule is not enforced. Patients who show no improvement after a reasonable period are advised to return home. Advanced cases and active types of disease are only exceptionally admitted. Those who can afford to pay more than the low prices charged are not admitted. Friends are only allowed to remain a week, and pay $1.50 per day. The institution is non-sectarian; there is a stone church in the grounds, in which services are held nearly every Sunday by clergymen of any denomination who may volunteer their services.

The number of patients treated during 1902 was 271; including thirty-seven free cases.

Saranac Lake village can be reached in thirteen hours by rail from New York without change of carriage. The patient can have all his meals brought to him in the train.

The Gabriels Sanitarium

is situated on Sunrise Mount, on land given by Dr. Seward and Mr. Paul Smith, almost surrounded by State lands with thousands of acres of pine trees and the like. This district is on the north shore of the lower St. Regis Lake, a lovely chain of lakes about five miles long, with sandy shores and very little rock. The neighbourhood is comparatively level, with one mountain (St. Regis) about 914 metres high.[1] The sanatorium consists of detached houses of two or three stories, built of hard wood, heated by one central boiler house about 200 metres from the main building. Pure air is forced into the buildings through a shaft, and heated on its way by radiating pipes. The air can in this way, it is said, be changed every five minutes. There is a good supply of pure soft water, and a complete installation for hydrotherapy. Only early cases are admitted. Both rich and poor are accepted, the fees of the former helping to support the latter. The staff includes a house physician and nursing sisters. The latter receive no personal remuneration.

[1] Solly, *loc. cit.*, p. 210.

The Loomis Sanitarium

is situated about 120 miles from New York, two miles west of Liberty, Sullivan Co., in the midst of a rolling mountainous country, which forms the highest land between New York and the great lakes. The Catskill Mountains are some twenty miles to the north and east; southward is a wide valley for forty miles; westwards the view extends over the tops of hills for fifty miles along the river Delaware into Pennsylvania. The value of this beautiful country was advocated years ago by Dr. St. John Roosa and the late Dr. Alfred Loomis. There are practically only two seasons, winter and summer, with a rapid transition between the two. The winters are cold and dry, while even in summer the air is dry and exhilarating and the nights cool and refreshing.

The sanatorium now has beds for ninety with additional tent accommodation in summer. It stands on a southerly slope, protected by a rocky wooded ridge to the north. *Grounds*: 193 acres, surrounded by open country, and laid out with roads, paths and terraces.

The sanatorium consists of a group of buildings scattered across the turf and connected with paths. The largest is the administration building (fig. 5), which is a picturesque three-story building of wood and stone with verandahs and round pointed roofs, and outbuildings attached in a long line beside it. This contains on the ground floor the reception-room, library, dining-room, offices, drug-room, butler's pantry, kitchen, store-room and laundry. On the next floor are the solarium, four emergency wards, laboratory, nurses' rooms, baths and closets, guest rooms and sleeping quarters for the resident staff. On the third floor are servants' quarters and store rooms. Another building, the casino, is a two-story building with pointed roof and large open verandah devoted to amusement, and containing a billiard table, piano, harmonium, etc. Two other cottages of two stories each accommodate respectively twenty-three and sixteen patients. Five other one-story cottages accommodate eight, eight, four, four and five patients respectively. There are two other buildings, of which one accommodates seven, the other ten patients. The buildings are mostly flat on one side and rounded on the other with verandahs which are protected in winter by glass at the exposed ends, but remain open to the south (fig. 6). There

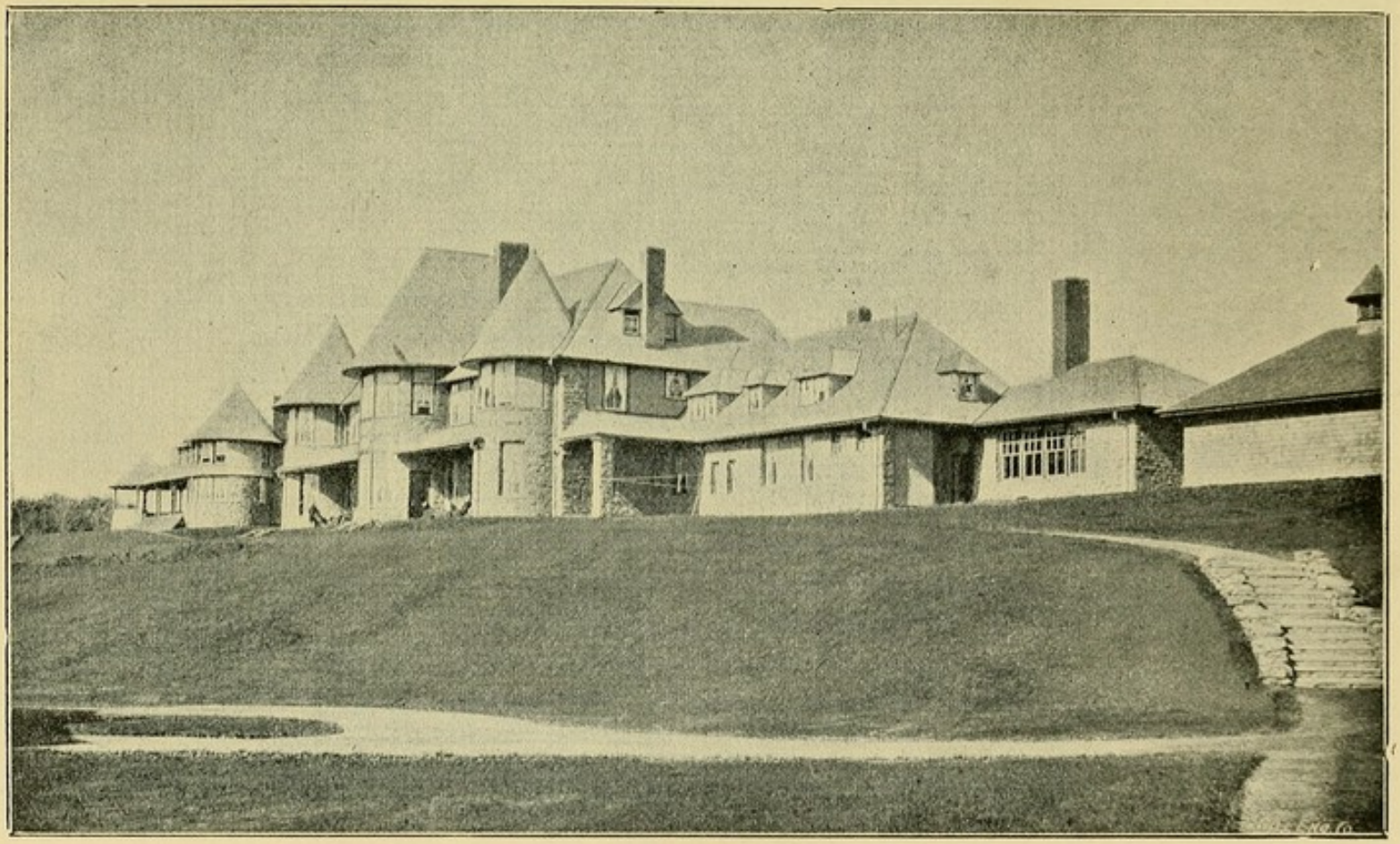


FIG. 5.—THE LOOMIS SANITARIUM—ADMINISTRATIVE BUILDING. [*Face page* 94.

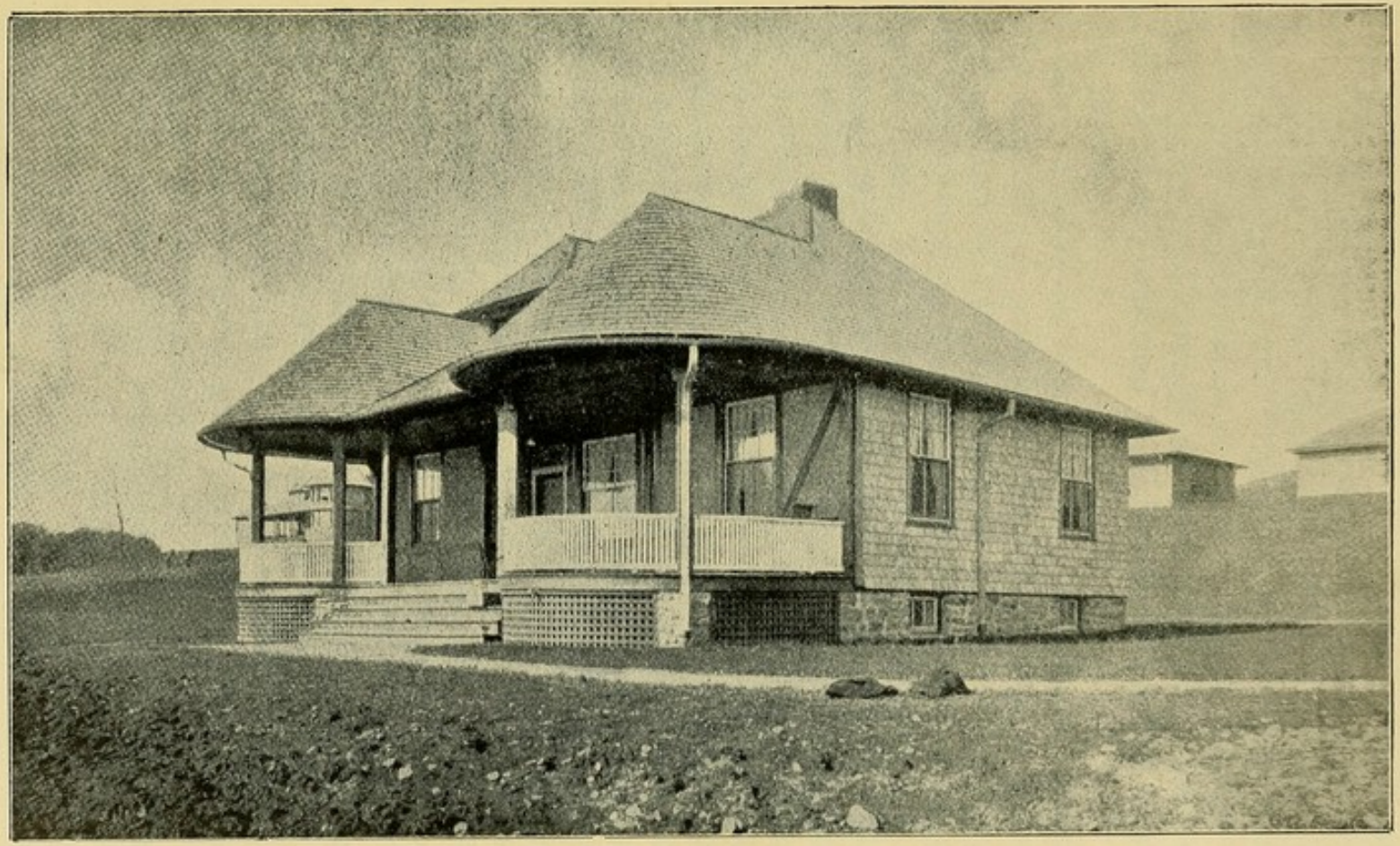


Fig. 6.—The Loomis Sanitarium—Marcy Lester Cottage. [*Face page* 94.

are bathrooms and closets in every cottage, averaging one to every four patients. Each cottage has one or two parlours. The bedrooms average 3·6 × 4·3 metres in size, some provided with chimneys. Nearly all accommodate but one patient, eight have beds for two apiece. Each building is heated by its own hot water or steam pipe plant, and is lighted with electricity from a central dynamo. Ventilation is by open windows, through the steam heating level, and through the open fireplaces. The temperature is not allowed to exceed 65° F. by day and 40° by night in the winter months.

The walls and floors are capable of easy cleansing and disinfection. The furnishing is comfortable but simple, without unnecessary hangings, and without fixed carpets. The water supply is from two large springs which fill a reservoir above the highest part of the sanatorium. The sewage is disposed of according to the Waring system. Trained nurses are kept in the sanatorium. There is also a nurses' training school, consisting at present of thirteen members, who are given practical training every day, and lectures and recitations every four days. The superintendent is a graduate of a New York training school ; the course of training of two years' duration. The physician in charge lives in a separate house ; a house physician and assistant house physician are lodged in the administration building. Service is held every Sunday in the same building. A memorial chapel will probably soon be built. There is a good laboratory with bacteriological, radiographic and other experimental work and a fully equipped throat-room. No general assembly rooms have been provided beyond the dining-room and casino, as patients are expected, and are able as a rule, to spend nearly all their time out of doors. Most of them take a large amount of exercise ; some cycle, play tennis, or ride. Breathing exercises are taught by the house physicians. In the case of sudden and serious illness, patients are transferred to the infirmary. The usual duration of treatment is about six months.

Fees : $10 to $15 per week ; $7 in double-bedded rooms. Friends of patients pay $2 per day. The charges are only sufficient to render the sanatorium self-supporting. In some of the cottages, patients are admitted who pay higher fees and bring their own servants. The medical management is vested in a medical board which is mainly in New York, but is represented at the sanatorium

by the physician in charge. Business matters are managed by a board of ladies in New York, and at the sanatorium by a lady superintendent.

Liberty is a station on the main line of the New York, Ontario and Western Railway, and is about three and a half hours by rail from New York. The sanatorium is on the telephone.

The New York Hospital and Dispensary for Consumption

is under the same management as the Loomis Sanitarium, and was started in the spring of 1894 in a small four-story house at 230 West 38th Street. It is intended for incurable and dying cases of consumption, and contains two wards; one for men and the other for women. There are two visiting physicians and a house physician. The hospital is to be removed to a larger building.

The Montefiore Home Country Sanitarium

an offshoot from the Montefiore Home for chronic invalids in New York city, is situated at Bedford, Westchester Co., in a sheltered situation on the Berkshire hills, which form the highest part of the country, and is forty miles from New York, or one and a half hours by rail.

Opened early in 1897 with beds for ten patients, it has since been successively enlarged to a fine institution of many pavilions with 160 beds, at a total cost of $200,000. The largest addition was completed in 1901.

Originally a farm of 136 acres which supplied the Montefiore Home with fruit and vegetables and dairy produce, it is surrounded by undulating ground, receiving slight shelter by a hill to the north-west.

The building consists of four pavilions and an administration block, united to the north by a corridor 99 metres long, somewhat after the style of the Massachusetts State Sanitarium.

The two inner and the two outer pavilions correspond respectively, the outer being 44 metres long × 9·7 broad, the inner 38 long × 8 broad; the administration block being placed symmetrically between them but a little further north. Each pavilion has two floors and a basement. The outer pavilions have on the first

floor each twenty beds in twelve rooms, and on the second floor each a ward with twenty-four beds. The inner pavilions have wards with eighteen beds on each floor. There is a sun room at the southern end of each pavilion with ten large windows, and large verandahs with southerly and northerly aspect. Each pavilion has its own closets, bathrooms, lavatories, store-room, nurses' room and cloak-room. The first and second pavilions are for men, the third for children, the fourth for women. The floors are of polished hard wood, with rounded angles, excepting in the closets, store rooms and kitchen, where they are of mosaic. The administration block has a basement, containing laboratory, mortuary, cloak rooms, lavatory and bathrooms, and two upper floors.

On the first floor are reading and dining-rooms for patients, reception room, offices and dining-rooms for the medical officers and staff. The kitchen department is behind.

On the second floor are the quarters of medical officers, matron and secretary; also an operation-room.

Behind the administrative block is the engine house, and further on the boiler house with crematorium, laundry, steriliser and dwellings for the male servants.

The place is lighted with electricity, heated by steam pipes; the water supply is from an artesian well.

The staff includes a resident medical officer, two assistants, and a visiting staff in New York.

Patients, who are admitted regardless of race, creed or nationality do a little light work in the sanatorium when fit for it.

There is no limit to the length of their stay, excepting from medical considerations.[1]

The Montefiore Home for Chronic Invalids

is an institution founded and maintained in New York mainly by Jewish munificence. It is not entirely devoted to consumptives, but has two wards with thirty beds each for male consumptives and one ward of forty-two beds for female consumptives. It is primarily intended for those who are poor but are not suitable for treatment in hospital owing to the chronic nature of their ailments. Consumptives who are admitted (who need not be Jews) may stay there

[1] See *Zeitschrift für Tuberkulose*, April, 1902, for description.

for the rest of their lives, but some who recover their ability to work leave of their own accord, or are sent to the country sanatorium described at p. 96. The home is on the Grand Boulevard about 300 yards from the Hudson river. Attached to the home is a park with large tents for use during rainy or windy weather. For weaker patients broad piazzas are available. The home itself is a fine building of red brick and granite in Italian style with a central block and two projecting wings, which together enclose an open courtyard. The centre is on five floors, including attics, the wings on four floors. In the rear between the two wings are the kitchen and laundry, the dining-room for 300 being over them, and accessible from the main hall in the centre building. In addition to the wards already mentioned, there are bedrooms for from two to sixteen patients mostly to the south, very few to the west and north. The larger bedrooms (eight to sixteen beds) have six to ten windows on north, east and south. There are also two very large sun rooms mainly for the winter months, a smoking-room, and large synagogue. The rooms are painted with a light-coloured oil paint, and have rounded angles. The heating is by steam; the lighting by gas and electric light; the ventilation is said to be good; sewage goes into the Hudson river; water supply is from the city supplies.

The male wards have two nurses each, the female ward has three nurses. There are three resident medical officers, to the senior of whom (Dr. Joseph Fränkel) I am indebted for these particulars.

The Pasteur Sanitarium

has been built by Dr. Paul Gibier, Director of the Pasteur Institute of New York, at Suffern, a little village about an hour's rail from New York. Situated at the foot of the Ramapo mountains, near a grove of pine and other trees, it has attached to it some 250 acres of land. The building is solidly built with ground floor, two upper floors and attics. A deep verandah runs opposite the first floor along the south and west sides, transformable by glass shutters into a solarium. On the ground floor are the laboratories and hydro-therapeutical department; on the first floor the dining-room, and a number of other day rooms. The kitchen, laundry, servants' quarters and machinery are in an annexe connected by a corridor

with the main building. Heating is by hot water, lighting by electricity. Windows are of the ordinary double-hung variety.

The medical director lives in a cottage 1,000 yards from the building, connected with it by telephone. A house physician lives in the sanatorium. There is a model farm on the ground, as well as the laboratories of the Pasteur Institute.

Charges: $12 to $25 per week; some free beds for poor physicians.

The New York State Sanitarium

is at Raybrook, Essex Co., between Saranac Lake and Lake Placid. It is said to have cost $200,000.

The De Peyster Hospital

for consumptive children aged two to sixteen, is situated a few miles from Verbank Station in Duchess Co., New York, about seventy-five miles from the capital. It has a southern exposure, and is protected to the north by pine woods. It is heated by steam, and has a long covered balcony on the southern side.

The hospital is unendowed, being supported by voluntary subscriptions, and under deaconess' management. Only curable cases are admitted.

Altitude: 335 metres. *Charges:* $2.50 per week.

The House of Rest for Consumptives

in New York which formerly subsidised beds in St. Luke's Hospital, has acquired a new place in which thirty advanced cases may be received.

The Brooklyn Home for Consumptives

was founded in 1881 under the name of the Garfield Memorial Home as a home for invalids, especially consumptives, who are not admissible to hospital owing to the chronic nature of their ailments. It is a purely benevolent and non-sectarian institution, and has two sections, one of which is attended by a homœopathic physician. A children's ward has recently been added. Both sexes are admitted free of charge, and patients in any stage, even the dying.

St. Joseph's Hospital

is probably the largest consumption hospital in the world. It is owned and managed by the Roman Catholic order of the Sisters of the Poor of St. Francis, who also have a number of other hospitals in various parts of Europe and America. It is open to the poor, irrespective of race, nationality or religion, and also admits patients for a small payment into small wards and private rooms. Consumptives in all stages are admitted, but are distributed into different wards according to their stage and condition.

The hospital is situated in the suburbs of the city, between 143rd and 144th Streets and St. Ann's and Brook Avenues, occupying the whole block. It is surrounded by a garden, and looks out on the south and east on to open park grounds. It is a large pile, with projecting wings on five floors including basement, with a south aspect, and contains accommodation for 365 patients. There are five large wards containing from twelve to sixteen beds on each floor, all looking south; and at the eastern and western ends of the buildings other small wards for from two to eight, and small private rooms for one patient each. The walls are of plaster or covered with glazed paint; the floors of varnished hardwood. The kitchen and laundry are in a separate wing. Behind the main block is a separate building for incipient and arrested cases of consumption. Further back are the power house, stables, and workshops, and to the extreme north-west, the mortuary. The water supply, sewerage and gas lighting are connected with the city systems. Besides the garden, small sheltered balconies at the ends of the building are used in all weathers for the open-air treatment, but patients are drafted as soon as they are fit to one of the country sanatoria. Both sexes are admitted; the men on the first and second, the women on the third and fourth floors. In the private wards $5 per week is charged, in the private rooms $10; but most of the patients admitted are too poor to pay anything. In 1897, 1,500 cases were treated, and about 1,000 applicants were refused for want of room. One of the cases had been under treatment for eight years.

There are twenty-seven nurses in the building. The medical staff consists of a physician-in-chief (Dr. C. M. Cauldwell, who kindly furnished the above particulars), a large number of visiting physicians, and a house physician.

THE SETON HOSPITAL

is a fine building at Spuyton Duyvil, a suburb of New York, with a beautiful view over the Hudson from its balconies. Since the beginning of 1898 selected cases from among the consumptive poor of New York city have been sent to this hospital by the Board of Health. The wards are airy and have each twelve beds. An even temperature is maintained by means of fans and ventilators; and in stormy weather patients make use of a large solarium containing growing plants. The staff includes two visiting physicians and a house physician.

CHAPTER XX.

NORTH CAROLINA—PENNSYLVANIA—RHODE ISLAND—TEXAS.

North Carolina.

THERE are two private sanatoria in this State: the Winyah and the Asheville.

THE WINYAH SANITARIUM

at Asheville was founded in 1878 by Dr. J. W. Gleitsmann, of New York, remodelled by Dr. von Ruck in 1888, and moved into new quarters in 1900.

The soil of the district is limestone and sandstone; the elevation 685 metres; the new buildings are situated close to the electric tramline, outside the city of Asheville, in a well-wooded park of 25 acres with mountains to the north. The buildings, which are light and attractive, consist of a main structure, a large annexe, and two cottages, all connected by glass-enclosed, steam-heated porches and passages. Walls and floors are double, filled in with mortar, to prevent conduction of sound. Abundant provision of piazzas has been made on all floors, looking north, south, east, and west. Many of these are enclosed with glass; some are steam heated. Where they overhang bedrooms the roof has been omitted and replaced by removable awnings. There are altogether eighty private rooms; also bath-rooms and dressing-rooms on every floor, both public and attached to special bedrooms. A number of reception-rooms have been provided, including a large dining-hall. Every room has a fireplace; the building is heated throughout with air warmed by steam radiators in the basement. Lighting is by electricity; the water supply and sewerage those of Asheville. A well-equipped laboratory has been provided. Dr. v. Ruck is aided by a lay manager and two physicians. Trained nurses are only obtained for special cases. *Charges:* $30 upward per week.

THE ASHEVILLE SANITARIUM

was opened in 1898 in the neighbourhood of the same city, on a wooded eminence 716 metres above sea-level, commanding a fine

view of the surrounding country. It has attached to it fifteen acres of park land, wooded with oaks and pines, and has its own supply of spring water. The building forms a handsome pile with three stories and basement, containing eighty rooms, provided with lift and electric light, and numerous verandahs and porches. In the basement (which is above ground) is the bathing department with swimming bath and gymnasium. It is intended for full-price patients: not exclusively consumptives.

Pennsylvania.

The Society for the Prevention of Tuberculosis in Pennsylvania is the pioneer society of the kind in the United States, possibly in the world, having been founded in April, 1892.

As late as 1901, however, consumptive patients in Philadelphia were being sent to five hospitals in the town (University, German, St. Agnes, St. Mary's, and Rush), only one of which was a special hospital. In the same year the Philadelphia Free Hospital for Poor Consumptives (which had no beds of its own) purchased an estate of 215 acres in the *Pocono Mountains* for a tuberculosis camp.[1] Another scheme dating from the same period was that of Dr. J. T. Rothrock, Forestry Commissioner of the State of Pennyslvania, who drew up plans and raised subscriptions for the establishment of camps for consumptives on the State Reservations. The first of these was started in *Clinton Co.*, which is 2,000 ft. above the sea-level. Large **A** tents were erected on permanent foundations, with heavy wooden floors, and a covered platform for rainy weather running in front of each row of tents. Shelter was to be given free of charge; but patients were to make their own cooking arrangements.[2]

In 1902 the State Sanitarium at White Haven (*Free Hospital for Consumptives*) was begun, on an estate of 250 acres. The State contributed $40,000 for the buildings and guaranteed $10,000 for maintenance.[3]

In 1903 a munificent offer was made by Mr. Henry Phipps the "steel magnate," of $1,000,000 for the erection and maintenance of an institute for the study, prevention, and treatment of tuberculosis, to be erected in a populous part of the city of Philadelphia, and to include a Finsen light department, a hydro-therapeutical department,

[1] *Brit. Med. Journ.*, 27th April, 1901. [2] *Ibid.*, 9th March, 1901.
[3] *Ibid.*, 2nd Aug., 1902.

and pavilions for 100 advanced cases of consumption; also a dispensary to be a centre for helping patients in their homes and for distributing information and appliances, disinfecting clothes and dwellings, delivering lectures, etc.

An existing law, however, prevents the erection of hospitals in the built-up parts of any city of the State.[1] In this year a scheme was elaborated by the Society for the Prevention of Tuberculosis in Pennsylvania to erect a number of sanatoria and dispensaries throughout the State in connection with the White Haven Sanitarium.[2]

Two Bills were introduced into the State Legislature (1) to increase the accommodation at White Haven Free Hospital for Consumptives by 200 beds, at a cost of $300,000; to erect a home for advanced cases of 100 beds somewhere between White Haven and Philadelphia, and five dispensaries in Philadelphia and other large cities of the State.

(2) The second Bill, promoted by the Society for the Prevention of Tuberculosis asked for $500,000 for the erection of sanatoria, beginning with two institutions in the State Forestry Preserves one in the Pocono region, in Lackawanna Co., the other in Franklin Co. near Palo Alto: each to contain 200 to 300 beds.[3]

Philadelphia now has two special hospitals for lung diseases, the Rush Hospital, and the Philadelphia Hospital for Diseases of the Lungs, the latter with two sections, one at Chestnut Hill for women, the other in Spruce Street for men. It appears that all consumptives in Pennsylvania are to be registered and removed to a camp in the mountains. This will at first be maintained by grants; later on it is expected to be self-supporting.[4]

THE PHILADELPHIA HOSPITAL FOR DISEASES OF THE LUNGS belongs to the Protestant Episcopal Mission of that city, and is managed by a board appointed by the bishop of the diocese, but admits patients of every religious denomination. It includes a small temporary hospital for men (House of Mercy) in the heart of the city, and a larger hospital for women at Chestnut Hill. These institutions are mainly, but not exclusively, intended for the reception of consumptives, and formerly went under the name of Homes for Consumptives. The patients are for the most part poor people,

[1] *Brit. Med. Journ.*, 14th Feb., 1903.
[2] *Ibid.*, 7th Feb., 1903.
[3] *Ibid.*, 14th March, 1903.
[4] *Ibid.*, 12th March, 1904.

who are admitted free of charge ; but well-to-do patients also enter at times, and make a donation to the funds, there being no stated charges for such cases. All stages are admitted, the length of stay being usually three months, prolonged to six, or more if advisable. The mission also has a number of sick-diet kitchens in the city, and helps the poor in this way in their own homes. In 1897, 164 were admitted to the two hospitals, and thirty-six helped in their own homes with food and money. The *medical staff* consists of two resident officers, a clinical clerk, and eight visiting physicians. There are altogether nine nurses.

The House of Mercy,

or male branch, is at 411 Spruce Street, next to the general offices of the mission. It consists of an ordinary house, which has been adapted for the purpose, and has twelve beds. This will probably be replaced by a more permanent and more suitable building. It admits patients in any stage.

The Chestnut Hill Hospital

is within twelve miles of the City Hall, in a residential suburb of Philadelphia at its most northerly part. It is surrounded by gentlemen's country seats of one to two acres, and has farm lands to the north, being practically in the country. The mean temperature of this part is some 6° colder than that of Philadelphia itself. The soil is of limestone. There are about thirteen acres of ground belonging to the hospital, partly wooded and partly open. The sanatorium is about 150 metres above the sea, on the crest of a hill which forms the highest ground for miles. There is no special shelter against wind from hills or trees. The buildings are on the southern slope, and consist of a central administrative block, with a number of cottages on each side, mostly built within the last ten years and accommodating sixty patients. The administrative building contains the day rooms, doctor's quarters, dining-room, kitchen and emergency room. There is also a small kitchen in each cottage. The patients' bedrooms are all to the south, corridors with double windows to the north. The rooms are large, and mostly contain but one bed, a very few having two. Most of them have chimneys. The walls are undecorated, the corners rounded. Every cottage has a large common room, which is used as a sun

parlour and for other purposes. The heating is by hot air; fresh air entering an empty space under the building, where it is heated by radiation from a drum, and then driven into the rooms. The lighting is by the city gas supply; the sewerage and water supply being also connected with the city systems. There is ample provision for both rest and exercise in the open air without exposure to bad weather.

THE RUSH HOSPITAL FOR CONSUMPTIVES

in Philadelphia has been recently enlarged by the addition of a wing 72 ft. long. On the ground floor are waiting and consulting-rooms, drug-room and a little sun parlour. On the second and third floors are two large wards for fifteen beds each, with bathroom and linen rooms, etc. The wards for the other patients are in the older portion. The institution receives patients in any stage. It is supported by voluntary contributions, and by an annual subvention of $5,000 from the State of Pennsylvania. The management is vested in a women's board. There is a large staff of consulting and visiting physicians attached to the hospital.[1]

Rhode Island.

In consequence of a petition signed by 250 physicians of the State presented in January, 1903, to the General Assembly, a State Sanitarium is being erected at Providence at a cost of $200,000.[2]

Texas.

This State was the first to provide suitable accommodation for its *tuberculous convicts.* For several years the Wynne Farm, about two miles from Huntsville, had been cultivated by convict labour; but in December, 1899, it was set aside for exclusive occupation by tuberculous convicts. If not confined to bed, they have to live entirely in the open air, and to sleep in a large stockade or pavilion. Each works according to his strength, the employment being wholly restricted to market gardening. The produce is sent to the prison proper, the overplus being sold in the markets. A net profit of $2,500 was made in two years;[3] and the medical results are said to be very satisfactory.

[1] Knopf, *loc. cit.*, p. 164. [2] *Zeitsch. f. Tuberk.*, April, 1902.
[3] *Lancet* and *British Medical Journal*, 1st June, 1901.

White Gables Sanitarium

or St. Mary's Sanitarium, is at Boerne, Kendall Co., South-West Texas. The town of Boerne, which was originally a colony of Germans, is on the river Cibolo, about thirty miles north-west of San Antonio, with which it is connected by rail. It contains about 700 inhabitants, and has no factories excepting one cotton gin, and is surrounded by very hilly country with deep gulches. The *climate* is a very good one for consumptives; average rainfall, 26 inches; mean temperature in January, about 56°, in July about 89°, with usually a pleasant breeze in summer. The soil is a black loam over limestone.

The sanatorium stands 435 metres above sea-level, in ten acres of ground, which is wooded to the north and east, and laid out as a flower garden and shrubbery to the south. It is sheltered from the north by a range of hills, and is open to the south.

The building is arranged round three sides of an open courtyard, the main block of three floors being at the western end, with a one-story projection on the north side of the courtyard, and a separate block to the east containing chapel, kitchen and laundry. The main block has four rooms on the ground floor, in addition to the office, nurse's room and vestibule; on the next floor are a reading-room, small kitchen, and seven other rooms; on the top floor a nurse's room, two large wards and two other large rooms. Along the western side of the block is a large verandah, with a balcony above it; along the lateral prolongation is another long verandah. There are water-closets on each floor, and a bath-room at the eastern end of the ground floor. The heating and lighting are somewhat primitive, and some of the rooms have no chimney. There is accommodation for twenty-five patients; the bedrooms are 3 metres high, and vary from 3 × 3·6 to 4·8 × 4·8, and face in every direction.

The sanatorium belongs to the Sisters of the Incarnate Word (R.C.); it was originally an old stone building bought by Dr. Wm. Miller, who acted as medical officer until last year, when it passed medically under the management of Dr. A. H. Davidson, and was completely reconstructed. The number of nurses varies according to need. Consumptives in every stage are admitted, as well as sufferers of both sexes from other ailments. Infectious cases are not admitted.

Fees: $25 to $90 per month.

I am indebted to Dr. Miller for an account of his system of managing the institution. Mainly intended for consumptives, it was necessary also to provide rooms for other medical and surgical cases, which were placed in a different part of the building. Acute and advanced cases were admitted to the institution, but hopeless cases were sent home. Early and quiescent (first and second stage) cases were not retained in the building, but sent on to one of a number of cottage sanatoria in the surrounding country, which were gradually organised by Dr. Miller. These consisted of a number of detached cottages of two and three rooms, well built and ventilated, with a central dining-hall and sitting-room, all comfortably furnished. Five such sanatoria were built up under his supervision, with accommodation for about 150 visitors, who were lodged and boarded with an abundance of well-cooked suitable food for about $25 per month. During 1896-7, 731 patients were under treatment at the sanatorium and the auxiliary resorts.

ADDENDUM—CALIFORNIA.

While going to press the following particulars have been received:—

Idylwild Sanatorium (1,600 metres), in a well-wooded valley near the San Gorgonio Mountains, 20 miles by stage coach from Hemet on the Santa Fé Railway. A central stone building, and cottages. Complete sewerage, water supply, central heating, steam laundry, electric lighting. *Terms:* $15 to $50 per week.

Pottenger Sanatorium (305 metres), among the foothills of the Sierra Madre, one mile from Monrovia. A stone building with patients' rooms on the second floor, large and well finished, in single row. Also a cottage, and tents fitted up like rooms. Central heating, electric lighting; throat department; laboratory; trained nurses. *Terms:* $30 to $50 per week.

Ballard Pulmonary Sanatorium (300 metres), in the outskirts of Pasadena. Open fire-places; electric lighting; treatment by continuous medicated inhalation, gymnastics, etc. *Terms:* $25 per week.

NEW HAMPSHIRE.

Pembroke Sanatorium, five miles from Concord, on the Concord and Manchester Electric Railway. Well-finished wooden cottages among the pine woods. Altitude: 180 metres. *Charges:* $15 per week.

SECTION II.—SOUTH AMERICA AND AMERICAN ISLANDS.

CHAPTER XXI.

ARGENTINE REPUBLIC—BRAZIL—CUBA—URUGUAY.

Argentine Republic.

A LEAGUE for the prevention of tuberculosis was started in this republic in 1899. It was proposed in Congress to erect sanatoria for the poor; but great difficulties were encountered in raising the necessary capital. There is also a project for a children's sanatorium. A summer nursing home on the German model has been opened. Two dispensaries have been opened; and since 1st January, 1904, it has been forbidden to put tuberculous patients with other invalids in the hospitals. Severe laws have been passed against the spread of infection. For instance, any house in which a consumptive has stayed for one day must be disinfected; and a fine of 200 pesos (about £40 or $200) is imposed if this be not done according to the instructions of the authorities. Public vehicles, theatres, churches, etc., have to be frequently disinfected, and spitting is forbidden under heavy penalties.[1]

Brazil.

The Association Pauliste des Sanatoria Populaires pour Tuberculeux was founded in July, 1899. A Brazilian league against tuberculosis was founded the following year. Other leagues exist in various provinces of the empire.

A *sanatorium* is being erected at Tunnel Brande for the poor.

[1] *British Medical Journal*, 7th Nov., 1903; *Tuberculosis*, Feb., 1904.

The site is 1,050 metres above the sea-level, 248 kilometres from Rio de Janeiro, near the village of Cruzeiro.

Another sanatorium for soldiers and sailors is to be erected by the Government at Campos dó Jordao. A railway is to be laid down from the town of Loréna, which is eight hours by rail from the capital.[1]

For *Canada* see *British Colonies*.

Cuba.

Two sanatoria for consumptives were projected in and near Havana during the American occupation in 1902. One section was to be attached to a military hospital on the outskirts of the town, and to be devoted to incurables. The other was to be about five miles out in the country, for presumably curable cases. Negotiations were in progress in May, 1902, for the purchase of an estate of 100 acres for this purpose. The prime mover was Major W. C. Gorgas, chief sanitary officer of Havana; the sanatorium was to be supported by the Cuban Government, and to be free for those unable to pay their way.[2]

Uruguay.

A league for the prevention of tuberculosis has been founded in this country. A dispensary is to be opened in Montevideo.[3]

[1] *Tuberculosis*, July, 1903. [2] *British Medical Journal*, 17th May, 1902.
[3] *Tuberculosis*, Jan., 1903.

SECTION III.—AUSTRIA-HUNGARY AND THE BALKAN PROVINCES.

CHAPTER XXII.

AUSTRIA-HUNGARY.

THREE or four popular sanatoria have been opened in Austria-Hungary, in addition to a number of others for paying patients. Various open health resorts also exist, which are frequented (mainly in summer) by consumptives.

Several societies for combating tuberculosis are in existence, both Czech and German. One of the latest is chiefly concerned in safeguarding the children of the Empire. A Bohemian society will co-operate with the Austrian one.[1]

Austria-Hungary.

THE ALLAND SANATORIUM

was founded in 1894 and opened in 1897, mainly through the exertions of Prof. von Schrötter, of Vienna, aided by Dr. Conrad Clar and Hofrath Christian Lippert. An abortive attempt was made in 1883, but it was not until ten years later that a syndicate was formed as the result of a fresh appeal, and the necessary funds subscribed, mainly by inhabitants of Vienna. The society entrusted with the erection of the sanatorium received a donation of 10,000 florins from the Emperor and Empress, together with others ranging from 100 to 100,000 florins. The site, which is of unusual beauty, is said to have cost over 62,000 florins, the various buildings nearly 362,000 florins, and the water supply another 18,000 florins.

The sanatorium is situated in a valley in the Wienerwald, about

[1] *British Medical Journal*, 26th Nov., 1904.

Sanatoria in Austria-Hungary.

Name.	Locality.	Alt. in Metres.	Beds.	Date of Opening.	Physician.	
Alland Sanatorium	near Vienna	430	108	1897	Dr. A. R. v. Weissmayr	Popular Sanatorium in connection with Vienna Hospitals
Queen Elisabeth Sanatorium	near Buda-Pest	340	116	1901	Dr. D. Kuthy	Popular Sanatorium built by Buda-Pest Heilstättenverein
Tannwald Sanatorium	Gablonz, Bohemia	—	30	1902	—	Popular Sanatorium in connection with K. Franz Joseph Hospital
Graz Sanatorium	Styria	—	—	proj.	Dr. Kraus	Popular Sanatorium
Reichenberg Sanatorium	Riesengebirge	—	—	proj.	—	,,
Gries Sanatorium	S. Tyrol	—	—	1901	Dr. Malfer and Dr. Nazarkiewicz	Pay Sanatorium
St. Pancratius	S. Tyrol	90	49	1902	Dr. Paul Fischer	Pay Sanatorium belonging to a Swiss Nunnery
Wienerwald	near Vienna	—	—	? 1904	Dr. Kraus	Pay Sanatorium
Zakopane	Galicia	1,050	72+	—	Dr. Dluski	,,
Marilla Völgy [1]	S. Carpathians	714	—	—	Dr. Hoffenreich	Pay San.; not exclusively for Cons.
Uj-Tatra-Füred [1]	Gerlach	1,004	—	—	Dr. v. Szontagh	,, ,,
Alpenheim	Aussee, Styria	700	—	—	Dr. Schreiber	,, ,,
Meran Kurhaus	Austrian Tyrol	320	—	—	—	,, ,,
Feketchegy [1]	Hungary	660	—	—	—	,, ,,
Keresztenysziget [1]	Szeben, Hungary	1,420	60-70	1894	—	,, ,,
Stoosz [1]	Hungary	670	—	—	Dr. Czirfusz	,, ,,

[1] See Kuthy, *A Tüdövész Szanatoriomok*, Buda-Pest, 1897.

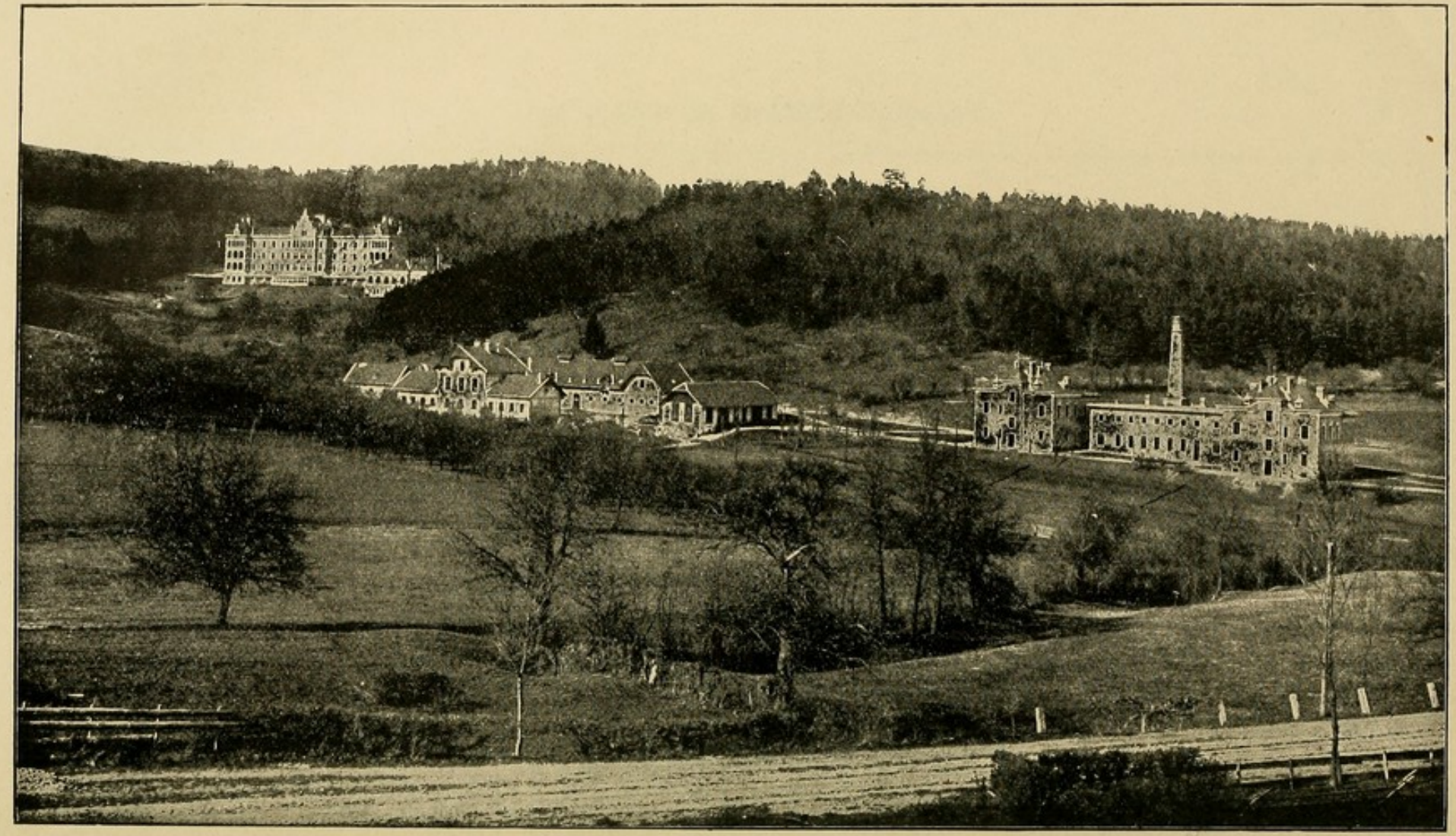
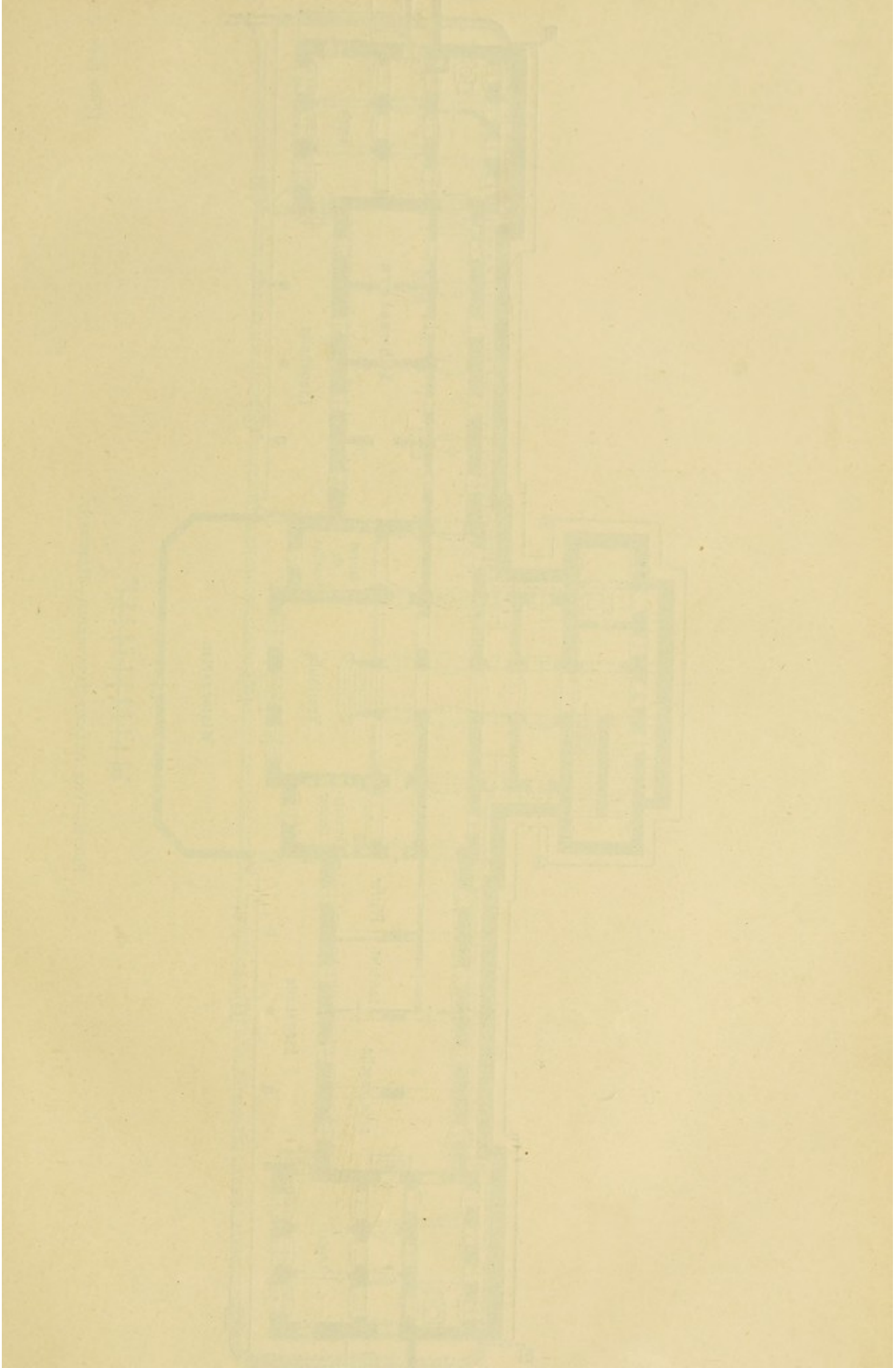


FIG. 7.—THE ALLAND SANATORIUM. [*Face page* 113.



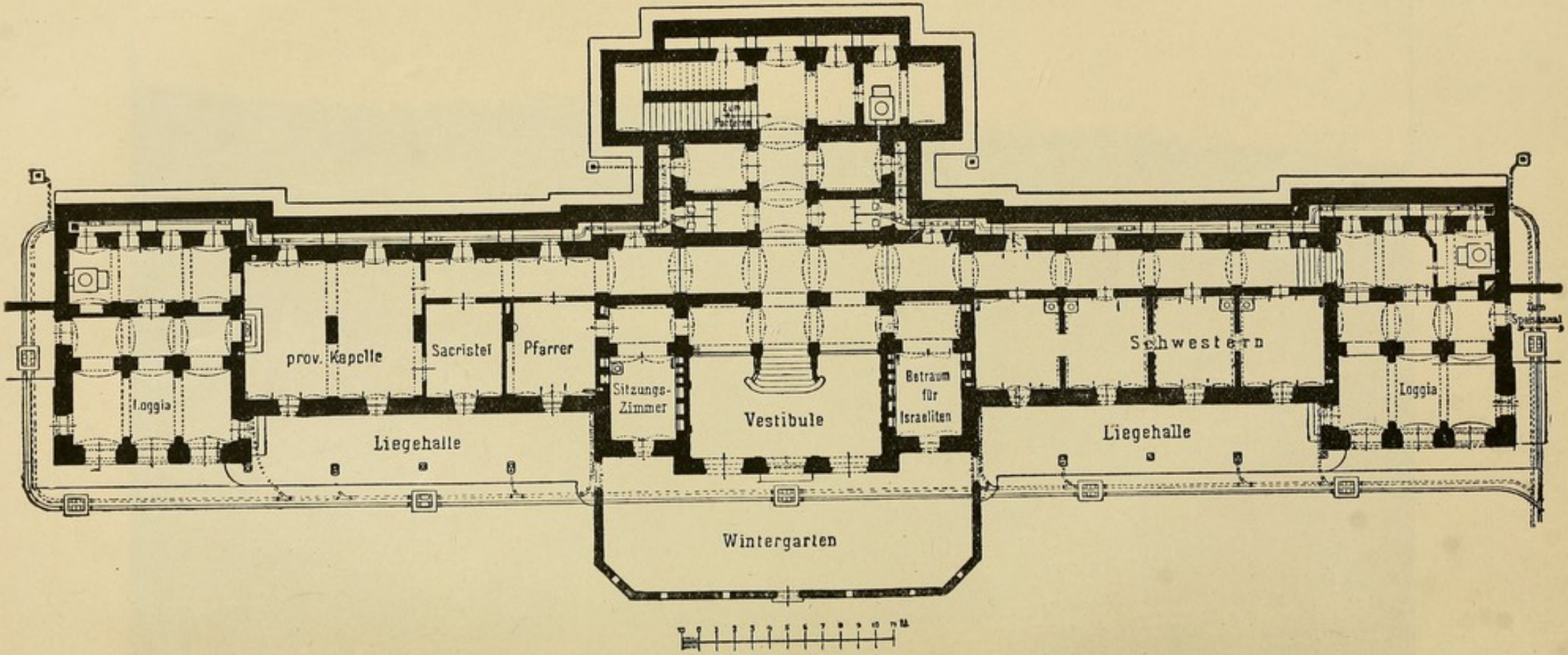


FIG. 8.—THE ALLAND SANATORIUM—BASEMENT.

[*Face page* 113.

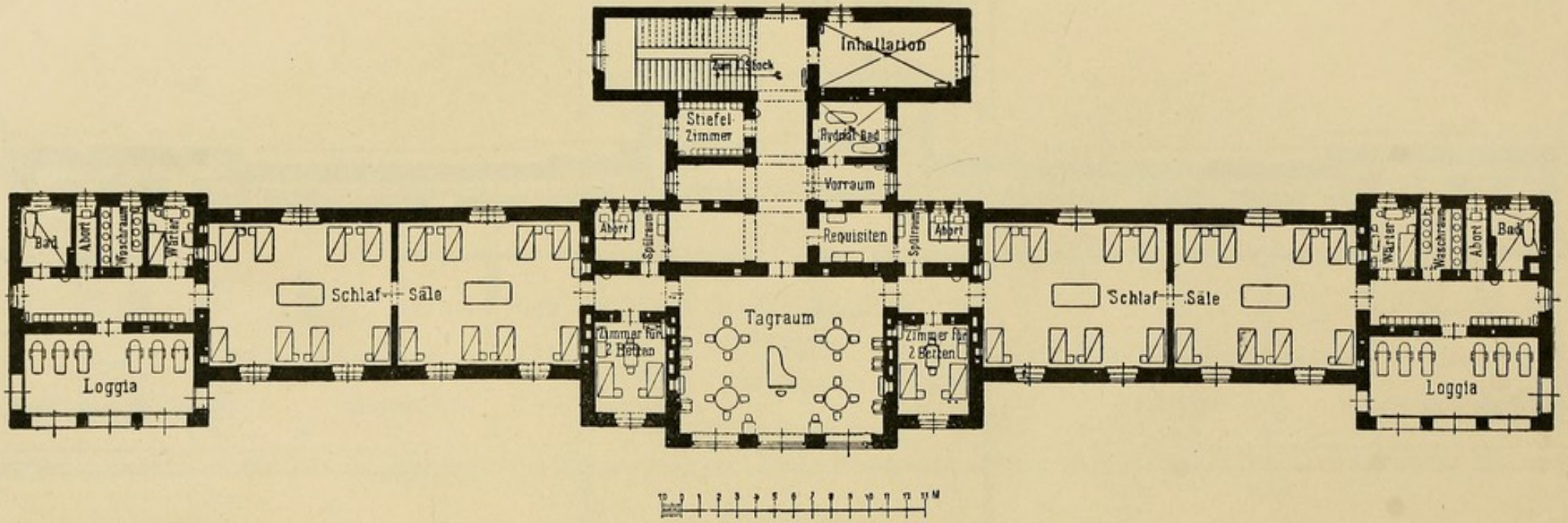


FIG. 9.—THE ALLAND SANATORIUM—GROUND FLOOR.

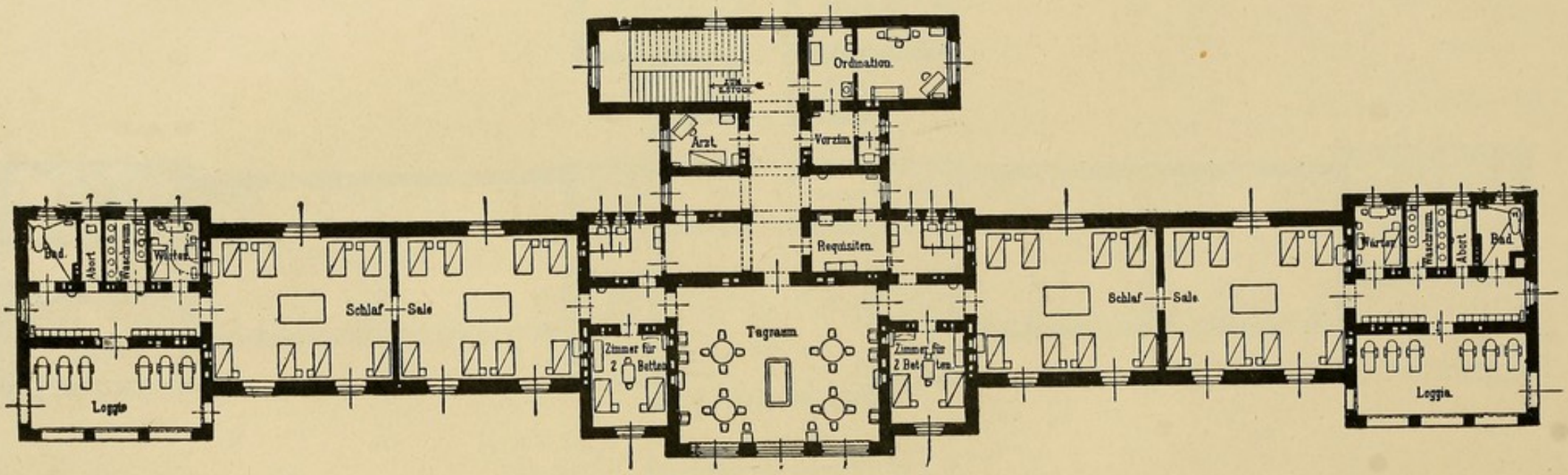


FIG. 10.—THE ALLAND SANATORIUM—FIRST FLOOR.

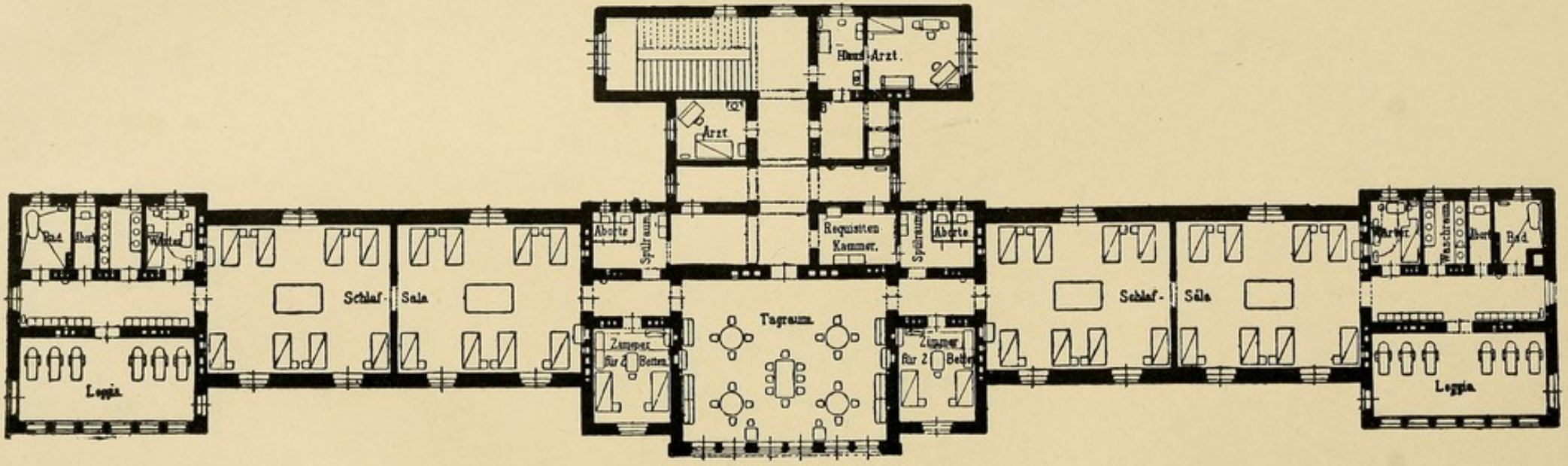
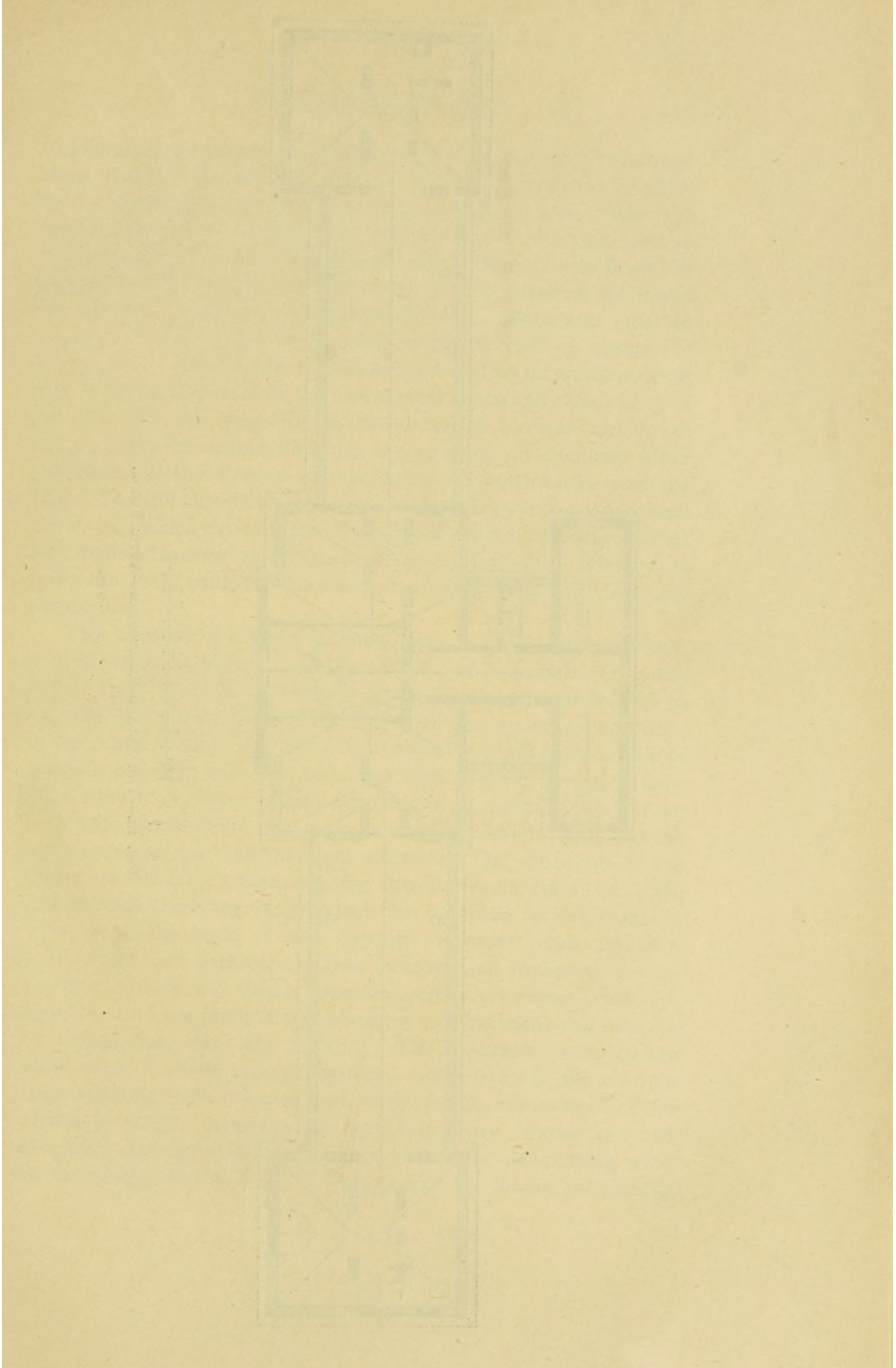


FIG. 11.—THE ALLAND SANATORIUM—SECOND FLOOR.



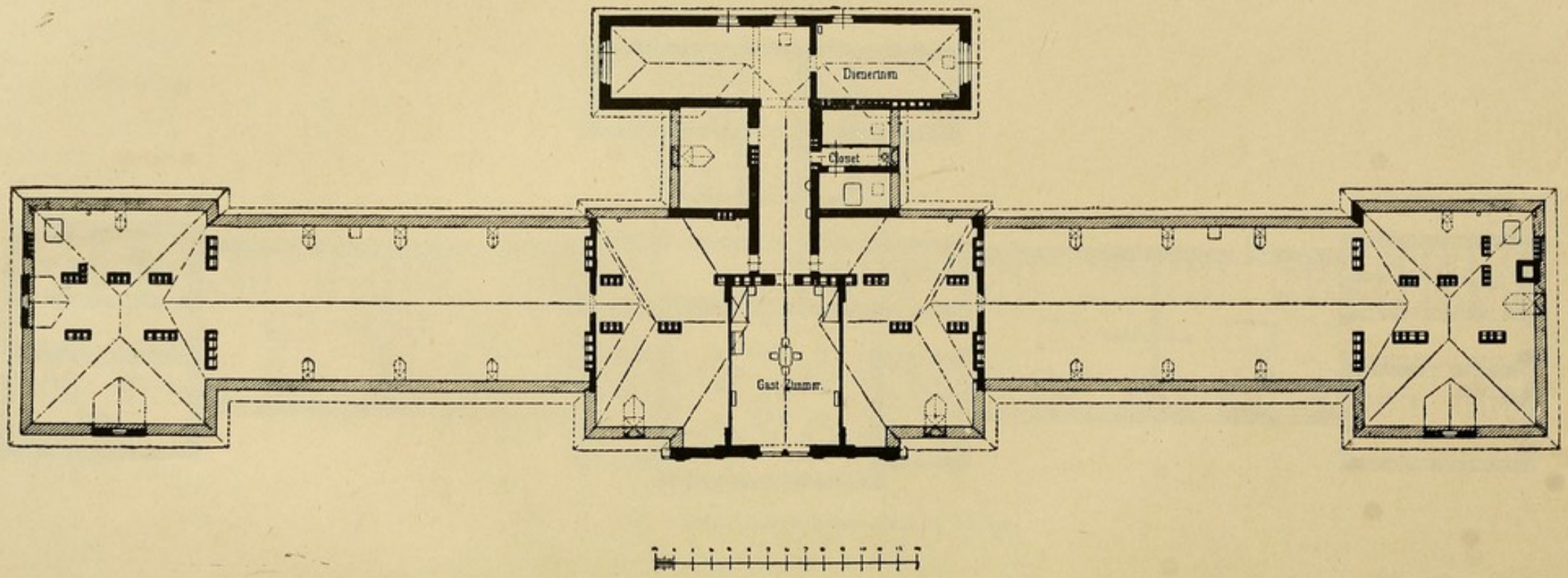


FIG. 12.—THE ALLAND SANATORIUM—ATTIC FLOOR.

16 kilometres to the west of Baden, 27 kilometres from Vienna, and about a mile from the little town of Alland. The grounds, which have a southerly slope, cover an area of 76½ hectares (about 190 acres), and consist of woodland, meadows and cultivated land in about equal proportions. The lowest point is thirty metres below the sanatorium, and the highest part of the property reaches the top of the adjacent mountain, 250 metres above it. Mountains exist to the east, north-east, and north-west, so that there is an absence of strong wind. Dust is also seldom noticed, and no factories or dense clusters of houses exist in the neighbourhood to sully the purity of the air. The soil is mainly of limestone, with a certain amount of clay. There was some difficulty in providing an adequate water supply, as all the streams in this region run northwards from the hills. To meet this difficulty a local landowner gave the sanatorium the springs which exist on the other side of the hill, and an aqueduct was made with iron pipes, provided by the Archduke Albrecht, to bring the water (which is pure and abundant) round the hill to the sanatorium.

This consists of a main building, with separate kitchen block, and of other necessary buildings which are separated from the former by a little hill. The main block (figs. 7-12), which looks to the south, has three upper stories, and contains on the ground floor in the centre a large day room 11 metres long. On either side of this is a bedroom with two beds, and behind these the space for a lift, a store-room, two water-closets; and in a projecting pavilion the bath and douche-room, boot-room, a large inhalation room, and the main staircase near the principal entrance. On either side of the centre are two large communicating dormitories for eight beds each, and beyond these the wings, which are occupied by day rooms in front, while the back of each contains a nurses' room, lavatory, water-closet and bathroom. This lavatory and bathroom are intended for daily and weekly ablutions, while hydrotherapeutic applications and the preliminary cleansing on admission take place in the rooms near the main entrance. The basement, owing to the rapid slope, is above ground in front. It contains in the centre a large vestibule with staircase, and rooms for the committee and for Jewish worship. Laterally are the temporary chapel and the chaplain's quarters, balanced by four rooms for the nursing staff. In the wings on this floor are two more day rooms, and behind

them the furnaces for heating the bath water. A fresh-air gallery runs along the south side of the building, with a glass winter garden in the centre.

The upper floors are similarly planned to the ground floor, with a large day room and two small bedrooms in the centre, two large dormitories on each side, and other day rooms, nurses' rooms, water-closets, bathrooms and lavatories in the wings. The central northern pavilion on those floors contains the quarters for the medical officers, as well as consulting rooms. The centre of the building has an additional story, of which the front forms a spare room for medical men who may come to study the methods of treatment, while the back contains the servants' quarters. Twelve patients are accommodated in the smaller rooms, and ninety-six in the large dormitories. The administrative block, however, has been arranged for 300, and the grounds could easily accommodate five or six times the present number. Future additions are to be in the form of scattered buildings in the park. In the present building the rooms are 4·70 metres high, forty cubic metres being provided in the large dormitories, and forty-five in the smaller bedrooms. The corners are rounded in every room. Floors are partly of terrazzo, partly tiled, mostly covered with linoleum on a basis of plaster of Paris. The walls are washable and undecorated. Furniture in the bedrooms consists of iron bedsteads, with plain wooden tables and chairs, and open iron pedestals with glass tops. The windows are large, mostly with two hinged upright sashes, and an upper transverse sash. Ventilation is by means of windows, ventilation shafts and openings under the windows. The building is heated by low pressure steam and lighted by electricity. There is an electric heater on every floor to heat water, etc., during the night. The rain water is carried into a pond on the way to the stream ; sewage and waste water into settling tanks, where they are treated with milk of lime, and after precipitation clarified by filtration.

Coming next to the administrative block, this is placed to the east of the main building, on a lower level, and communicates with it by means of a covered corridor. It contains a cellar story, with furnaces, etc. ; above this a small kitchen, more cellars, and the quarters of the women servants and gardener ; and on the next floor the large dining-saloon, sewing-room, kitchen, scullery, etc. The remaining buildings are at a distance from the main block, and

consist of laundry, engine house and disinfector, mortuary, laboratories, cowsheds and stables, together with the residence of the medical director, Dr. Alex. Ritter v. Weissmayr.

Patients are chosen at the general hospitals of Vienna, and are exclusively consumptives of the male sex in remediable stages. After a probationary period of three weeks, they usually stay three months. They are allowed in certain cases to do gardening and other suitable work, and to a large extent wait upon themselves. Judging by a private report, the plan and management of Alland Sanatorium appear to be admirable, excepting that the amount of fresh air is more limited at night than in a good English sanatorium.

Charges: 1 florin per day, or 2·50 in the smaller rooms. The parish or sick fund pays for the poor. There are five nurses in the establishment.

The sanatorium may be reached by the Southern Railway or the South-Western Railway. In the first case there is a drive of one and a half hours to Schwefelbad, three-quarters of an hour by rail from Vienna; in the second, a drive of three-quarters of an hour to Altenmarkt or Weissenbach, one and a half hours' journey from Vienna.

The Queen Elisabeth Sanatorium

is placed to the west of Buda-Pest, in a valley overlooking the village of Buda Keszi about one and a quarter hours by road from the city. It is sheltered to the north, west and east, by the Johannisberg, and is surrounded on three sides by beautiful woods. The grounds, given by Buda-Pest (twenty-eight acres) fall rapidly to the south-west. The portion to north-east, and west is covered with oak trees, while towards the south is a natural clearing which has been planted as a garden. Graduated walks varying from 2 per cent. to 10·5 per cent. in steepness have been made; tablets being placed to show the degree. There is also a flat walk, one end of which leads to a sunny glazed eastern pavilion for winter time, while at the other end is a summer pavilion in the midst of the woods.

The main building, which is of white stone with green verandahs and red tiled roof, has a straight front with projecting towers at the sides. Between these on the south side are *liegehallen* on the ground floor, first floor and second floor, supported by iron pillars given by the State. Behind the *liegehallen*, which are five metres

high and three and a half wide, are the chief wards in a single row; behind these the corridor. There are on the first floor six wards with each six beds, two with five apiece, one with two and one extra room. The single- and double-bedded rooms are beyond the projecting towers and have a separate balcony. The arrangement is similar on the second floor. To the north of the corridor is a central projection containing the W.C.s on one side, the common lavatories on the other. Next the W.C.s are rooms for disposal of sputum; also receptacles for dirty handkerchiefs and papers respectively. In the common lavatory each patient has a numbered basin, and a numbered glass shelf for the utensils. There is a separate opening for the water used in cleaning the teeth. The small wards have separate lavatories. The laboratory and rooms for assistant medical officer with separate bathrooms are also to the north. The entrance is on the ground floor at the western end. Next to it are the cloak rooms, where each patient has two lockers for indoor and outdoor boots and clothes respectively. Close by on the ground floor are the consulting rooms and small dental and operation rooms. Leading northwards is a closed well-ventilated corridor to the dining-room, which is in a separate building; the staircase is close by, with rounded stone steps. Further along the ground floor are two separate day rooms, the electric lift, and three wards each with six beds. Behind the corridor is a verandah where clothes may be brushed.

The western tower has an additional story; and over the whole building are attics. These are for servants' quarters. The eastern end has on each floor a nurses' room; and in the basement a very complete hydropathic installation. Heating is by low-pressure steam, the pipes brought through a tunnel from the engine house, and the radiators placed on the north side of the wards. Lighting is by electricity, a number of wall plugs being placed in the *liegehallen*. For ventilation each ward has a shaft, two large and one small window, and fanlights over the doors. Height of ward five metres. Floors are mostly of a special brown Hungarian patent asbestos resembling *torgament* (see p. 287). In the corridors this is coloured to resemble carpet. Corners are everywhere rounded. Walls are painted with enamel paint to 1·80 metres above the floor. In the wards are iron pedestals with glass tops; each bed has washable bedding, a linoleum strip on the floor, a chair, paper

basket and table beside it. The clothes lockers are in the corridor and have high feet and sloping tops. The cane lounges in the *liegehallen* are provided each with horse-hair mattress and bolster.

The dining saloon contains 1064·8 cubic metres air space. At the entrance is a lavatory, and a cupboard with numbered places for the serviettes. In front of the building is another *liegehalle* with a glass partition. The serving-room communicates with the kitchen in a separate building. Here there are two rooms for medical visitors.

The laundry and engine house are to the north-east, hidden by a group of trees, above which projects the tall chimney.

The water supply is pumped up from the town supply to a reservoir on the Johannisberg. The sewage is carried into filtration tanks under ground; after treatment with lime the sludge is dug in from time to time, the clear effluent goes on to an irrigation patch. There are separate pipes for rain water. The chief medical officer has a separate villa leading off the entrance drive, which curves round from south to north of the ground.[1]

The Tannwald Sanatorium

near Gablonz was the first popular sanatorium built in Bohemia by private subscriptions and maintained by the local treasury. It is placed in a cross valley of the Desse, on an eastern spur of the Isergebirg. Both sexes are admitted.

The Gries Sanatorium

was the first private sanatorium for paying consumptive patients opened in Austria. Situated not far from Bozen, the southernmost health resort in the Austrian Tyrol, with a steep cliff behind it to the north, it is further protected by evergreen trees, and separated by a vineyard from the public road. The house is substantially built, in three stories with attics above, a large balcony on the first floor at the western end, smaller ones on the south side.

The floors are without carpets. The walls are covered with washable distemper, or in the corridors and staircases painted in oils. The furniture includes bentwood, leather-covered ottomans, and other articles easy to keep clean. The electric lighting is from the town of Gries. Patients are forbidden to smoke or to

[1] Description in *Zeitsch. f. Tuberk.*, April, 1903.

talk about their own ailments; and care seems to be exercised to prevent the spread of infection.

St. Pancratius in Arco.

This sanatorium belongs to the Congregation of the Sisters of the Cross in Ingenbohl, Lucerne, Switzerland, who raised the funds for its erection, and continue to manage it with medical help. Situated in a district of great natural beauty, it has the Sarcatel mountain to the north, and in front of it a plain four kilometres long surrounded on three sides by high mountains and ending on the Lago di Garda. Monte Brione shelters the sanatorium from the strong lake wind, while on other sides the only gap in the mountains is where the Sarca bursts through. Scattered houses are placed to the north of the building, but the mountains can be reached without passing through the town. The building has a straight front with three projecting pavilions to the north of the corridor, the bedrooms forming a single row to the south. The basement contains the kitchen department, store rooms, douche rooms, sisters' rooms, heating apparatus, and a few common rooms for patients. On the ground floor is the office and lift and chief staircase, the dining-saloon in the west wing, the drawing-room and second medical officer's room in the east wing. Closets and lavatories are placed in all three northern pavilions. On the first and second floors, the patients' rooms occupy three sides, the north side being utilised for consulting rooms and laboratory below, and chapel above. Three bedrooms on the third floor are used for sisters who come for a holiday. The whole building is supplied with electric light and bells, telephone from the doctor's room, hot and cold water in the corridors and hot water radiators. The walls are covered with washable paper, the floors with "Eubæolith" of a light brown colour; in the bedrooms are metal pedestals, lounge chairs covered with removable covers, washable bedhangings and awnings. There are double doors, so that clothes can be removed without entering the bedroom. A number of common rooms have been provided, such as billiard-room, music-room, etc.; but the drawing-room may only be used from 8 to 9.30 P.M. Nobody can enter or leave the building without the knowledge of the portress. The main entrance has next to it a cloak-room with boot-room; the door opens by touching a knob, and is self-closing. The staircase is forbidden to patients going up-

stairs, who must use the lift. A subterranean passage leads from the kitchen to a distant spot whereon has been erected a coal depot, laundry and disinfector, so that no objectionable smells can reach the patients' quarters.[1]

Zakopane Sanatorium.

The village of Zakopane in the Tatras chain of the Carpathians has a great reputation as a health resort for consumptives, enjoying a very dry atmosphere and plenty of sunshine. Three kilometres uphill from the village is placed the sanatorium, in a dominating position overlooking the valley, on a private estate surrounded by pine woods.

The building is shaped somewhat like Hohenhonnef, with wings at obtuse angles. The ground floor is occupied by vestibule, office, cloak rooms and those for the staff. The four upper floors contain seventy-two patients' rooms, for one or two patients, all on the south side, the north of the corridor being occupied solely by servants' rooms, W.C.s and bathrooms. There are one large and two small dining-rooms, a chapel, consulting rooms, laboratory, surgery, operation room and hydropathic department. An electric lift, electric bells and speaking tubes serve every floor. The place (including lift and staircase) is heated with low-pressure steam; hot and cold water are laid on at every floor; lighting is by electricity. The bedrooms have double doors, linoleum on the floors, model furniture, washable walls and a large verandah or balcony on every floor. There is a complete system of drainage. The telephone and telegraph connect with the village, and a special post office is in the building.[2]

The Sanatorium of Marilla Volgy,

in the South Carpathians,[3] is well sheltered on all sides against wind, and is isolated by beautiful woods. The place is lit with electricity, and has covered verandahs for the fresh air treatment. The diet is very strict.

[1] Description and plans in *Zeitsch. f. Tuberk.*, Feb., 1904.

[2] Description in *Zeitsch. f. Tuberk.*, July, 1903.

[3] I am indebted to Kuthy (*A Tüdövész Szanatoriomok*, Buda-Pest, 1897) for the following descriptions of Hungarian sanatoria.

THE SANATORIUM OF UJ-TATRA-FÜRED,

or Neuschmecks, is in the highest part of the village of Gerlach. The soil is of clay; the winter dry and cold, the summer cool, of medium humidity. Fogs are rare; and the absence of any glacier in the neighbourhood is also an advantage. Mountains of 3,000 metres shelter the sanatorium to the north, and there is very little dust or wind from any quarter. The sanatorium has a southern aspect, and has a ground floor and two upper floors. The eastern end consists of four projecting square towers with pointed tops, connected by a lower central portion. Great pains have been taken to render the building thoroughly dry. There is central heating by warm air, and ventilation of the same kind in cold weather. In the rooms for one patient the air can be renewed fifty times per diem. The sanatorium communicates with the thermal bathing establishment and the dining saloon by means of a covered corridor. It is a great drawback that, owing to this arrangement, and to the proximity of several other bathing establishments, patients cannot be completely supervised. There are several balconies on the south and west sides of the building, and a large winter garden. The rooms are well lighted; there are double windows, hot-water pipes in the corridors and staircases, and a separate stove in each room.

It is mainly a summer resort, and not exclusively reserved for consumptives, who are received in the early stages alone. Dr. v. Szontagh uses massage and cold ablutions, friction with moist compresses, seldom any douches, but pulmonary gymnastics and inhalations. The *diet* is abundant, but not medically supervised. Milk and kefir are largely given.

The sanatorium is nine kilometres (five and a half miles) from the railway station of Poprad Felka, nine hours by rail from Buda-Pest, and a little more from Breslau.

A few poor patients are received, but the institution is essentially for paying patients.

Kuthy mentions several other places in Hungary which would be suitable for consumptives, but are little frequented by them (see table).

At *Keresztenysziget* (Isle of the Christians), in the province of Szeben, there is a fine establishment founded by a society, in June, 1894, with the aid of various philanthropists, as a convalescent

home, and called the "Curhaus auf der Hohen Rinne". It is placed in a pine wood, about five or six hours' drive from Nagy-Szeben. The principal block contains the dining-saloon and administration, besides which there are two wings, bath-houses and other buildings. The rooms are comfortable, for one, two, three and four persons, mostly with verandahs, and all capable of being warmed. The food is said to be excellent. Patients can be treated by hydrotherapy, massage, electricity and inhalations. The *charges* are 12 florins per week.

Consumptives also visit *Meran* in the Austrian Tyrol for treatment by hygienic methods. This place is situated on the southern slopes of the Alps, and has a dry and bracing climate with an average of seven snowy and fifty-two rainy days. The mean winter temperature is higher than at Montreux, but decidedly lower than at Torquay. There is a fine Kurhaus, with a number of reception-rooms, and arrangements for medicated baths, pneumatic chamber, grape cure, whey cure, etc.[1]

[1] Solly, *loc. cit.*

CHAPTER XXIII.

THE BALKAN PROVINCES.

Bulgaria.

A SANATORIUM was projected in 1902 in the district known as Tscham-Koria (Firwood), nine kilometres from Samokov at the foot of the Rilo-Dagh Mountains. There is here a beautiful pine wood traversed by a noble stream, well sheltered against wind, and full of wildly romantic scenery. There is now a hotel and some thirty private houses for summer visitors, including one belonging to Prince Ferdinand. The district is under the control of the magistrate of Samokov, with the help of a doctor from the same town.[1]

Roumania.

A site for a sanatorium has been bought by the hospital authorities at Gory near Bucharest, 1,100 metres above sea-level.[2] A government grant has been made of £17,500 for a tuberculosis hospital.[3] A State lottery is planned to pay the costs of erection.

[1] *Tuberculosis*, Oct., 1902. [2] *Heilstättenbote*, April, 1901.
[3] *Zeitsch. f. Tuberk.*, July, 1904; *Tuberculosis*, June, 1904.

Section IV.—BELGIUM.

CHAPTER XXIV.

BELGIUM.

The campaign in Belgium against tuberculosis has been mainly directed towards the establishment of *dispensaries* in the towns. Some fourteen of these are now in existence, at Namur, Mons, Tournai, Charleroi, Brussels, Ghent, Antwerp, Bruges, St. Trond (Limbourg), Liège, Huy, and Verviers. In these institutions, which are supported by voluntary contributions, the physicians examine the patients, and give hygienic advice. An ex-working man is connected with each dispensary, whose business it is to obtain information as to the circumstances of the patients, their housing and occupation. Through him they are instructed in hygiene; they receive bedding, spit flasks, long chairs, etc. where needed, and two quarts of Pasteurised milk a day. If likely to obtain benefit, they are boarded out with farmers in the country.[1] Associated with the dispensary at Mons is a fresh-air cure: patients go out in the morning into the country, are provided with food and shelter, and return in the evening to sleep in a special ward in the town hospital.[2] The shelter is placed in the re-entering angle of a wood overlooking Mons. An old constructional railway line is used to carry the patients. Four meals a day are provided at the shelter, and the last at the hospital. There is accommodation for fifteen or sixteen patients under the shelter, which has a double wooden roof; another is to be added for a similar number. The shelter has so far not been used in winter.[3]

Several seaside *convalescent homes* exist for children threatened

[1] *Brit. Med. Journ.*, 11th May, 1901.
[2] *Tuberculosis*, Sept., 1903. [3] *Ibid.*, June, 1904.

with tuberculosis and other ailments—such as the one at Middel Kerke with thirty beds, that at Venduyne with 200, and that at Ostende. There is an inland convalescent home for children at Esneux, about half an hour's rail from Liège, and three more for adults at Bockryck-Genck-lez-Hasselt, Bonsecours, and Crainhem-Tervueren. All three are inland at a low altitude.

Of *societies* for combating tuberculosis, the first in Belgium was the *Oeuvre Liégeoise des Tuberculeux*, followed by the *Ligue Nationale Contre la Tuberculose*. This was originated by the medical societies in 1897-98, and is supported by private contributions. Several provinces, however, give annual subsidies to the *Ligue*.

Several of the Belgian *hospitals* have set aside special wards for the open-air treatment of consumptives. This has been done for twelve years in the Military Hospital at Brussels.[1] Of *sanatoria*, there are now two private ones for paying patients, at Mont sur Meuse and Bockryck; another was opened for the poor of the city of Liège in 1903; a fourth is being built for Brussels, and two more are projected.

BELGIAN SANATORIA.

Name.	Locality.	Beds.	
Bockryck Sanatorium	Bockryck-Genck-lez-Hasselt	60	Dr. Loriers
Borgoumont Sanatorium	Spa	114	Dr. van Beneden
Brussels Sanatorium	La Hulpe	50	—
Bruggmann Sanatorium	Alsemberg	80	—
Mont sur Meuse Sanatorium	Mont sur Meuse	60	Dr. Hottlet

THE BORGOUMONT SANATORIUM

for men of the city of Liège, is situated near Spa by the river Borgoumont, at 415 metres altitude. Protecting it on the east, north and west, are woods partly consisting of conifers, and the mountain La Fagne, which rises to 650 metres.

There are three chief buildings; a central one facing south forming a curve, containing the wards; an administrative block with doctor's house to the east, and a kitchen block.

The central building has a basement, approached from behind, and an air gallery surrounding it in front and at the sides. In the

[1] *Zeitsch. f. Tuberk.*, Nov., 1900.

centre of the basement are rooms for recreation and gymnastics; on the ground floor reading and day rooms; on the first floor an additional balcony for patients requiring rest and seclusion. To the sides are wards, seven with six beds, thirteen with four, four with three, eight single-bedded, and above these the servants' bedrooms. Connecting this building with the kitchen block is a wing containing in the basement the engines and heating apparatus; and on the ground floor a large dining-room. The kitchen block has in the basement the electro-motors for disinfection and laundry, the remaining apparatus being above this on the ground floor. On the first floor, on the same level as the dining-room, is the kitchen department, approached from the north. On the second floor are the quarters for the kitchen staff, and in the attics the linen rooms with drying apparatus. Dirty linen goes down a shoot into the basement, thence by special galleries to the disinfector and laundry: thence to the mending room, whence it is distributed by a different route. The steam engine, dynamo and accumulators are placed in a separate building on the road to the kitchen block. The administration block includes the bath and douche rooms; above these the laboratories, offices, main entrance and consulting room. A staircase communicates with the central building to the north. The doctor's house projects southwards so as to command the fresh air galleries. In this block are also the isolation rooms and those of the nurses.

The floors are of a special cement (*béton armé*, système Hennebique) covered with *linolith* which is run on to it and forms a surface free from joints. The walls are enamelled. Heating is by low-pressure steam; radiators mostly under the windows. Ventilation shafts carry off the impure air to the roof, aided by an electric fan: cubic space per head thirty-three cubic metres. There are sash windows, not French casements. The doors have a ventilator with parallel panes of glass.

Sputa are disinfected in an autoclave at 110° and then sent to a septic tank.

Cost, including land (fifty-six hectares), the private road, etc., 1,200,000 frs. Towards this sum, the Provincial Council of Liège gave 1,100,000 frs. free of interest. Montefiore Levi also loaned to the Council 300,000 frs., the interest on which he devotes to the mutual benefit societies. The effect of this is to reduce the *fees payable* by

them for sanatorium treatment to 1 fr. per day. Others pay 3½ to 7½ frs., according to domicile and room occupied: the higher charges being for single-bedded rooms.[1]

The Popular Sanatorium for Brussels

is being built at La Hulpe near Waterloo. The ground, of ten hectares, has been leased from the State for ninety-nine years, and has a southerly slope. The main building will have all patients' rooms on the south side, and will consist of a raised basement, ground floor and three upper stories. The basement will contain the dining-hall projecting forwards; also the kitchen, cloak rooms and douche rooms. On the ground floor will be four patients' rooms, a vestibule, laboratory and surgery, doctor's room overlooking the open-air gallery, the chapel, consulting rooms and quarters of the secretary and medical director. The first and second floors will each have eighteen beds for patients. On the north side will be the lavatories, W.C.s, linen room and nurses' rooms. On the third floor, two dormitories for patients, an infirmary, linen room and staff rooms. Cubic space thirty cubic metres per head. Heating will be by low-pressure steam, lighting by electricity. Two fresh-air galleries will be arranged on each side of the main building, the third in front of the ground floor. Drainage into septic tanks. The laundry and engine house is in a separate building to the north.[2]

The Bruggmann Sanatorium.

A sanatorium is projected for the city of Brussels with eighty beds, to be paid for by a legacy of 5,000,000 frs. left for the purpose by George Bruggmann. An estate of twenty hectares has been secured for it at Alsemberg. This is wooded with pine trees, and is well sheltered. The building, for forty men and forty women, will be lighted by electricity and heated by low-pressure steam. The kitchen and administration will be in a separate building to the north.[3]

Another sanatorium is projected by a group of communes in Brussels.[4]

[1] *Zeitsch. f. Tuberk.*, April, 1902, Sept., 1903. *Tuberculosis*, Oct., 1903.
[2] *Sanatoria Populaires*, first report, Brussels, 1904.
[3] *Tuberculosis*, Sept., 1903; *Rev. Belge de la Tub.*, 1st Jan., 1904.
[4] *La Lutte Antituberculeuse*, 30th Nov., 1901.

MONT SUR MEUSE SANATORIUM,

opened in 1901, in a picturesque part of Namur, overlooking the valley of the Meuse, stands on a limestone plateau 200 metres above sea-level, protected by well-wooded mountains to north, east and west, and far from towns and factories.

The principal building is of granite with brick framework to the windows, which are casements surmounted by fanlights. It forms an imposing structure surmounted by a central dome and two smaller lateral towers, and contains an elevated basement, ground floor and three upper stories. The aspect is south-south-east; the building line straight with a central and two lateral projections. A large balcony runs along the ground floor on the south side and smaller ones on the first and the central parts of higher floors. A verandah occupies the space in front of the basement, which contains the offices, bath and douche rooms, cloak rooms, kitchen department, store rooms, heating apparatus and refectories for the staff. Above this is a dining-saloon for eighty people, and a day room with billiard table: also a ladies' room, writing-room, director's room, laboratory and a few patients' rooms. Above these are servants' rooms; and on these three stories with patients' rooms, surmounted by a flat cemented roof. The building is one room and corridor thick, excepting at the projections, where these are northerly projections with staircases, and a few rooms for visitors with a north aspect. The ends of the corridors have been blocked by W.C.s. These are of English type, in pairs. The sewage is treated with lime in underground tanks, and then applied to the land. There is a chapel on the first floor. The different floors are connected by an easy staircase and an electric lift, which goes up to the flat roof, where there is a refreshment room. Walls are everywhere smooth with rounded angles; floors covered with linoleum, or (in corridors and bathrooms, etc.) with mosaic. Bedrooms have no curtains or blinds excepting wooden sun blinds; they contain 80 to 150 cubic metres air space, and are very simply furnished. Heating is by low-pressure steam; lighting by electricity. A pure and sufficient water supply was obtained at considerable expense.

The establishment also has a separate doctor's villa, the secretary's villa, stables and coach house, laundry, disinfector and engine

house, mostly at a distance from the main building. There is a well-wooded park and a large kitchen garden.[1]

Bockryck Sanatorium,

at Bockryck-Genck-lez-Hasselt, 1½ kilometre from Bockryck Station in the province of Limburg, is placed on a plateau far from populous centres in the midst of beautiful country. The soil is stated to be permeable; the climate dry and bracing. There are fifty-two hectares belonging to the place, including gardens, a farm with tuberculin-tested cows, and several ponds, two of which can be used for swimming.

The building consists of a group of ordinary substantial houses transformed for the purpose by the addition of balconies, verandahs and awnings. A large verandah forms a winter garden containing billiard table, etc. In addition to patients' rooms, there are a large dining-room, chapel, music and reading-room, ladies' room, dark room, bath and douche rooms, laboratories, etc. Most of the patients' rooms face south. The heating is by low-pressure steam; the lighting by petroleum lamps. Water is from a deep well. Six meals a day are provided. The *charges* are seven frs. per day for board and medical attendance, two to four frs. for the room, with extra for lighting, laundry, beverages, and special nursing.

[1] *Le Mouvement Hygiènique*, Bruges, Sept., 1901.

Section V.—THE BRITISH ISLES.

CHAPTER XXV.

THE BRITISH ISLES.

There has been a large addition to the number of sanatoria for consumptives in this country, both for the poor and for the wealthier classes. Several of our chest hospitals have seen the necessity for country branches managed on open-air principles. A number of country sanatoria have been erected by the co-operation of District Councils, etc.; one has been erected by the Boards of Guardians of Liverpool.

For middle-class patients there are a number of small institutions in various parts of the country, and a few larger ones; but none so large as the average German sanatorium. It is noteworthy that the largest sanatoria of this kind have been opened in Scotland by means of companies, to which the leading physicians of the country have given their names. Such a proceeding is regarded as unprofessional in England, although it is more likely to ensure proper support and therefore greater efficiency. In the King's Sanatorium, a splendid example of royal and of private philanthropy, the experiment is to be tried of receiving two distinct classes at two very different charges.

Country colonies are still greatly needed for consumptives who have recovered. There is great danger that such patients will relapse later on, owing to unsatisfactory conditions of life.

There are also far too few beds for consumptives in advanced stages, who are a grave danger to the community unless treated with proper precautions in suitable quarters.

CHAPTER XXVI.

THE NORTHERN COUNTIES

Including Northumberland, Cumberland, Durham, Westmorland, Yorkshire, Lancashire, and Cheshire.

Name and County.	Locality.	Opened.	Beds.	Elevation in Metres.	Fees per Week.	
CUMBERLAND—						
Cumberland San.	Blencathra	1904	20	266	Free, or 30s.	—
DURHAM—						
Bellevue San.	Shotley Bridge	1899	20	150	3 to 5 guineas	Dr. E. W. Diver
Durham County Sanatorium	Stanhope	1899	45 [1]	213	Free; 30s. or 42s.	Dr. John Gray (non-resident)
LANCASHIRE—						
Liverpool San.	Kingswood	1901	40	150	£1; 3 rooms at 3 guineas	Dr. Herapath Wood
Liverpool Hosp. for Consumption	Liverpool	1864	44	—	—	Being rebuilt
Liverpool Parochial Sanatorium	Heswall	1902	24	200	Free	—
Manchester Hosp. for Consumption	Bowdon	1875	50	—	5s. downwards	—
Delamere San.	Birch Hill	—	90	128	—	Being built
NORTHUMBERLAND—						
Northumberland Sanatorium	Barrasford	—	50 [2]	200	—	Being built
WESTMORLAND—						
Westmorland San.	Meathop	1900	28 [3]	64	Free; and 2 guineas	Dr. T. H. J. E. Hughes
YORKSHIRE—						
Bradford San.	Eastby	1903	52	—	Free	For pauper cases
Hull and E. Riding Conv.	Withernsea	1900	28	6	20s. to 25s.	—
Leeds Hosp. for Consumption	Armley	1903	20	—	Free	Drs. Trevelyan and Woodcock
Leeds San. for Cons.	Gateforth Hall	1901	32	21	Free	Drs. Trevelyan and Woodcock

[1] Twenty-five for men. [2] Eventually 100. [3] Fourteen for men.



FIG. 13.—BELLEVUE SANATORIUM. [*Face page* 131.

Cheshire.

In addition to the Bowdon Sanatorium (see Lancashire) a sanatorium is projected for the county of Cheshire.[1] The Chester Union Infirmary has special wards for male and female patients.

A *boarding school* (St. Hilary School) at Wallasey, receives children requiring open-air treatment: reference permitted to Dr. Walther of Nordrach (*see also* Lancashire).

Cumberland.

THE CUMBERLAND SANATORIUM

is on the southern slope of Saddleback, Blencathra, two miles from Threlkeld Station.

It is built near a farm, and consists of wire-wove dining-room and wings, with a central administration part for doctor, matron and servants. Heating is by hot-water pipes; lighting by lamps. The cost has been £8,536; the estimated weekly cost 30s. The charge for free beds is £78 per annum. When free beds are not occupied, patients will be admitted at 30s. per week.

The sanatorium was founded by the Cumberland branch of the National Association for Prevention of Consumption. Hon. secretary, Dr. J. B. Bird, 2 Brunswick Street, Carlisle.

Durham.

The *South Shields Union Infirmary* has special wards for open-air treatment. (Weatherley, *Tuberculosis*, London, April, 1904.)

BELLEVUE SANATORIUM,

in the valley of the Derwent, is fourteen miles from Newcastle-on-Tyne, Durham or Hexham. It stands on a hillside commanding beautiful and extensive views of the surrounding country, which is well wooded (fig. 13.)

Grounds: Two acres. There is good shelter from north and east by high hills and woods.

The building (not specially constructed) consists of a large private house, standing in its own grounds in which are placed open-air sleeping chalets and shelters. Some of the latter are

[1] *Lancet*, 27th July, 1902.

capable of revolving, others can be opened or closed on any side to afford protection against the weather.

Patients take their meals out of doors, or in a large conservatory. Lighting is by gas.

Both sexes are admitted.

Station; Shotley Bridge, one mile (N. E. Railway).

Telegrams: Diver, Shotley Bridge.

The Durham County Sanatorium

is in the upper part of Weardale, some distance west of the coal-fields, in a district well-wooded with pines and other trees. Surrounded by moorland, it is sheltered to the north by a spur of the Pennine Chain which rises in places to 200 metres above the institution. The grounds (two and a half acres of orchard, protected by high walls) are on the north bank of the Wear. The soil is of limestone; average rainfall thirty-six inches.

The building (not specially built), originally called Horn Hall, is of stone, and has been considerably altered for its present purpose. The bedrooms have from one to four beds apiece (mostly two or three) and are nearly all on the south side. French windows have been substituted for double-hung casements; the walls painted with duresco, the floors covered with cork carpet and varnished, while additional bathroom and lavatory accommodation were added. In 1901 an additional wing was added, also another kitchen, a large dining-room, two large lavatories with baths, and another staff bedroom. This year another block has been added, still further to the west. The bedrooms in the original block have fireplaces, but the fires are seldom lighted. About half the new bedrooms are heated by hot-water pipes, the rest are unheated. Lighting is by gas. The patients wash only in the lavatories; there are six baths and eight W.C.s. The water supply is pure and abundant. There is one verandah, and many shelters in the grounds for day use only.

The sanatorium is maintained by subscriptions from the working classes at the rate of threepence per quarter; annual subscriptions from the wealthier classes; weekly payment by inmates who do not subscribe regularly; and annual subventions from District Councils, boards of guardians, etc., at the rate of £75 per bed per annum. Regular subscribers have precedence for themselves and their families to the full extent of their subscriptions, but patients are

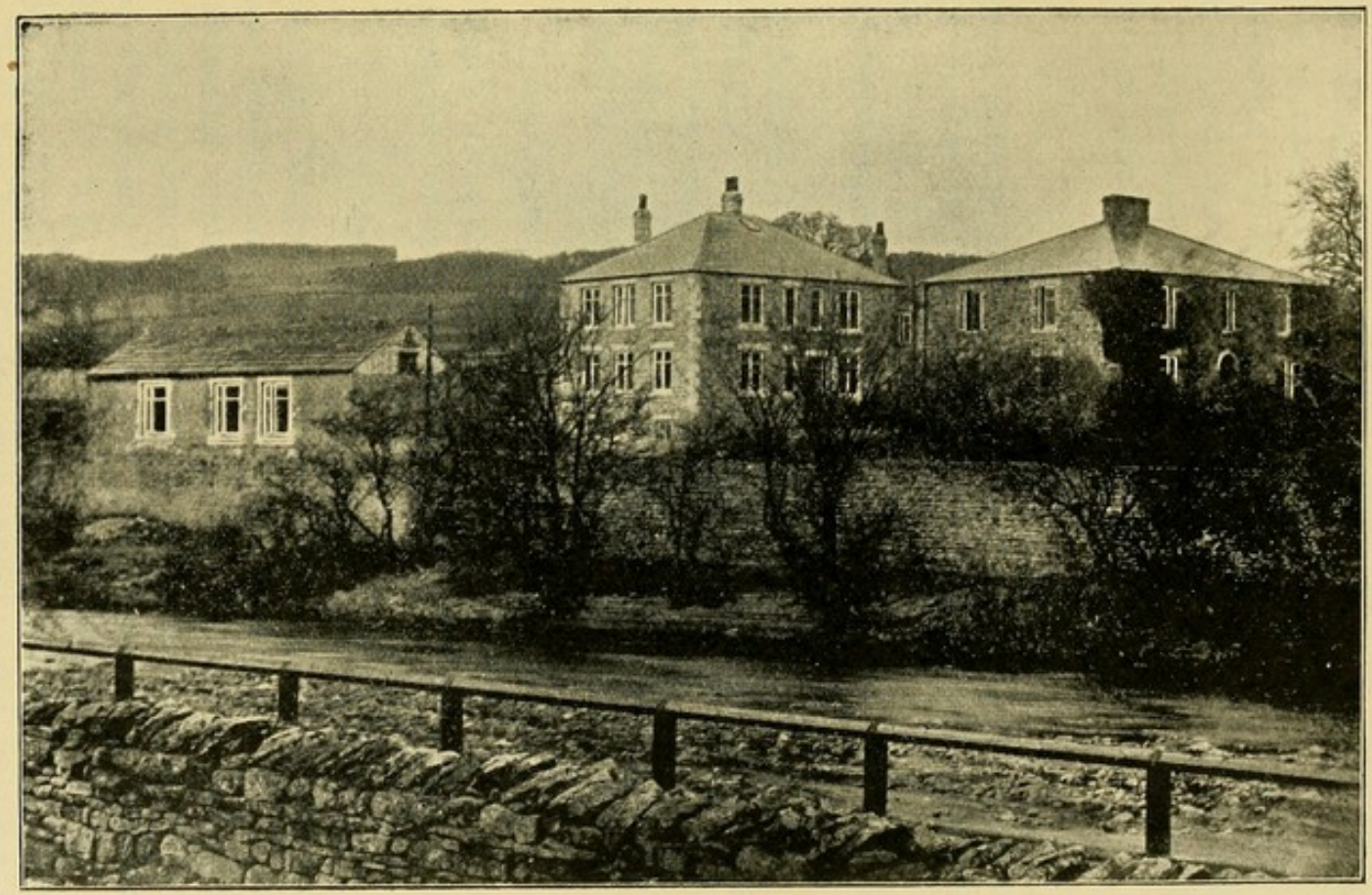


FIG. 14.—THE DURHAM COUNTY SANATORIUM. [*Face page* 132.

admitted from a distance after their claims have been satisfied. Average stay fourteen and a half weeks.

Horn Hall is held on lease for eighty years. The average cost with thirty beds (1903-4) was 22s. 6d. per week.

Staff: Medical officer: Dr. John Gray of Stanhope (non-resident), a matron, secretary, etc.

Applications: To the secretary, 54 John Street, Sunderland.

The Durham Sanatorium was founded mainly by the exertions of Dr. William Robinson and Dr. Scurfield, and is managed by a committee of which the former is chairman (fig. 14.)

Lancashire

possesses a *Country Hospital for Chronic Diseases of Children* at Heswall on Deeside, in addition to the institutions mentioned in the table.

A County Sanatorium is projected. (*Brit. Med. Jour.*, 6th Sept., 1902.)

The *Blackburn Union Infirmary* has a special ward on the second floor for male cases of consumption. Female cases are to be put into new wards to be shortly opened.

In the *Prescot Union Infirmary* there is a special ward with twenty beds for male consumptives. (Weatherley, *loc. cit.*)

THE LIVERPOOL HOSPITAL FOR CONSUMPTION

and diseases of the chest is in the midst of the city, in a situation quite unsuitable for open-air treatment. It is to be reconstructed.

THE LIVERPOOL SANATORIUM,

at Roughhill, Kingswood, between Frodsham and Helsby, in Delamere Forest, occupies one of the highest points in Cheshire. The sanatorium commands a view of the village of Molesworth, Eaton Hall, the seat of the Duke of Westminster, the city of Chester, the river Mersey, and (on a clear day) Snowdon and Moel Fammau.

Surrounding it is prettily wooded undulating country. The site (forty-five acres) has been secured on a long lease from the Crown, and has been planted with 3,000 young fir trees by a generous donor.

The buildings consist of a main block and a number of detached blocks. In the main block are, on the ground floor, the medical

officer's and matron's quarters, and behind the corridor (which ends in the lavatories) the consulting rooms and laboratory. On the first floor are a limited number of bedrooms for patients; in the attics, quarters for the staff.

In front of the building, with a south or south-west aspect, is a long balcony, and in the centre a short verandah. Running back from the centre of the building is a passage leading to the dining-hall, and beyond it the kitchen department, with servant's bedrooms.

Most of the patients are accommodated in small detached bungalows, each containing from four to six bedrooms, with bath-rooms, etc. All the rooms are built with rounded angles and corners, free from projecting mouldings. There are no fire-places; heating and lighting being by hot-water pipes and by electricity. The Vyrnwy water main of the corporation of Liverpool runs within a mile of the place. A new block for twenty more patients is being erected.

The sanatorium, which is intended primarily for the patients of the Consumption Hospital in Liverpool, and is only open to those living within a radius of twenty miles, owes its existence to the generosity of Lady Willox and Mr. W. P. Hartley, who between them have subscribed £15,000 for the purpose and promised more for the latest addition. Patients nominated by subscribers have preference.

Stations: Frodsham (L. and N.W. Railway) three and a half miles; Mouldsworth (Cheshire Lines Railway).[1]

The Liverpool Parochial Sanatorium

has been built by the three Poor Law Unions of Liverpool on the banks of the Dee, largely at the instigation of Dr. Nathan Raw.

It consists of an administrative block in the centre, on either side of which are two-story wings for the two sexes. In the rear of the main building is a dining-hall connected with it by corridors, beyond which is the kitchen department. In front of the centre administration block is a sun bath divided for the two sexes. The wards are on either side, two for three patients, six single-bedded. Cubic air space 28·3 cubic metres; casement windows for ventila-

[1] For plans see *The Hospital*, 13th Dec., 1902.

tion. There is a separate staircase on each side; also separate bath and lavatory accommodation for the two sexes on each floor.

Cost of ground (fifteen acres), £1,200. Cost per bed including land, £500, without, £328.[1] Cost per week, 25s.[2]

Patients who have resided for a time in one of the Liverpool workhouses are alone admissible. The cases admitted have so far been too advanced as a rule to expect very good results. *Grounds:* Seventy-five acres.

The Manchester Hospital for Consumption

has its out-patient department in the heart of Manchester, the in-patient department at Bowdon in Cheshire. The latter used to be in the country, but is now a small commercial and manufacturing centre. Round the hospital is a large garden of about three-quarters of an acre, in which are open-air shelters. There are two wards for men and two for women, each 7·3 × 5·2 metres, with 56·6 cubic metres per bed. Ventilation is effected by means of hot pipes, open windows, and an extractor, the air being changed about three times per hour. Heating is chiefly by fresh air passed over hot pipes; lighting by electricity. Large verandahs have been built round the building for open-air treatment. Average stay twelve weeks.

The Delamere Sanatorium

is being built near the one for Liverpool in Delamere Forest. It will contain beds for 100 patients, on somewhat the same plan as the King's Sanatorium. Built at the expense of Mr. W. J. Crossley for nearly £80,000, an endowment fund of £100,000 is being raised by subscriptions. There is to be a three-story building with a south frontage of 100 yards. The bedrooms all face south, many being provided with balconies and verandahs. There will be four wards with six beds apiece, ten with four apiece, the rest single-bedded. Running north is a corridor leading to the dining-room, chapel and kitchen.

The buildings will be warmed with hot water, and lit by electricity. Electric fans will exhaust the air in still weather; electric lifts will be provided. The nurses and servants will occupy a building 100 yards from the main block, and the resident medical officer will be

[1] Weatherley, *loc. cit.* [2] N. Raw, *British Medical Journal*, 27th Sep., 1902.

quartered on the ground floor of the main building.[1] *Grounds:* Seventy acres.

Access: As for Liverpool Sanatorium (p. 133).

Northumberland.

The Northern Counties Hospital

for consumption and diseases of the chest at Newcastle-on-Tyne is an urban hospital with five beds and no grounds, and therefore unsuitable for open-air treatment.

The Northumberland Sanatorium.

A site has been found for the above at Barrasford, eight miles from Hexham, thirty from Newcastle-on-Tyne. Grounds over sixty acres, including ten of woodland. The ground slopes to the south and west, and is well sheltered from north-east winds, with pine trees to north and west.

The buildings are to house 100 patients eventually, but at first only thirty men and twenty women. There is to be a two-storied building of wood and iron, with long wings diverging from a central open-air gallery at an obtuse angle; running north from the centre is to be a projection containing matron's room, consulting rooms, cloak rooms, nurses' hall, and an open lobby leading to the grounds; and beyond this at right angles another block containing the dining-hall, recreation-hall and kitchen department. This northern projection will be of one story only. Sanitary pavilions will project northwards from the wings, with nurses' duty rooms and patients' entrance close by.

The bedrooms, entirely single-bedded, will be on the south side of the corridor. Over the first floor open-air gallery will be nurses' quarters. There will be two staircases near the open-air galleries in small projections to the north, and emergency staircases in the wings, and in the kitchen department of the servants' quarters. In out buildings will be an isolation ward, laundry and disinfector, boiler house, mortuary, stables and caretaker's cottage. The cost is estimated at £50,000. Lord Armstrong, President of the local Society for Prevention of Consumption, gives £4,000. Three other gentlemen give £1,000 each; £5,000 is promised from the Robert

[1] *British Medical Journal*, 19th July, 1902.

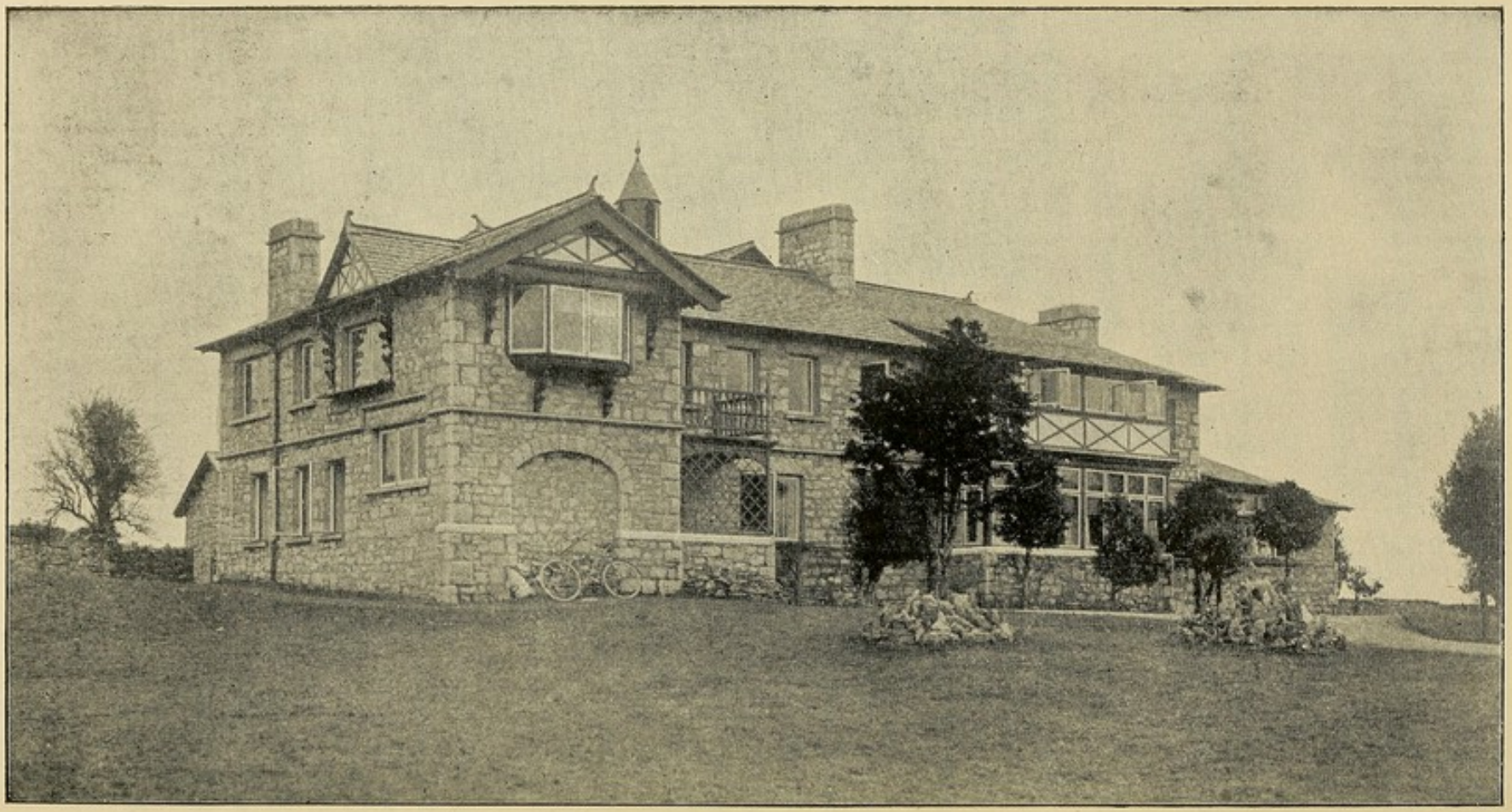


FIG. 15.—THE WESTMORELAND SANATORIUM.

[*Face page* 137.

Scott charity, and a like amount later on. The Northern Counties Chest Hospital proposes to join forces with the Sanatorium Committee on certain terms.[1]

Westmorland.

THE WESTMORLAND SANATORIUM

at Meathop, near Grange-over-Sands, is a converted convalescent home, standing on limestone soil on a sunny eminence in a sheltered situation. It consists of a two-story stone building with two large wards respectively for eight men and eight women. To these have been added a detached wooden dining-room, and a number of sleeping chalets which can be opened on every side. Heating is by hot-water pipes; lighting by oil lamps.

The sanatorium was founded mainly by the exertions and generosity of Dr. W. S. Paget Tomlinson, and is supported by annual subscriptions from a number of district councils and boards of guardians in Westmorland, paying £60 per bed. Those who are nominated to these beds mostly come in free. The North Lonsdale District Council pays for two beds at £75 each. Additional beds occupied on behalf of some of the subscribing bodies are paid for at the rate of £1 per week.

When there are unoccupied beds, residents in other counties are admitted at two guineas per week. The average cost per bed is £93 10s. per annum.

The staff consists of doctor, matron, three nurses and four maids. Both sexes are admitted (fig. 15.)

Yorkshire.

The *Huddersfield Union* has a small hospital for ten consumptives on Crossland Moor Workhouse Estate. The *Sheffield Union* is adapting a small block with twenty beds for the open-air treatment. This was one of the first to adopt open-air treatment. The *York Union* has set apart wards for consumptives. In the *Eccleshall Union* there are also separate wards; a sanatorium is projected.[2]

Very complete arrangements have been made for the city of *Leeds*. A sanatorium has recently been erected for the poor of

[1] Annual Report, June, 1904. [2] Weatherley, *loc. cit.*

Bradford. There is also one at *Withernsea* for those able to pay modest fees.

The Bradford Union Sanatorium

at Eastby lies in seven acres of ground off the road leading to Barden Moor. The buildings were specially designed, and face south-east, being sheltered to the north and west by rising ground, and to the east by fir trees. The plans include a stone-built administration block with dining-room attached, and two pavilions of wood and tiles with interior walls of Bruckner's fireproof plate. The pavilions are raised on piers, and between them, sunk so as to be entirely below the floor level of the pavilions, is the boilerhouse. The administration block of two stories contains rooms for the resident medical officer, matron, nurse and servants (two); also surgery and consulting room. The dining-room approaches it at one corner, and is built like the pavilions. Each pavilion has a single row of bedrooms, with a corridor behind. In the centre is a four-bedded room with projecting bay window; on each side of this are two single-bedded rooms, then two double-bedded rooms, and at each end a five-bedded ward. The windows are full-width casements, reaching nearly to the floors. The doors of the wards are nearly opposite the windows; there is also an unglazed window into the corridor. In the rear of the centre is a projection, open at the sides, containing an open staircase, bath and douche rooms, lavatories and earth closets (four for each pavilion). The bathroom is lighted from the north and from the branch corridor; it is separated from the douche room by an incomplete partition. Over the centre of the pavilion is the nurses' room. With this exception the whole is of one story. There is no verandah. The corners are everywhere rounded; the floors covered with linoleum. Heating is by low-pressure hot-water coils; lighting by electricity. Electric bells lead to the nurses' room. In the administration block are open fireplaces, and two earth closets. The waste water runs away in open channels on to the land. The administration is in the hands of the medical officer of the Union Hospital, with a resident medical officer on the spot. No patients are admitted excepting such as have been in the Union Hospital. A sub-committee of the Board of Guardians visits once a fortnight. The Skipton and Keighley Unions have the right to six beds apiece. The laundry and disinfec-

tion are done at the workhouse. *Cost:* About £10,000 for fifty-two beds; the land cost £570. The Duke of Devonshire allows the use of adjoining woodlands for hammocks, shelters, etc.[1]

The Leeds Tuberculosis Association

includes a number of representative citizens, the President being Sir James Kitson, and three ex-Lord Mayors being Vice-presidents. The Vicar of Leeds is a member; the four Boards of Guardians send representatives, as well as the Workmen's Hospital Committee, the Leeds Co-operative Society, etc. It is heavily subsidised by the corporation (who gave £1,500 in 1904) as well as by boards of guardians, etc., the remaining funds being derived from private sources. The Association has a central out-patient room, from which patients are sent to the Consumption Hospital or the sanatorium, according to their condition. These institutions are managed by the Association as tenants of the City Corporation. They have also started a Samaritan Association to help the patients' families at home. The Medical Officer of Health, Dr. Spottiswood Cameron is an influential member, and is naturally consulted on all technical matters within his province. Two physicians (Dr. Trevelyan, of Victoria University, and Dr. H. de C. Woodcock) are accredited to both the hospital and sanatorium, visiting the former almost daily, the latter once a week. I am indebted to Dr. Woodcock for information concerning the arrangements at Leeds.

The Leeds Hospital for Consumptives

at Armley Hall, Gott's Park, was formerly a private country seat, and occupies the highest part of the district, on the way to Bramley. It is used for advanced cases who apply to the Leeds Tuberculosis Association. There are at present twenty beds (eight for women), but forty could easily be received, or more with sleeping shelters. The average stay of patients is about three months.

The Leeds Sanatorium

at Gateforth Hall, near Hambleton, five miles from Selby, also occupies a beautiful country residence in the Yorkshire plain, surrounded by 2,000 acres of ground, including a beautiful rose garden, and an old-fashioned flower and fruit garden, as well as woods and

[1] For plans see *Hospital*, 23rd July, 1904.

cultivated lands and farms, two of which are at present let to tenants, but which may possibly one day form the nucleus of a colony of convalescents. The soil is sandy; the climate is said to be very sunny. The river Aire is about two miles off. The building is an old mansion in Georgian style, consisting of a central hall surrounded by a staircase, round which the various wards are grouped; and of a wing which is at present occupied by the staff. There are also six shelters for use in bad weather. Part of the estate is used for a sewage farm for Leeds.

Staff: In addition to the two visiting physicians there is a resident house physician, a matron and a trained nurse.

Beds: Thirty-two, capable of being raised to fifty or more.

The York branch of the National Association for the Prevention of Tuberculosis subsidise two beds at £50 each per annum. The medical officers, however, have the right to veto unsuitable patients.

Average stay has been fourteen weeks; patients contract to stay at least two months.

THE HULL AND EAST RIDING CONVALESCENT HOME

at Withernsea has near it a small sanatorium for consumptives, containing a large dining-room on the ground floor, and four large wards on two floors (one with four beds, the others with eight apiece); nurses' duty room on upper floor, bathroom and lavatory attached to each ward. The aspect is southerly; covered balconies run round the south and west sides on each floor which can be used for beds. The building is well sheltered from the east by the convalescent home, and has attached to it about six acres of ground. Distance from the sea 200 yards. *Soil:* Boulder clay containing at various depths pockets of gravel.

Staff: Resident medical officer at the convalescent home; non-resident medical staff visits at least once a day.

Terms of admission: Only those with tubercle bacilli in sputum are admitted. They must agree to stay at least thirteen weeks if the case be considered suitable, and to pay for this time in advance; then week by week. If sent out by the medical staff before the thirteen weeks have expired, the balance is returned; if they leave without permission, the balance is retained. Patients from Hull and within twenty-five miles' radius pay £1 per week; beyond this radius, £1 5s. per week.

CHAPTER XXVII.

THE MIDLAND COUNTIES

Including Shropshire, Worcestershire, Staffordshire, Warwickshire, Derbyshire, Nottinghamshire, Leicestershire, and Northamptonshire.

Name and County.	Locality.	Opened.	Beds.	Altitude in Metres.	Fees per Week.	
NOTTINGHAMSHIRE—						
Notts Sanatorium	Mansfield	1902	30	143	31s., 10s., or free	Dr. Dora Bunting
WORCESTERSHIRE—						
Midland San.	Belbroughton	1901	20	230	3 guineas	Dr. Phillpot
Worcestershire San.	Knightwick	1902	16	94	30s., 20s., or free	—

Leicestershire.

There is a project for a county sanatorium in Leicestershire.

Northamptonshire.

The *Kettering Board of Guardians* is erecting a consumption hospital with twenty beds. (Weatherley, *loc. cit.*)

Nottinghamshire.

In addition to the County Sanatorium, the *Nottingham Board of Guardians* have erected a special sanatorium for pauper consumptives. (Weatherley, *loc. cit.*)

THE NOTTINGHAMSHIRE SANATORIUM

is about three miles east of Mansfield, at the southern end of Sherwood Forest, on the slope of the pine-clad Ratcher Hill, facing a wide expanse of heather and bracken. The grounds (fifty acres, half woodland) were a gift from the Duke of Portland, and are continuous with a large tract of similar country.

The main road from Mansfield to Southwell is half a mile to the south. *Soil:* Sandy. The building faces south-south-east, and is sheltered to the north by pines, oaks and beeches. It is of wood on brick foundations, with corrugated iron roof, the inner walls in the wards of compo. boarding, the joints covered by semicircular beading and the whole surface covered with petrifying liquid, the angles being rounded. The plan is T shaped, with the stem running north. The centre, of two stories, is used for administration, and contains on the ground floor a corridor running north and south, on one side of which is from before back a matron's sitting-room, staircase, kitchen, scullery and larder; on the other side matron's bedroom, a servants' bedroom, cook's room, staff sitting-room, linen room, W.C. and a place for boots and knives. On the first floor are two staff bedrooms, medical officer's sitting-room, drug store, and dispensary.

The central end of each wing is composed of cloak-room, a single-bedded room (styled an isolation room), bathroom and pantry on the men's side, a staff bathroom replacing the pantry on the women's side. The ends of the wings form large wards. There are verandahs front and back for the outer two thirds of the length of the wings, with sanitary pavilion attached to the northern verandah; the ward floors are covered with linoleum. There are open fireplaces in the matron's and doctor's sitting-rooms. The heating with this exception is by hot-water pipes; a separate boiler supplies the baths. Electric lighting; cubic space in the large wards 1,650 cubic feet. Water supply from Mansfield waterworks. Sewage goes into septic tanks 200 yards from the building.

In addition to this building, there are three sleeping shelters for men, and one or two beds for women. The administration is large enough for double the number of patients. There is access under the floors to water pipes and electric wires.

Cost: £5,300 (£220 per bed). Additional beds will cost much less.

Administration: by Nottinghamshire Association for the Prevention of Consumption.

Admission: Patients are eligible (if medically suitable) who come from Nottinghamshire or within ten miles of its borders; preference given to those from the county. Minimum period of residence three months. Nomination to a free bed costs £75 per annum, or

£40 for six months; recommendation by a member of the Association, one guinea a week. When beds are not occupied by free patients, others may be admitted with thirteen recommendations and ten shillings a week payment, or without recommendation for 31s. per week, in this order. Working expenses £65 per bed.

Among large subscribers are the Newark, Nottingham and Mansfield Corporations, the Basford Guardians, the Duke of Portland and various private members, firms and trade societies.

Staff: Four consulting physicians, amongst whom Dr. Ransom took a prominent part in founding the sanatorium; three visiting physicians and surgeons, a resident medical officer, matron, etc.[1]

Staffordshire.

The *North Staffordshire Infirmary* at Stoke-upon-Trent has two wards set apart for consumptives, opening out on to balconies. In the *Wolverhampton Union Infirmary* several special wards have been built for the same purpose. (Weatherley, *loc. cit.*) A *County Sanatorium* is projected for fifty patients; the estimated cost £17,500, and the cost of maintenance £5,000 per annum, of which the Staffordshire County Council would find half. A site has been offered by Col. Wilkinson outside Lichfield. The City Council are in favour of the scheme.[2]

Warwickshire.

The *Birmingham Union* has a small hospital for six male patients erected in the infirmary grounds. (Weatherley, *loc. cit.*) There is a scheme for the erection of a more completely equipped sanatorium.

At *Leamington* two old wards of the Warneford Hospital, each with four beds, have been set apart for consumptives, one for each sex.[3]

Worcestershire.

The Midland Open-air Sanatorium,

Bourne Castle, Belbroughton, is situated on a breezy upland commanding extensive views to the south and west. The pine-clad

[1] Plans in the *Hospital*, 14th Feb., 1903. See also *Tuberculosis* (London), July 1902.

[2] *Lancet*, 21st Nov., 1903. [3] *British Medical Journal*, 31st Jan., 1903.

hills of Great and Little Fairley and the Licksy and Clent Hills are stated to shelter it from east and north.

The grounds, of twenty-five acres, consist largely of pasture and agricultural land. *Soil:* Gravel.

The house is a picturesque building facing south, with lofty rooms opening on to the terraces by French windows. The dining hall extends the whole width of the building, and has four large French casements.

Patients are quartered mainly in chalets (sixteen beds), some of which revolve while others open on every side. These have no heating apparatus beyond oil lamps occasionally used, nor electric lighting, but are otherwise well adapted to their purpose. They are connected with the castle by electric bells. There are special chalets for bathing purposes, and for earth closets.

Among the amusements provided are tennis, archery, croquet and trout fishing.

The staff consists of the resident physician, a visiting physician, a trained nurse, matron, secretary, etc.

Access: Hagley (G.W.R.), Bromsgrove (M.R.).

Telegraphic Address; Sanatorium, Belbroughton.

The Worcestershire Sanatorium,

at Knightwick near Worcester, on the western slopes of the Ankerdine Hills, is the result of the generosity of Mr. J. Dangerfield, of Bilston, who offered a house and thirty acres of land for the purpose for five years at a yearly rental of £1 per annum, with option of purchase, to the Worcester County Council, on condition that the place was put into repair and the maintenance assured. Eventually the offer was accepted by the Worcestershire Association for Prevention of Consumption, the Worcester County Council giving a coronation gift of £300, and Dr. Corbett, of Impney, giving on behalf of his late brother £1,000. Several of the local Friendly Societies have subscribed.

The King's Norton Guardians and four business firms have taken free beds at £75 per annum.

The sanatorium consists of two pavilions (one for each sex) in addition to the original house as administration block. It is sheltered to north and east by hills, and has a south-west aspect overlooking the valley of the Teme.

Each pavilion has eight cubicles with corridor on north side, verandah on the sunny side, and large French windows, over which are ventilating grids leading to shafts in the roof.

Heating is by hot-water radiators; lighting by electricity. The machinery, furnaces, etc., are placed in a separate building to the north, formerly a coach house and stables.

Admission: As in the case of Nottinghamshire Sanatorium (p. 141) *mutatis mutandis*. There are ten free beds.

The staff includes a resident medical officer and matron. Chairman of the Committee, Dr. Dixey, of Malvern, who was largely instrumental in founding the sanatorium.[1] The cost of alterations, heating, lighting, etc., amounted to £2,292.[2]

[1] *British Medical Journal*, 29th Nov., 1902, and 6th Dec., 1902; *Lancet*, 13th Dec., 1902.

[2] First Annual Report.

CHAPTER XXVIII.

THE EASTERN COUNTIES

Including Lincolnshire, Rutland, Huntingdon, Bedford, Cambridge, Hertford, Norfolk, Suffolk, and Essex.

Name and County.	Locality.	Opened.	Beds.	Altitude in Metres.	Fees per Week.	
BEDFORD—						
Daneswood San.	Woburn Sands	1902	22[1]	—	Free (Jews only)	Dr. W. E. Facy (non-res.)
ESSEX—						
Maldon San.	Maldon	—	12	—	2 to 2½ gns.	Dr. H. L. Ewens
NORFOLK—						
Mundesley San.	Mundesley	1899	31	61	5 guineas	Dr. Bardswell
Kelling San.	Holt	1903	42[2]	—	Free, or 30s.	W. J. Fanning, L.R.C.P.
The Beeches	Long Stratton	1901	7	37	2 to 3 gns.	Miss Mary Smith, L.R.C.P.
SUFFOLK—						
East Anglian Sanatorium	Nayland	1900	35	79	4 to 6 gns.	Dr. Jane Walker (non-res.)
East Anglian Sanatorium	„	1904	27[3]	61	Men 2 gns. women £1	Dr. Jane Walker (non-res.)

Bedfordshire.

DANESWOOD SANATORIUM

at Woburn Sands has been partially endowed by Mr. Bischoffsheim, so that Jewish consumptives are admitted free.

Essex.

There is a sanatorium at Maldon; and a private boarding house for consumptives in early stages, or for convalescents, at Thorneycroft, Clacton-on-Sea, under two ladies who were themselves formerly patients. Terms from two guineas.

[1] Fourteen for men. [2] Thirty-two for men. [3] Twelve for men.

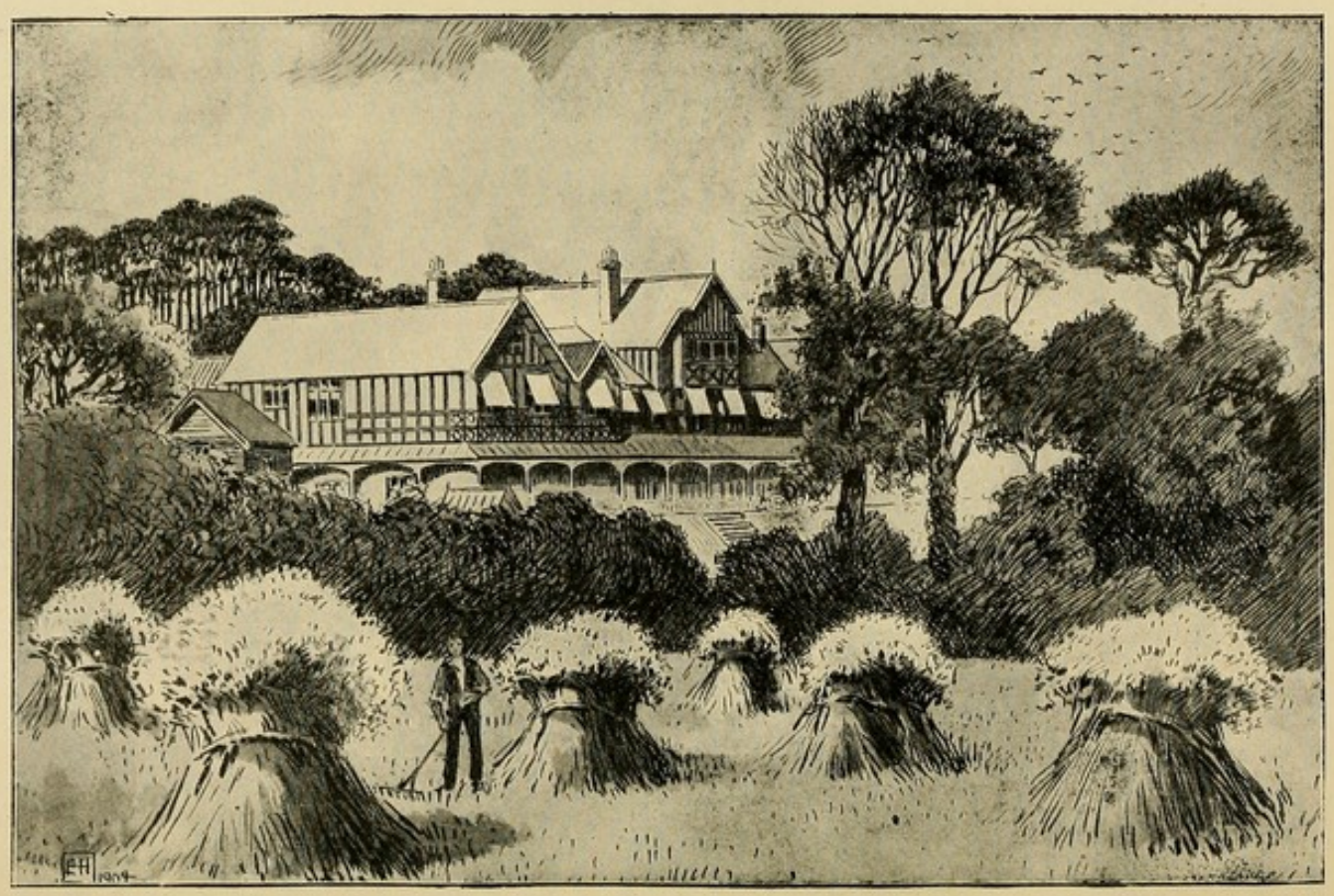


FIG. 16.—THE MUNDESLEY SANATORIUM. [*Face page* 147.

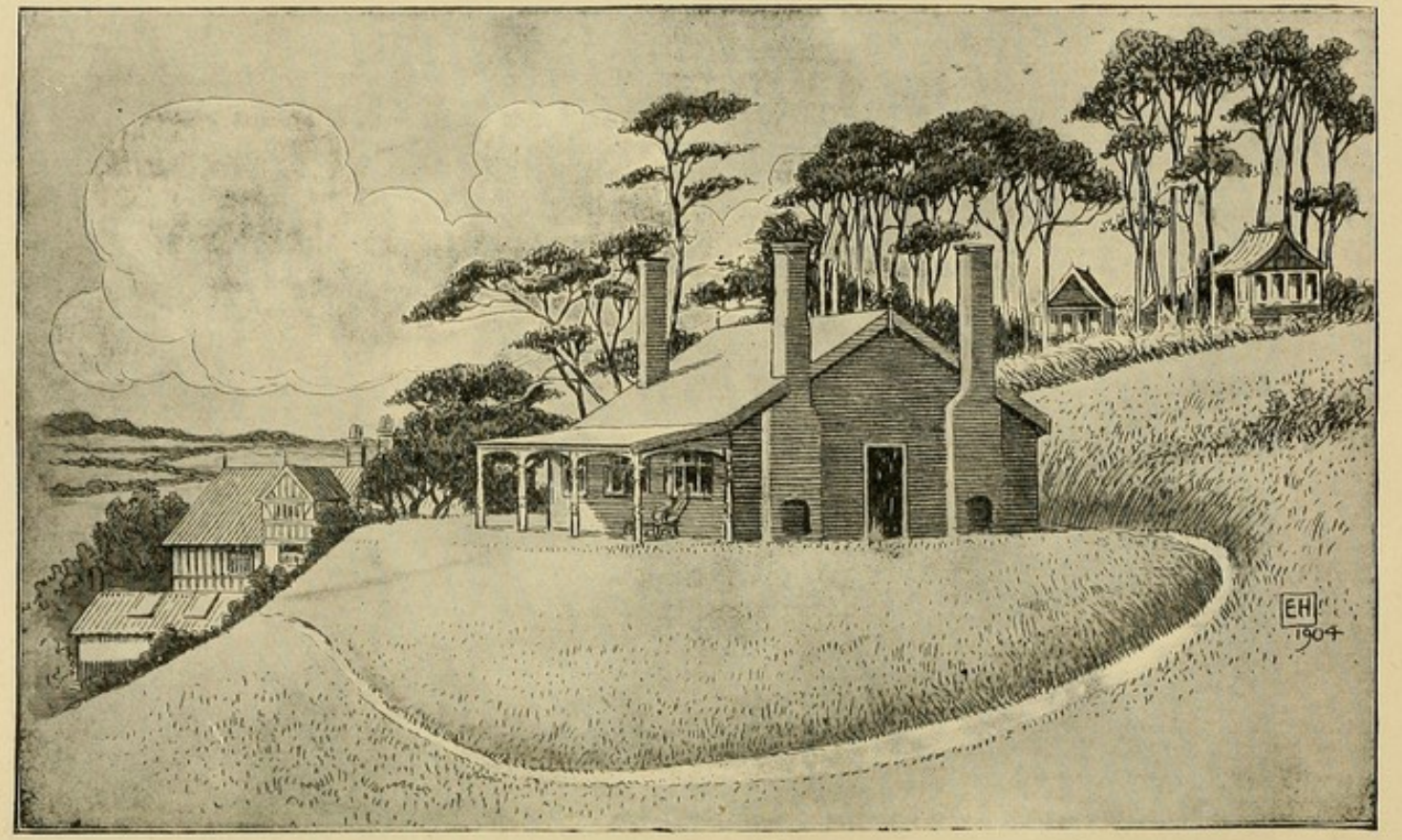


FIG. 17.—MUNDESLEY SANATORIUM—THE BUNGALOW. [*Face page* 147.

Norfolk.

THE MUNDESLEY SANATORIUM

is about half a mile from the village of Mundesley and seven miles from Cromer. About a mile from the north coast of Norfolk, running parallel with it, is a ridge somewhat sparsely covered with pine trees, commanding extensive views southward over agricultural land. Immediately to the south of this, is a good-looking wooden two-story building surrounded by thirty acres of land, part of which has been laid out with walks, lawns and flower-beds. Running along the south front is a glass verandah. The entrance is at the eastern end. On the ground floor are seven bedrooms for patients, a large dining-room and drawing-room, mostly facing south. A wide corridor behind these runs the whole length of the building. Behind it at the western end are the kitchen block and the office; at the eastern end the medical officer's rooms. On the first floor are twelve bedrooms, nearly all on the south side. The bedrooms are of good size, with casement windows surmounted by fanlights. Above each bedroom door is another fanlight opening into the corridor. Bathrooms, lavatories and earth closets are to the north. The walls are papered; the floors, excepting in dining- and drawing-rooms, covered with linoleum which is curved upwards under a fillet on the walls. Furniture is simple; but some curtains and carpets are used. Heating is by hot-water pipes (in some rooms also by open fires); lighting by electricity, produced in an engine house to the north-east. The water supply is from a deep well. Subsoil is deep sand overlying the chalk. A bungalow with five rooms for convalescents lies up the hill, east of the engine house. Sleeping chalets for two patients apiece, with numerous windows, and special day shelters of wood and glass are placed in the grounds (figs. 16, 17).

The treatment differs somewhat from that adopted at Nordrach. Each patient's dietary is determined by analysis, so that gain in weight may be obtained without forced feeding. The milk is from tuberculin-tested cows. Golf and gentle bicycling are often permitted. Rectal thermometry is practised as at Nordrach.

Access: Mundesley Station (G.E.R., Joint Midland and G.N.R.)

Telegrams: Sanatorium, Mundesley.

The sanatorium was founded by Dr. Burton-Fanning, but is now in the hands of Dr. Noël Bardswell.[1]

Kelling Sanatorium,

Holt, near Cromer, was started in a dwelling-house, which has been considerably altered and added to. The grounds are of thirty-five acres, well sheltered by woods to the east, north and west. The house is mainly used for administrative purposes. Running north from it is an addition which has attached to it on the west side two parallel rows of buildings composed of Mack slabs, plaster and flooring, and forming wards and separate rooms for thirty-two patients. These wards have large French casements opening on to the terrace and are divided by partitions into compartments each for one or two patients. Heating is by hot-water pipes in some of the wards; no heating but lamps provided in most Lighting is by acetylene produced on the grounds. The water supply is from a deep artesian well, pumped up by an oil engine.

There is a separate house for the resident medical officer, and a large number of revolving shelters are in the grounds.

About three-quarters of a mile from the sanatorium is a separate colony for ten women under a trained nurse, in two houses.

Staff: A resident medical officer, matron and four nurses; Dr. Burton-Fanning is honorary consulting physician. There are medical referees in London, Norwich, Lincoln and Fakenham. The management is in the hands of a representative and influentially supported committee. Dr. Burton-Fanning deserves the chief credit of founding the sanatorium. There is an endowment fund of £1,500. Beds can be endowed for £78 per annum.

Applications: To the honorary secretary, Dr. H. W. McConnell, Matlaske Hall, Norwich.

Access: Holt Station (Midland and Great North Railways).

The Beeches,

Long Stratton, consists of a dwelling-house and two sleeping chalets, under the care of a trained nurse and resident lady physician. The subsoil is gravel.

Terms: 2 guineas where two share one room; 2½ to 3 guineas in separate room.

[1] Dr. Bardswell has been appointed Resident Physician to the King's Sanatorium.

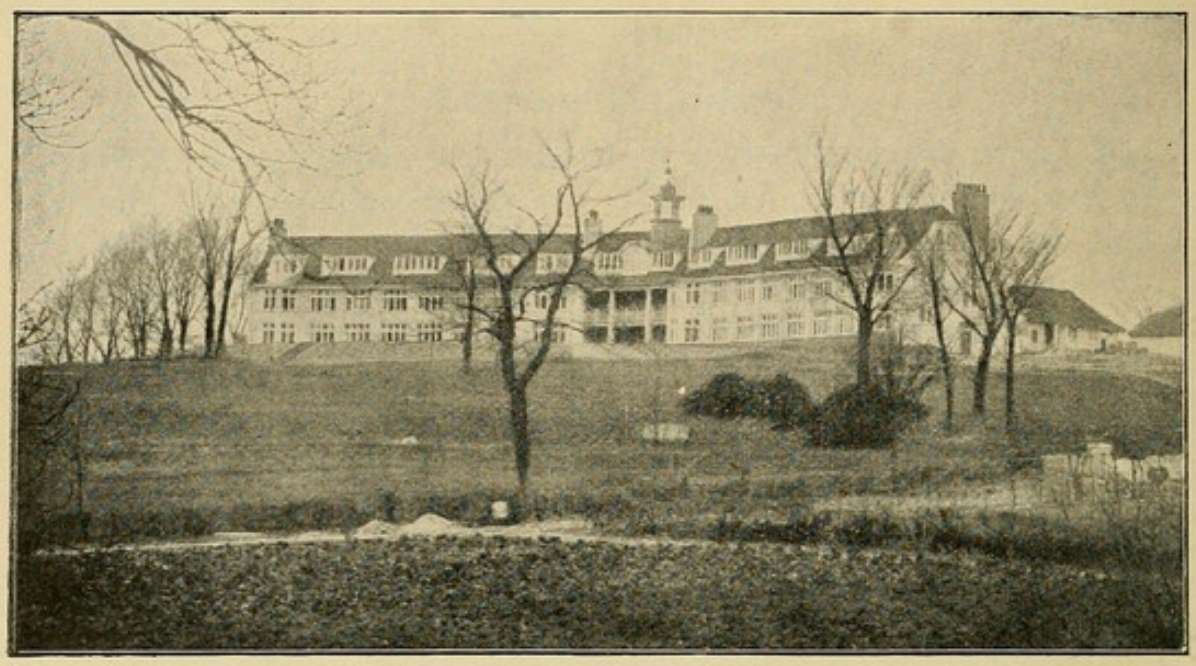


Fig. 18.—The East Anglian Sanatorium.

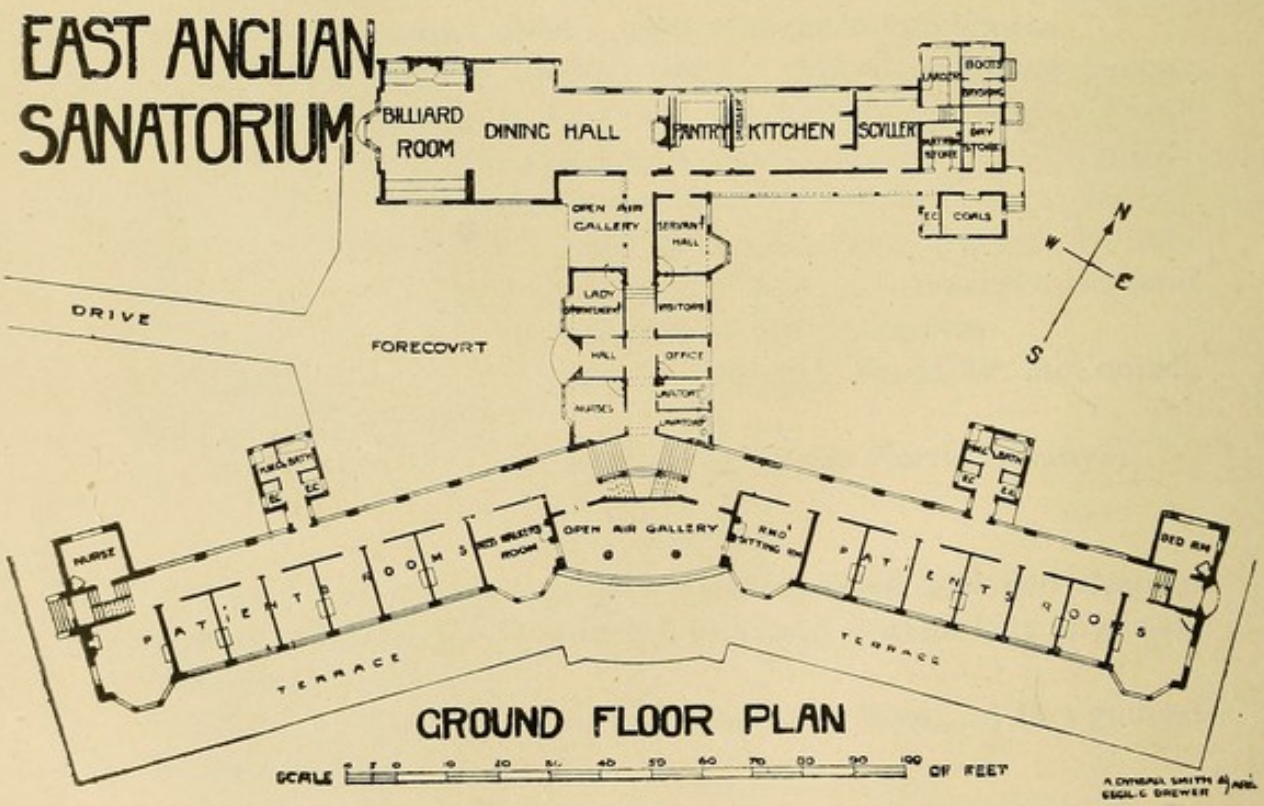


Fig. 19.—The East Anglian Sanatorium. [*Face page* 149.

Applications: To the matron or the resident physician.
Access: Forncett Junction (G.E.R.), four miles.
Telegrams: Beeches, Hempnall.

Suffolk.

THE EAST ANGLIAN SANATORIUM

is the historical successor of other sanatoria started by Dr. Jane Walker at Denver in Norfolk and at Boxted near Colchester. The present building is at Nayland, near Colchester, on land belonging to a farm of ninety-four acres, from which comes the milk and cream for the sanatorium. Six acres, well sheltered by trees and hedges, have been converted into flower and kitchen garden, with a number of flat and sloping paths for patients, and a few shelters here and there. The sanatorium is on the rounded summit of a hill, on light sandy soil, overlying London clay.

The building, which has two stories and attics, is in the shape of an inverted **Y** with very diverging limbs, one looking south-south-east, the other east-south-east. These limbs are but one room and corridor deep, and consist mainly of patients' bedrooms. At their junction is a central open-air gallery, behind which is the main staircase. Still further north, in the stem of the **Y**, are, on the east side, two lavatories, the office, a visitors' room and a servants' hall; on the west side a nurses' room, the entrance hall, matron's room and an open-air lobby. The foot of the **Y** is formed towards the west by the dining-room and recreation-room, towards the east by the kitchen department. The corridor behind the patients' bedrooms has on the north two projecting pavilions containing earth closets and bathrooms, and at the ends two rooms on each floor for the nurses. A central open-air gallery is found on both floors. Two rooms near the centre on the ground floor are for the medical officers. Verandahs have been purposely omitted from in front of the patients' bedrooms. These are about $4{\cdot}27 \times 3{\cdot}05$ metres. The building is heated by low-pressure steam, and lighted by electricity. The water supply is from a deep well. The engine house is a little behind the eastern end of the building, near the kitchen department (figs. 18, 19).

Staff: Dr. Jane Walker, 122 Harley Street, London (visiting physician), to whom applications should be made; resident medical officer, Miss Stacy, M.B.; matron, nurses, etc.

Access: Bures Station (Great Eastern Railway), three and a half miles.

Telegrams: Sanatorium, Nayland.

A Sanatorium for Poorer Classes

has this year been started in the grounds of the East Anglian Sanatorium. The men (twelve beds) are accommodated at the farm, and have to do what farm work they are fit for. Another building with fifteen beds has been erected for women, who have to do some of the household work.

CHAPTER XXIX.

THE SOUTH-EASTERN COUNTIES

Comprising Oxfordshire, Berkshire, Hampshire, Isle of Wight, Channel Islands, Buckinghamshire, Kent, Surrey, and Sussex, but excluding Middlesex and the Metropolitan Area.

Name and County.	Locality.	Opened.	Beds.	Elevation in Metres.	Fees per Week.	
BERKSHIRE—						
London Open-Air San.	Wokingham	1901	60	67	3 guineas	R. A. Stevenson, L.R.C.P. J. C. Wadmore, L.R.C.P.
HAMPSHIRE—						
National Sanatorium	Bournemouth	1855	71 [1]	? 36	7s. 6d.	Dr. Blathwayt and a visiting staff
Overton Hall	,,	1898	12	36	4 guineas	Dr. Conrad Stein
Firs Home	,,	—	20	? 36	10s. 6d.	No resident medical officer
Hahnemann Home	,,	1879	32	36	21s., 7s. 6d. or free with letter	Three physicians, one surgeon (non-res.)
St. Joseph's Home	,,	—	72	36	Free, 8s., 6s.	Dr. Conrad Stein (non-res.)
Linford Sanatorium	Ringwood	1899	24	49	5 gns., a few at 4	Drs. Mander Smyth and Felkin
Moorcote	Eversley	1899	20	90	3 to 4 guineas	Dr. Haydn Brown
ISLE OF WIGHT—						
Royal National Hosp.	Ventnor	1869	155 [2]	24	10s.	Dr. Dalby and two others
St. Catherine's Home	,,	1879	12	—	10s. 6d.	No resident medical officer
JERSEY—						
The Pines	St. Brelade's	1904	8	—	7 guineas	Dr. Newington
KENT—						
Royal Sea-bathing Inf.	Margate	1791	16 [3]	—	30s., 12s., 8s.	—
OXFORDSHIRE—						
Hailey Sanatorium	Ipsden	1900	30	76	3 guineas	Dr. F. S. Arnold (res.)
Kingwood Sanatorium	Peppard	1900	12	115	4 to 5 guineas	Dr. Esther Colebrook
Maitland Cottage San.	,,	1901	16	115	25s., 30s., 8s., with nom.	,,
SURREY—						
Crooksbury San.	Farnham	1900	24	125	5 gns., a few at 4	Dr. F. R. Walters
Whitmead Hill San.	Tilford	1899	20	92	,,	Dr. Hurd-Wood, Dr. Howard G. Pesel
Heatherside	Camberley	1904	100 [4]	122	Free	See Brompton Hospital
Ockley Sanatorium	Ockley	1903	12	107	2½ guineas	Dr. Clara Hind
Woodhurst San.	Dorking	1902	16	92	1½ to 2½ gns.	Miss Mary R. McDougall (non-res.)
SUSSEX—						
Eversfield Hospital	St. Leonards-on-Sea	1884	55	—	13s., 17s., 42s., 105s.	Dr. Gambier (res.)
King Edward's San.	Midhurst	—	100	151	—	Being built
Rudgwick Sanatorium	Rudgwick	1900	14	73	2½ guineas	Dr. Annie McCall (non-res.)

[1] Twelve more being added.

[2] One hundred and four for men.

[3] Out of 162 in all.

[4] Fifty-two for consumptives.

Berkshire.

THE LONDON OPEN-AIR SANATORIUM,

Pinewoods, Ninemile Ride, Wokingham, is situated in undulating country consisting largely of pine woods and open heather land. Eighty-two acres have been acquired, on sandy soil consisting of Bagshot sand. The buildings are well sheltered by trees to the north, and have an open clearing in front. They consist of a central administrative two-story block with wings for the patients, a dining-room block with kitchen behind, laundry, stables, engine house and isolation block (fig. 20). The central block has rooms for the medical officers and matron, with a verandah on the south side, entrance hall, etc., to the north. Connected with this by covered corridors, and forming with it a concavity to the south, are the pavilions with patients' rooms, one for men, the other for women. The bedrooms are light and airy; they have large windows of casements with fanlight above; curtains with pole fixed a foot inside the room, smooth washable walls with well-rounded angles, simple furniture, electric lighting, and heating by steam pipes and if necessary open fires. There is no fanlight over the door. Behind the rooms are well-lighted, airy corridors and beyond them baths, douche room and W.C.s. At the end of each pavilion is a two-story *liegehalle* (fig. 21); behind this, a northerly verandah. The staircases are made without risers, the dust falling through to the ground underneath. The dining-hall is opposite the entrance to the north. Three of its sides are open to the air, and provided with large French windows and doors. The fourth leads to the kitchen department. The machinery for lighting is duplicated.

Staff: Two resident medical officers; matron and nurses, etc. Also a staff of visiting physicians.

Applications to the secretary, 20 Hanover Square, London W.

Access: Wellington College (S.E.R.), two miles; Bracknell (L.S.W.R.), three and a half miles. Connection with G.W.R. at Reading.

Hampshire.

A sanatorium is projected for the various Poor Law Unions of Hampshire. There is also a scheme for a sanatorium promoted by Dr. Fraser (medical officer of health, Portsmouth) for a joint



FIG. 20.—THE LONDON OPEN-AIR SANATORIUM.

[*Face page* 152.

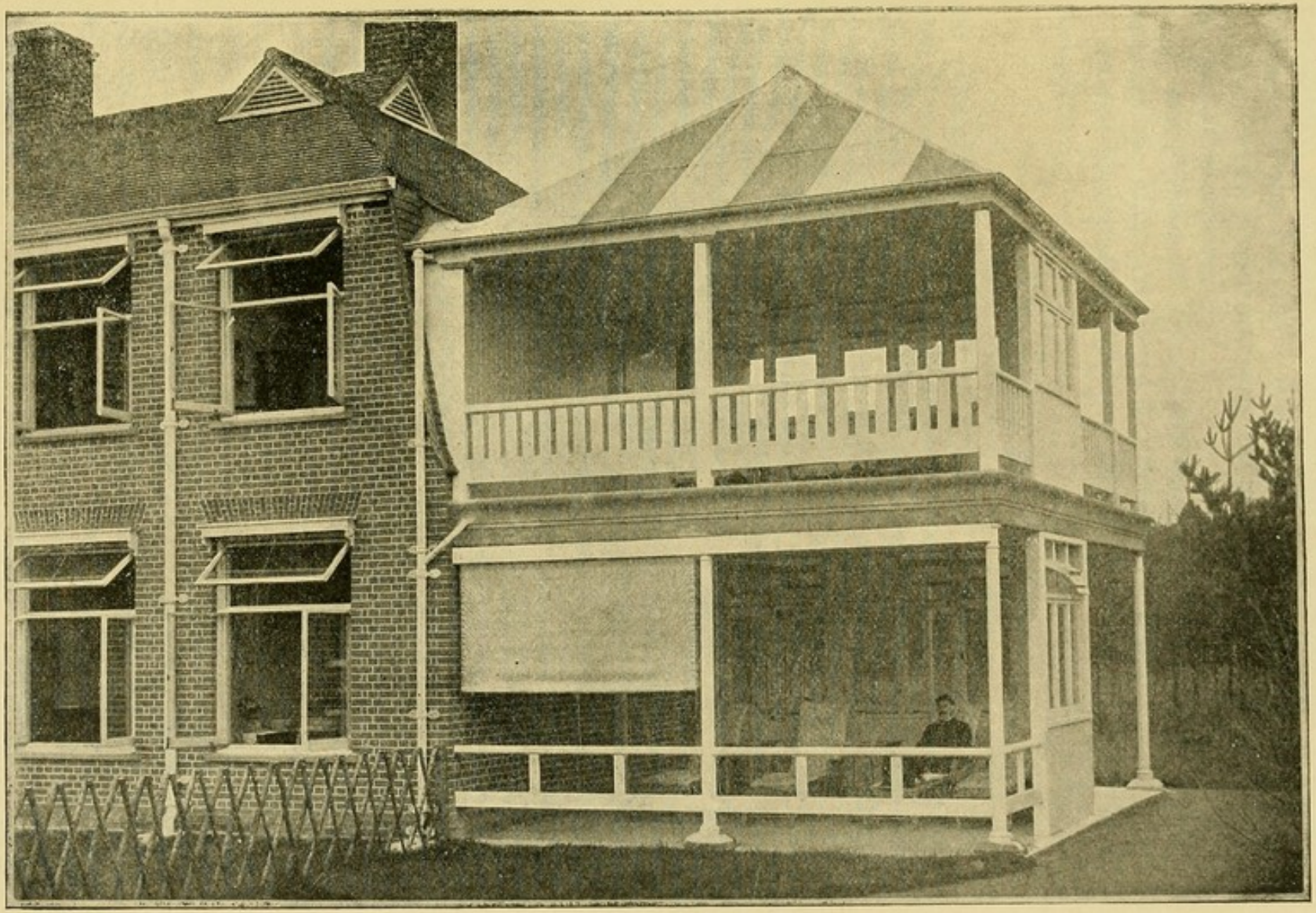


FIG. 21.—THE LONDON OPEN-AIR SANATORIUM.

[*Face page* 152.

sanatorium to be supported by the District Councils of Alton, Basingstoke, Bournemouth, Farnborough, Fordingbridge, Hartley Wintney, Itchen, Petersfield, Winchester and Portsmouth.

The *Portsea Union Infirmary* has had some of its wards altered for open-air treatment.

In the *Portsmouth Union Infirmary* a few two-storied wards have been set aside and altered for the same purpose.

In the *Southampton Infirmary* there are special wards for consumptives.

THE NATIONAL SANATORIUM

for consumption and diseases of the chest at Bournemouth is situated in a valley at the back of Bournemouth, close to the Mont Dore Hotel, the grounds of the two institutions touching one another. The sanatorium has three acres of land, partly kitchen garden, partly flower garden and shrubbery, with a fine lawn to the south of the building, beyond which is a rapid descent to the bottom of the valley. The place is extremely well sheltered, and shares in the climate of the less bracing parts of Bournemouth. The building is a two-story one, the upper floor being for women, the lower for men. The aspect is south-south-west, the entrance being to the north side. At the eastern end is a large chapel; behind the building near the centre is a yard with various domestic offices shut off from the garden, and ending in a small mortuary and *post-mortem* room. Corridors run from end to end of the building; the patients' rooms are to the south of these, including on each floor a large dining-saloon and a day room, a ward for five patients, eight with three apiece and two single-bedded; to these an extension has been made at the western end which brings up the total number of beds to seventy-one. The dining-saloons, day rooms and wards are both cheerful and light; the furniture plain and simple but suitable; walls painted, floors covered with linoleum, windows large. Special ventilating windows have been introduced at the eastern end where otherwise the chapel would block the current of air. The staff rooms, lavatories, bath rooms and W.C.s. are in a projecting pavilion on the north side. Heating by open fires and hot-water pipes; water supply, sewerage and electric lighting those of the town of Bournemouth. Shelters have been erected in the grounds for men and women respectively.

The institution is closed during July and August, when the heat would be oppressive. Male applicants under seventeen, female under sixteen, are not admitted.

Admission by a nomination from a governor, a medical certificate (early cases only) and payment of 7s. 6d. per week. Eight free beds. An annual subscription of three guineas or a donation of £5 (in the case of collections, £10) entitles to a nomination for the year concerned. Apply to the secretary.

Staff: Resident medical officer, three visiting physicians, visiting surgeon, dentist, matron, three nurses, etc.

Overton Hall,

Poole Road, Bournemouth, originally built for a school, is planned somewhat like a miniature Hohenhonnef (p. 297) with diverging wings, a verandah on the south side, and two northern wings running at right angles to the main portion. The bedrooms are partly on the south side (eight) partly on either side of the northern projections. The furniture is specially contrived; floors covered with linoleum and paint; walls coated with duresco; windows, large French casements, or ordinary "guillotine". Heating is by open fires, lighting by electricity. The W.C.s, lavatories and bathrooms are all to the north of the corridor. Shelters and other ingenious contrivances are found in the garden, which stretches between the house and the road.

Staff: Dr. Conrad Stein, medical director, lives in an adjoining house. The sanatorium is in charge of a matron. It was originally opened by Dr. Pott, one of the pioneers in open-air treatment.

Access: West Bournemouth Station is within a few minutes' walk.

The Firs Home

is a home at Bournemouth for consumptives in an advanced stage.

The Hahnemann Home

is a convalescent home admitting consumptives recommended from the homœopathic dispensaries in Bournemouth. It is a house of three stories and basement, with balconies to two of the floors, situated in a good part of the west cliff. Patients sleep in wards containing three or four beds apiece. Males under seventeen or

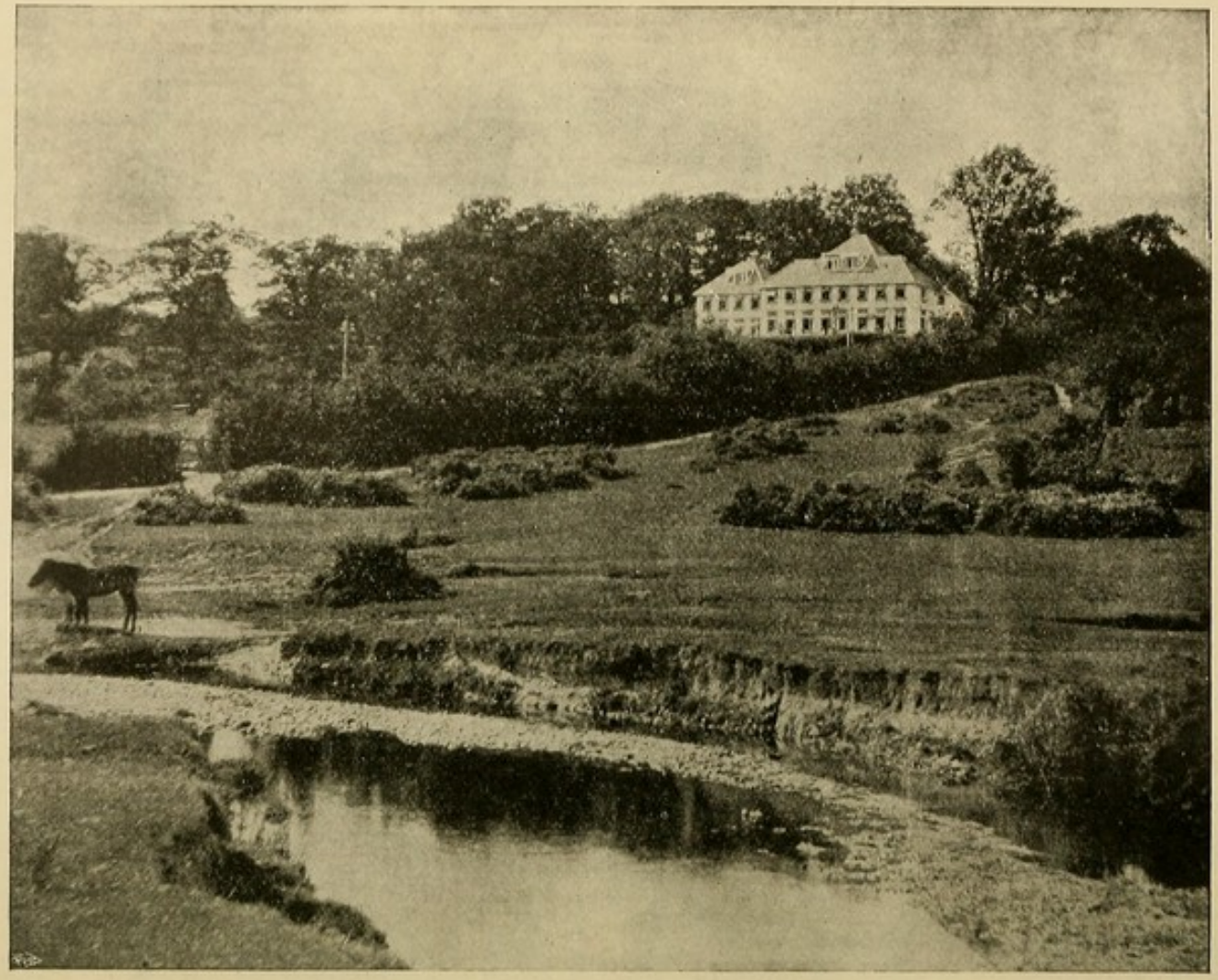


FIG. 22.—LINFORD SANATORIUM. [*Face page* 155.



FIG. 23.—LINFORD SANATORIUM. [*Face page* 155.

females under fifteen are not admitted. Applications to the secretary at the home.

St. Joseph's Home

is a Roman Catholic home for consumptives at Bournemouth, admitting others requiring convalescent treatment, under the care of sisters of mercy, and maintained by voluntary subscriptions. The patients are received in wards with two to eight beds respectively. The charges per week for those admitted without recommendation are 12s. for men, 8s. for women, 6s. for children. Applications to the hon. secretary at the home.

Linford Sanatorium,

Ringwood, was one of the first in England to be specially built for "Nordrach" treatment. It is situated in the open country, two and a half miles from the little town of Ringwood, being surrounded on all sides by the heather-covered moorland which forms a large part of the New Forest, and within a stone's throw of some 1,500 acres of woodland, chiefly pines and oaks. *Subsoil:* Gravel, with here and there patches of clay, overlying Bagshot sands at a depth of about twelve feet. The sanatorium (figs. 22, 23) consists of residential building, a refectory behind it with premises for the staff, kitchens, dining-hall, etc.; of a farm with eight beds for patients, and the "old refectory," containing the medical officer's quarters, office, etc. There is also an engineering block to the west of the latter. *Grounds:* Thirty-six acres, including about two of garden and meadow round the office.

The residential portion is near the top of a hill facing south-south-east. It is a two-story brick building with all the patients' rooms to the south. These have each two large casement windows, wood-panelled walls, floors of maple, floraxed, and specially designed furniture. Each room has a douche in the corner, and a fixed wash-basin, both supplied with hot and cold water, and is heated by an American radiator. Size of room 3·9 × 4·5 × 2·7 metres high or fifty cub. metres air space. The only hangings are washable curtains. There are a few strips of carpet. The rooms in the farm are a trifle smaller, and have a douche room in common. There is no *Liegehalle* or verandah, and the terrace in front of the main building is at a lower level than the bedrooms owing to the fall of the ground.

Water supply from a private well. W.C.s are built out on the

north side of the building. Sewerage goes into filtration tanks. At the farm there are earth closets. There is a refrigerator for meat and milk; the latter comes from specially fed cows at the farm.

Treatment: Strict Nordrach.

Staff: Two resident physicians, one of whom was a patient and assistant physician at Nordrach.

Access: Ringwood Station (L.S.W.R.)

Telegraphic Address: Smyth, Linford, Ringwood.

MOORCOTE,

Eversley, near Winchfield, is in a district richly wooded with pine trees, the soil being gravel overlying sandy tertiaries. The house stands in its own grounds of seven and a half acres; it faces south, and is well sheltered by trees. The building is a two-story one (not specially built), with roomy corridors and large hall; and rooms for fifteen patients. Shelters have been erected in the grounds. An over-flow house, called *Glencote*, receives five patients who require less nursing or are of a different description.

Staff: Resident physician, lady superintendent and two trained nurses.

Access: Winchfield or Wokingham (S.W.R.); Wellington College (S.E.R.), about four miles.

Isle of Wight.

THE ROYAL NATIONAL HOSPITAL FOR CONSUMPTION.

and diseases of the chest was founded by the late Dr. Hassall on the Undercliff about a mile west of Ventnor, and has grown to an institution with eleven residential blocks and a chapel.

Protected to the north by a thickly wooded slope which rises to the greensand cliffs, surmounted by the lofty chalk downs, to the east by a rising piece of Undercliff, and to the west by tall trees, it is separated from the sea by about 300 yards of undulating ground, part of which has been converted into garden and shrubbery.

Grounds: Twenty-two acres, soil sandy. The climate of the Undercliff is known for its mildness. The winters are warmer than at most English health resorts; and the summers are slightly cooler than further inland. Altogether, it is less bracing than the coast further east, or than the inland hill resorts of England.

The separate blocks are of brick and stone, with slated roofs, and



FIG. 24.—ROYAL NATIONAL HOSPITAL FOR CONSUMPTION. [*Face page* 156.

are only united by an underground passage. They all face south, the four eastern blocks being for women, those west of the chapel for men (fig. 24). Owing to the slope of the ground, the eastern blocks have three stories, the western four, while in other respects they preserve architectural uniformity. The westerly blocks being more modern are a trifle larger and better finished. Each block has a separate entrance behind, a covered verandah along the ground floor, and covered balconies to all but the topmost stories above. All the patients' rooms are single bedded with southerly aspect, the north side containing all the staircases, nurses' and servants' quarters. On the ground floor on the south side are sitting rooms (some provided with billiard tables, bagatelle boards, etc.) mostly for the use of patients, a few being reserved for nurses, one for the chaplain and the hospital library. The ninth block contains the administrative department; it has on the south side a handsome dining-hall 23 × 14·6 × 9·7 metres high, with parquet flooring, walls panelled below and painted above, handsome painted ceiling; large windows. At one end is a stage for entertainments; at the other, a large orchestrion and the portrait of the founder. This hall and the chapel are the only parts where male and female patients meet. In the grounds there is a dividing line which they are not allowed to cross. On the north side of the ninth block are consulting rooms, dispensary, board room, bathrooms, and quarters of the resident medical officers, as well as the kitchen department on the second floor. The eleventh block has twenty-one bedrooms; the floors and staircases are of polished teak; walls of Parian cement with rounded angles; doors and windows sunk flush with the walls, balconies of iron, wide enough to permit of beds being wheeled out on to them. Throughout the older blocks the walls are painted, the floors of deal with painted borders and linoleum in the centre, excepting in the dining-room.

In the bedrooms, the windows are alternately bow and flat; the top floor has mansard windows. The cubic space varies from thirty-four to fifty-one cubic metres per head. Ventilation is partly effected by warm air from the corridors. There are also ventilating shafts going up to the roof, provided with steam pipes. By these means 140 cubic metres of air are introduced per head per hour, at a uniform temperature of 62° F. Heating is by steam pipes and radiators; lighting is by electricity. The furniture is

simple and suitable. There are no passenger lifts. On the other side of the entrance drive, sunk below the road level, is the engine house for heating and pumping water, with a large softening tank. The water is from a private well.

There are shelters in the grounds for open-air treatment. Four meals a day are provided: the hours are more reasonable than those usually in force in British hospitals.

The *staff* includes three visiting physicians (Drs. Robertson, Whitehead and Williamson); three resident medical officers, etc. *Applications* to the secretary, 34 Craven Street, Charing Cross, W.C. Admission, if suitable, by nomination with weekly payment.

A subscription of three guineas per annum entitles to one nomination annually.

Access: By rail and steamer to Ventnor.

Telegrams: Undercliff, London.

St. Catherine's Home,

Ventnor, is a small home for advanced cases of consumption, provided with verandahs and other conveniences. The nursing is done by the nursing sisters from St. Margaret's, East Grinstead.

Applications to the sister in charge.

The Channel Islands.

A sanatorium is to be opened shortly at the Pines, St. Brelade's Bay, Jersey, in the house belonging to the late General Boulanger. The house forms a hollow square with the rock behind it, and has a fine view over the sea. The grounds cover seven acres.

Terms: Seven guineas.

Kent.

In the *Medway Union Infirmary*, there are separate wards for pulmonary tuberculosis.

The Royal Sea-bathing Hospital

at Margate was founded by the eminent physician Dr. Lettsom for the reception of patients suffering from tuberculous ailments requiring sea air or sea bathing. It has large grounds, an operating theatre, baths supplied with hot and cold water, and a number of verandahs which are often used for continuous open-air treatment.



FIG. 25.—HAILEY SANATORIUM. [*Face page* 159.

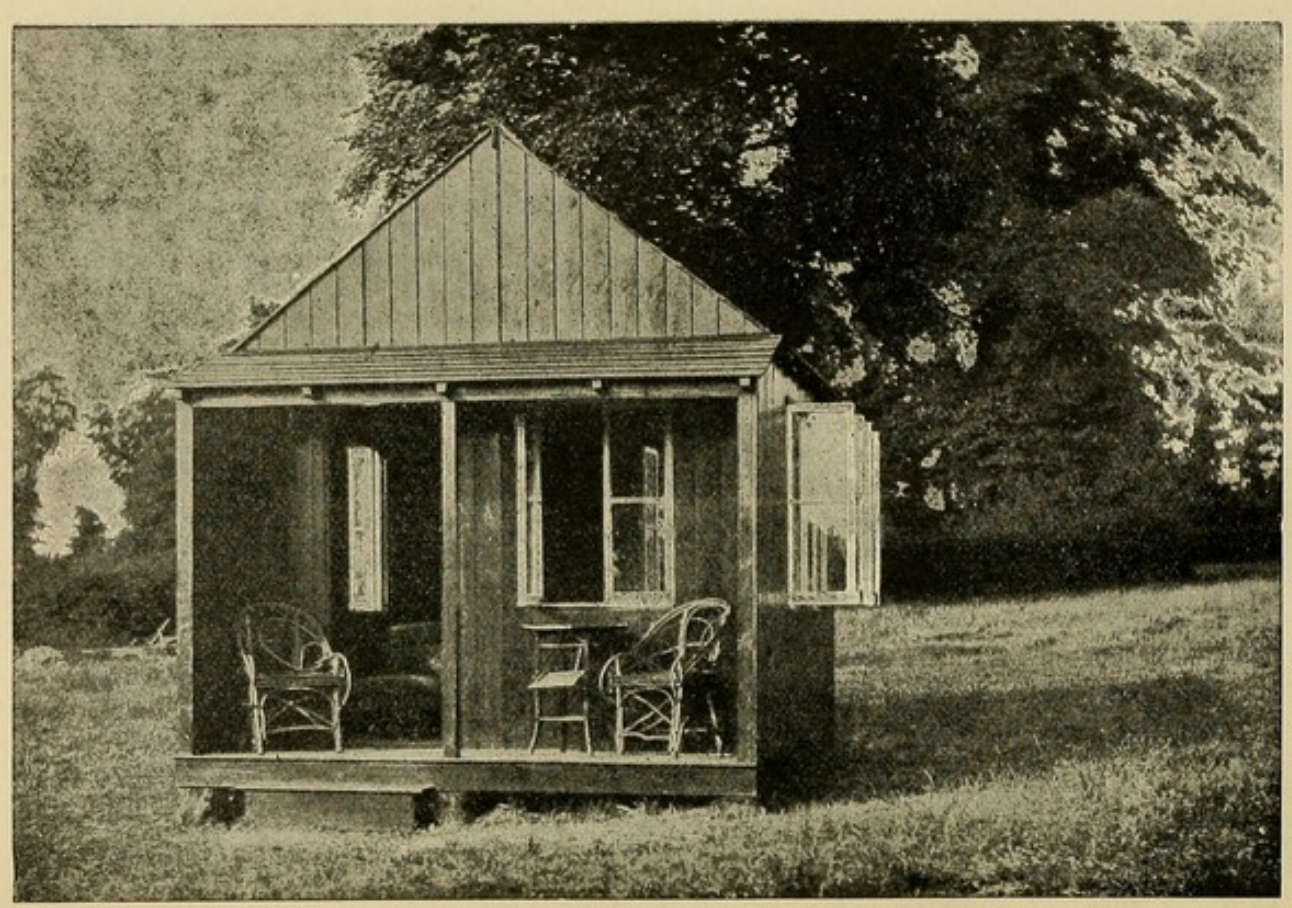


FIG. 26.—HAILEY SANATORIUM—A CHALET. [*Face page* 159.

Out of the 150 beds, only sixteen are for pulmonary tuberculosis, four each for men, women, boys and girls; these must be in the first stage. Children under six years of age are not admitted. An electrical department has recently been added for the treatment of lupus by X-rays, with a special surgeon in charge. An isolation block has also been built with twelve beds.

Staff: There are two resident medical officers, and a number of honorary physicians and surgeons, mostly eminent members of the profession in London.

Admission: With governor's recommendation, 12s. per week for adults, 8s. for children. Without recommendation, 30s. per week. Each recommendation is good for four weeks.

The Seaside Sanatoria

at Sandgate have been the subject of lengthy correspondence in the medical papers. They face the open street, and have too restricted an amount of ground for proper treatment.

Oxfordshire.

Hailey Open-air Sanatorium,

Ipsden, Wallingford, consists of an old country house on the Chiltern Hills, to which have been added a number of sleeping chalets, a bungalow, etc. Dominated by the highest chain of the Chilterns, which form a sort of amphitheatre to north, east and west rising to 180 metres altitude, the sanatorium is surrounded by open fields which extend to the valley of the Thames, and enjoys beautiful and extensive views in many directions. The situation is bracing, and outside the grounds somewhat exposed. In addition to thirteen acres surrounding the sanatorium, there is a detached thirty-five-acre patch of breezy upland a quarter of a mile away, which belongs to the estate, but has hitherto not been used for open-air treatment. Round the house is a well-kept garden with good lawn, lofty ivy-clad elm trees and ornamental pines, and further off an orchard and meadows, one of which is sprinkled with chalets. The soil of the district is chalk, covered with brick earth or gravel.

The house is used for administrative purposes; the dining-room occupies the whole depth of the northern end. Over the entrance, to the east, is a large glass verandah (fig. 25). In an adjoining garden is

a bungalow of wood and iron with six beds. A cottage provides four more beds. The main provision for patients is in the shape of chalets (fig. 26), which are of wood on piles, with shallow verandah on the south side, large casement windows occupying the other three sides, ventilating space all round the roof, door and incomplete partition separating from the verandah. The floors are covered with cork carpet. Heating (not much used) is by closed stoves. Sanitary provision is mainly in the shape of earth closets. There is a good water supply. Baths and lavatories are in the house; washstands and other suitable furniture in the chalets and rooms. Lighting is by acetylene gas.

Dr. Reinhardt, the founder of the sanatorium, lives at Goring (five miles) and acts as visiting physician. He was attached to the Stourfield Park Sanatorium at Bournemouth until it was closed.

Staff: A resident and a visiting physician, matron, secretary, nurses, etc.

Access: Wallingford (G.W.R.), four and a half miles; or Goring Station.

KINGWOOD,

Peppard Common, is placed in a cherry orchard attached to a farm with fifty acres, on the Chiltern Hills. The soil is gravel over chalk; the air pure and bracing, the surrounding country consisting of farms, open commons and woodland. The house is of two stories with attic, and has a south-east aspect. The rooms have large casement windows with fanlights over. All the bedroom doors have similar fanlights and are simply furnished. Heating is by hot-water pipes; lighting by lamps and candles. There is a built-out dining-room at the western end. Delicate children are admitted, as well as ladies and gentlemen.

Staff: a medical director (Dr. Esther Colebrook) who lives within a short distance, secretary, matron, etc.

Terms: As in table; one double room at three guineas per patient.

THE MAITLAND COTTAGE SANATORIUM

for poorer patients is in the same district as the preceding. The cottage has been specially built, of wood on brick foundations, and accommodates sixteen patients (eight men), in rooms with one to

three beds apiece. The aspect is south-west; verandahs and shelters are provided, and a dining-room and general room. Surrounding the house are fields and distant woods. Patients are expected to do what work on the farm, chicken-yard, etc., they are fit for. Only early cases are admitted. There is a matron in charge.

The Woolwich Borough Council maintains three beds. Applications to the medical officer, stating patients' medical and financial position. With subscriber's nomination of £10, the weekly cost is reduced to 8s. for three months. Laundry is extra.

Access: Reading (G.W.R., L.S.W.R., S.E.R.), six and a half miles.

Surrey.

The *Richmond Union Infirmary* has special wards for consumptives.

CROOKSBURY SANATORIUM

is situated in the most beautiful part of the Surrey hills, between Godalming, Farnham and Haslemere, in a district combining all the essentials for the open-air treatment, within a moderate distance by rail from London. Stretching for over twenty miles to the south-west is a tract of sandy country, covered with pine woods and heather. The climate of this district is dry for England, while in the higher parts, such as Hindhead and around Crooksbury Hill, it is distinctly bracing, with a large proportion of sunshine and a pleasant sharpness in the early morning air which tempers the heat of summer.

The soil (lower greensand) is extremely porous, so that the ground is dry almost immediately after heavy rain, and yet is not dusty. The surrounding hills, covered with pine woods, shelter the sanatorium on all sides, excepting the south, where the ground slopes away gently towards the valley of the Wey. The grounds (thirty-two acres) have been laid out with several miles of paths of the most varied character and gradient. Beautiful and extensive views are obtainable from many parts of the grounds, northwards towards the Hog's Back and the hills above Aldershot, southwards over a circle extending from near Leith Hill and the Charterhouse School to Hindhead and the Hampshire hills. Within a short walk are the ruins of Waverley Abbey, and Moor Park, with Stella's Cottage, a memento of Dean Swift. The Farnham golf

links are within a stone's throw of the grounds, and many beautiful walks and drives may be found within a few miles.

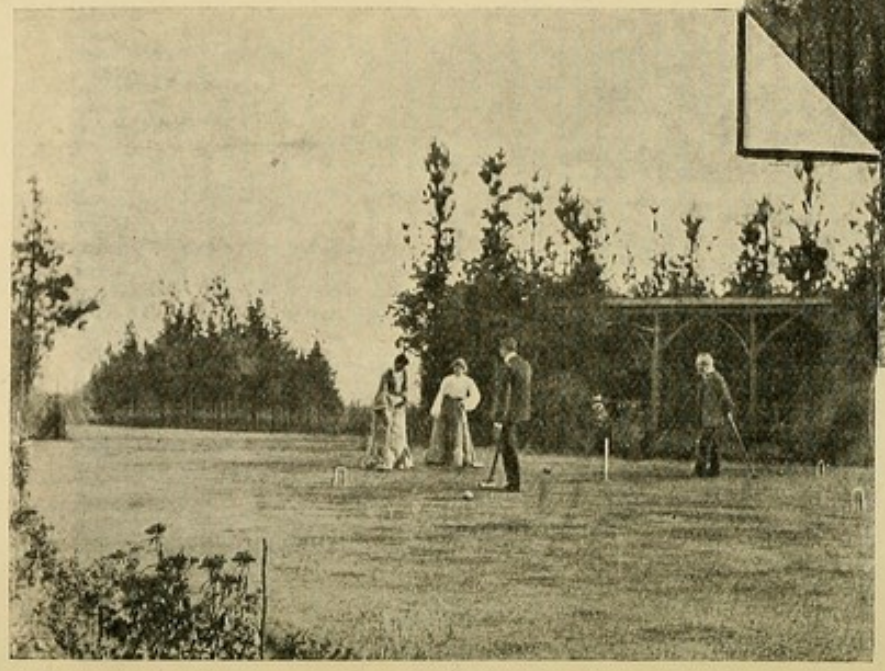
The buildings, which were specially erected for the purpose, consist of a main block, a separate building for slighter cases and convalescents, the bungalow, the doctor's house, and a number of sleeping chalets and summer houses, besides engine house and various outhouses (figs. 27-30).

The main block (fig. 27) is of one story, with nurses' room and box rooms in the roof. It looks south-south-east on to a flower garden with three lawns and an encircling ring of pine trees, through which a number of avenues have been cut for views and walks. Twelve bedrooms with French windows opening on to a tiled terrace are served by a long corridor, behind which lie two sanitary pavilions, and a light and airy dining-room with twelve large windows surmounted by fanlights; and behind this again is the kitchen department with servants' bedrooms overhead. The place is solidly built of brick with white rough-cast and red-tiled roof. The inner walls and ceilings are of hard cement covered with washable distemper, all angles rounded and dust-retaining ledges avoided. Floors are waxed and polished, covered with a few detachable strips of carpet in the corridors and bedrooms. These are mostly 3·7 × 3·0 × 3·4 metres (or 37·74 cubic metres) a few being larger, and are fitted with corner cupboards having sloping roof and mirror doors, and with specially designed tiled corner washstands. The large French windows are surmounted with fanlights. On the opposite side an air-shaft leads across the corridor to the open air. The furniture and fittings are both practical and artistic, and have been specially designed or chosen for the purpose. Each room is finished a little differently from the rest, so as to make it more home-like and less like an institution. The bathrooms are provided with needle baths. Waterproof roller blinds have been placed over the south windows instead of verandahs which would make the rooms dark and stuffy.

The bungalow, which is of wood on brick foundations, contains the surgery, consulting room, matron's sitting-room and two other rooms. The annexe (fig. 28) is higher up the hill, and is a solidly built two-story building, with a south-south-west aspect. The staircase is at the western end, with a covered porch and large balcony in front of it. The rooms, as in the main building, are in a single row,



FIG. 27.—CROOKSBURY SANATORIUM—MAIN BLOCK. [*Face page* 162.





A Summer House.

Fig 30.—Crooksbury Sanatorium—A Croquet Lawn.

[*Face page* 163.

looking into a terrace. The upper floor is usually reserved for ladies. In all essentials the bedrooms are fitted and finished as in the other block; but a fanlight over the bedroom door replaces the airshaft; and a nurses' kitchen and bedroom with sanitary pavilion are the only rooms north of the corridor.

Throughout the sanatorium the heating is by hot-water pipes and radiators; the lighting by electricity, which is produced in the grounds. The water supply is pure and abundant; earth closets are used, and the kitchen water disposed of by irrigation.

Staff: Dr. F. Rufenacht Walters (resident physician and lessee), a matron, three trained nurses, etc. Dr. Walters devotes himself entirely to the sanatorium, having given up his hospital appointments and practice in order to do so.

The sanatorium is intended for the educated classes; the comfort and well-being of the patients is made the first consideration, profits being freely spent on improving the place.

Access: Farnham (L.S.W.R.), three and a half miles; Tongham (L.S.W.R.), two miles; Ash (S.E.R.), four miles.

Telegraphic address: Sanatorium, Farnham.

Whitmead Hill Sanatorium,

Tilford, is on a small plateau overlooking the valley of the Wey, with heather-clad hills beyond, and the pine-clad Crooksbury Hill half a mile to the north-west. To the east, is a well-wooded slope, and between it and the house a shallow valley belonging to the estate. The grounds (ten acres) are wooded in part with large beech and pine trees, the rest forming garden, shrubbery and moorland. There are several shelters. The soil is lower greensand; the aspect southerly.

Originally a private house, a wing has been added on at the western end (fig. 31), with a deep glass verandah in front of it, and a narrow balcony for the upper floor. Behind these are twelve bedrooms in single row, with corridor to the north; the upper floor being reserved for ladies. The floors are covered with linoleum; the walls distempered. Each bedroom has half-glazed French windows with fanlights over, and is finished with washstand, bedstead and chest of drawers. *Cubic space:* Twenty-seven cubic metres. There is a bathroom on each floor, and a staircase at the eastern end which connects the new with the older part.

The original building is a picturesque house with several gables, having the entrance porch behind and a low verandah in the centre of the south side. At the eastern end there is an additional story; a few beds for patients are in this part of the building, and on the ground floor the dining-room and drawing-room, consulting-room and kitchen department. This portion is comfortably furnished, but has no special advantages for open-air treatment. The whole place is lit with electricity; heating is by hot-water pipes in the corridors, and open fires in the bedrooms; these are only allowed under the direction of the doctor, and are charged extra. There are fine views from many of the rooms and from the terrace over Hindhead, the Surrey and the Hampshire hills. To the north of the sanatorium are the house and grounds of the medical director, and further east the stables and a small cottage.

Staff: The resident physician, assistant physician, secretary, matron, a trained nurse, etc.

Access: Farnham Station (L.S.W.R.), three and a half miles.

Telegrams: Nordrach, Tilford.

HEATHERSIDE,

Camberley, is the sanatorium and convalescent home for the Brompton Hospital for Consumption (p. 172). It stands on an elevated plateau on the Chobham Ridges, surrounded on three sides by pine woods, but enjoying an extensive view on the south side over Frimley Common, Farnborough and Aldershot, the horizon being bounded by the Hog's Back and Crooksbury Ridges, sinking into the Waverley Woods. A prominent feature to the south-west is the memorial chapel in which were buried Napoleon III. and his son.

The grounds (twenty acres) are planted with a remarkable variety of conifers, forming originally part of the Heatherside estate planted by the late Mr. Mongredien, and touching the Heatherside nurseries at the north-east corner. Near by is a large tract of land used by the War Office. The soil is gravel and sand (Upper Bagshot).

The buildings (figs. 32-35) consist of a two-storied block forming an X, the centre raised to three storys; behind this an assembly hall and two dining halls attached to the kitchen department, and connected at the sides by covered corridors with the nurses' house and the medical officer's house.



Fig. 31.—Whitmead Hill Sanatorium. [*Face page* 164.

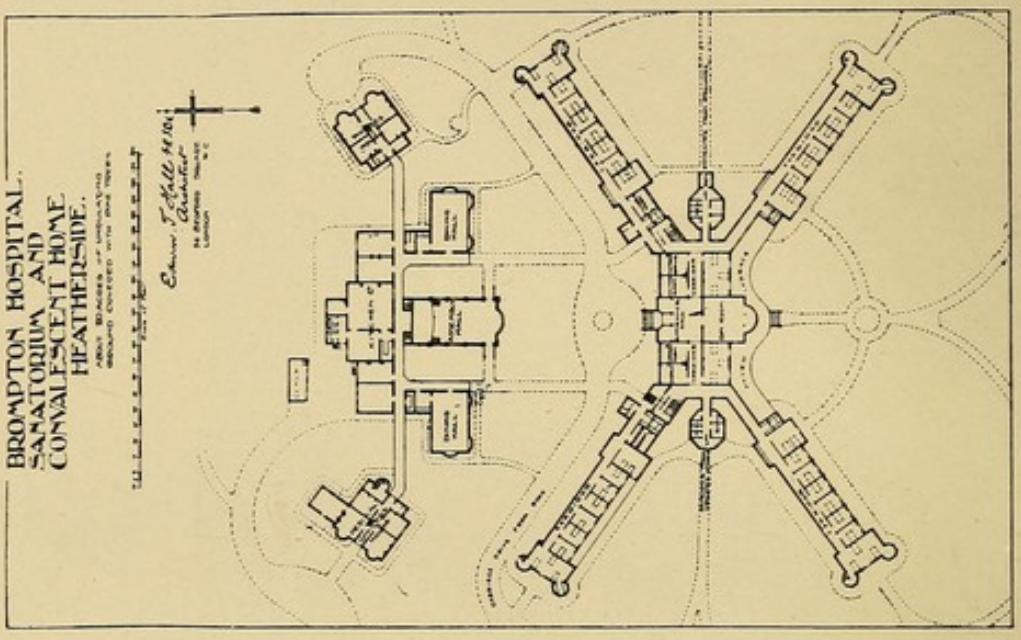


FIG. 32.—HEATHERSIDE—GROUND PLAN.

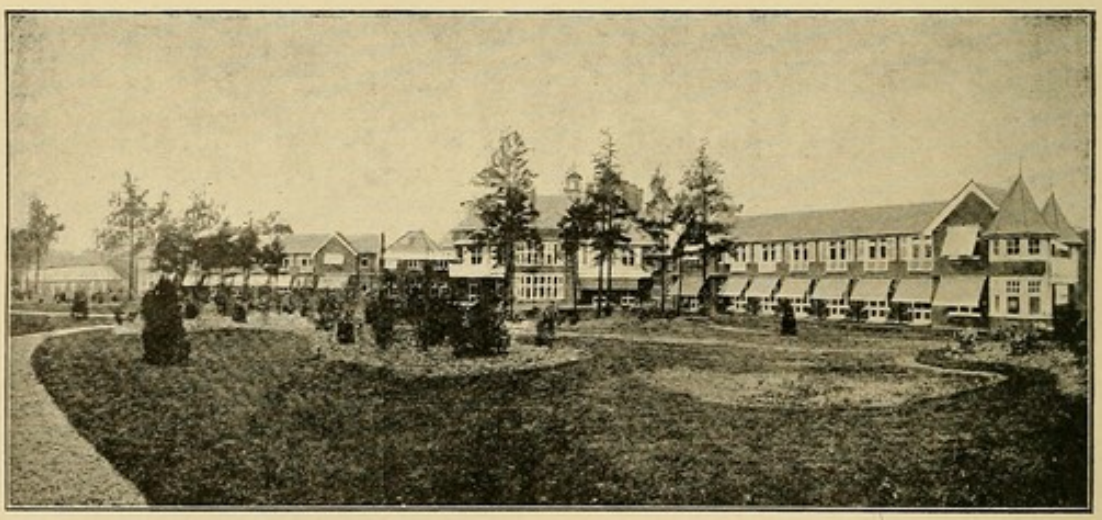


FIG. 33.—HEATHERSIDE. [*Face page* 165.

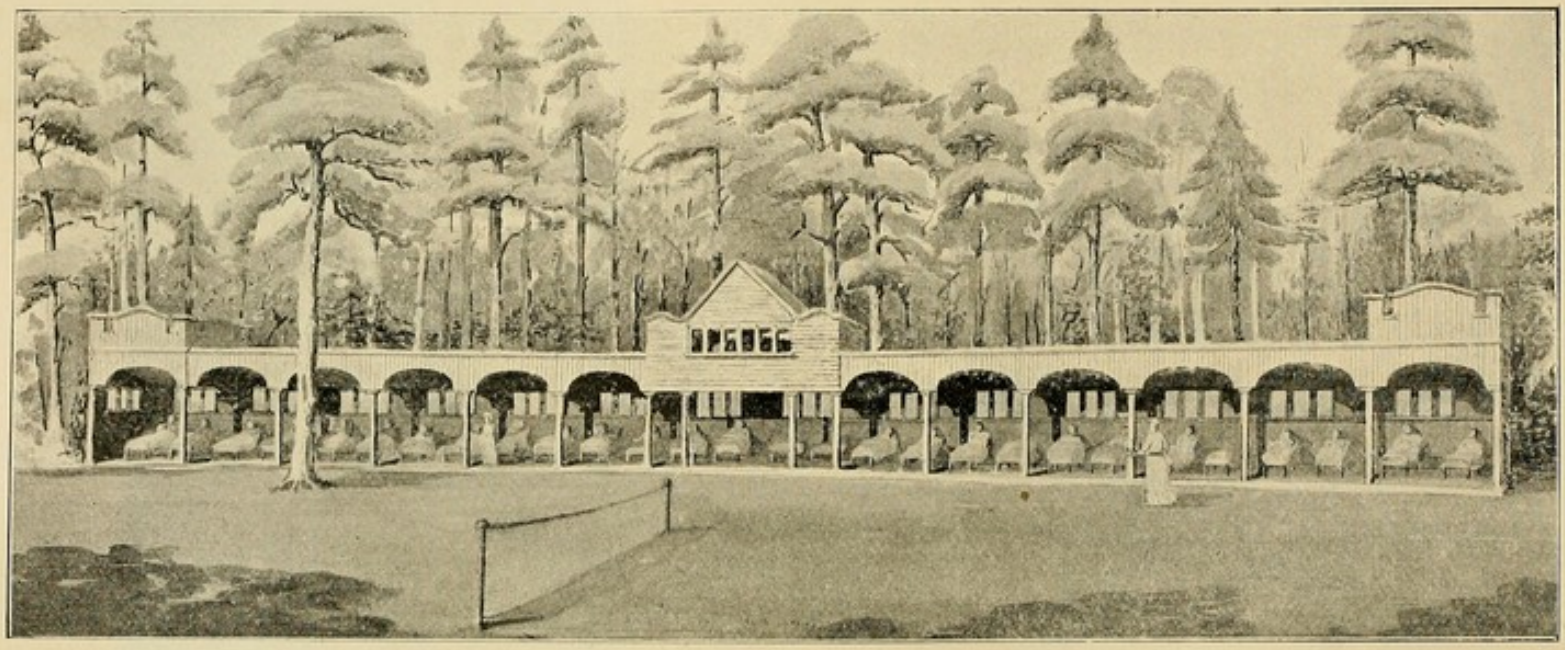


FIG. 34.—HEATHERSIDE—LIEGEHALLE. [*Face page* 165.



FIG. 35.—HEATHERSIDE—IN THE GROUNDS. [*Face page* 165.

The main building has in the centre a day room and two three-bedded wards, and behind these the entrance hall, dispensary, consulting-room, waiting-room and matron's office. The southern arms are intended for consumptives, the northern arms for convalescents from other diseases. They are arranged so as not to overshadow one another. In the angle between the two are sanitary pavilions, accessible from the grounds, and quite isolated. Each arm consists of a three-bedded ward at the further end, a two-bedded ward near the centre, and six single-bedded rooms between; with a similar arrangement above. There is also a linen room and a nurses' room to each arm; a main staircase to each northern arm and safety staircases in turrets at the ends of every arm.

The bedrooms are finished with great attention to detail; angles rounded, walls and ceilings washable, floors covered with linoleum.

Large French windows half-glazed to the south side, with fan-lights over and roller blinds. The windows open to the ground level even on the upper floor. Cubic space: thirty-seven cubic metres, height three metres. There are open balconies at the end of each pavilion, and large *liegehallen* in the grounds (fig. 34).

The dining rooms and recreation hall have large multiple windows opening like louvre shutters with combined movement. Heating is by hot-water pipes, lighting by electricity. At a distance, near the entrance gates, is the machinery block with lighting plant, laundry, boilers, mortuary and laboratory. Cost £70,000.

Staff: Resident medical officers, with a visiting staff in common with the hospital at Brompton, etc.

Access: Frimley Station (L.S.W.R.), two miles; Camberley (L.S.W.R.), three miles.

Ockley Sanatorium

is on the south side of the Surrey hills, which protect it against north and east winds, and commands beautiful views of Leith Hill and the surrounding country. The grounds amount to two acres; the soil is a light clay.

The bedrooms are each provided with open fireplaces, and one or two large windows. The *staff* consists of a resident physician (Dr. Clara Hind) with two nurses.

Access: Ockley Station (L.B.S.C.R.) on the Horsham line, one mile.

WOODHURST SANATORIUM,

Tower Hill, Dorking, is near Glory Woods, of some forty acres in extent, to which the patients have access. The grounds belonging to the sanatorium cover one and a half acres. The house (not specially built) is on high ground, and has large rooms with good windows commanding pretty views of the surrounding country, which is well wooded with oak and birch and fir trees. *Soil:* Sand and gravel. Lighting is by gas; the sewerage that of Dorking.

Staff: A non-resident medical officer, matron and secretary (husband and wife), sister and nurse and servants.

Access: Dorking Station (L.B.S.C.R., or S.E.R.), one mile.

Women only are admitted.

Sussex.

Complete arrangements have been made in connection with the *Brighton Infirmary* for open-air treatment. A ward of thirty beds opening on to a balcony was set apart for men; and similar arrangements are contemplated for women. Dr. Newsholme, the medical officer of the hospital, has also set apart a ward of ten beds at the isolation hospital on the downs as a sort of school for consumptives. When a case is notified in unsatisfactory quarters, the sufferer is removed to this ward and taught the hygienic principles of more immediate consequence; while his family are housed in another pavilion and the home thoroughly disinfected. Each patient stays a month—not long enough for curative but sufficient for educational purposes. More recently a special sanatorium for such cases has been opened on the downs. At *Steyning Infirmary* there is a small out-door ward for consumptives.

EVERSFIELD HOSPITAL,

St. Leonards-on-Sea, is a good-looking building with covered and uncovered balconies on the south side, large windows, and wards occupying mostly the south and west sides. There is a large dining-hall on the ground floor, with a nurses' day room under it and large wards on the two floors above it. Lavatories, baths, etc., occupy the north-eastern angle, and the remainder of the space north of the corridor is occupied by staff rooms, sitting-rooms and small wards. There are forty-seven beds in the large wards, eight in private

wards. The charges for the former are 13s. with, or 17s. without a subscriber's letter, which is available for four weeks. In private wards the charges are two to three guineas.

Staff: A resident and several visiting medical officers, matron and nurses. A subscriber may recommend one in-patient annually for every guinea subscribed.

King Edward VII. Sanatorium

is the outcome of a gift from an anonymous philanthropist to the King in commemoration of his coronation. It is being built at Easebourne Hill, about three miles from Midhurst. The grounds (151 acres) correspond with what is marked as Lord's Common on the map, and formed part of the Cowdray Estate belonging to the Earl of Egmont. The sanatorium is placed on a natural plateau from which the ground slopes rapidly to the south, giving extensive views over the South Downs and intermediate country. The soil is lower greensand.

The building consists of an administrative portion to the north, united by a double corridor with the patients' quarters. The former has the main entrance to the north, with near it on the west side the waiting, consulting, operation, X-ray and dark rooms, the committee room, dispensary, laboratories, medical library and medical officer's sitting-room. Over this are the medical officer's quarters; and under them the porter's room. To the east of the entrance is the dining-room communicating with the kitchen department. On the first floor of the central portion facing south are the rooms for matron and nurses' sitting-room, from which the patients' quarters can be quickly reached through the upper corridor. Above are the bedrooms for nurses and servants in separate parts.

The patients' portion is intended for eighty-eight poor people, and twelve well-to-do, and is divided into three distinct blocks connected by corridors on each floor. On the ground floor of the centre block are recreation rooms and cloak rooms for each sex of the poorer patients, and the hydro-therapeutical department. On the first floor are twelve wards, and two spare rooms for the well-to-do; also two sitting-rooms. All these have a balcony facing south, separated the one from the other by canvas screens. The bedrooms are $4{\cdot}2 \times 3{\cdot}3 \times 3{\cdot}3$ metres (or forty-eight cubic metres per head). There is a bathroom for every three patients, and an attendants'

room. The well-to-do patients have separate access to the grounds, the douche rooms, consulting-rooms, dining-hall and main entrance. On the top floor of the central block are wards for twenty-two bed-patients, also with a balcony. These can easily be served from the kitchen, and are near the medical officer's and nurses' quarters and the passenger lift. The side wings form an obtuse angle with the central portion. On the ground floor on each side is a corridor for walking exercise in rainy weather; also sixteen bedrooms with a wide terrace in front, and nurses' rooms, linen rooms, bathrooms, etc., behind. At the ends are emergency staircases which will lead to *liegehallen*. In the basement on the men's side are workshops. There will be a clock tower and a tiled roof. The wings have no second floor. The cost of the building has been estimated at £60,000; a large sum has been spent on bringing from a distance a suitable water supply. The foundation stone was laid by H.M. the King on 3rd November, 1903; it is expected to be finished by the end of 1905. Mr. John Brickwood, a well-known brewer, has offered to present a chapel at an estimated cost of £20,000.[1]

Rudgwick Sanatorium

is situated in beautiful country near the borders of Surrey and Sussex, on a hill which gives distant views over the Sussex Weald and the South Downs and Surrey hills. A pre-existing house is used as an administrative block; in the grounds (four acres of garden and meadow) a special building has been erected consisting of a double row of bedrooms with corridor between, surmounted by a similar story above. Eight rooms have two windows apiece; two have French windows and lead on to a balcony. Over the porch on wooden pillars is a bathroom and closet. The water supply is from a private well. There is a large recreation hall 15·25 × 6 metres with large doors and nine large sliding windows facing east and west, used in bad weather. The soil is a light clay (Horsham clay). Heating is but little employed: in the common rooms there are hot pipes. Lighting is by lamps and candles. Ladies and gentlemen are admitted. The place is managed by a matron assisted by a nurse. The medical officer comes down periodically from London.

Access: Rudgwick (L.B.S.C.R.) on the line from Horsham to Guildford, half a mile.

[1] *British Medical Journal*, 5th Dec., 1903.

THE WINTER HOME FOR CONSUMPTIVE GIRLS

at St. Leonards, although not strictly a sanatorium, deserves mention.

THE RICHMOND HOUSE CONVALESCENT HOME

at Worthing is connected with the Infirmary for Consumption and Diseases of the Throat and Chest, Margaret Street, London, W. It is an ordinary house, with accommodation for fifteen or sixteen patients, who have latterly been treated in the garden on open-air principles. No resident medical officer. Admission by subscriber's letter and payment of 11s. 6d. per week, or 15s. without letter. The average stay is short.

CHAPTER XXX.

MIDDLESEX AND THE METROPOLITAN AREA.

THERE are now four chest hospitals in London, with, together, 665 beds, and complete in-patient and out-patient departments; two of these have country branches or sanatoria. A fifth institution consists of an out-patient department only, but with a small convalescent home at the seaside. There are also a home for consumptive girls, and four homes for incurable cases, not exclusively reserved for consumptives: these have collectively over 180 beds.

Many of the *poorhouse infirmaries* have made special arrangements for consumptives. In the *Bethnal Green Infirmary* there are special wards. In the new *Camberwell Infirmary*, the top floor of three wards, each with twenty-four beds, has been reserved for the purpose, fitted with large windows all round. On the top is a flat roof where patients can rest. The building has electric lighting, lifts, etc. The *City of London Union* has the south block reserved for consumptives. The *Fulham Union* has two wards for open-air treatment; the *Hampstead Union* has arranged open-air wards; the *Holborn Infirmary* has separate quarters for consumptives, and a large garden and galleries; the *Kensington Union* has three wards (two for men), altered for the purpose; the *Lewisham Infirmary* has a separate ward, and verandahs; the *St. Mary Islington Union* has a separate top floor adapted with open-air galleries; in the *St. Marylebone Infirmary* the top flats are mostly used for consumptives; the *St. Pancras Union* has beds for forty-two such cases at the infirmary at Dartmouth Park Hill North; the *Shoreditch Infirmary* has special wards; the *Southwark Infirmary* five top wards with 120 beds; and the *Wandsworth Union* is treating consumptives in temporary iron buildings at Tooting.

Middlesex and the Metropolis.

The Metropolitan Asylums Board have been repeatedly urged to set aside beds for consumptive paupers at the *Gore Farm Hospitals*, but have not yet done so. These were originally intended for smallpox cases, but have been almost or quite empty for some years. There are two hospitals on a site of 160 acres near Dartford, which have cost (with the site) about £320,000. There is an upper hospital with 1,040 beds, and a lower with 850; they are sheltered from north and east, in well-wooded grounds, and are invisible the one from the other. It was stated by Dr. Dunfield (medical officer of health for Kensington) that on 7th July, 1900, there were 1,562 consumptives in the Metropolitan workhouses and infirmaries, of which 1,000 could have been moved to sanatoria, and of which 400 were in an early stage.

A *sanatorium for the working classes* is projected, originating with a conference of delegates from various friendly societies. A deputation went to Germany in November, 1902, under the guidance of Dr. Hillier, to inspect the sanatoria there. It is proposed to erect a sanatorium with 200 beds, one-third to be in solidly built structures, the remainder in chalets. The friendly societies are to be invited to endow beds at about 25s. per week for the use of their members. The cost is estimated at about £50,000.

A *sanatorium for Middlesex* is projected; also one for employees of the *Post Office;* each of these is to have 100 beds. At the *Dreadnought Hospital*, Greenwich, shelters for open-air treatment have been placed on the flat roofs (fourteen patients).

Name.	Locality.	Beds.	Founded.	
Royal Hosp. for Diseases of the Chest	City Road	80	1814	Resident and visiting physicians
Brompton Hosp. for Con.	Fulham Road	321	1841	See also Heatherside, Surrey
City of London Hosp. for Diseases of the Chest	Victoria Park	164	1848	Resident and visiting physicians
Mount Vernon Hosp. for Consumptives	Hampstead	120	1860	Resident and visiting physicians
Mount Vernon Hosp. for Consumptives	Northwoods	112	1904	Dr. Kelynack and visiting physicians
Infirmary for Consumption	Margaret Street	—	—	—
Home for Cons. Females	Paddington	26	—	—
St. Peter's Home	Kilburn	80	—	Not exclusively for cons.
Friedenheim	Hampstead	44	—	,,
St. Luke's House	N. W.	16	—	,,
Free Home for the Dying	Clapham	—	—	,,

THE ROYAL HOSPITAL FOR DISEASES OF THE CHEST,

City Road, is placed by the side of a busy main thoroughfare, and is therefore unsuitable for open-air treatment. A country branch sanatorium is projected.

THE BROMPTON HOSPITAL FOR CONSUMPTION,

Fulham Road, S.W., is well known for its large and luxurious wards and the excellence of its arrangements ; but its position and the relatively small size of its garden make it by no means an ideal spot for open-air treatment. Some of the wards, however, have been set aside for such treatment, and are said to have yielded good results. It now has a country branch, which is partly convalescent home, partly sanatorium (p. 164).

THE CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST

although in the midst of a densely populated district, has the considerable advantage of being near a large open space (Victoria Park). The soil is gravel, and is sufficiently raised above the river Thames to be dry. Light iron balconies with glass roofs surround it on the sunny sides, which serve the three floors and are used for open-air treatment.

THE MOUNT VERNON HOSPITAL FOR CONSUMPTION

and Diseases of the Chest is the only one of the London chest hospitals whose position really lends itself to the open-air treatment. Situated 91 metres above sea-level, near the top of a hill capped with Bagshot sand, with a fine view over western London, it is surrounded by a residential district consisting chiefly of houses with large gardens and of extensive open spaces, including Hampstead Heath, parts of which rise to 122 metres above sea-level, and help to protect the hospital from the north and east winds. A fair-sized garden with terraces, flower beds, lawns and shelters, lies below it on the slope of the hill. The hospital escapes most of the fogs which settle over the lower parts of London in autumn and winter, and enjoys a more bracing climate with more sunshine. Its chief drawback is its exposure to south-west gales and the lack of extensive grounds. The hospital (fig. 36) was enlarged in 1903. The newer portion has three tiers of balconies on the south-west front,



Fig. 36.—The Mount Vernon Hospital, Hampstead. [*Face page* 172.

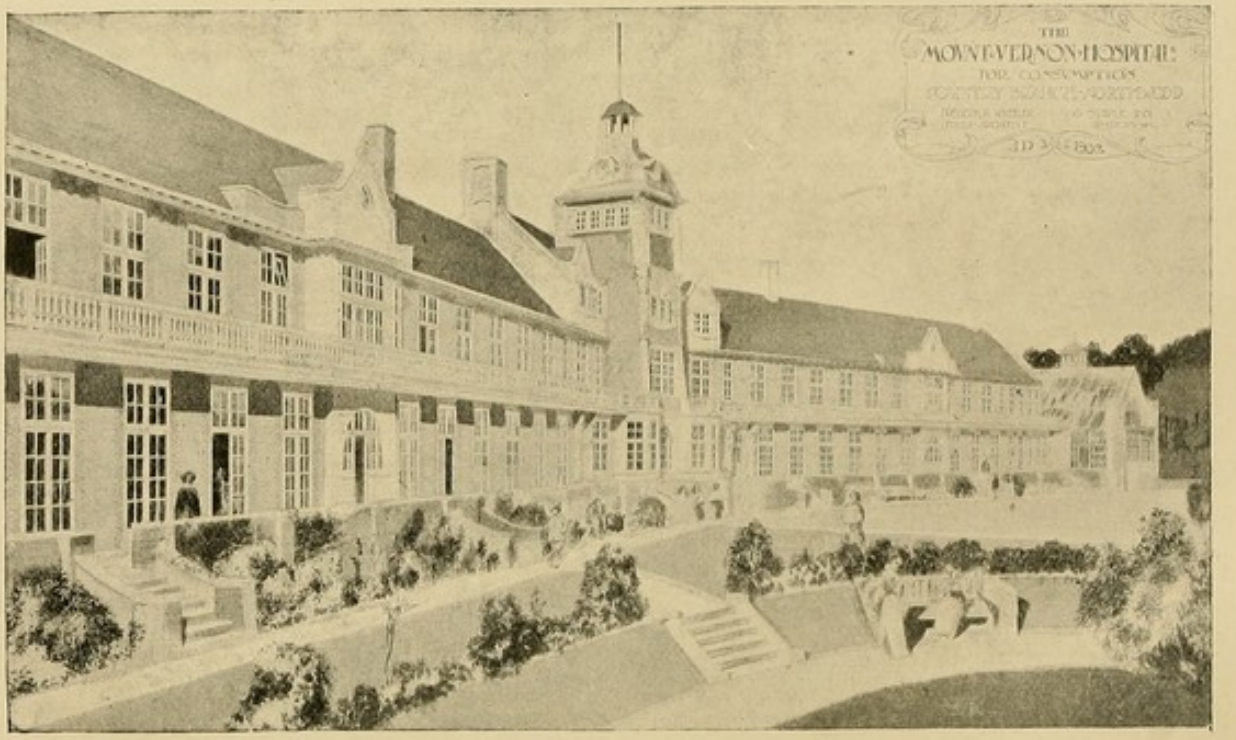


FIG. 37.—THE MOUNT VERNON HOSPITAL, NORTHWOODS. [*Face page* 173.

one on the ground-floor level with seven beds, two above with fourteen apiece, all provided with folding glass shutters. Beneath the lowest balcony is a sheltered space which is used by male patients in wet weather; and a room in the west wing serves the same purpose for the women. The wards are nearly as airy as the balconies, with large triple windows, painted cement walls and polished floors, and have from two to eight beds apiece. Adjoining some of the wards are balconies; attached to two are turrets with windows all round. The basement is occupied with out-patients' rooms, etc.; the large dining-room, board-room and chief staff rooms are on the ground floor; the kitchen and quarters for nurses and servants are under the roof. There are passenger and food lifts, electric lighting, and in the wards open fireplaces.

A pathological building is being erected in the grounds.

There is also a complete *out-patient department* at 7 Fitzroy Square, in the centre of western London, as well as at Hampstead.

This hospital has opened a *country branch* at Northwoods.

THE MOUNT VERNON COUNTRY BRANCH HOSPITAL

at Betchworth Heath, Northwoods, is the outcome of a gift of £120,000 by an anonymous benefactor, part of which sum has been set aside for an endowment fund. It is situated near the Hertfordshire border, the soil being sand and gravel overlying chalk, the elevation 113 metres. The grounds (104 acres) are in the midst of green fields and woodlands; they include about thirty acres of woodland, mostly pines and larches. Large gardens and orchards are provided, in which patients will be able to do light work. There is good protection to the north, west and east.

The building is on a southerly slope and is of two stories. The central block faces south, and contains rooms for matron and resident medical officer, board-room, servants' bedrooms, and a large water tank in the clock tower.

The wings run south-south-east and south-south-west; they consist of wards on the south side, a wide corridor with projecting sanitary pavilions to the north. Two terraces at different levels run in front of the building, and a wide balcony on the upper floor. There are ten wards with ten beds apiece, and twelve single-bedded rooms; in addition to which each wing has a consulting room, an electric bath, and a winter garden at the end, and communicates

with its own isolation block with independent arrangements for cooking and nursing. The ward windows are large casements to the floor level, with fanlights reaching to the ceiling. They have special blinds in lieu of verandahs. Cubic space per head is 39·6 cubic metres. The furniture is simple; walls are of washable distemper (in kitchens and sanitary blocks white tiles are used); lighting by electricity. The corridors have large windows to the north and pivoted windows into the wards near the ceiling. The sanitary pavilions are disconnected by a short well-ventilated lobby. Each contains eight bathrooms, special spray and douche room, lavatories, cloak and boot rooms, ward maids' and nurses' sinks, and patients' W.C.s Running north from the centre block is a corridor leading to the physician's house, the dining-room, nurses' room and kitchens. The place is heated by open fires and by Langfield's warm-air system. Electric lifts are provided.

The *staff* includes resident and visiting physicians, and sixteen nurses under a matron.

Patients are passed through the hospital at Hampstead before admission to Northwoods.

Access: Special omnibus from the hospital at Hampstead; or rail from Baker Street to Northwoods (sixteen miles).

Applications to the secretary, 7 Fitzroy Square, London, W.

CHAPTER XXXI.

THE SOUTH-WESTERN COUNTIES

Including Cornwall, Devon, Somerset, Dorset, Wilts, Gloucester, Hereford, and Monmouth.

Name and County.	Locality.	Opened.	Beds.	Altitude in Metres.	Fees per Week.	
DEVON—						
Dartmoor San.	Chagford	1903	20	230	3 to 5 gns.	Dr. A. Scott Smith
Devon and Cornwall Sanatorium	Didworthy	1903	16	—	31s. 6d., or free	Dr. J. Penn Milton
Dunstone Park San.	Paignton	1900	10	167	3 to 4 gns.	Dr. T. Carson Fisher
Western Hosp. for Incipient Cons.	Torquay	1850	40	61	12s. 6d.; 7s. 6d.	No res. med. off.
Mildmay Con. Home	,,	1886	10	—	10s. 6d.; 7s.	No res. med. off.; advanced cases
DORSETSHIRE—						
Alderney Manor San.	Parkstone	1900	28	64	4 guineas	Dr. W. Denton Johns
GLOUCESTER—						
Cotswold San.	Birdlip	1898	39[1]	244	5 gns.; a few at 4	Dr. Etlinger; Dr. Philip Savill
Painswick San.	Painswick	1900	12	183	2½ guineas	Dr. W. McCall
SOMERSETSHIRE—						
Nordrach-upon-Mendip	Mendip Hills	1899	40[2]	263	4 to 6 gns.	Dr. Thurnam; Dr. Chas. E. Wheeler
Mendip Hills San.	,,	1900	20	260	3½ to 5 gns.	Dr. Chowry Muthu
Luftkur San.	Portbury	1904	—	122	4 to 10 gns.	Dr. A. C. Falkiner
Engel Home	Cheddar	—	—	—	10s. to 30s.	No res. med. off.; advanced cases
St. Michael's Home	Axbridge	—	41[3]	—	Free	No res. med. off.; advanced cases
WILTSHIRE—						
Roy. Victoria Meml. Sanatorium	Winsley	1904	60[4]	183	6s., and free	—

Cornwall

has combined with Devonshire to erect and maintain a sanatorium at Didsworthy (see Devon, p. 176).

[1] Six in chalets. [2] Additional beds in tents in summer.
[3] Twenty-four for men. [4] One hundred in summer.

Devonshire.

The *Plymouth Board of Guardians* has set apart special wards for open-air treatment.

THE DARTMOOR SANATORIUM,

at Chagford (fig. 38), is on the north-eastern border of Dartmoor, in a sheltered position about half a mile from Leigh Bridge where the South Teign joins the North Teign river. The district is well known for the beauty of its scenery. Some of the neighbouring tors rise to over 430 metres above sea-level. Soil: granitic and very porous.

The building faces south, and is lit with electricity. Belonging to it are eighteen acres of land.

Access: Moreton Hampstead Station (G.W.R.), seven miles; Okehampton (L.S.W.R.), eleven miles.

Telegrams: Sanatorium, Chagford.

DUNSTONE PARK SANATORIUM

is on Marldon Hill, near Paignton, South Devon, about one and a half miles from the town, in an open situation commanding fine views over the sea, the river Dart and Dartmoor. Higher hills are stated to shelter it on the north and east. The grounds (four acres) comprise garden and field, with croquet lawns, and numerous shelters. Soil: sandstone. The house (not specially built) has two floors and a basement; it is well provided with balconies. The windows are of the ordinary double-hung kind. Heating by open fireplaces. Lighting by lamps and candles.

Management: Dr. T. Carson Fisher (resident); Miss J. M. Hayes, lady superintendent, is a certificated nurse.

Access: Paignton (G.W.R).

Telegrams: Sanatorium, Paignton.

THE DEVON AND CORNWALL SANATORIUM

at Didsworthy, two miles from South Brent near Dartmouth, on South Dartmoor, was erected by the local branch of the National Association for Prevention of Consumption. Cost: £6,600. The Cornwall County Council contributed £500, and maintain two beds at £65 each.[1]

[1] *Lancet*, 25th October, 1902.

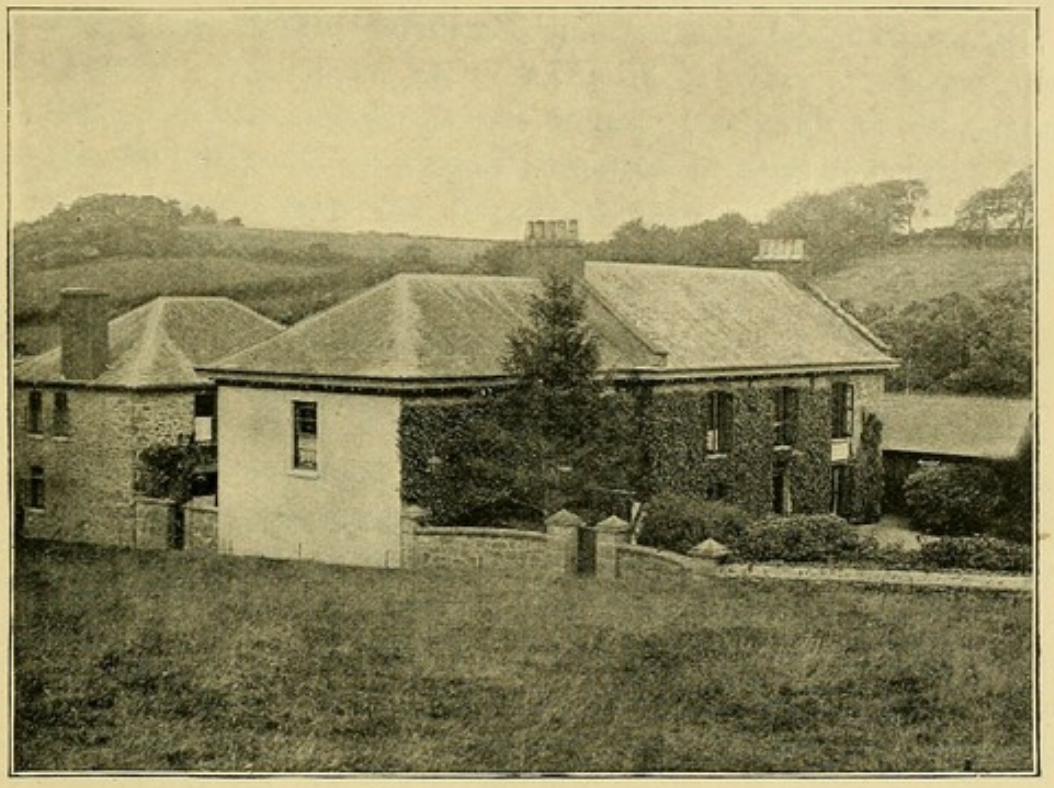


Fig. 38.—The Dartmoor Sanatorium, from the South-West.

[*Face page* 176.

THE WESTERN HOSPITAL FOR INCIPIENT CONSUMPTION,

at Torquay, was originally a private house, which was transformed in 1850 into a convalescent home for those affected with chest complaints, mainly owing to the initiative of the Hon. Mrs. Powys Keck. The walls are whitewashed, floors boarded, stained and polished, rooms fairly lofty and airy, but varying in size. Recently two verandahs have been added for open-air treatment. Heating is by open fires, lighting by gas. Aspect southerly, climate mild and sunny. Soil: limestone. Patients over the age of fifteen, male or female, are eligible if medically suitable and of good character. The hospital is open from 1st October till 1st June. *Charges:* 7s. 6d. with a nomination (£2 2s. per annum), available for four months; 12s. 6d. without. A deposit required in case of death. Cost of maintenance (1903) was 16s. 4d. per week. The *staff* consists of a matron, secretary and servants; in addition to an honorary medical staff.

Access: L.S.W. Railway.

THE MILDMAY CONSUMPTIVE HOME,

Torquay, is intended for advanced cases, ineligible for other institutions, and is open the whole year. The house (not specially built) has a south-west aspect, with large windows and airy rooms. There is a revolving shelter in the grounds (half an acre).

The place is managed by a fully qualified nurse as lady superintendent, with two nurses under her; and by an honorary staff, committee and secretary. *Terms:* 7s. per week with a subscriber's nomination (two guineas per annum) or 10s. 6d. without. Guarantee required in case of death. Applications to the hon. secretary.

Dorsetshire.

A sanatorium for this county is projected.[1] Lord Ilchester has contributed £500 towards the funds.[2]

ALDERNEY MANOR SANATORIUM,

Parkstone, is a "chalet" sanatorium on high land near the sea and the valley of the Stour. Six hundred acres of pine woods and heather have been rented for the sanatorium. There is also a

[1] *Lancet*, 24th May, 1902. [2] *Ibid.*, 29th Nov., 1902.

large garden, surrounded by a seven-foot wall. Although within three miles of Bournemouth, the climate is somewhat different, being less relaxing than the latter in summer time. The soil is gravel.

The original manor house, an old one-story building, is used for administrative purposes. There are also a bungalow, and a number of sleeping huts (fig. 39), all built of wood with corrugated iron roofs and outer walls, large windows on four sides and ventilation in the gable. Heating is by Choubersky's stoves, which burn anthracite; but in this part of England the winters are mild. The dining-room is a large building of the same kind, with windows on all sides. Two sun baths have been arranged for ladies and gentlemen respectively; and sun bathing machines for bed patients. For amusements, croquet, sea-bathing (under medical supervision), fishing on Lord Wimborne's preserves, and rabbit shooting on the estate itself, are provided. A bandstand has been erected for occasional concerts. A local land agent gives lessons by arrangement in the management of landed property.

Staff: Dr. Denton Johns, the resident medical officer, was engaged in open-air treatment in Bournemouth as early as 1897. There are also a secretary, a matron, nurses, etc.

Access: Parkstone Station (L.S.W.R.), two miles; Bournemouth, three miles.

For *Bournemouth Sanatoria*, see pp. 153-155.

Gloucestershire

has combined with Somerset and Wilts to found and maintain a sanatorium in Wiltshire. There are also two full-price sanatoria.

The Cotswold Sanatorium

is near the top of the Cotswold Hills, not far from the sources of the Thames and Severn. The Cotswold hills, which are mainly of oolitic limestone, and rise in places to 275 metres above the sea-level, are partially covered with pine woods and beech interspersed with firs. Some fifteen metres below one of the highest parts, in a slight depression, sheltered by woods and rising ground to the north and east, the sanatorium has been placed. It has a southerly aspect, overlooking the Painswick valley and Minchinhampton common, while from the grounds behind a view is obtained of the

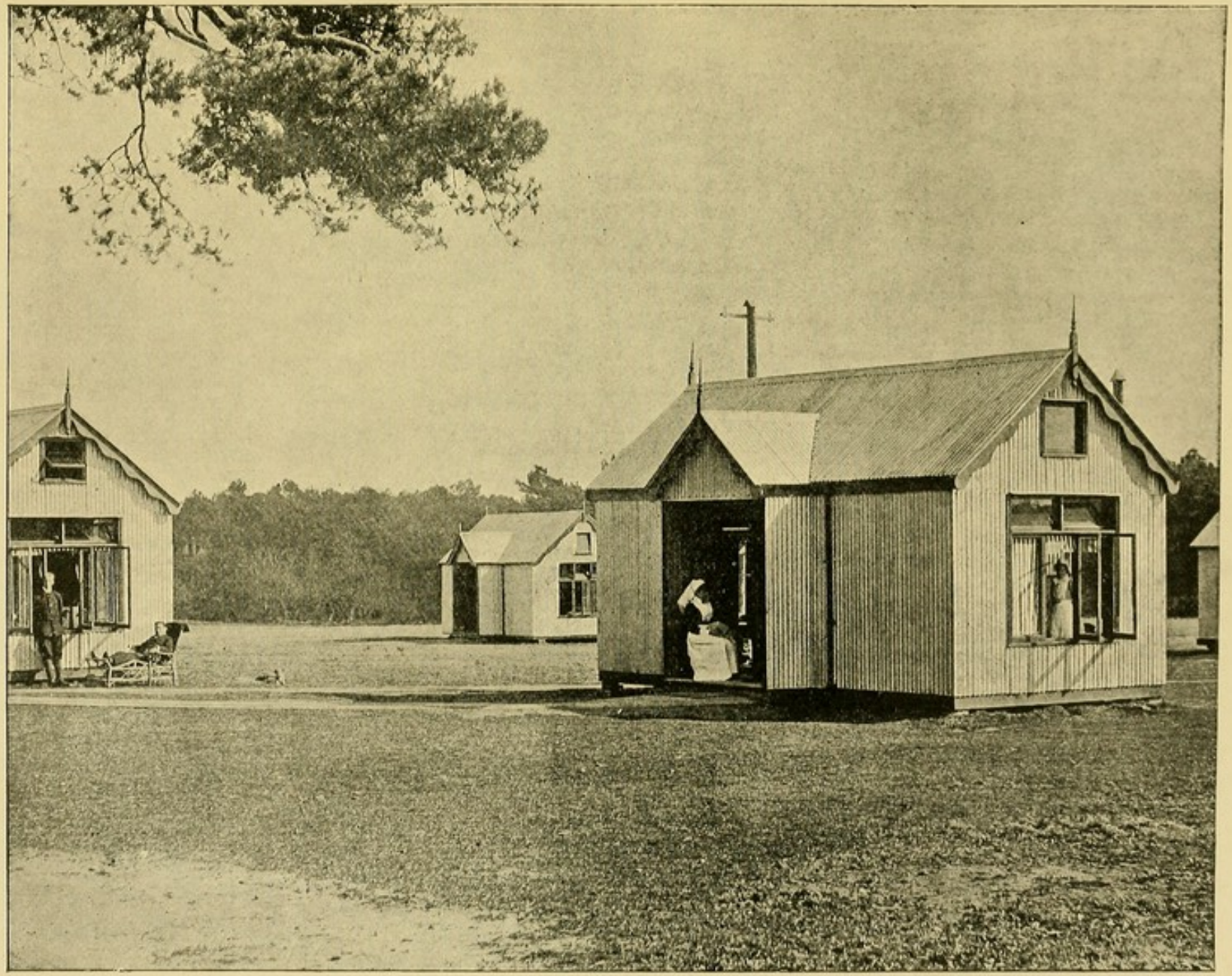


FIG. 39.—ALDERNEY MANOR SANATORIUM. [*Face page* 178.

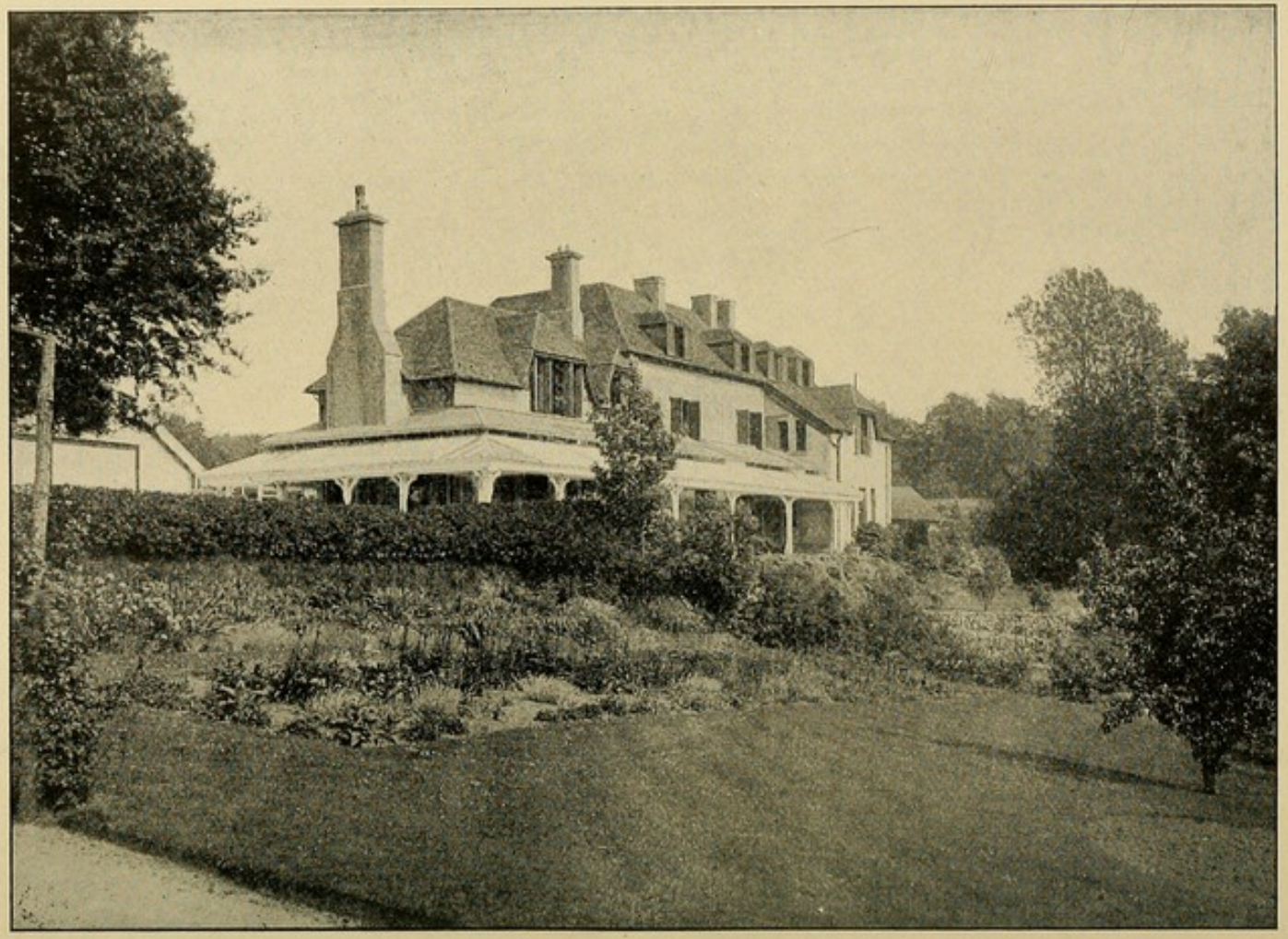


FIG. 40.—THE COTSWOLD SANATORIUM. [*Face page* 179.

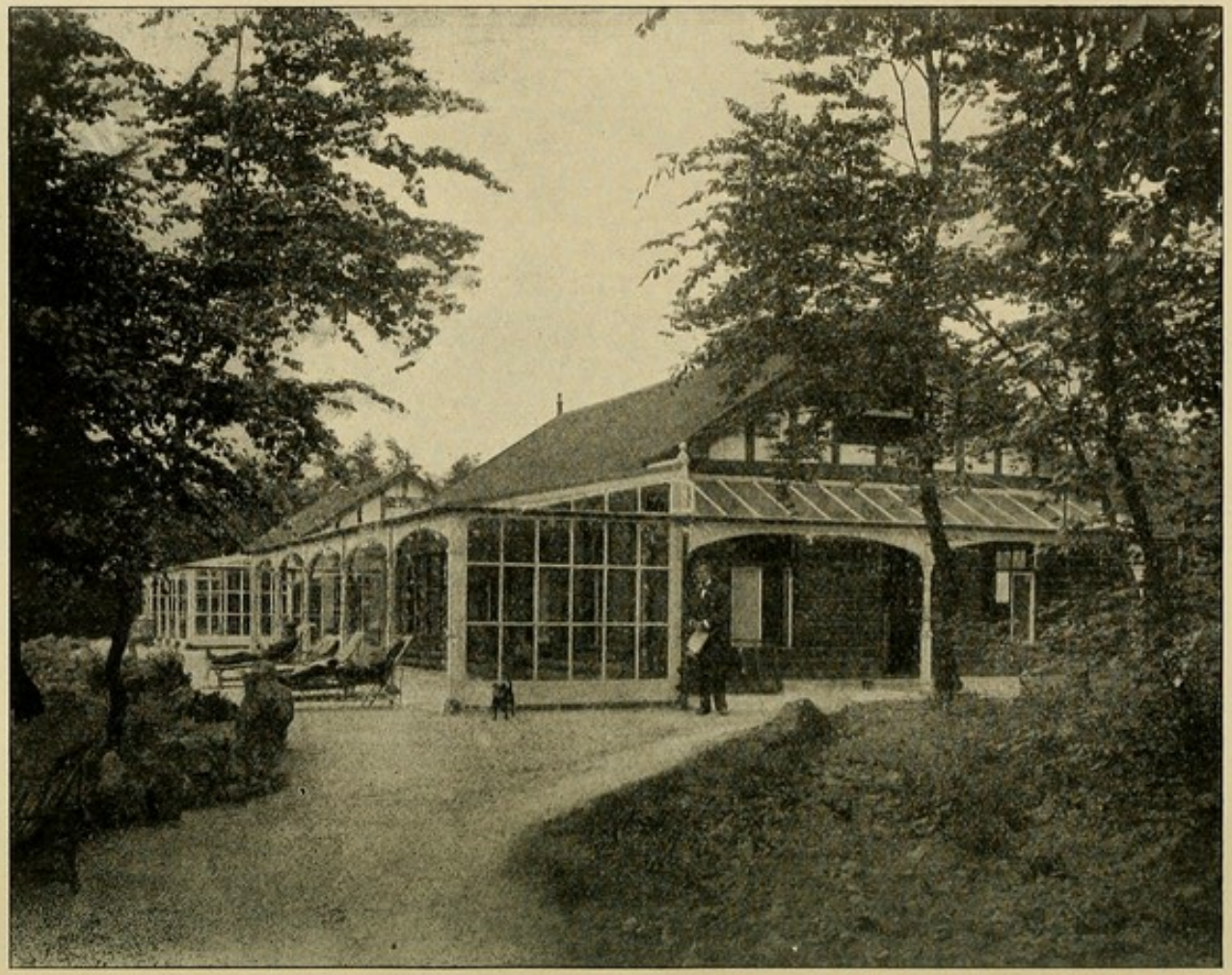


FIG. 41.—THE COTSWOLD SANATORIUM—THE WEST BLOCK. [*Face page* 179.

entire Severn valley, stretching from the Shropshire Hills in the north to the commencement of the Bristol Channel in the south-west. The Malvern hills are seen to the north-west, and the Welsh hills beyond. The soil is dry, the climate bracing, the rainfall moderately heavy. The grounds (sixty-seven acres) provide a large extent of sheltered walks in the garden and woods. These are mostly fairly level, while hilly walks abound outside the grounds.

The buildings consist of residential blocks for the patients, with others for the servants, and for the engine and pumping house. The main block (originally a private house) is a two-story stone building with attics (fig. 40), containing the dining-room, consulting and staff rooms, and some of the patients' rooms, and communicating behind with the kitchen department. A corridor runs along each floor, most of the rooms being on the south side. These vary in size, the smallest being 3·6 metres × 2·4 and 3 metres high, mostly nearly double this size. The windows are large French casements with fanlight above and louvre shutters outside. The ceilings and inside walls are covered with enamel-like gloss from petrifying liquid in various colours.

A wide verandah forty-six metres wide and the same in height, with special ventilating features, runs half round the house.

The other residential blocks (two in number) are one story, of wood on stone foundations, with a wooden kitchen block joining them edge-wise. This was part of the original sanatorium. The bedrooms are nearly all on the south-west side; behind them runs a corridor, and behind this in each block two other bedrooms, two bathrooms and a passage leading to the back verandah. In front of each wooden block runs a glass-covered verandah, and to the sides and back a narrower one of the same kind. The ends of these verandahs are protected by screens of wood and glass. Cubic area of bedroom 27·2 cubic metres; window space 124 sq. centimetres. In the grounds are numerous shelters, also sleeping chalets.

The heating, lighting, furnishing, and water supply, are the same in all the residential blocks. Radiators fed by low-pressure hot water supply every bedroom, corridor, bathroom and closet. Electric lighting is provided throughout, including the main garden walks. Electric bells are placed in every room, verandah, shelter, closet and bathroom, communicating with doctors and nurses or servants. Bathrooms are supplied with hot and cold water baths and

douches; also a needle bath. Many of the bedrooms also have hot and cold water laid on. Furniture is specially made, neither to catch nor to retain dust.

Sanitary arrangements: W.C.s in the main block, earth closets elsewhere. Water supply is of excellent quality pumped up from private springs by a water wheel and an electromotor. Dairy produce is from a model farm near Gloucester under sanitary supervision; cows are tuberculin-tested.

Beds: Fourteen in the mansion, nineteen in the bungalows; six in sleeping chalets, used chiefly in summer time.

Access: By rail to Cheltenham, Gloucester or Stroud, thence by carriage (seven miles). Applications to the secretary, 2 Ormond Place, Cheltenham. The Cotswold Sanatorium was founded by Dr. Pruen, of Cheltenham, who has recently retired from the medical management, but remains on the board of directors.

Telegrams: Cotswold Sanatorium, Birdlip.

Painswick Sanatorium,

on the Cotswold Hills, is well protected to the north and east by the hillside covered with beech and fir woods, and enjoys the same climatic and scenic advantages as the Cotswold Sanatorium (p. 178). The grounds (eight acres) have a number of graduated walks, a large lawn, revolving and other shelters.

The buildings comprise the physician's house, dining and recreation hall, kitchen and a number of sleeping chalets. They are mostly of corrugated iron lined with wood, with large windows. The dining and recreation hall is provided with eleven sliding windows, and doors on four sides: floor stained and polished, walls and roof stained and varnished. Curtains and carpets are not used. The kitchen is in a separate building connected with the dining-hall by a corridor. Lighting is by lamps and candles.

The sleeping chalets are raised on brick piers and built with double wooden walls open at the eaves and with felt between. They have windows on every side and ventilators at the gables. The outer walls are painted, the inner ones stained and varnished. Each has two divisions, and a verandah along the front into which beds can be wheeled, and is connected by electric bell with nurses' room. They have no heating apparatus: there is a tortoise stove in the dining-room.

Management: By the resident physician, whose wife acts as matron, assisted by a fully trained hospital nurse. Dr. McCall has a licence from the bishop of the diocese to hold divine service.

Access: Stroud (four miles); Gloucester (six miles).

Somerset.

There are two sanatoria in this county for full-price patients; another institution under trained nurses, and two homes primarily intended for the poor. Also a sanatorium in Wiltshire (p. 183) for three counties. For pauper cases, the *Bath Union* has two wards for ten male and ten female cases respectively, specially adapted, with rounded angles, linoleum floors, large windows, etc., communicating with two large airy courts planted with trees and shrubs; also a special dining-hall. Cost of alterations under £1,900; the loan to be repaid in ten years. The *Bristol Union* propose to build at Fishponds, in the city, a one-story pavilion of wood and iron, consisting of four wards 18 × 4·5 metres, also a dining-room, kitchen, nurses' room, bathroom and offices, at an estimated cost of £1,305.[1] The *Frome Union* has recently erected special wards. The *Yeovil Board* had a project for a sanatorium for all the divisions of Somerset.[2] The *Axbridge Union* has four dayrooms and four bedrooms for the two series. (Weatherley, *loc. cit.*)

NORDRACH-UPON-MENDIP,

Blagdon, Bristol, was the first sanatorium opened in England by a patient and assistant of Dr. Otto Walther (p. 310). It is situated on one of the highest points of the Mendip Hills, which are composed of limestone and sandstone, covered for the most part with moorland, with scattered copses of beech and fir. The road from Langford Station leads through a cleft in the hills, up a long steep ascent, to an elevated tableland between 243 and 262 metres above sea-level. The approach to the sanatorium is through a fine avenue of beech trees, which shelters the house on the south-east side, while the north is protected by a ridge of hills, and woodland forms a shield from the prevailing south-west winds. In front of the house is a large lawn and flower garden, beyond which lies a "dell," a beautiful and peaceful spot even in rough weather. *Grounds:* Sixty-five acres. The sanatorium (fig. 42) comprises a

[1] *Lancet*, 9th March, 1902. [2] *Ibid.*, 30th Nov., 1901.

stone building, forming the main block, and a colony of bungalows a short distance away (fig. 43); the whole is heated by hot-water pipes, and lighted by electricity. The water supply is from springs at the junction of the limestone and sandstone. There are seven bath-rooms with hot and cold water laid on. Meals are taken in a dining-hall attached to the house (fig. 44), modelled on that at Nordrach in the Black Forest. The treatment is strictly on "Nordrach" lines.

Access: Langford Station (G.W.R.), five miles, connecting at Yatton Junction (eleven miles), with the main G.W.R. line. Wells, ten miles.

Telegrams: Nordrach, Blagdon.

THE MENDIP HILLS SANATORIUM,

Hill Grove, over Wells, is on the south-eastern slope of the Mendip Hills, about two and three quarter miles from Wells, and has much the same soil and climate as Nordrach-upon-Mendip (p. 181). The grounds cover 160 acres, including fine woods and meadows. The building (not specially constructed) is a solidly built mansion of two stories, fitted with electric light and heated by hot-water pipes. It is well sheltered from cold quarters by woodlands. Sleeping chalets have also been erected in the grounds. The sanatorium belongs to a syndicate, and is managed by a resident secretary, with the help of a resident physician.

Access: Wells (G.W.R.); Binegar (Somerset and Dorset railway), three miles, connecting with Midland and L. and N. W. systems.

LUFTKUR SANATORIUM,

Portbury, is built upon an outlying spur of the Mendip Hills, near the Bristol Channel. It has beautiful grounds of over 400 acres, with lawns and woodland, sheltered walks, an open-air swimming bath, etc., commanding views of the Bristol Channel and the Welsh mountains. The house, which was not specially built for the purpose, is a two-story country gentleman's mansion, with large rooms, the bedrooms provided with large windows (some French casements, some double-hung sashes) and with cork carpet floor covering. A few are in double rows with a well-ventilated passage between. The entrance hall is a handsome room with intricate panelling and ornamentation on ceiling, mantelpiece and walls. There is a fine billiard-room with a frieze in relief next the ceiling

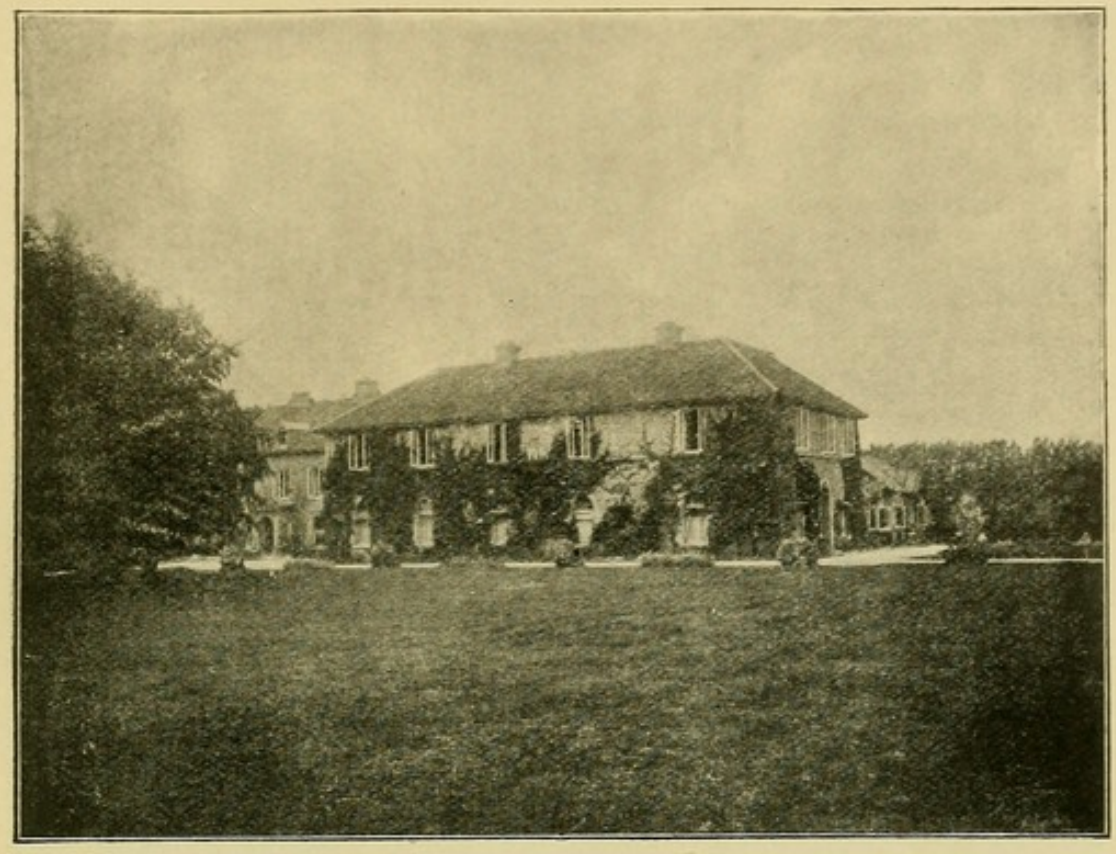


FIG. 42.—NORDRACH-UPON-MENDIP. [*See page* 181.



FIG. 43.—NORDRACH-UPON-MENDIP—A BUNGALOW. [*Face page* 182.



FIG. 44.—NORDRACH-UPON-MENDIP—DINING HALL. [*Face page* 182.

and the usual top-lighting. The general rooms have polished floors. All the walls can be washed. Excepting in the bedrooms, the heating is by hot-water pipes. The lighting is by gas. The sanitary arrangements are said to be perfect; there is a complete installation of shower, plunge and spray baths, and special arrangements have been made for the treatment of laryngeal complications. For open-air treatment there are a south verandah with a glass roof, and two comfortable pavilions. A home farm and model dairy are attached to the place.

Staff: The resident medical officer has been Assistant Resident Medical Officer at Falkenstein Sanatorium in Germany, and was himself cured by open-air treatment. A consulting laryngologist comes out from Bristol.

Access: Portbury (one and a half miles), or Flax Bourton (three and a half miles), both on the G.W.R.

Telegrams: Luftkur, Portbury.

St. Michael's Home,

Axbridge, Somerset, was built and endowed by the late Mrs. William Gibbs, of Tyntesfield, Bristol, in 1878, for consumptives who are members of the Church of England, and is under the care of the Sisters of St. Peter's Community, St. Peter's Home, Kilburn. It is not intended for mere convalescents, nor for chronic incurables, but for those who need medical treatment and care.

Charges: none beyond cost of sputum flask and of the journey, and a guarantee of funeral expenses in case of death.

Apply to the Sister in charge.

The Engel Home,

at Cheddar, has been opened for those waiting admission to the St. Michael's Home. *Charges:* 10s. to 12s. per week.

Private rooms for ladies at 20s. to 30s. per week.

Wiltshire.

The Royal Victoria Memorial Sanatorium

for the counties of Gloucester, Somerset and Wilts, at Winsley, near Limpley Stoke, on the borders of Wilts and Somerset, is placed in an old stone quarry, from which the building materials are

largely drawn, and enjoys an extensive view over the river Avon, the Avon and Kennet Canal, and the Wiltshire Downs, including the White Horse at Westbury. The grounds cover fifty acres. There is good protection to the north from the quarry bank, and from woodland.

The buildings are of the Hohenhonnef type (p. 297), with wings diverging in front at an obtuse angle, behind at a right angle, a central northern projection, and a separate building for kitchen department with dining-room over, approached by a covered way and bridge. The bedrooms are all single-bedded, and lie south of the corridor excepting in the wings, where they form a double row.

There are three stories; a deep verandah runs in front of the ground-floor which runs round the wings; the upper floors have balconies. The northern wings contain lavatories, bathrooms and W.C.s. In the centre of the ground floor are the entrance hall, office, main staircase, reception room, library, a large cloakroom and disinfecting room. There are verandahs on the north side between the projections. One wing contains the medical officer's quarters, with laboratory and dispensary; the other the matron's quarters, linen room and store rooms. There are staircases near the wings; a passenger lift has been provided. In the attics are rooms for the female staff. The building is of rough Bath stone with red-tiled roof. All angles are rounded and ledges avoided. The heating is by hot-water pipes. Cost about £23,000, or just over 6d. per cubic foot, of which the site and levelling amounted to £3,176. Annual cost estimated at £4,000. The Bristol Corporation gave £1,000 towards cost of erection, and maintain twenty free beds at £65 each. The Bath Corporation gave £500, and supports two free beds; Swindon supports two free beds, Gloucester one. Two rural district councils have borrowed £250 repayable in ten years, and each maintain a bed.[1] All but five beds are allotted to public bodies or private subscribers.

Dr. L. Weatherley has been largely instrumental in founding the sanatorium; which is intended for poor people of either sex who are not paupers.

[1] *Lancet*, 21st May, 1904; 5th Dec., 1903; 4th April, 1903; 4th March, 1903; 19th Oct., 1901. *Brit. Med. Journ.*, 28th May, 1904.

CHAPTER XXXII.

WALES

Possesses two private sanatoria for consumptives. Others for the poor are projected for Swansea, Cardiff, South Wales, and West Wales respectively. At *Swansea*, it is proposed to erect wards for open-air treatment in connection with the convalescent home now being built for the Swansea Hospital.[1] At *Cardiff* the guardians have been urged to alter a ward on the first floor for male consumptives; or in the alternative to start a sanatorium at Pentyrch.[2] For *South Wales* (Glamorgan and Monmouthshire) a sanatorium of 100 beds is projected. In the first instance there are to be twenty beds, at an estimated cost of £5,000, the cost of maintenance being estimated at about £1,600.[3] The *West Wales* branch of the National Association (Pembroke, Caermarthen and Cardigan) proposes to build a sanatorium for twenty poor (not paupers) and eight paying patients. The buildings are to be Speirs & Co.'s composite wood and iron structures. The estimated cost is £7,000, the cost of maintenance £1,500 per annum. Three sites were offered: the one on the Highmead estate offered by Col. Davies Evans may possibly be decided upon.[4] The other two are at Fynone (Mr. Colby) and on the Gwbert estate (Mr. C. Morgan Richardson) respectively.[5]

The *Atcham Union Infirmary* has the top ward set apart for twenty tuberculous men. (Weatherley, *loc. cit.*)

There is a *Home for Convalescents* after sanatorium treatment at Haner-y-Ffordd, at Queen's Park, Colwyn Bay, in the higher part of the place, immediately below the Pwllycrochan woods. *Grounds:* Quarter of an acre. *Proprietress:* Miss Matthews, formerly matron

[1] *British Medical Journal*, 24th Jan., 1903. [2] *Ibid.*, 2nd July, 1904.
[3] *Ibid.*, 18th Oct., 1902.
[4] *Tuberculosis* (London), April, 1904. *British Medical Journal*, 2nd Jan., 1904.
[5] A site near Llanbyther has finally been selected. *Lancet*, 25th Dec., 1904.

of Pendyffryn Hall. *Terms:* Three guineas.[1] *Another* is called Tan-y-Geulan, Llanfairfechan, kept by Mr. and Mrs. Kyme Wright, the former of whom was a patient at Nordrach. *Altitude:* 122 metres. *Terms:* Two and a half guineas.

Name and County.	Locality.	Opened.	Beds.	Altitude in Metres.	Fees.	
CAERNARVON—						
Nordrach in Wales	Penmaenmawr	1900	23	—	5 gns.	Dr. G. Morton Wilson
DENBIGH—						
Vale of Clwyd San.	Ruthin	1901	19	137	5 gns.	Dr. Crace-Calvert; Dr. Cecil Fish

NORDRACH IN WALES

Pendyffryn Hall, Capelulo, near Penmaenmawr, is situated between that place and Conway, in a picturesque district well wooded with pine trees and deciduous trees of various kinds (fig. 45).

The house (not specially built) is a stone mansion standing in grounds of 100 acres, well sheltered to east and north-east by mountains, which also afford suitable graduated walks, rising to 300 metres above sea-level. The soil is of gravel and sand over slate rock, etc. The climate is mild in winter and cool in summer; rainfall thirty-one inches.

The physician was himself a patient at Nordrach, and treatment is strictly on similar lines. The matron is a trained nurse.

Access: Penmaenmawr or Conway (L.N.W.R.)

Telegraphic address: Pendyffryn, Penmaenmawr.

THE VALE OF CLWYD SANATORIUM,

Llanbedr Hall, Ruthin, is on the western slopes of the Clwydian range, which rises behind it to a height of nearly 550 metres above sea-level. The view from the house and grounds extends over the Vale of Clwyd, including on a clear day Rhyl on the sea-coast to the north, and Snowdon to the west. The grounds (thirty acres) are surrounded by extensive park lands with woods of larch and pine, and are well protected to north and east. Higher up on the mountain side are tracts of heather and bracken. The soil is of

[1] *Medical Press*, 23rd Sept., 1903.

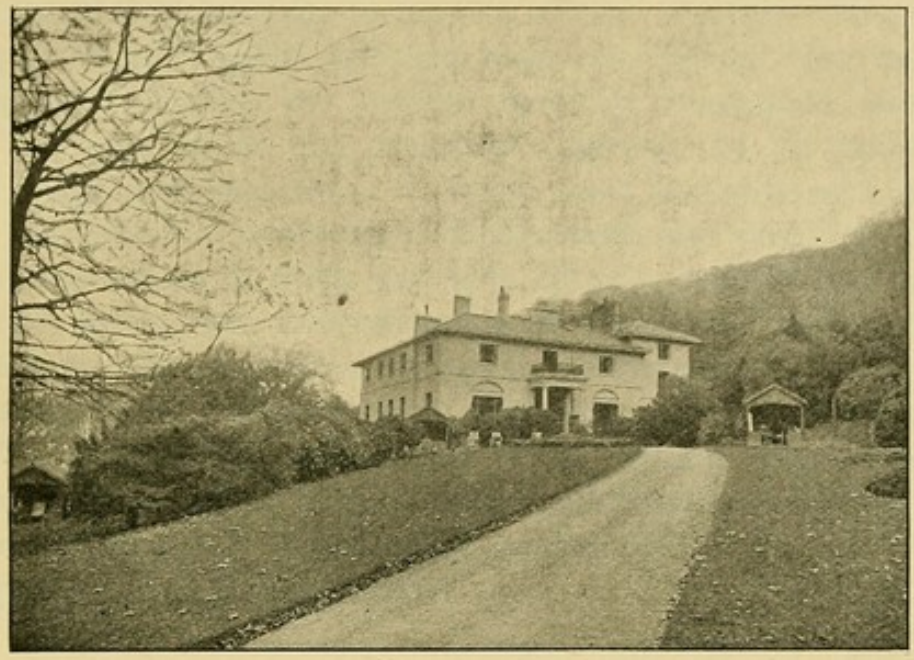


Fig. 45.—Pendyffryn Hall.

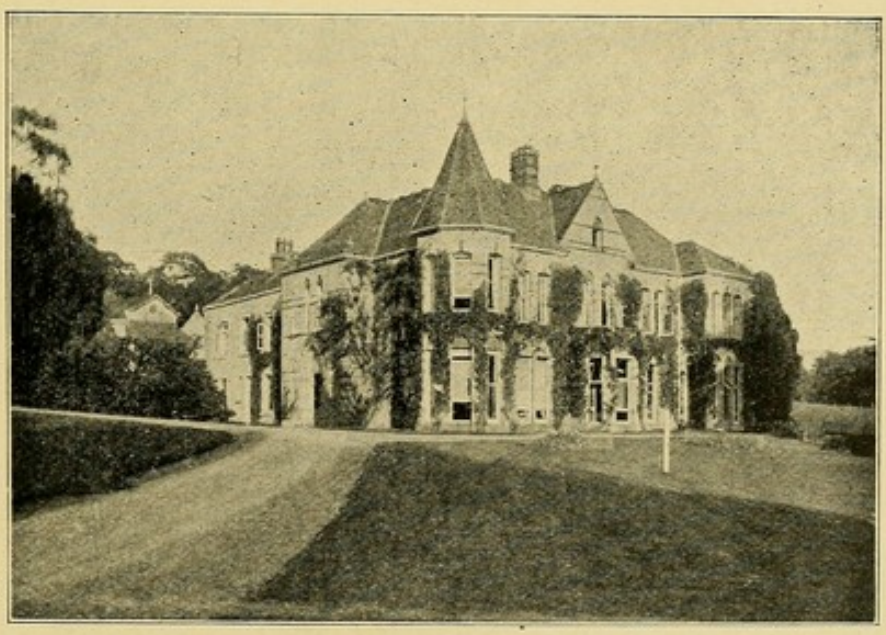


Fig. 46.—The Vale of Clwyd Sanatorium,
from the North-West. [*Face page* 186.

red sandstone; the climate cool in summer, mild in winter; rainfall about twenty-five inches (fig. 46).

The house (not specially built) is a stylish mansion with two stories and attics, to which additions have been made. The walls and floors are washable; the furniture specially constructed; heating by hot-water pipes and radiators; lighting by oil lamps; windows large and numerous; in many cases fanlights over the doors. The aspect of bedrooms is chiefly south and west. In the annexe (seven rooms in single row with corridor behind) they face west. The dining room and offices are on the ground floor of the main building. There are four shelters in the grounds.

Treatment is on Nordrach lines: both physicians were patients there. The matron is a fully qualified nurse. Special stress is laid upon graduated up-hill walking, for which the place is well suited.

Access: Ruthin (L.N.W.R.), two and a half miles.

Telegrams: Sanatorium, Ruthin.

CHAPTER XXXIII.

SCOTCH SANATORIA.

Name and County.	Locality.	Opened.	Beds.	Elevation in Metres.	Fees per Week.	
NORTHERN SCOTLAND—						
Inverness—						
Grampian San.	Kingussie	1901	20	260	4 guineas	Dr. de Watteville
CENTRAL SCOTLAND—						
Forfarshire—						
Sidlaw San.	Auchterhouse	1903	40	244	2 guineas	Dr. R. C. Macfie
Kincardineshire—						
Banchory San.	Banchory	1900	52	—	5 guineas	Dr. D. Lawson, Dr. J. S. Cooper, Dr. I. S. Stewart, etc.
Kinross-shire—						
Ochil Hills San.	Milnathort	1902	60	244	4 to 6 gns.	Dr. Thos. Neill, Dr. E. Watt.
Perthshire—						
Hillside Home Con. San.	Barnhill	1901	20	91	—	Dr. Stirling
SOUTHERN SCOTLAND—						
Ayrshire—	Ashmark	—	12	244	—	Being built
Edinburgh—						
Royal Victoria Hospital for Con.	Craigleith	1894	102 [1]	46	Free; 8 beds at 21s.	Dr. R. W. Philip (vis.) and others
Woodburn San.	Morningside	1899	24	—	5 guineas	Mrs. Mears, L.R.C.P., Dr. Goodchild
Lanarkshire—						
Bellefield San.	near Lanark	1904	30	*ca.* 183	—	—
Peeblesshire—						
Caverhill San.	near Peebles	1904	14	247	2½ gns.	Dr. Caverhill (vis.)
Renfrewshire—						
Bridge of Weir San.	—	1898	80	79	£1, or free	—
Paisley San.	—	—	—	—	—	—

Northern Scotland

comprising the part north of the Caledonian Canal.

[1] Forty-seven in shelters.

Aberdeenshire.

A sanatorium is projected for the city and county of Aberdeen. It is to have forty beds, at an estimated cost of £7,000, and a yearly charge of £3,400. Negotiations were in progress recently for ten acres of land on Deeside.[1] A proposition was also made some time ago to erect a specially constructed pavilion for consumptives at the Cottage Homes for Convalescents at New Hills near Aberdeen, with separate kitchen, dining-room, and facilities for open-air treatment.[2]

Inverness-shire.

THE GRAMPIAN SANATORIUM,

three miles above Kingussie, is in the Upper Speyside district, in the valley of the Gynack, facing the main Grampian range to the south-east, at a distance of seven miles, and having the Monaliadh hills behind. The soil is glacial drift overlying mica schist. Ten acres of ground have been acquired; the building (fig. 47) occupies a level clearing sheltered from west, north-west, and north-east by rocky slopes, and surrounded by woods and moorland. The trees are chiefly Scotch pine, with some larch and birch. The medical director has treated patients in this district by open-air methods since May, 1899.[3]

The building looks south-south-east, and is of two stories, built in stone. All the patients' bedrooms are south of the corridors. Most of these rooms are 4 × 3·3 × 3·3 metres. The end rooms on the ground floor, which are 7·3 × 6 metres, are used as dining and drawing-rooms. Above these are a pair of narrow long rooms, one of each pair facing to the sides of the house. The corridors are seven feet wide. Behind on the ground floor is at one end the kitchen department, at the other the doctor's quarters, gentlemen's bathroom and a storeroom; centrally the entrance, two staircases, lavatories, bathrooms, and W.C.s. On the upper floor, servants' rooms are over the kitchen, the rooms for matron and nurses over the doctor's rooms. Two gaps are left between the rooms on each floor for ventilation; but most of the space north of the corridors is occupied. The patients' bedrooms have floors of stained and

[1] *Lancet*, 12th Dec., 1903. [2] *Ibid.*, 11th Nov., 1899; 15th and 22nd June, 1901.
[3] *Ibid.*, 12th Dec., 1903.

polished wood, walls painted with duresco, rounded angles and specially designed furniture. The windows are mostly sash windows, with a rounded revolving fanlight above, and similar ones over the doors. In the centre are a few with covered verandah or balcony, and these have French casements. The rooms and hall are heated by open fires, the fireplaces in bedrooms occupying part of the south side. Lighting by electricity. Good and abundant water supply. Sewage goes into the town drains. The milk is from tuberculin-tested cows.

Staff: A medical director and assistant; matron (Mrs. de Watteville), two nurses, etc.

Access: Kingussie Station (three quarters of a mile), on main Highland line.

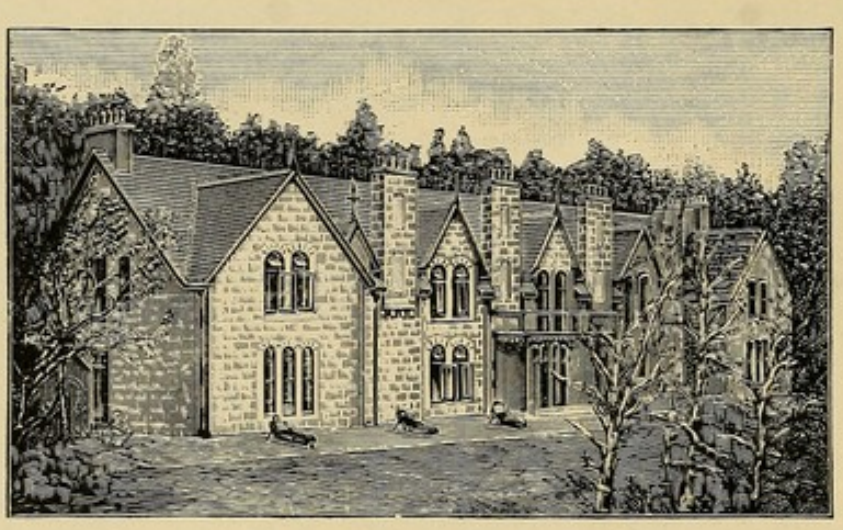


FIG. 47.—THE GRAMPIAN SANATORIUM.

[*See page* 189.

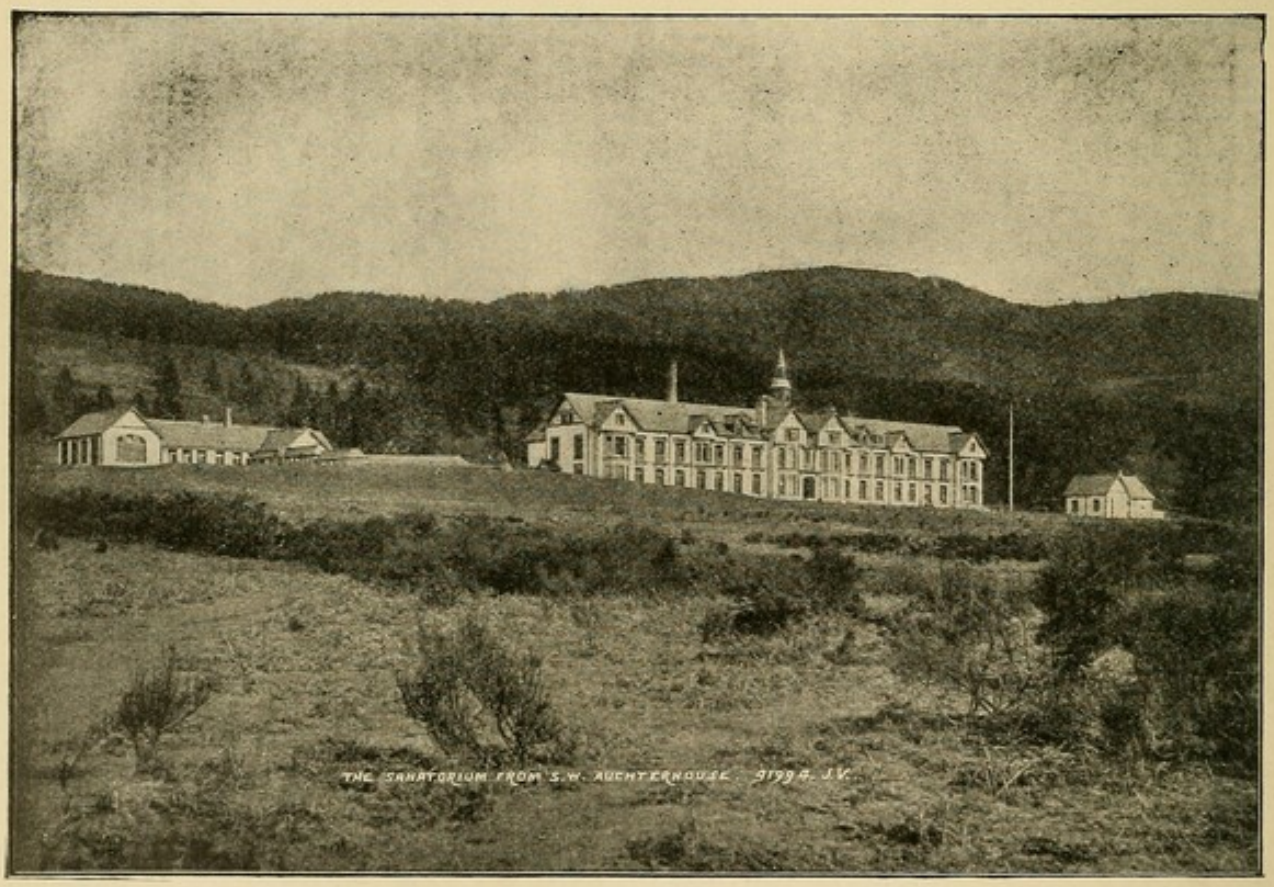


FIG. 48.—THE SIDLAW SANATORIUM.

[*Face page* 191.

CHAPTER XXXIV.

CENTRAL SCOTLAND

Comprising the part between the Caledonian Canal and the Forth and Clyde Canal. There are in this district three sanatoria for full-price patients, and one for the poor.

Forfarshire.

THE SIDLAW SANATORIUM,

at Auchterhouse, on the Sidlaw hills, is well protected to the east and north by a circle of pine and heather-clad hills, and has a fine view over the river Tay with the Fifeshire and Midlothian hills, about forty miles in extent. To the west is Schiehallion and the whole range of the Perthshire mountains. The grounds, of twenty-one acres, which were given by the late Earl of Airlie, have revolving and other shelters, one of which is sixty metres above the sanatorium. The sanatorium (fig. 48) was erected at the expense of A. H. Moncur, Esq., ex-Provost of Dundee, and partially endowed. It is a two-story building of stone, with attics; the bedrooms all on the south side, each with its own radiator (low-pressure steam), electric lighting and special furniture. The kitchen, dining-room, larders, dairy, servants' hall, etc., are in a separate block connected by a covered way. The laundry, engine house, etc., form another building behind the main one. There are also engineer's house and stables. Out of the forty beds, twenty-eight are in single-bedded rooms, the rest in threes. The total cost was £25,000.

Staff: Medical superintendent, matron (a trained nurse), nurse and two probationers, nine servants, engineer and gardener; also a consulting staff of eminent physicians and surgeons, and an admission committee.

Access: Auchterhouse Station (one and a half miles), on the Dundee and Newtyle Railways.

Terms: One guinea to local applicants, two guineas to those from a distance. Applications to the hon. secretary, Town House, Dundee.

Kincardineshire.

THE BANCHORY SANATORIUM (NORDRACH-ON-DEE)

was the first sanatorium in Scotland which was specially planned and built on a carefully selected site for open-air treatment, and lies west of Banchory, in the same district as Balmoral Castle. This district enjoys a mild winter climate, a relatively low rainfall for Scotland (twenty-nine in.) a large proportion of sunshine, and pure air of a dry bracing character, rich in ozone. South-west winds prevail there during nearly nine months of the year. The sanatorium is built in the middle of a pine forest on a southern slope, and is protected to the north by a range of hills rising in one part to 471 metres (Hill of Fare), to the south by the Goch Hill (337 metres) while to the far west lie the peaks of the Grampians. The grounds are laid out with a number of walks of known gradients, indicated by colour bands on the trees; they are furnished with shelters and command beautiful views. The soil is a porous red gravel: grounds twenty-five acres.

The building (figs. 49-51) is on three floors, with a central higher tower, and is only one room and corridor deep. The ground floor contains a large drawing-room, another smaller room used as a library and waiting-room, dental-room, chart-room and dispensary, consulting room and bedrooms. In front of it is a glass-covered verandah. The building has recently been enlarged. Occupying over two-thirds of the outer wall space are French windows with fanlights above and louvre shutters outside. Similar windows are found along the corridors and similar fanlights over the bedroom doors. Each bedroom has douche bath and two fitted-in basins, served with hot and cold water, steam pipes, electric bells and lights, rounded angles, walls painted in colours, floors of polished wood. As a protection against damp and fire, a four-inch thickness of silica wool has been placed in every wall. In projecting pavilions, north of the corridors are W.C.s, lavatories and bathrooms: twelve plunge, shower and sitz baths are provided there. The water supply is pure and abundant. On the middle corridor is a throat room. Two lifts are provided.

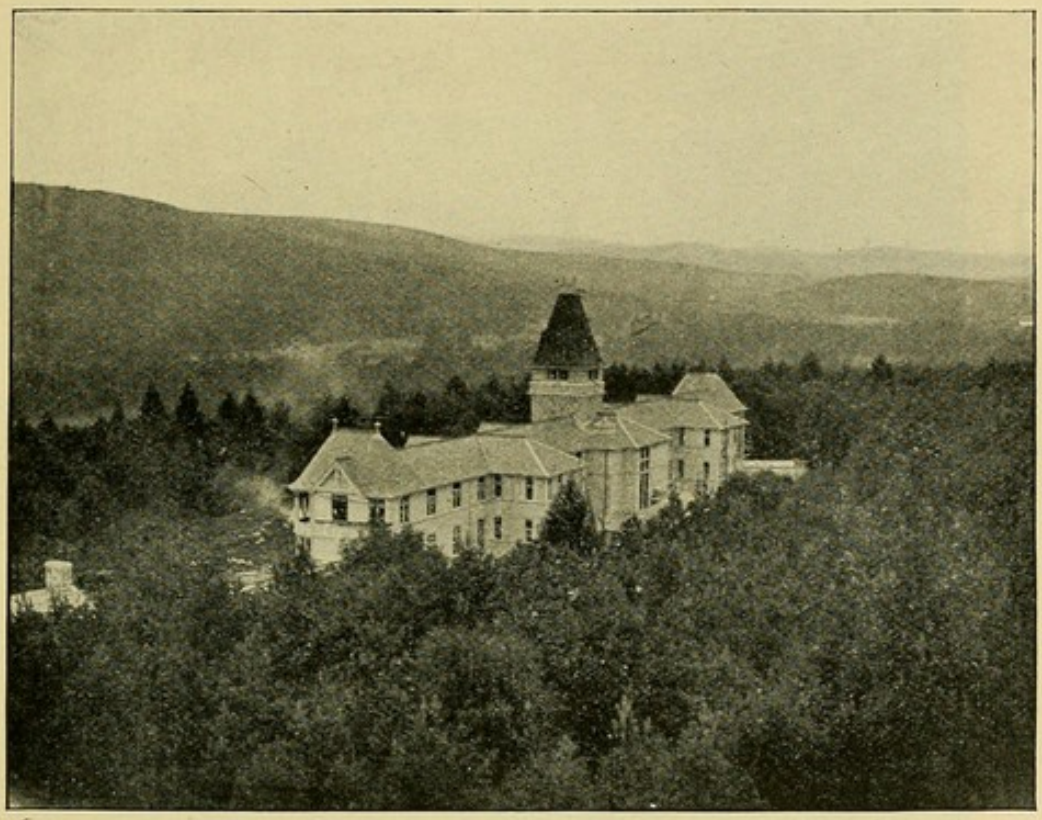


FIG. 49.—THE BANCHORY SANATORIUM. [*Face page* 192.

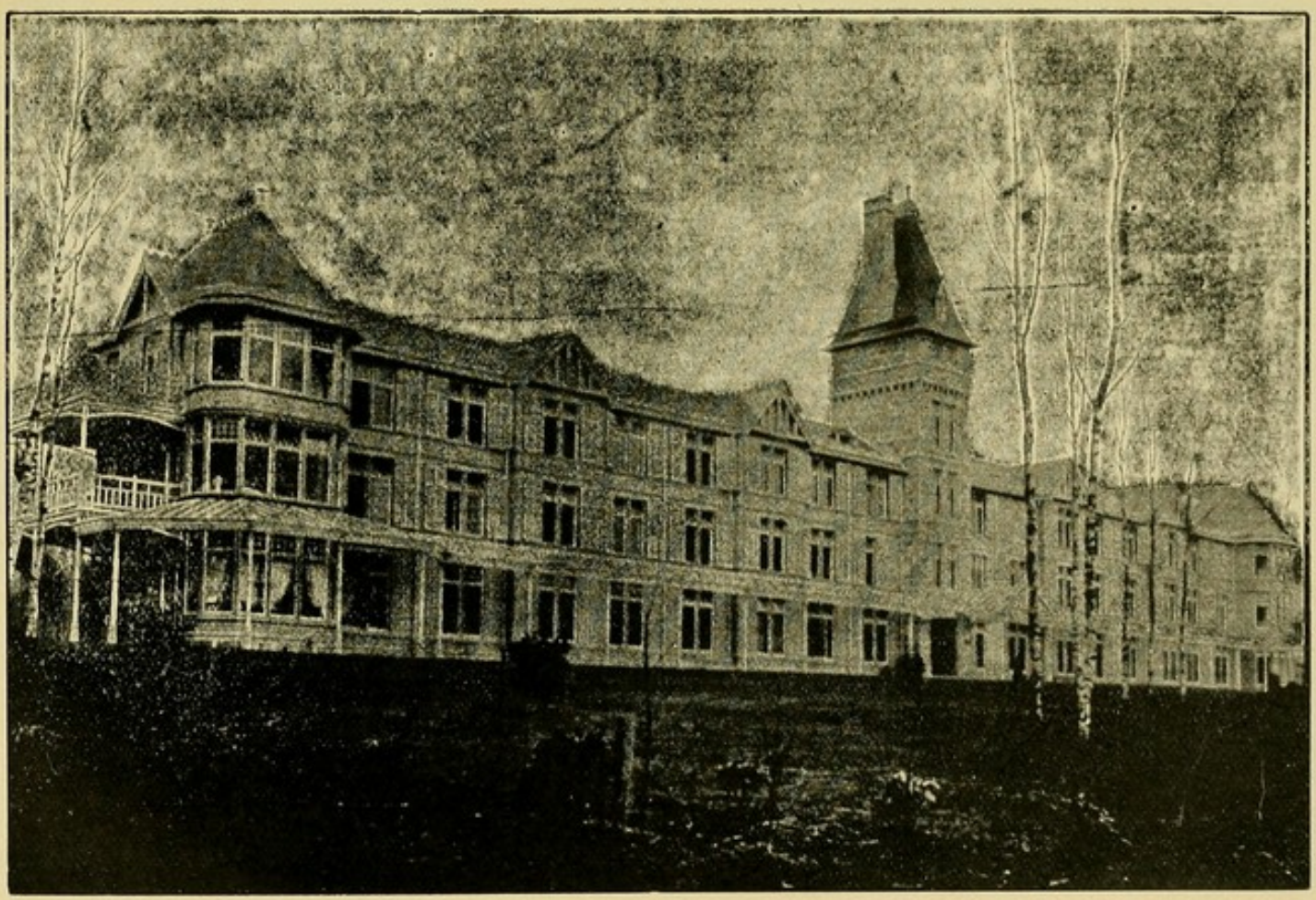


FIG. 50.—THE BANCHORY SANATORIUM. [*Face page* 192.



FIG. 51.—NEAR BANCHORY SANATORIUM. [*Face page* 192.

The dining-room, together with kitchen department and servants' bedrooms form a separate block fifteen metres to the eastward, connected with the main building by a continuation of the corridor which has in front of it an open glass verandah. The dining-room 17 × 7.3 metres has on three sides large windows opening outwards.

The engine house with boiler and cell room is over thirty metres from the main building, shut off by densely wooded ground. The machinery is duplicated in case of accidents. West of this block is the residency, with quarters for the medical officers, matron and nurses. There is a fully equipped laboratory under a clinical pathologist at a distance from the main building; the work done therein has earned recognition by the Royal Society of London and the British Medical Association. There is a completely equipped electrical department within the main building, for X-ray, high-frequency current and ultra-violet light treatment, etc.

Cost, including land, nearly £700 per bed.

Staff: A medical superintendent with two assistants and an electro-therapeutist, matron, and staff of fully trained nurses; also a consulting laryngologist from Aberdeen University, and a surgeon dentist.

Access: Banchory Station (two miles), *viâ* Aberdeen.

Telegrams: Sanatorium, Banchory, Scotland.

Kinross-shire.

THE OCHIL HILLS SANATORIUM

is on an elevated plateau on the southern slopes of the Ochil hills, overlooking Loch Leven. It is protected to the north, north-east, and north-west by wooded hills, some of which rise eighty metres above the building. The grounds of 460 acres include moorland, pine woods, an ornamental lake and boating pond, and command splendid views of loch and mountain scenery.

The building is of three stories with basement at one end. The patients' bedrooms occupy (with a few exceptions) the south side of the three corridors, behind which are to be found in three pavilions the nurses' rooms, bathrooms and lavatories, electrical room, consulting-rooms, and on the ground floor the music-room, all beautifully and suitably finished.

The kitchen department occupies a partially separated block

behind the centre of the ground floor, to which is attached the laundry, boiler house, and electric plant, with a wing for the medical officer's quarters. Over the boiler house and laundry is the dining-room; and over this are staff bedrooms. The dining-room is reached from the first floor corridor. The heating is partly by open fires, mainly by low-pressure steam pipes. Lighting is throughout by electricity. There is a complete electrical installation for treatment; spray, shower, plunge and sitz baths on every corridor, and a lift for patients. There are three common rooms in addition to the dining-room; also a photographic dark room in the basement, which also contains a laboratory, dispensary, inhalation room, boot room, heating chamber, and a few staff rooms.

Cost: £35,000.

Staff: Two resident physicians, three eminent visiting specialists, matron and trained nurses. Secretary, 141 West George St., Glasgow.

Access: Kinross Junction (four miles), on the main N.B. Railway.

Perthshire.

THE HILLSIDE HOME CONSUMPTIVE HOSPITAL

was built by Sir Robert Pullar, and is managed by the *Society for the Treatment and Relief of Incurable and Chronic Ailments and Care of Convalescents in Perth and Perthshire.* It stands on the western slope of Kinnoul Hill, has a southerly aspect, and is sheltered to north and east.

Cost: £8,000; weekly cost of maintenance, 32s. 6d.[1]

ELLERSLIE,

Comrie Road, Crieff, is a private sanatorium with at present eight beds, under the care of Dr. Campbell, formerly at the Bridge of Weir and the Ochil Hills Sanatorium. Surrounded by well-wooded country, and protected to north and west by the Grampians, it stands 150 to 180 metres above sea-level. The district has enjoyed a reputation for some time past as a health resort. *Terms:* three guineas to £3 10s.

[1] *The Stethoscope*, April, 1903. *British Medical Journal*, 10th Nov., 1900; 17th August, 1901.

CHAPTER XXXV.

Southern Scotland,

Comprising the part south of the Forth and Clyde Canal.

Ayrshire.

A sanatorium is to be built for the poor of this county at Ashmark, Glen Afton, on the north side of Carcow Glen in a beautiful and well-sheltered spot on porous limestone soil.

It will consist of a T-shaped group of buildings, the cross of which will be for patients' quarters, and will end in two separate cottages, one for five women, the other for seven men. Each will have a sanitary pavilion to the north, and good-sized single-bedded rooms on the south side of a corridor. At the ends will be double *liegehallen* looking north and south. The upright part of the T will run north, and consist of administration with a dayroom and dining-hall attached. Other cottages will be added as occasion arises. The place is to be lit by electricity.

Access: New Cumnock Station (G. and S.W.R.).

Lanfine Cottage Home for Consumptives.

This institution, intended for incurable consumptives, was opened in the year 1904 at Broomhill in connection with the *Association for the Relief of Incurables* in Glasgow and the west of Scotland. It consists of a hospital section, one story high, and a two-story administrative block, between which is a corridor. The hospital section consists of two main wards each with eight beds, and two single-bedded rooms.

Applications to the secretary, 101 St. Vincent Street, Glasgow.

Edinburgh.

The Royal Victoria Hospital for Consumption,

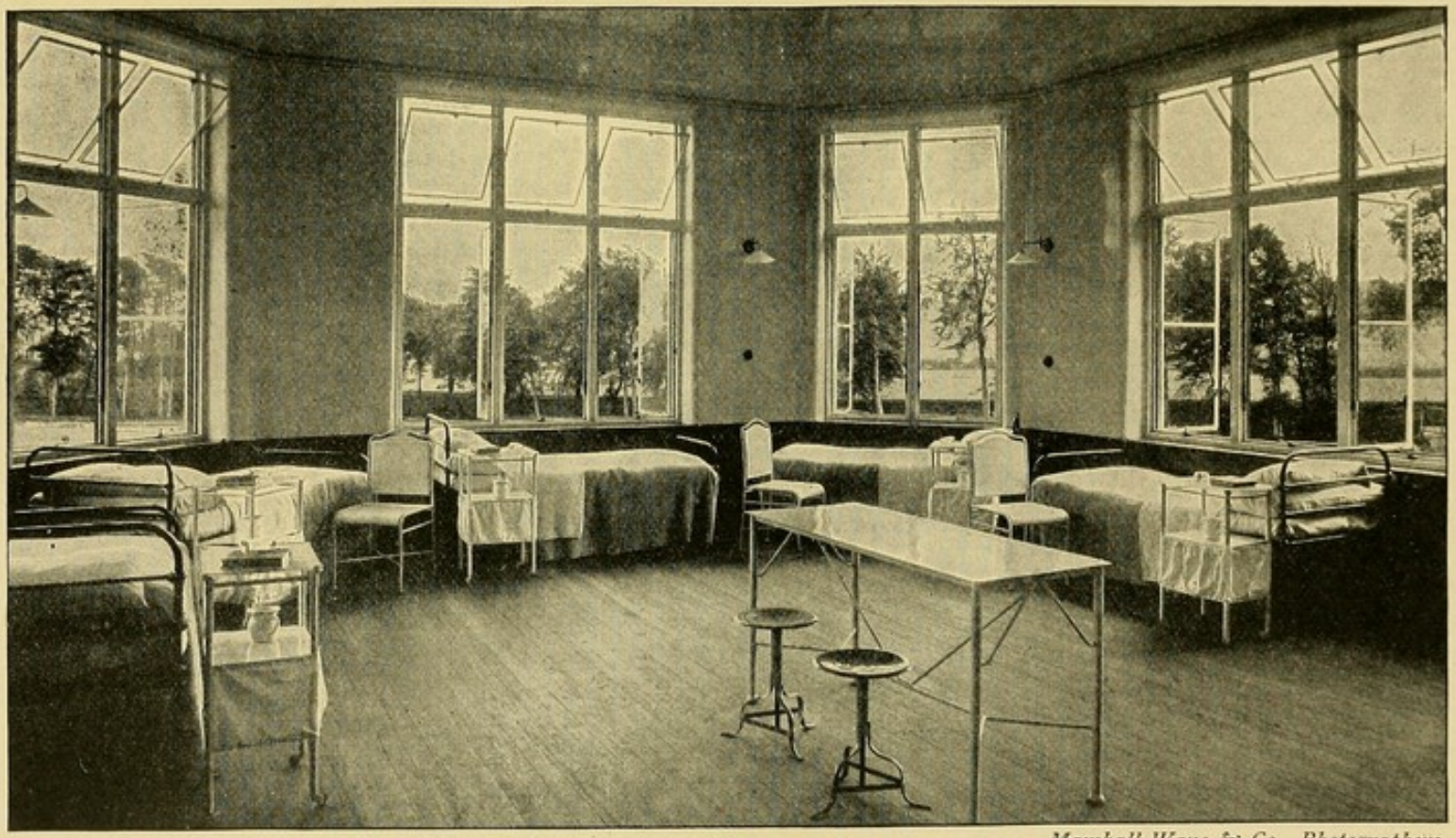
Craigleith, Edinburgh, was for a time the only place in Scotland where poor consumptives could gratuitously obtain open-air treat-

ment. It was originally a private house, but has been much altered and added to. The grounds (seventeen acres) are well-wooded round the margins, but consist mainly of lawns and flower-beds sloping south. The soil is sand overlying rock; and although quite close to Edinburgh city, the place is surrounded on all sides by open fields. The original building has ordinary guillotine windows, and wards with about 28·3 cubic metres air space or more Windows are kept open night and day, the beds being if necessary protected with waterproof sheeting. Heating is by open fires; the floors are of plain polished wood, the walls distempered or painted. The annexes, three of which were opened in 1903, consist of two pavilions (fig. 52) with eight beds each (four in a ward) and two with twelve beds each (six in a ward). They are **Y**-shaped, with a nurses' room and sanitary pavilion behind and two diverging wards in front. They are of one story, with the floor raised about 1·2 metres above the ground, built of brick, cemented inside with rounded angles, large steel casement windows with fanlights over forming most of the outer surface. The floors are of wood on cement slabs. A nurses' kitchen is placed in the wedge-shaped space between the diverging wards. There is one bathroom to every four patients, and a common lavatory and a cloak-room, all tile-lined. The heating is by open fires, the lighting by electricity, which is also laid on to the shelters in the grounds. The engine house with tall chimney is placed on the north side behind tall trees. Simple furniture of suitable kind is provided; glass-covered pedestals with open metal shelves, narrow reclining couches with horse-hair mattresses covered with waterproof, being used outside. A number of small sleeping shelters have been erected in the grounds to temporarily increase the accommodation. Each of these has two beds; the roof is of corrugated iron, the front is open, the sides glazed. In these patients are quite comfortable, even in winter. Five meals a day are provided, two consisting of soup or warm milk. This institution was founded by Dr. R. W. Philip, and owes its further extension largely to him.

Leith Poorhouses.

Six men and six women are being treated at this infirmary by open-air methods.[1]

[1] *British Medical Journal*, 25th June, 1904.



Marshall Wane & Co., Photographers.

INTERIOR OF NEW PAVILION, SHOWING ARRANGEMENT OF BEDS IN RELATION TO OPEN WINDOWS.

FIG. 52.—THE ROYAL VICTORIA HOSPITAL FOR CONSUMPTION. [*Face page* 196.

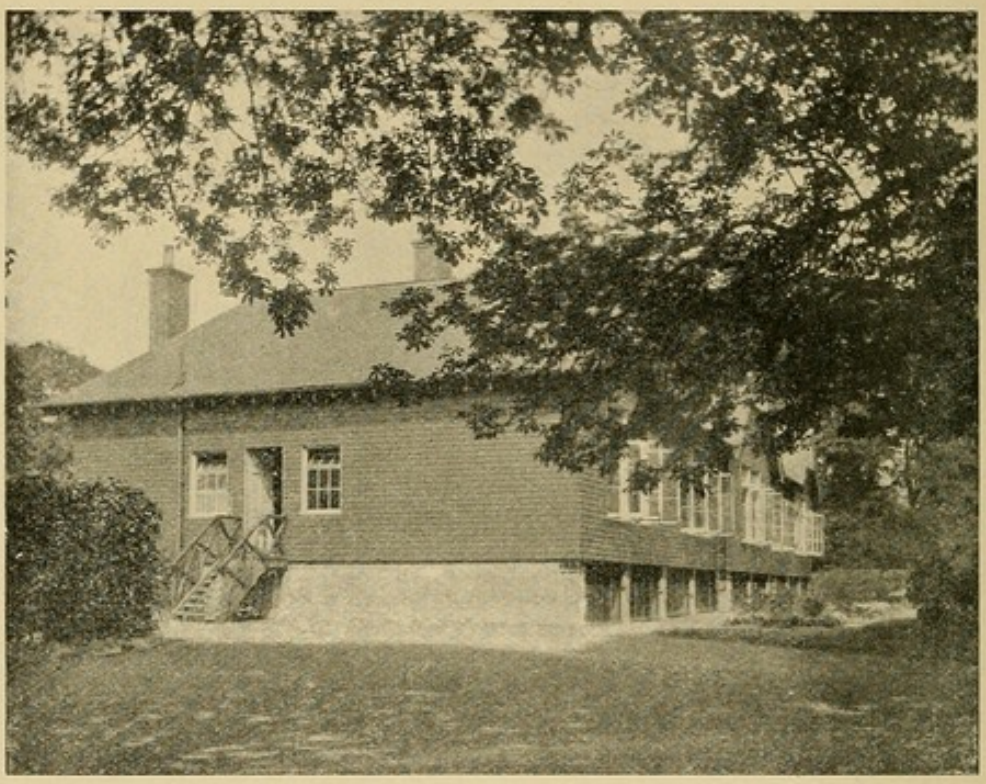


FIG. 53.—WOODBURN SANATORIUM. [*Face page* 197.

WOODBURN SANATORIUM,

at Morningside, a suburb of Edinburgh, was originally a private house with six acres of land, close to the open country, and has been completed by the addition of a detached wooden pavilion containing beds for ten patients, the original building containing the dining-room and administrative portion. The soil is of red sandstone; the climate that of Edinburgh, mild but changeable, with a fair amount of mist and wind. Standing under the shelter of Blackford Hills, the sanatorium faces the Braid and Pentland Hills, the former being one mile distant, the latter three miles. The garden is well-wooded with fine trees, and has been provided with a few shelters, and an "open-air dining-room" with corrugated iron roof and open sides. The stone mansion has two floors and attics; in it are found the drawing-room, dining-room (open on three sides) and some large airy bedrooms facing south. The pavilion, raised on brick piers, is of wood, covered with oak shingles, lined with felt, and internally faced with match boarding (fig. 53). The rooms are 4·5 × 3·3 × 3·3 metres high, and have extra large casement windows surmounted with fanlights. They are all to the south of the corridor, and have similar fanlights over the doors. The floors are waxed and polished, the walls varnished, the furniture suitable. To the south of the corridor are a small kitchen, lavatories and W.C.s. The roof is ventilated all round. Heating is by hot-water pipes and open fire-places; lighting by electricity. There are also a few sleeping chalets, each with a dressing-room attached. They are open front and back, provided with louvre shutters, and connected with the house by electric bells.

Access: Edinburgh Suburban, Morningside Station.

Peeblesshire.

THE CAVERHILL SANATORIUM

is situated four and a quarter miles from Peebles on the top of a hill with woodland to north and west. The soil is sandy; the grounds cover twenty acres, and consist partly of grass and farmland, partly of moorland. The buildings comprise a wooden pavilion with seven beds, a chalet with four beds and a cottage with three. The rooms are all single bedded; they are lighted with lamps; hot pipes are laid on but not much used. A spray bath is provided for every two rooms. Both men and women are admitted.

Staff: The place is managed by Mr. and Mrs. J. H. Caverhill and a resident medical officer. Dr. Caverhill, of Edinburgh, is visiting physician.

Access: Peebles Station (N.B.R.).

Lanarkshire.

BELLEFIELD SANATORIUM

for male consumptives belonging to Glasgow and district, is about one mile from Lanark in a well-sheltered situation, and has twenty seven acres of ground. It consists of a pre-existing house which is used for quarters of medical officer, matron and staff; of a wood and iron pavilion (Speirs & Co.), and of five double-bedded chalets. The pavilion contains to the left a projecting wing with a south-east aspect, containing a ward for ten patients, five double-bedded rooms in the centre, and to the right a large dining-room. Each of the smaller rooms has a large three-sided bay window with French casements; on the door is a fanlight. Behind the rooms is a wide corridor with numerous French casement windows. Near the patients' entrance is a large examination room. Behind the main pavilion, is a block with kitchen department. The lavatories and cloak-rooms are in separate projections. All angles inside are rounded, walls panelled and varnished. The sewage flows into septic tanks.

The sanatorium was erected by the Glasgow and District Society for Prevention of Tuberculosis. The Glasgow Corporation voted £5,000 towards the expenses; a local newspaper collected over £7,000.[1] The administration is planned for sixty patients eventually.

Renfrewshire.

THE BRIDGE OF WEIR CONSUMPTION SANATORIUM

was erected by the late Mr. Quarrier, of Glasgow, well-known for his philanthropic works, who was struck with the good results of open-air treatment of tuberculous children from his orphanages, and decided to extend the benefits to adults.

Bridge of Weir is a village on the G. and S.W. Railway about

[1] *Tuberculosis* (London), July, 1904. *British Medical Journal*, 12th March, 1904; 14th May, 1904; 18th June, 1904; 31st Jan., 1903. *Lancet*, 29th Nov., 1902.

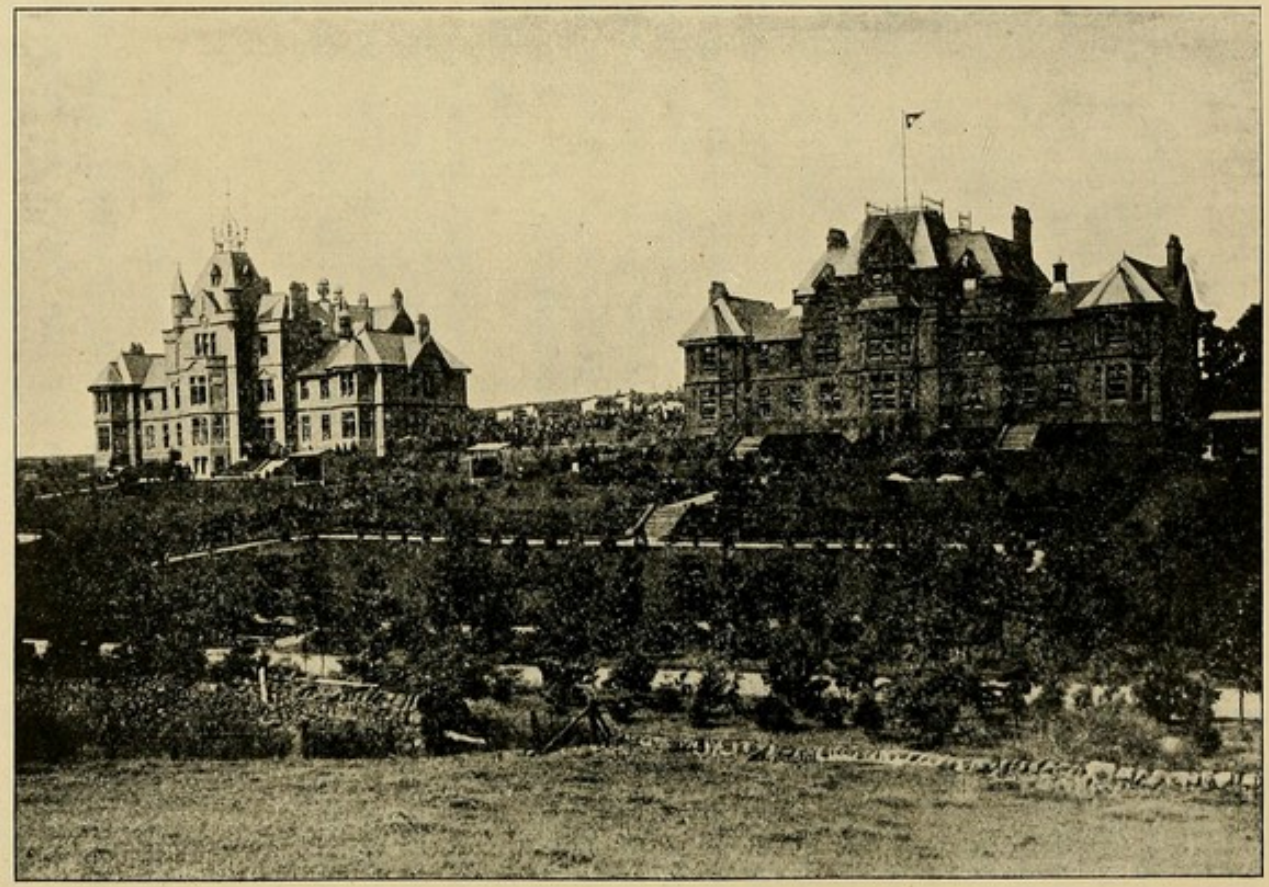


FIG. 54.—BRIDGE OF WEIR SANATORIUM. [*Face page* 199.

sixteen miles from Glasgow. Two miles further by road, nestling amongst the hills, is a small group of buildings consisting of an old and a new patients' block, an administration block, with laundry, engine house, etc., and the secretary's residence (fig. 54).

The old block is a handsome stone building of two stories, with an additional one in the centre. Patients' rooms are nearly all on the south side, the corridor to the north, with a handsome marble vestibule in the centre and lavatories at the ends. The bedrooms are floored with polished boards, the angles next the walls being rounded with a bold curve. Walls are washable, furniture simple, and fittings fairly free from dust-retaining ledges, although the whole building is beautifully and almost luxuriously fitted up. The walls are double and the windows were also double, the ventilation being originally by means of warm air by propulsion. It was, however, soon discovered that this was a hindrance to treatment, so that the inner windows have been everywhere removed, and simpler methods adopted. The ground floor, originally day rooms, has been transformed into wards. The dining-room is on the first floor. In the basement are bathrooms, and space for the heating apparatus, together with cloak-rooms.

The newer block is the same style as the first, but with some modifications and improvements. A new kitchen department has been built behind the centre of the corridor. On the roof is a Mann's extraction flue. In the bedrooms the concave skirting next the floor has been replaced by one which ends above in a convex border. Each block has forty beds. An extension with forty-eight more beds is planned. The building is intended for Scotch women and girls above the age of sixteen. There are about a dozen beds for men in a separate house in the grounds. A doctor's house is projected. Patients are sent from a dispensary in Glasgow.

Staff: A resident medical officer, matron, three nurses, etc. There is an advisory board of five distinguished physicians.

A sanatorium is projected for *Paisley*.

There are special open-air pavilions at the *Asylums* for Glasgow situated at *Woodilee* and *Gartloch*.

CHAPTER XXXVI.

IRELAND.

Name.	Locality.	Opened.	Beds.	Elevation in Metres.	Fees per Week.	
Royal National Hosp. for Con.	Newcastle, Co. Wicklow	1896	90[1]	82	7s., 25s. 30s.	Dr. B. H. Steede, res. med. off.
Forster Green Hosp. for Con. and Dis. of the Chest	Fortbreda, Belfast	1897	40	61	Free, by letter	No res. med. off.
Rostrevor San.	Rostrevor, Co. Down	1899	23	107	3½ gns.	Dr. F. Howard Sinclair
Altadore San.	Kilpedder, Co. Wicklow	1901	15	229	3½ to 5 gns.	J. C. Smyth, L.R.C.P.

In addition to the above, consumptives are admitted into the Throne Hospital, Belfast, to the Royal Hospital for Incurables, Dublin, and to some of the general hospitals. Great activity has been shown by the Irish boards of guardians in providing separate quarters for consumptives. It was stated in 1903 that seventy-two out of 159 unions had made such provision : a much larger proportion than in England.[2] The Belfast Board of Guardians have decided to remove the 260 cases of consumption now in the infirmary into a country sanatorium. The abbey at Whiteabbey, originally a hydropathic establishment, and within ten minutes' rail of the city, has been offered for the purpose for £5,000. It has thirty-three acres of beautifully wooded and sheltered grounds, overlooking the sea, with fine garden and greenhouses : elevation forty-two metres. The proposal has, however, been opposed on the grounds that the site is too small, too low, too near a populous neighbourhood, on a clay soil, and too much exposed to the north and east.[3] The *Westmeath*

[1] Including twenty in tents; shortly will be 110 without tents.

[2] *Lancet*, 11th July, 1903.

[3] *Tuberculosis* (London), April, 1904. *Brit. Med. Journ.*, 30th Jan., 1904; 21st May, 1904. *Lancet*, 23rd Jan., 1904.

County Board of Guardians has added two shelters to the front of the infirmary for open-air treatment, a disused ward being used at night. Somewhat similar arrangements have been made in other cases.

For non-pauper cases, there is a project for a sanatorium for the *County of Cork*. Twenty district councils have united for this purpose. A free site has been offered of twenty acres at Myshall, Coachford, by Mr. Barter. The plans are for fifty beds, with administrative block and doctor's house.[1] At present there is only a *Hospital for Consumption* at Cork, which is in an unsuitable position. Another sanatorium is proposed for *Belfast* by the Public Health Committee. There are to be 100 beds, with provision for full-price patients as well as the poor. The buildings, of wood and iron, together with site, etc., are estimated to cost £20,000; the annual cost £50 per head. In *Dublin* a site for a sanatorium has been offered to the branch association for prevention of consumption by Dr. Walsh, R.C. Archbishop of Dublin, in connection with the demesne of Beaumont (110 acres) recently acquired for a convalescent home for patients of Mater Misercordiae Hospital. The Sisters of Mercy would do the nursing and administration.

THE ROYAL NATIONAL HOSPITAL FOR CONSUMPTION in Ireland, at Newcastle, in the Wicklow Hills, is three miles from the sea, on the southern slope of a hill which shelters it from the north, and to a less extent from the east. To the south-west and west, at a distance of a mile or two, is a chain of hills 200 to 250 metres high. The grounds cover twenty-eight acres; the soil is gravel, in the deeper parts of which are many springs of water. The climate is mild and equable, with 77 to 84 per cent. mean daily humidity and about forty inches rainfall. Prevailing winds north-west and south-west.

The hospital consists of an administrative block connected by glass shelters with two other blocks for men and women respectively, and of two more wooden blocks, one of which is not yet completed. The original side blocks have each three floors, two of which have covered balconies on the south side. These blocks accommodate twenty-four in single-bedded rooms and eight in wards with four beds apiece. The new ward completed for men has

[1] *Brit. Med. Journ.*, 19th Dec., 1903; 14th Nov., 1903; 23rd April, 1904.

twenty-six beds, the one for women will have thirty-two. These blocks also have large verandahs which are used by night as well as day. As a temporary measure two tents have been erected, each with ten beds, and with sides which can be freely raised to admit air. Ventilation in the hospital is by open windows, the plenum system having been abandoned. Heating is by low-pressure steam pipes in the new buildings, including verandahs; by open fires in the older blocks. Lighting is by electricity. Sewage flows into septic tanks and filter beds. There is a large newly constructed dining-hall to seat 100, and a separate doctor's house has been built in the grounds.

Staff: Two visiting physicians, a resident medical officer, matron, five nurses and three probationers, twelve servants, engineer and assistant.

Admission: By letter, and payment of 7s. per week; earlier admission to single-bedded rooms, 25s. or 30s. Subscriptions of £3 per annum or a donation of £31 10s. entitle to one letter annually. Apply to the secretary, 5 Leinster Street, Dublin. Cost of maintenance (1903) per head per diem a little over 2s. 6d.; food only 1s. 2d.

THE FORSTER GREEN HOSPITAL FOR CONSUMPTION

and Diseases of the Chest, at Fortbreda, on the Castlereagh Hills, a short distance from Belfast, has incorporated with it the Belfast Hospital for Consumption which was opened in 1880. Erected through the munificence of the late Mr. Forster Green, it adopted his name on moving into the new quarters.

The hospital stands in its own well-wooded grounds of forty acres, on a sandy subsoil, on a western slope overlooking the Belfast Lough. The hospital was originally a private mansion, and has seven or eight villa residences within half a mile. The grounds contain sheltered walks, and are provided with a shelter with shifting panels and room for five lounge chairs. There is also a large conservatory, and a verandah three metres deep along the south side of the building. The latter consists of two floors and a basement. Ventilation is by open windows, the plenum system having been abandoned. Lighting is by electricity. An electric passenger lift is provided. The windows are extra large, of the usual double-hung kind; walls distempered; floors covered with heavy linoleum, or

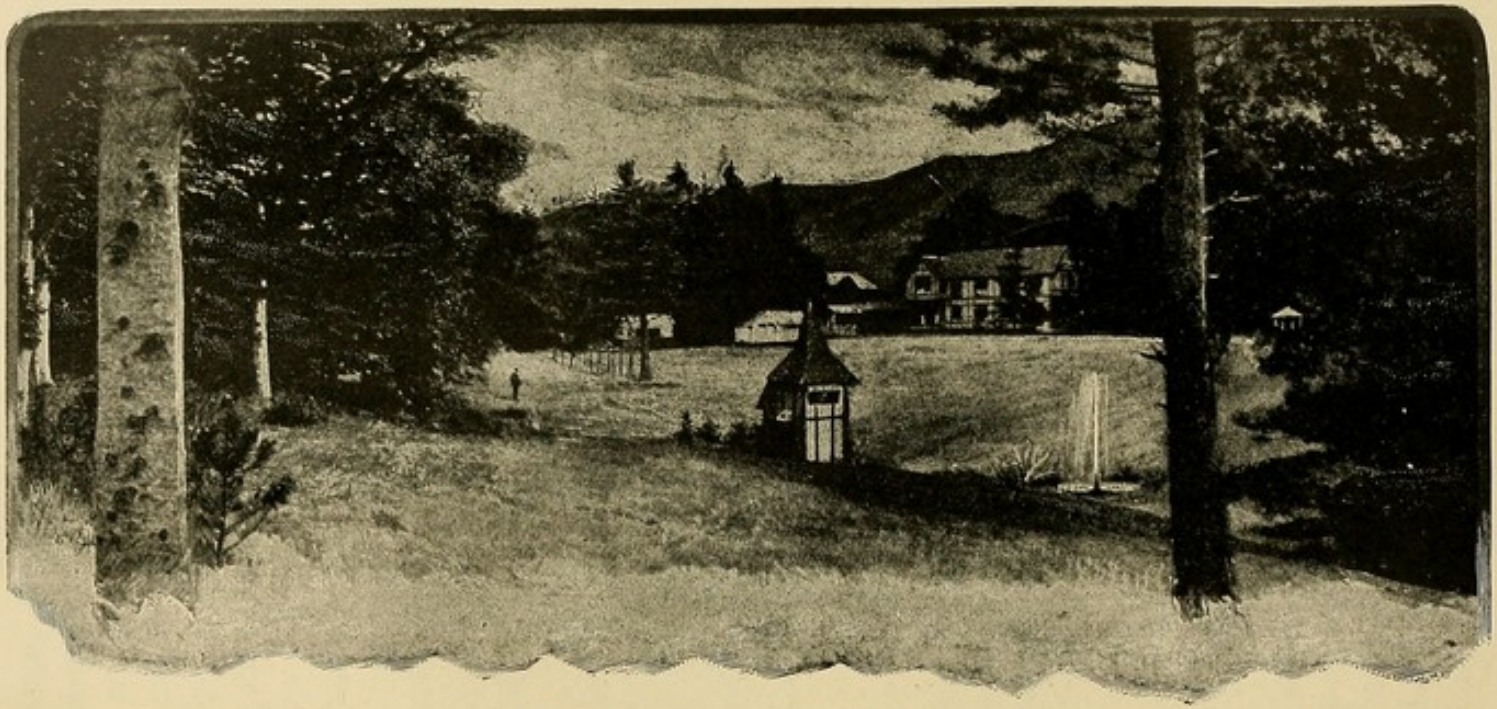


FIG. 55.—ROSTREVOR SANATORIUM. [*Face page* 203.

with polished pine or stone. Wards contain two to five beds each.

The dining saloon, kitchen department, etc., are on the ground floor or basement; a large board room and four wards on the first floor; sitting and bedrooms for nurses and matron with seven wards on the second floor; bathrooms and servants' rooms in the attics.

Staff: Three visiting physicians, a surgeon, laryngologist, pathologist, dentist, matron and secretary.

Admission: Free by letter. A donation of £50 entitles to one in-patient and four extern patients per annum.

Rostrevor Sanatorium,

by Warrenpoint, co. Down, is on a western slope among the Mourne Mountains, three and a half miles from Rostrevor village, two miles from Carlingford Bay. The climate is mild and equable; the rainfall moderate. *Soil:* Gravel overlying granite. The place is well sheltered against wind, the Mourne Mountains rising to a height of 823 metres above sea-level to the north and east. The grounds have a number of walks of various gradients, rising sixty metres in all, some of which are lit by electricity. They are well wooded with pine and larch.

The building consists of two parts at right angles to one another, a picturesque timber structure with two stories and a red-tiled roof, with balcony on first floor and a covered verandah at the end connecting it with the doctor's house and servants' rooms, kitchen and offices. The rooms have casement windows. On either side in the grounds are eleven bungalows or sleeping chalets, facing due south, and protected from strong winds (fig. 55).

There is electric lighting; heating is by hot-water pipes and open fireplaces. The X-ray apparatus, high frequency current and massage are all employed when indicated. Three hospital nurses are kept. Suitable precautions are taken as to disinfection. There is a good supply of soft water.

Three chief meals and four intermediate ones are given. The milk is from tuberculin-tested cows.

Access: By Great Northern Railway from Belfast or Greenore to Warrenpoint (three miles).

The resident physician is on the staff of the Forster Green Consumption Hospital.

Altadore Sanatorium,

Kilpedder, co. Wicklow, is situated amongst the mountains, in the midst of some of the finest scenery in Ireland. It is well sheltered to the east, north and west by woods and mountains, some of which rise to a height of over 610 metres above sea-level. To the south the sanatorium commands a view of the sea, five miles away. The soil is of gravel and sand, rainfall moderate. The grounds, of 630 acres, include a beautifully wooded glen, and a large variety of lovely walks, with full provision for graduated climbing. The building consists of a squarish mansion of two stories, with turrets at the corners, and has rooms for nine patients. There are also bungalows with six more beds. Electric lighting. Milk from tuberculin-tested cows. Treatment strictly as at Nordrach, where the resident physician was for a time.

Access: Greystones (five miles); Bray (eight miles); both on the railway from Dublin.

Telegraphic address: Altadore, Newtownmountkennedy, Co. Wicklow.

Section VI.—THE BRITISH COLONIES.

CHAPTER XXXVII.

AUSTRALIA AND NEW ZEALAND.

Name.	Locality.	Colony.	Beds.	Opened.	Elevation in Metres.	
Victoria San. for Cons.	Echuca	Victoria	15	1891	ca. 96	Early stages
,,	Mt. Macedon	,,	43	—	ca. 600	,,
Austin Hosp.	Heidelberg	,,	41	—	—	Advanced stages
Melbourne Hosp.	Melbourne	,,	—	—	—	,,
Amherst Hosp.	,,	,,	24	—	—	Early stages
Kilmore Hosp.	,,	,,	9	—	—	,,
Stawell Hosp.	,,	,,	6	—	—	,,
Queen Victoria Homes for Cons.	Thirlmere	New South Wales	42	1898	—	,,
Wentworth Falls San.	Wentworth Falls	New South Wales	20	1903	865	,,
Home for Cons.	Panamatta	New South Wales	—	—	—	Advanced stages
Liverpool Benevolent Asylum	Liverpool	New South Wales	—	—	—	,,
James Brown San.	Belais	South Australia	50	1894	335	Early stages
Nunyara San.	,,	South Australia	28	1902	320	,,
Dalby San.	Dalby	Queensland	30	—	340	,,
Roma Hosp.	Roma	,,	—	—	300	,,
Diamantina Hosp.	Diamantina	,,	—	—		Advanced stages
Cambridge San.	Maungakawa	New Zealand	33	1903	274	Early stages

Australia.

A Victorian Association for the Prevention of Tuberculosis was formed in December, 1901.[1] A similar association was founded the same year in New South Wales.[2]

[1] *Lancet*, 18th Jan., 1902. [2] *Brit. Med. Journ.*, 17th May, 1902.

In Victoria, in addition to the institutions mentioned in the accompanying table, a sanatorium is projected in the Castlemaine district.[1] The buildings of the Viticulture College at Rutherglen are to be converted into a sanatorium.[2] There is also a scheme for removing tuberculous inmates of lunatic asylums to a provisional sanatorium at Sunbury.[3] A project for a hospital for advanced cases at Hornsby, twenty miles from Sydney, has met with fierce opposition.

In South Australia it is proposed to convert a disused lunatic asylum at North Terrace into a home for advanced cases.[4] Mr. J. H. Angus has recently presented the Government with an estate of eighty acres together with buildings for the same purpose; the whole valued at £80,000.[5]

In Victoria a somewhat rigid quarantine system is enforced against consumptives.[6]

In West Australia the Colonial Secretary has been petitioned to erect a sanatorium.[7]

THE VICTORIAN SANATORIUM FOR CONSUMPTIVES,

at Echuca, with a branch at Mount Macedon, has been greatly developed of late years. *Echuca* is on the River Murray, near the borders of New South Wales, 156 miles by rail from Melbourne, surrounded by forests of eucalyptus. The climate is described as warm, equable and very dry, with a mean annual temperature of 58·9° F. The country round is rather flat, and the town is liable to severe inundations.[8] The area attached to the sanatorium is too small for graduated walks.[9]

Macedon is forty-four miles north-west from Melbourne, in mountainous heavily timbered country. The climate is bracing, somewhat cooler than Melbourne, with an annual rainfall of thirty-five inches. Mount Macedon in the neighbourhood rises to over 3,000 feet above sea-level.

There is, I believe, no resident medical officer at either institution; Dr. J. O. Smith is hon. medical officer in Echuca; Dr. Duncan Turner is hon. consulting physician in Melbourne.

[1] *Tuberculosis*, Jan., 1904.
[2] *Lancet*, 25th June, 1904.
[3] *Brit. Med. Journ.*, 20th Dec., 1902.
[4] *Brit. Med. Journ.*, 26th Sept., 1903.
[5] *Tuberculosis*, July, 1904.
[6] *Brit. Med. Journ.*, 12th March, 1904.
[7] *Brit. Med. Journ.*, 2nd Jan., 1904.
[8] *Australasian Health Resorts*, Bruck, 1888.
[9] *Lancet*, 15th March, 1903; 20th June, 1903.

THE AUSTIN HOSPITAL FOR INCURABLES

has a special building with forty-one beds for consumptives in advanced stages. A donation of £5,000 from Mr. Joseph Kronheimer, of Melbourne, has rendered possible the erection of another building to accommodate another sixty patients, provided the Government agree to bear half the cost of maintenance.[1]

THE QUEEN VICTORIA HOMES FOR CONSUMPTIVES

founded to commemorate the jubilee of her reign has taken over a pre-existing institution at Thirlmere, and added to it. This institution was founded and for some years maintained by Captain Goodlet, until in 1898 it passed into the hands of the Jubilee Committee. It is said not to be well supported.[2] There is a government grant proportioned to the subscriptions.

THE WENTWORTH FALLS SANATORIUM,

at King's Tableland, in the Blue Mountains, is sixty-two miles from Sydney in the midst of a forest of eucalyptus and pine. Grounds extending over 300 acres have been acquired for it by the Queen's Diamond Jubilee Fund Committee. The cost of site and buildings is estimated at £5,000. The plan is said to resemble that of the King's Sanatorium at Midhurst (p. 167). The original house forms the central portion of the sanatorium, and will accommodate the matron and nurses. Immediately behind this wings representing wards run out at right angles. A covered way, fully open to the north on each side, leads to the patients' quarters, on one side two wards of six beds each, on the other one ward of six beds and two single-bedded wards. Cubic space 1,200 feet (thirty-four cubic metres). All walls and ceilings have been painted and varnished. There is a separate cottage for the doctor. *Medical officer:* Dr. McIntyre Sinclair.[3]

THE JAMES BROWN SANATORIUM

is on the Mount Lofty Range seven miles from Adelaide. The climate is stated to be an almost ideal one, being dry and bracing,

[1] *Tuberculosis*, July, 1904. *Lancet*, 12th March, 1904; 28th Feb., 1903.

[2] *Brit. Med. Journ.*, 6th Feb., 1904. *Lancet*, 13th Nov., 1901.

[3] *Brit. Med. Journ.*, 18th Jan., 1902; 14th Feb., 1903. *Lancet*, 19th July, 1902; 16th Jan., 1903.

enabling patients to live in comfort out of doors all the year round. In summer the temperature is several degrees below that of Adelaide, and is seldom oppressive. In winter the thermometer rarely falls below 45° F.

The buildings consisted in 1901 of four blocks, a central one for the staff, one for male and one for female patients, and a large dining hall (12 × 8 metres and 6 metres high), all connected by covered passages. The accommodation has recently been increased, a Gooch wing being added by the efforts of C. H. Gooch, Esq.[1] The buildings are freely supplied with verandahs. The grounds extend over thirty acres; patients can also wander freely over the hills.

Charges: 15s. per week; the rest of the expense as well as the cost of the buildings (£8,000) being met by the legacy of the late James Brown. *Physician:* Dr. A. H. Gault.

Nunyara Sanatorium

is under the same medical direction as the James Brown Sanatorium. It is placed on the north side of a gentle slope with a well-wooded hill to the rear which shelters it from the cold south-south-east and south-west winds in winter. The outlook is a magnificent one, giving a panoramic view of the Adelaide plains shut in on one side by the Mount Lofty Range, on the other by the Gulf. There is a large fruit garden, as well as woods of eucalyptus and pine. Grounds cover sixty acres. The buildings are of wood, with covered verandahs on the sunny side. Floors are polished, angles rounded, wooden furniture and woodwork enamelled white. Windows are large; a lavatory basin with hot and cold water is in each room; electric bells, and hot-water radiator. Lighting is by acetylene gas.

The dining-room and kitchen occupy a separate block. In the grounds are open-air galleries and shelters, some of which revolve.

Terms: Four guineas a week. *Physician:* Dr. A. H. Gault.

The Dalby Sanatorium,

or Jubilee Sanatorium, is on the open downs, in a piece of land of over 100 acres, with no trees within three miles. It is built on the pavilion system, each block connected with the next by a large

[1] *Lancet*, 27th Feb., 1904.

circular verandah opening on to a grass courtyard. The matron came from the Children's Hospital at Brisbane.[1]

New Zealand.

In this colony sanatoria have been opened near Dunedin and at Otaki and Cambridge; others for thirty patients each are projected near Auckland, Hamilton, New Plymouth, Masterton, Nelson, Christchurch, Naseby, Lawrence and Queenstown. Some of these may already exist.[2]

THE CAMBRIDGE SANATORIUM

in New Zealand, is in an elevated spot in the hills with a fine view over the Waikato plains. It consists of a pre-existing half-timbered house for the administration, and a number of chalets for patients. These have from one to six beds each, and are lit by electricity.

Medical Officer: Dr. Roberts.

[1] *Nurses' Journal*, Nov., 1900.

[2] *British Medical Journal*, 12th Mar., 1904; 10th Sep., 1904. *Tuberculosis*, July, 1904.

CHAPTER XXXVIII.

THE DOMINION OF CANADA.

Canada.

Name.	Locality.	Province.	Beds.	Opened.
Muskoka Cottage San.	Gravenhurst	Ontario	50	1897
Muskoka Free San.	,,	,,	100	1902
Laurentian San.	St. Agathe des Monts	Quebec	25	1898
Kentville San.	Kentville	Nova Scotia	20	1904
Calgary San.	Calgary	S. Alberta	—	Being built
Kamloop San.	Kamloop	British Columbia	—	Projected

There is now a Canadian Society for the Prevention of Tuberculosis for the whole Dominion, in addition to local societies. The total accommodation for consumptives appears to be not over 200 beds, including those in hospitals. A sanatorium will probably be established in each of the provinces, with the co-operation of municipalities, the Provincial and Federal governments. One is to be erected at Ottawa. A hospital for advanced cases is being erected near Toronto. The site cost $30,000. The National Sanatorium Association, which established the two sanatoria at Gravenhurst, has purchased a site for a third; a philanthropic citizen has promised to contribute $25,000 for the buildings. A fourth sanatorium is projected on the Pacific coast. It was stated in 1901 that a large tract of land on the north side of the Second Mountain at Montreal had been given as a site for a new consumption sanatorium by the Fathers of the Holy Cross, who have charge of the Côte des Neiges College. A philanthropist of Toronto offered to endow it if the provincial government erected it.[1]

[1] *Lancet*, 23rd Feb., 1901; 14th Feb., 1903; 18th June 1904. *British Medical Journal*, 2nd Jan., 1904.

THE MUSKOKA COTTAGE SANITARIUM,

opened 1897 at Gravenhurst, was the first to be erected by the National Sanitarium Association of Canada. It is situated on the shores of Lake Muskoka, 125 miles north of Toronto, about 244 metres above the sea-level, and is protected to the north and west by rocky hills and by a neighbouring wood of deciduous and coniferous trees. The soil consists of Laurentian rock; the climate is dry, bracing and free from dust.

The buildings consist of an administrative block and a number of cottages. The former has a central tower and diverging wings. It contains bedrooms for twenty patients, and has a deep verandah in front of the ground floor, which forms three chief solaria facing respectively south, south-east and south-west. It has also a number of reception rooms. Over the verandah is an open balcony. The building is heated by steam pipes.

The cottages contain each from four to six bedrooms and a large sitting-room with an open fireplace. The verandahs can be enclosed by glass screens. The cottages are heated by hot-water pipes, and are finished in hard wood. Every building has a southerly aspect, and is lit by electricity; all the beds are in separate rooms. A laboratory has been established at the sanatorium by the provincial government.

There are three chief and three intermediate meals.

Only patients in early stages are admitted.

Physician: Dr. J. H. Elliott. *Fees:* $6 per week.

THE MUSKOKA FREE SANITARIUM,

at Gravenhurst, near the Muskoka Cottage Sanitarium, was also erected by the National Sanitarium Association on condition that the town paid at the rate of forty cents a head a day for the treatment of patients sent there. A site of fifty-six acres was presented by W. J. Gage, of Toronto, together with the trustees of the late Hart A. Massey. The Grand Trunk Railway Co. grants free transit to 100 patients per annum, and charges half fares beyond this number. A research laboratory was given by W. E. H. Massey, Esq.

Physician: Dr. Perfitt. Average duration of stay 170 days.[1]

[1] See Knopf, *Pulmonary Tuberculosis*, Philadelphia, 1899. *Zeitsch. f. Tuberk.*, July, 1901. *Lancet*, 19th May, 1900; 5th Jan., 1901; 23rd Feb., 1901; 14th Nov., 1903. *British Medical Journal*, 2nd Jan., 1904; 9th April, 1904.

THE LAURENTIAN SANITARIUM,

erected 1898, stands on the mountains of that name, nearly 600 metres above the sea-level, about a mile from St. Agathe des Monts, and sixty-four miles north of Montreal. The district comprises innumerable lakes and forests, and is dry and bracing. The site, which is fairly well protected to the north, is on 100,000 acres of crown lands which were set apart as the Trembling Mountain Park, and overlooks the village of St. Agathe. The building is square and unpretentious, with three floors and attics, a verandah on the ground level and a covered balcony above it. The verandahs can be enclosed with glass screens, and are provided with fireplaces.

Management: The sanatorium is in charge of trained nurses and a staff of visiting physicians.

THE KENTVILLE SANITARIUM

is on a bluff overlooking the village of Kentville in the Annapolis valley, seventy miles from Halifax. The soil is sandy; the grounds (eighteen acres) are wooded with pines and oaks. Elevation twenty-three metres. Each patient has a separate room, with large French window opening on to the piazza, where the beds are placed whenever the weather permits. The electric lighting and water supply are from the town. Three chief meals and three "lunches" are served. There is no resident physician; but a matron who was trained in the Massachusetts State Sanitarium and the Sharon Sanitarium. Dr. Wm. Woodworth, of Kentville, is connected with the institution by telephone, and pays regular visits. The cost of the building was £4,000.

Charges: $8 per week, including medicine and medical attendance.

THE CALGARY SANITARIUM

is being built in Southern Alberta by Dr. Wills.

British Columbia.

A sanatorium is to be erected at or near Kamloop on the North Thompson river in the "dry belt," where the average rainfall is 1·55 in. and the maximum in a wet season 6·25 in.; altitude 335 metres. The soil is very porous; pine forests abound.

CHAPTER XXXIX.

SOUTH AFRICA AND INDIA.

Cape Colony.

A SANATORIUM founded by the late C. J. Rhodes at *Kimberley* was opened in 1897. During the Boer war it was used for wounded soldiers. I do not know whether it has resumed its intended functions. Kimberley is on the high inland plateau of South Africa, 650 miles from Capetown, with which it is connected by rail.

The climate is dry and sunny; rainfall 18 in., mean annual humidity 55 per cent.; mean summer temperature (Oct. to March). 72°; mean winter temperature (April to September), 56°.

The sanatorium is about half a mile from the town, on the tram line to Beaconsfield, on the brow of a hill overlooking the town and the neighbouring Orange River Colony hills, and has well-laid out tennis and croquet courts. *Grounds:* Seven to eight acres. *Altitude: ca.* 1,250 metres.

The building contains about thirty bedrooms, several of which can be arranged *en suite;* large dining-room, drawing-room, ladies' morning room, smoking and billiard rooms, together with the appointments of a first-class hotel, and excellent sanitary arrangements.

It is intended for early and curable cases of pulmonary and throat disease, but apparently has no resident medical director. The charges, which were intended to render the institution self-supporting, without repayment of the original capital, were fixed at 15s. to £1 per diem, according to room, with special rates for the week or month.

Applications to the secretary, with banker's reference.[1]

[1] *Lancet*, 26th March, 1898.

A home for consumptives was opened in 1895 at *Middelburg* by Miss Blennerhassett and Miss Sleeman. Middelburg was then a picturesque village, well planted out with gardens, about 1,200 metres above sea-level, on the railway from Port Elizabeth and East London, eighteen hours by rail from the former.[1]

A hotel at *Lemonfontein*, Beaufort West, and a sanatorium at *Claremont*, about two miles from Wynberg, are recommended.[2] At the former, charges are about £3 10s. to £4 per week.

A branch of the National Association for Prevention of Tuberculosis has recently been formed at Cape Town.[3]

Natal.

A branch of the National Association for Prevention of Tuberculosis was founded this year at Durban by Dr. Murray Gray.[4] A special wing for consumptives has been opened at the Durban Hospital.

India.

A home for consumptives was opened in 1902 at Hazaribagh in connection with the Women's Friendly Society of Calcutta.

Hazaribagh is 600 metres above sea-level on the Chota Nagpur plateau, the highest ground near Calcutta. It has a dry climate; the heat is never exhausting, and in winter the place is distinctly bracing. The surrounding district is said to resemble the Transvaal and Orange River Colony.[5] The home is at present only for women and children.

[1] Dr. Shien, *Brit. Med. Journ.*, 27th Oct., 1900.
[2] Lieut.-Col. Batterby, *ibid.*, 15th Dec., 1900.
[3] *Tuberculosis* (London), April, 1904.
[4] *Brit. Med. Journ.*, 13th Feb., 1904.
[5] *Lancet*, 6th Oct., 1902; 26th Dec., 1903.

Section VII.—DENMARK.

CHAPTER XL.

DENMARK.

As in England, so in Denmark, the fight against tuberculosis began with the erection of *seaside hospitals or homes for scrofulous children.* There are at present five of these: *Refsnaes*, with about 130 beds, founded thirty years ago by Dr. Engelstad, mostly by means of voluntary contributions; *Snogebaek*, on the island of Bornholm, supported by the city of Copenhagen, receiving about 100 children yearly; *Hellebaek*, founded in 1896 by the "Society for Children's Sanatoria for Copenhagen and the neighbourhood"; *Odder*, in a village in Jutland, erected 1900 by the "Society for Bathing Scrofulous Children"; and *Juelsminde*, with sixty beds, for children of both sexes, aged four to fourteen years in the earliest stage of scrofula, built in 1902, partly from private subscriptions, partly from those of the various parishes and the State. There is also a "*Society for Country Colonies for Poor Children*," under royal patronage, which has three colonies in which thousands of children from Copenhagen are received free during the summer holidays by Danish country people. Various societies also exist for providing children at school with food.

There are also two *convalescent homes* for children, at Zaandwort near the Hague, and at Wyk van Zee; but these are not exclusively for tuberculous cases.[1]

The *Finsen Light Institute* at Copenhagen moved into new and more suitable quarters in 1902.

Of *sanatoria* for adults, six have been opened, and three more are projected.

[1] *Heilstätten-Correspondenz*, Jan. and July, 1898.

Societies: The National Association for Combating Tuberculosis was founded in 1901 at the instigation of Profs. Lorentzen and Rördam, and was honoured with royal patronage. It now has over 30,000 members, and received a guarantee from the State of 500,000 kr. on loan, and a yearly subscription of 100,000 kr.

The first sanatorium for consumptives to be erected in Denmark was that at Vejlefjord, erected by a society originating with the Danish Medical Association. Most of the remaining sanatoria have been erected by the National Association.[1] Advanced cases will be accommodated in small *homes* with from six to ten beds apiece.

DANISH SANATORIA.

Name.	No. of Beds.	Date of Opening.	Physician.
Vejlefjord Sanatorium	93	1900	Dr. Saugman
Boserup ,,	144[2]	1901	Dr. Strandgaard
Fredensborg ,,	20	1902	—
Silkeborg ,,	122	,,	Dr. Bang
Haslev ,,	22	1903	Dr. Helms
Ry ,,	24	1902	Dr. Isager
Aalborg ,,	60	Projected	—
Dairy farmer's ,,	—	,,	—
Skjorping ,,	100	,,	—
Refsnaes ,,	130	1874	Dr. Schepelern
Juelsminde ,,	52	1902	Dr. Hoff-Hansen

Dr. C. Theodore Williams states that there are now 409 beds for consumptives in Danish sanatoria, or one for each 6,000 population.

REFSNAES SANATORIUM

is on a peninsula jutting westwards from the northern part of Zealand. In the centre of the island is a small group of hills, and on the south side of this, on the Kallundborgfjord, are the hospital buildings. The institution possesses ten hectares of ground, mostly pine wood, this district being exceptionally well wooded as compared with the rest of the island. The soil is sandy. There are a number of separate houses, one being larger than the rest. In the centre of this, on the ground floor, is a large lavatory. Next to

[1] *Tuberculosis*, May, 1904.

[2] *Tuberculosis*, April, 1902, states 126 beds; *ibid.*, May, 1904, 136 beds. C. Theodore Williams in *Tuberculosis* (London), 144 beds, eighty for men, sixty-four for women.

this is the dining-room; after this a large room for consultations. The western end contains the matron's room; the eastern end, the surgery and schoolroom. The bathrooms are in a pavilion projecting from the centre of the building. On the first floor are dormitories. The nurses' room is at the west end; sick rooms with fifteen beds, special nurses' and doctors' rooms at the east end. There is altogether accommodation for sixty-five boys and sixty-five girls. Some of the stronger children sleep in another building, a third building is used for infectious cases. Six wooden shelters are placed on the shore, with walls on only two sides, not quite reaching the roof.

The ventilation of the various buildings is by open windows and suction shafts; the lighting by petroleum.[1]

Juelsminde Sanatorium

is on a peninsula between the Kattegat and Vejlefjord, sixteen kilometres east of the sanatorium of that name. Five hectares of land belong to it, wooded with fir trees and extending to the sandy beach. To the north is a well-wooded hill. The building, a long white building in the form of a cross, with red-tiled roof, is forty metres from the sea, and six metres above it. The projection in front is for bathrooms, that behind for kitchen and laundry. The rest of the building consists chiefly of wards. On the ground floor are the vestibule, dining-room, doctors' and nurses' rooms, and three for children confined to their beds. On the first floor are the large wards and sisters' room. The wide corridor behind these has washstands with water laid on. In the attics are the linen room, steam stove for drying linen, clothes room and servants' bedrooms. The W.C.s are in two sanitary towers; the heating apparatus, bathroom and servants' hall in the basement.

The floors are lined with linoleum. Lighting is by petroleum. There are large windows with fanlights and ventilation shafts in every room.

On the beach is a *Döcker baracke* and a wooden dressing-room. Early cases are received here without limit to duration of stay; graver cases are sent to Refsnaes. The total cost of the establishment was 150,000 frs. It is supported by voluntary contributions with a subvention from the State.[2]

[1] See *Zeitsch. f. Tuberk.*, Feb., 1901, for description. [2] *Ibid.*, April, 1903.

CHAPTER XLI.

DANISH SANATORIA FOR ADULTS.

VEJLEFJORD SANATORIUM

is situated on the north side of the Vejlefjord, a branch of the Kattegat, about twenty-five metres above sea-level, and 300 metres from the shore. The grounds (forty-two hectares) are wooded with beeches, oaks and firs, most systematically laid out with graduated walks, so that there are some seventy walks for patients divided into seven classes, varying from level to one in eight. A small pier serves the place, which is beautifully sheltered by wooded hills to the west, north and east. The climate is mild and equable.

There are three chief buildings, a main block, with engine house to the north, and the medical director's villa to the north-east. The main building is of white brick, with a straight front with slight central and lateral projections, three stories, basement and attics. A curved fresh-air gallery lies to the east side, divided into a northern and a southern portion, and the latter subdivided into sections for seven to ten patients. Another *liegehalle* is in the woods. The basement contains kitchen department, douche rooms, etc. Other bathrooms are found on each floor. The ground floor is mainly occupied by day rooms. In the eastern wing is the dining-room, ten metres square; and towards the centre in succession, the reading room, conversation room, consulting room, operation room and laboratory. The western part is set aside for those requiring special nursing, and has a verandah in front of it, divided by movable partitions. The bedrooms are in single row, in front of a wide corridor. There are seventeen double-bedded, fifty-nine single; the latter have sixty to seventy-seven cubic metres of air space. The height varies from 3·1 to 4·4 metres. The floors are covered with linoleum, except in the bathrooms and corridors, where

they are of terrazzo. Lighting is by electricity. Heating by hot pipes which can be heated by steam or hot water. The casement windows have fanlights above, but no curtains. To help in ventilating the lower public rooms, corridors and sick rooms, electric fans and shafts are provided. Drainage discharges into septic tanks, the effluent being carried into the sea.

The engine house has attached to it a laundry and disinfector. The hot pipes are brought into the main building through a tunnel.

Dr. Saugman has three assistants.

The building was established by a company. After 4 per cent. has been paid on share capital, and depreciation provided for, the rest of the profits go to form a fund which may be used to diminish the charges when necessary. There is also a subvention from the State of 18,000 kr. for two free beds. The *charges* are from six to nine and a half kr. per day.[1]

Boserup Sanatorium

was erected by the communes of Copenhagen, in well-wooded ground near Roskilde in the island of Zealand, three-quarters of an hour by rail from the metropolis, and is managed by the St. Hansen Hospital. It consists of two stone buildings, one for men, the other for women and for the medical director. The wards are on the first and second floors, some being for six beds, some for two and a few single bedded. They are light and airy, with casement windows surmounted by fanlights, but without fanlights over the doors. Nearly all are on the south side; a few to east or west. Some have recessed covered balconies. They are warmed with radiators, and have extraction flues and linoleum covered floors. The kitchens, bathrooms, offices and machinery are in the basement, and in front of this is a *liegehalle* twelve feet high.

The water supply is from an artesian well; the sewage goes into septic tanks.

The *charges* are 1.20 kr. per day, or for members of sick benefit societies 60 ore; the cost is 3 kr., the difference being defrayed by the commune sending the patient.[2]

[1] *Tuberculosis*, Oct., 1902. *Tuberculosis* (London), April, 1904. *Zeitsch. f. Tuberk.*, i., 2, p. 167.

[2] C. T. Williams, *Tuberculosis* (London), April, 1904; May, 1904.

Fredensborg Sanatorium

was originally an ordinary dwelling house, converted into a sanatorium for the Society of Typographers.

Silkeborg Sanatorium,

in Jutland, is about a mile from the town of that name, which generously presented the site and water supply, and constructed the road to it. Slightly raised above the surrounding wooded country, it has but little shelter to the north. There are numerous lakes in the neighbourhood, which is hilly. The soil is of moraine gravel free from clay. The main building has a straight south front with wings and centre projecting to the north. The administration block and doctor's villa form separate buildings.

The main block has a basement, three stories and attics. In the centre of the ground floor is a large day room with walls panelled with wood and painted in gay colours. Next to it is a large dining-room on the eastern side; the office and six double-bedded rooms to the west. The latter have French windows and are intended for such as require special nursing. The western wing contains the consulting rooms, laboratory, sisters' rooms, lavatories, etc.; the eastern being occupied by wards. The upper floors are somewhat similarly arranged. Most of the wards, with altogether 112 beds, have a southerly aspect; the rest look east or west; the majority are for three to six beds apiece; twenty-eight cubic metres have been allowed per head. The wardrobes are on the south side of the corridor, the lavatory basins on the north side. Here the floors are of terrazzo, the walls enamelled. The basement is occupied by the bathing department, the kitchen, etc.; cooking is done by steam and gas. There are also an ice-making machine, meat-cutting machine, an apparatus to Pasteurise milk, all driven by electricity. Heating is by hot-water pipes, lighting by electricity. Special ventilation is provided for the kitchen and dining-saloon.

Doors have the upper half as a window, which is removable. The engine house with laundry, destructor, disinfector and mortuary are to the north, connected with the main block by a tunnel. There are two fresh-air galleries, one on either side of the main block. They have asphalted roofs, on which turf is placed in summer to keep it cool. On the south side of each is a wall one metre high,

above which are placed low windows in winter. Next the *liegehalle* is a boot-cleaning room. The doctor's house commands a view of the south side of the building.[1] Men only are admitted. The cost was £170 per bed.

Haslev Sanatorium,

also for the working classes, is about one hour's journey from Copenhagen.[2]

Ry Sanatorium

is for women, and is placed about twenty kilometres east of Silkeborg, in a young pine wood, on a ten-hectare patch of land. It has the kitchen department, heating and disinfecting apparatus in the basement; the day rooms, consulting rooms, laboratory, nurses' rooms and two infirmary rooms on the ground floor; wards for four to six patients on first floor. The lavatory arrangements are in the corridor. Lighting is by gas (Benoit's system), cooking also by gas. The *liegehalle* is in a separate building. Another house contains the disinfector and quarters for the staff. The doctor comes out once or twice a day from the neighbouring village.[3]

[1] *Tuberculosis*, Feb., 1904. *Tuberculosis* (London), April, 1904.
[2] View in *Tuberculosis* (London), July, 1904 (Hillier).
[3] *Tuberculosis*, Feb. 1904.

Section VIII.—EGYPT.

CHAPTER XLII.

EGYPTIAN SANATORIA.

Several hotels exist in various parts of Egypt with resident medical officers, and almost entitled to be called sanatoria. They are, however, by no means exclusively devoted to consumptives, and the climate does not appear to be very suitable for open-air treatment during part of the year. Among the best-known hotels which might be safely visited are two at Helouan, where Dr. Page May lives; Mena House, near the Pyramids (Dr. Bentley); three at Luxor; and one which was specially built for a sanatorium at Assouan.

Al Hayat Sanatorium,

Helouan, was built with the financial assistance of Baron Knoop, and managed by two German medical men, one of whom (Dr. F. Plehn) has written a description in *Zeitsch. f. Tuberk.*, October, 1903. Land was bought at the edge of the limestone plateau of Mokattam, about equally divided between this and the sloping sandy ground which runs towards the Nile. To the north is a deep wadi which is flooded once or twice a year; to the east is the desert plateau extending to the Red Sea. The sanatorium consists of three to five story buildings partially enclosing a large rectangular garden. The place appears to be most luxuriously finished, with marble pillars, rounded angles, roll-up blinds and ventilating fans just under the roof, mosaic floors, enamel painted walls, etc. In the west wing are consulting rooms, laboratory, gymnasium and quarters for second medical officer and laboratory attendants. The kitchen and dining-room are in the east wing, which is connected

by a glazed corridor with the top of the cliff, where there is a fine view over the town and the Nile Valley and Pyramids. All the patients' rooms have a southerly aspect. In very hot weather they can be ventilated through the corridor from the north. Sick and healthy alike are admitted; the uppermost floor being intended for declared consumptives. Cases of nephritis, gout, rheumatism, arthritis and tropical complaints are all received. There is a separate hospital for infectious cases. There is a special verandah for brushing clothes on each floor.

The engine house, disinfector and laundry are in another building.[1] The place was opened in December, 1903, and has eighty beds.

The Tewfik Palace Hotel,

at Helouan, stands about 140 feet above the valley of the Nile, in the highest part of the town, which is three miles from the river. Helouan is half an hour by rail from Cairo.

The Cataract Hotel,

at Assouan, is built in horse-shoe shape, with the convexity looking west. It is said to be specially planned with a view to the requirements of invalids, and to be well sheltered against prevailing winds. An English housekeeper is in charge of the domestic arrangements. Further information may be obtained from a little book on Assouan by W. E. Kingsford (Simpkin, Marshall, & Co.).

[1] *Zeitsch. f. Tuberk.*, Oct., 1903. *Lancet*, 26th March, 1904.

Section IX.—FRANCE.

CHAPTER XLIII.

FRENCH SANATORIA.

THE prevention and treatment of tuberculosis has received much attention in France of late years. Several important societies have been started which have had a most useful influence on public opinion, and have led to better public prophylaxis, and directly or indirectly to the establishment of a number of sanatoria. The most important of these societies are the *Œuvre de la Tuberculose* (scientific); the *Ligue contre la Tuberculose* (popular, the first of its kind in Europe); the *Œuvre des Enfants Tuberculeux;* and the *Œuvre des Jeunes Filles Poitrinaires.* The *Œuvre des Hôpitaux Marins*, the *Œuvre des Hôpitaux de Montagne*, and the *Assistance Publique* of Paris and other towns and cities are also concerned with tuberculosis, but do not limit their scope to this disease. A new Antituberculosis Society of a popular educational character was founded in 1900 under the presidency of Dr. J. T. Peyrot; a number of well-known physicians are in the committee. In 1902 125 French societies and institutions for the prevention of tuberculosis were federated into one society.[1] This was, however, dissolved after an existence of a year and a half. Some five or six of the original societies grouped themselves together as the *Fédération Antituberculeuse Française* with Prof. Brouardel as president.[2] The rest have retained their independence.

A new society (*La Femme Tuberculeuse*) was started in Paris in 1904, which devotes itself more especially to women and children. Under its auspices, a new *dispensary* has been opened in the Rue Carpeau, Montmartre, which aims not only at giving

[1] *Brit. Med. Journ.*, 19th April, 1902. [2] *Lancet*, 31st Jan., 1903.

medical but also hygienic and domestic advice. Women are taught there how to bring up their young children, where to get milk of good quality if weaning is necessary, and the elements of housekeeping. Lodgings and clothes are disinfected, spit-flasks and other medical necessaries provided. A *House of Rest* with room for 120 visitors has been leased in the suburbs at Larue near Bourg la Reine; and a *convalescent home* is to be opened in the centre of France where patients can stay six months. The administration of this society is in the hands of Drs. Bouchard, Brouardel, Budin, Armand Gautier and Pozzi.[1] In addition to the above dispensary, and those of the *Œuvre des Enfants Tuberculeux* there are fourteen *dispensaries* in the city of Paris, including two at the Tenon and Laennec Hospitals. Dispensaries have also been opened at Angoulême, Autun, Brive (Corrèze), Dijon, Laval, Lille, Lyon, Mayenne, Nantes, Reims, Sémur, Tours, Nancy, Bois Colombes and Poitiers.

The French metropolis is ill provided with special *chest hospitals*. Wards were set apart in three of the general hospitals in 1897 (Boucicaut, Laennec and Lariboisière) for consumptives. The former, which is airy and well constructed and in a suitable quarter, has done very useful work, and is to be enlarged to 300 beds. The latter was a failure, and speedily obtained the reputation of a death-trap.[2] Wards are to be set apart for the same purpose at the Tenon, St. Antoine, and St. Louis Hospitals, as well as the annexe of the Hôtel Dieu, the Broussais Hospital, and the 27th Bastion. With the conversion of the Château de Dugny into an isolation hospital, this would provide a grand total of 2,093 beds, 167 of which will be reserved for surgical cases.[3] In some of the provincial towns (*e.g.*, Montpellier,[4] Tours, Havre), special wards have also been opened for the same purpose. There is a special hospital at Montmorency. The *Château de Dugny* is near Bourget (Seine), in a park with an area of 125 hectares, partly wood and partly meadow land, traversed by a little stream, the Morée. The principal building has a frontage of seventy metres, and the interior is divided into 200 rooms, and is estimated to be capable of accommodating 1,000 patients.[5]

[1] *Tuberculosis*, March, 1904. *Lancet*, 12th March, 1904.
[2] *Lancet*, 5th Nov., 1898. [3] *Ibid.*, 16th April, 1904.
[4] *Gaz. Hebd. de Méd. et de Chir.*, 18th August, 1898.
[5] *Lancet*, 16th April, 1904.

To meet the expenses of providing accommodation for the tuberculous poor in Paris, the *Assistance Publique* set aside 1,000,000 frs. from the last hospital loan. More recently, the Minister of the Interior has written to the various prefects in France urging them to comply with the recommendations of the permanent tuberculosis committee, which are, to place the tuberculous poor in special instead of general hospitals, or failing this in special pavilions or at least special wards; and where several hospitals exist in the same district, to set aside one or more as a tuberculosis hospital; furthermore, to prevent any communication between tuberculous and non-tuberculous patients. Incurable and advanced cases are received in the *Sanatoria of Agnetz* (Oise, for men) and *Brévannes* (women) both under the *Assistance Publique*.[1] Brévannes now has 200 beds open, and will have 300 at the end of 1904.[2]

The *Villa Louise Ruel* at Cannes (opened 1890, thirty-five beds) receives young work girls of Paris suffering from various chronic maladies. Each has her own room; and all expenses, even those of the journey, are paid.

A sanatorium is stated to exist in *Annam* on the plateau of Lang-Sa near the health resort of Dalat, 100 kilometres from the coast. Good roads have been made to it from Saigon and Phang-kung.[3]

Plique and Verhaefen[4] estimated the number of French sanatoria for paying patients in 1903 at twelve, with 392 beds, and 100 more being prepared. They stated that there were eighteen for the poor, with a total of 1,105, and 615 more projected.

As regards *treatment* in the French sanatoria, four or five meals are usually provided; less exercise is prescribed than in the average English sanatoria, and systematic hill-climbing is less common than in Germany. In *disinfection* of rooms, formalin vapour or the corrosive sublimate spray are usually adopted. At Ormesson the floor boards are oiled, then washed with sublimate solution; then painted with paraffin and benzine which is left to harden. This is done once a year; the floors are wiped daily with corrosive solution.

[1] See also children's sanatoria, p. 240.
[2] *Brit. Med. Journ.*, 27th Feb., 1904.
[3] *Zeitsch. f. Tuberk.*, Sep., 1902.
[4] *La Cure de La Tuberculose dans les Sanatoriums Français*, Paris, 1903.

CHAPTER XLIV.

FRENCH SANATORIA FOR THE PEOPLE.

Name.	Department.	Opened.	Beds.	
Cimiez	Alpes Marit.	1890	17	Dr. L. Bar; a Jewish charity, open 15th Nov.-1st April.
Angicourt	Oise	1900	170	Assistance Publique of Paris (men only)
Hauteville	Ain	1900	104	For Lyons
Chécy	Loiret	1902	18	League of the Loiret; for Orleans
Bligny	Seine et Oise	1903	125	Œuvre des Sanat. Pop. de Paris
Lay St. Christophe	Meurthe et Moselle	1902	80	Œuvre Lorraine de la Tuberc.; for Nancy; Dr. Nilus, res. med. off.
Forges Les Bains	Seine et Oise	,,	200	—
Feuillas-Pessac	Gironde	,,	60	Œuvre du San. Girondin; for Bordeaux and Gironde
Algiers	Algeria	—	60	A section for the poor; dormitories; 3 to 5 frs. per bed

In addition to the above, sanatoria are being built for Lille (two), Rouen, Nantes and at Gueret. One of the sanatoria for Lille is being promoted by the *Ligue du Nord contre la Tuberculose*, with Dr. Calmette at the head. A site has been secured at Montigny en Ostrevent near Douai, thirty-seven metres above sea-level, in a forest of oaks, pines and elms. There will be 100 beds; both sexes will be admitted. The building is expected to be ready in June, 1905. The other sanatorium for Lille, promoted by Dr. Ausset, is to be at Avesne. The sanatorium for Rouen will be forty-five metres above sea-level, overlooking the valley of the Seine, on the edge of a large forest of pines. It will at first contain twelve beds. Sanatoria are also projected at Hendaye (near the Spanish frontier), Magny (Rhone), for Versailles, and Seine et Oise[1] (proposed by the Municipal Council of Versailles), another at Canigou in connection with the pay sanatorium, and another of 100 beds for the National Society of

[1] *British Medical Journal*, 16th Feb., 1901.

Teachers.[1] The latter is to be in a wood of 111 hectares in the domain of Vaucluse not far from Paris. Two sanatoria are projected at Arcachon. Several *agricultural colonies* have been established in connection with the children's sanatoria in France (see p. 240). Dr. Malibran has also opened Les Villas Sanatorium near Mentone, where the consumptive poor are taught bee-keeping, silkworm rearing, olive gathering, flower gathering, etc. Patients stay indoors at sundown, and shut the windows for an hour or more. Another agricultural colony has been founded at Canet by Dr. Vaudremer. Workmen's gardens have been opened at Sedan, St. Etienne, etc.

The Angicourt Sanatorium.

The beginning of this sanatorium dates back to 1885, when the Assistance Publique of Paris decided to build a large sanatorium for the poor consumptives of the metropolis. Comprehensive plans were drawn up, but owing to lack of funds nothing further was done for several years. In 1893 the *Pari Mutuel*—which receives the funds derived from taxes on horse-racing—offered the sum of 700,000 frs. towards the expenses of the building. It was therefore decided to begin building the administrative portions together with one half of the patients' quarters, which was all that could be finished with the money in hand.

The site was chosen beyond Creil, near Liancourt (Oise), on a plateau ninety-five metres above sea-level surrounded on three sides by pine woods, overlooking the valley of the Oise to the south-east, with the village of Angicourt. In order to increase the shelter, which is inadequate, the building was sunk, and the ground in front of it cleared away. Owing to the solid method of construction and to unexpected difficulties with the soil, the undertaking proved to be much more costly than was anticipated, four successive contractors failing over it. By 1898 one quarter of the main mass had been finished; but a further contribution from the *Pari Mutuel* of 500,000 frs. enabled them to complete another quarter by 1901, as well as the administrative portions. The completed portions were accordingly opened for use.

The complete sanatorium will when finished consist of two symmetrical residential blocks united by a covered way with the

[1] *Zeitsch. f. Tuberk.*, July, 1902. *La Lutte Antituberc.*, 31st March, 1902.

dining-saloon in the centre, behind which are the administrative portions. Each residential block will be of the Hohenhonnef type, and will look south-south-east. It is the more southerly block which has so far been opened. The building is of stone, with three stories and attics. Everywhere angles have been rounded, walls are painted, floors of hard polished wood. In front of the ground floor is a fresh-air gallery or verandah extending the whole length of the building. Behind this is a corridor three metres wide, giving access in succession to the consulting rooms, bath and douche rooms, W.C.s, a large cloak-room with lockers for each patient, a lavatory, a library, and a large day room which occupies the whole south-west extremity. Staircases at each end lead to the upper floors. Next the central staircase on the first floor is a lavatory behind, three single-bedded rooms in front. Further on the corridor leads to other wards, each for three beds, excepting one at the south-west end which will serve as an infirmary and contain seven beds. Each room has a chimney and is 3·85 metres high. The windows are large with numerous panes and fanlights above. Outside are wooden sun-blinds. The next floor is similar. Each floor has on the north side an attendants' room, a dirty linen receptacle and W.C.s. It appears that the attic story is also to be used for patients, although it is far less suitable than the others.

The dining-room lies in the centre of the corridor which runs from the north-east wing of the present building to the south-west wing of the second pavilion. Behind this, connected by a covered way, is the kitchen. Behind, but on a higher level, are two buildings, one of which is for the house physicians and staff, the other for laundry and engine house, near the water reservoir. Further north, in a special garden, is the medical director's house. Further west, masked by the trees of the park, are the cowstalls, the stables and mortuary. The grounds cover twenty-eight hectares. The sanatorium is intended for early and presumably curable cases.[1]

Hauteville Sanatorium,

for the city of Lyons, has been built by private initiative, largely owing to the exertions of Dr. Dumarest. An undulating plateau

[1] See Sersiron, *Les Ptisiques Adultes et Pauvres*, Paris, 1898. Grillot, *Le Sanatorium Français*, Paris, 1900.

900 to 1,000 metres above sea-level with a gentle inclination to the south-west was chosen, dominated by a wooded crest rising to 1,237 metres above sea-level, and overlooking the village of Hauteville. The soil of this district is of sand over limestone.

The sanatorium consists of three buildings, a centre and two wings at obtuse angles, all three united by open-air galleries. The centre block which looks south-east, has three stories and a basement, and a tower in the centre. On the ground floor it has a large dining-room on the south side, flanked by two day rooms for men and women respectively. The wings have rooms behind as well as in front of the corridor. Running along the south side of all three buildings are wide and lofty fresh-air galleries. There are no verandahs in front of the bedrooms. The walls are smooth with rounded corners; the floors of oak parquet treated with paraffin and laid over asphalte. The sanatorium has electric lighting, low-pressure steam heating, a complete system of baths, steam disinfector and laundry. Attached to it is a well-equipped institute with four laboratories, under the care of Prof. Arloing and Dr. Guinard. It is intended for curable cases of both sexes.[1] Patients in this sanatorium rise in summer at 6.45, breakfast at 7.30, take a short walk and a long rest in the open before lunch at 10; then a long rest until the midday meal. At 4.30 they have tea or coffee; at 7 supper; at 9 all go to bed.[2]

The Orleans Sanatorium,

at Chécy, is a long straight building of two floors and attics, with a verandah in front of the ground floor, bedrooms above, and a fresh-air gallery at each end. The administration block is behind, united to it by a covered way.[3]

The Lay St. Christophe Sanatorium,

near Nancy, is a long straight building consisting of a central administration, with two wings united by central open-air galleries. Each wing has a basement, two floors and attics. The open-air galleries are in two tiers; behind them is the administration block.

[1] Grillot, *Le Sanatorium Français*, Paris, C. Naud, 1900. Dumarest in *Trans. Fourth Congr. Tub.*, 1898.

[2] *Medical Review of Reviews*, 9th April, 1903. [3] Grillot, *loc. cit.*, for view.

A verandah runs in front of the basement the whole length of the wings and centre.

Drs. Spillmann and Haushalter have been mainly concerned in starting this sanatorium.

The Bligny Sanatorium,

at Brii sous Forges, was built by the *Œuvre des Sanatoriums Populaires de Paris*. It consists of two pavilions facing south and south-east united by open-air galleries looking south-south-east, all of two stories, excepting the extremity of the east wing, which has also a basement, and four towers which have an additional top story.

The fresh-air galleries are divided into a north and a south portion. Behind their centre is the dining-saloon, running north, which leads to an administrative portion containing consulting rooms, etc. The main staircases are at the junction of the fresh-air galleries with the wings. Near them are bathrooms, douche rooms, W.C.s and nurses' rooms. The wards are mostly for three beds apiece, separated by lavatories, all to the south side. Isolation wards and nurses' rooms are at the extremity of each wing. In the basement of the east wing are the douche room, laboratory, radiography room, electric room, dark room, surgery, and quarters for the nurses. Over the dining-room and serving-room is a day room and a chapel. Over the administrative pavilion are quarters of the medical officer, and a ward kitchen. Under the dining-room is the kitchen department. At a distance are stables and farm buildings. In the interior of the main building all angles are rounded, walls are smooth and washable; windows are large casements with fan-lights above. The sanatorium is surrounded by a well-wooded park.

Up to the present only one wing has been completed, so that only men are admitted.[1]

[1] *Zeitsch. f. Tuberk.*, Nov., 1903. *La Lutte Antituberc.*, 30th Nov., 1901.

CHAPTER XLV.

FRENCH SANATORIA FOR PAYING PATIENTS.

Name.	Department.	Elevation in Metres.	Opened.	Beds.	Fees in Francs per Day.	Medical Director.
Canigou	Pyr. Orient.	670	1890	100	14-16	Dr. Giresse
Durtol	Puy-de-Dôme	520	1898	60	14-20	Dr. Sabourin
Trespoey	Basses Pyr.	220	1896	32	16-20	Dr. Crouzet
Gorbio	Alpes Marit.	250	1900	53	18-30	Dr. Malibran
San. des Pins	Loir et Cher	150	,,	54	14+	Dr. Hervé
Meung-sur-Loire	Loiret	—	—	17	12-18	Dr. L. Leriche
Algiers	Algeria	200	—	40[1]	6-15	Dr. Verhaeren
Dienne	Cantal	1,300	1903	—	—	Dr. Markeszuwski
Mont-des-Oiseaux	Var	—	1902	160	—	—
Aubrac	Aveyron	1,400	1900	50	10 and 20	Dr. Saunal

A sanatorium is also stated to exist at Thorenc near Grasse under M. Esmonnet. There is an establishment at St. Martin Lantosque near Nice, 1,000 metres above sea-level, which receives paying patients in summer time.[2]

The Canigou Sanatorium.

This sanatorium, which is near Vernet les Bains, Pyrénées Orientales, was the first private establishment of the kind in France, being founded in 1890 under the direction of Dr. Ch. Sabourin. Situated at the intersection of the valleys of the Cadi and the Tech, it has a southerly aspect, looking towards the Puy de Falgouras and the town of Le Vernet, which has been known since 1181 for its sulphur springs. Mountains protect it from wind on nearly all sides—the Canigou to the east, the Cerdagne Mountains to the north and the Perra to the south, leaving an open valley towards the south-west. The soil consists of sand and pebbles resting on gneiss and granite.

The sanatorium is situated in a park of twenty to twenty-five

[1] Out of 200.

[2] L. Petit, *loc. cit.*, p. 253.

hectares, which is well wooded with chestnut trees, acacias, oaks and evergreen oaks, and various kinds of pine trees. Palms, aloes, olive trees and cacti grow freely without artificial shelter. It was originally an "open sanatorium," in which the patients merely spent the day during the winter season, returning to sleep in hotels and apartments in the town. At that time it consisted of a series of verandahs open on one side, glazed on the other; of a dining-room, drawing-room, consulting-room, administrative and douche rooms. In September, 1896, however, when Dr. Giresse succeeded Dr. Sabourin, it was opened for the whole year, and completed by the addition of sleeping quarters.

The present building, which is of three stories, has accommodation for about 100 patients; a new building is, however, in contemplation. The bedrooms, which face south-south-east, west and north, have a mean capacity of sixty cubic metres. The windows, which are wide open during the day, and partially open at night, are provided with screens near the beds, but no curtains. During the coldest part of the year (15th December to 15th January) they are heated with warm air; for the rest of the year no artificial heat is required. The passages are lighted with gas, the bedrooms only with candles. The drinking water is taken from a torrent which comes down from Mount Canigou, and is filtered through sand, pebbles and iron scoria. The sewage is carried by an abundant water supply into the river a few hundred metres below the village. There are nurses as well as servants in the establishment.

The average length of stay is five to six months; patients are allowed to go home after a while, returning for other courses of treatment until they are cured. There would be great advantages if they were to stay until their recovery is assured; but they would seldom stand so long a separation from their families.

The most convenient route to the sanatorium from Paris is by the Barcelona night express to Perpignan, thence to Villefranche de Conflent, which is about half an hour's drive from the sanatorium.

The Durtol Sanatorium,

or the sanatorium of the Château of Durtol, is situated on very pervious black volcanic sand, at a little village three kilometres

from the large town of Clermont-Ferrand in Puy-de-Dôme. It has a station of its own on the line running from Clermont-Ferrand to Limoges, and is half an hour's drive from the Clermont station, or nine hours' journey from Paris. Being somewhat raised above the plains, it has a good view of the valley of Clermont and of the distant mountains of Forez. It is open to the south, protected to the north, north-east and north-west by mountains and hills thickly wooded with pine trees, and provided with numerous good roads and paths. The strong winds, which come from the north-east, are completely warded off by the woods extending the whole length of the park, which is of five hectares. The climate is sedative compared with the rest of Auvergne. The rainfall is regular but not abundant, and prolonged droughts are unknown. Excepting in very severe winters, the cold weather is of short duration and not very intense. Fogs seldom reach the place. The sanatorium consists mainly of an old Louis XIV. chateau (fig. 56), which has been altered and added to by the proprietor, Dr. Chas. Sabourin, formerly director of the Canigou Sanatorium.

The bedrooms, which are on the two upper floors, are nearly all provided with chimneys. Fires, however, are seldom needed, rugs and plaids, etc., being sufficient to keep the patients warm. The floors are covered with linoleum ; the walls with anaglypta painted and varnished, the angles rounded. There are two dining-rooms, the larger of which opens by folding doors into a room for theatrical representations. There is also a large library, a billiard-room, music-room, laboratory and chapel. There are seven large verandahs for rest in the open-air. Some of these are in the woods. The sanatorium has its own dairy farm. The water supply is of great purity. Hydropathy is not employed excepting in the form of cold bathing or friction with cold water.

The sanatorium is open the whole year. Durtol is a telegraph station, and very near some of the famous bathing resorts of Central France.

The Trespoey Sanatorium,

about half an hour's drive from Pau (Basses Pyrénées) is situated in the midst of a cultivated plain, on the edge of the valley of the Ourse, which is about forty metres below. Originally a private house, it was altered and adapted to its present purpose by the



FIG. 56.—THE DURTOL SANATORIUM. [*Face page* 234.

proprietor and medical director, Dr. Crouzet. The climate is chiefly remarkable for the absence of wind, high wind only blowing three or four times during the course of the winter. There are no forests in the neighbourhood; the high road to Pau has a number of villas on each side with patches of woodland, which form a protection against the west wind; there is similar protection towards the east. The soil is a very permeable sand to a depth of about four and a half to five metres, where a thin layer of clay is met with. The sanatorium is on a steep hill, and has a fine view of the Pyrenees in the distance and the river valley in the foreground. It stands in a park of about seven hectares (seventeen acres), containing pine trees and other conifers, and laid out in paths at various inclinations, well provided with seats. Round it is meadow land.

The sanatorium consists of three buildings, the chief of which is of two stories above a basement and ground floor. In the basement are the kitchen department and bathroom. On the ground floor the dining-room, library, drawing-room, consulting-room and two rooms for patients. The next floor has six bedrooms, and the top floor two bedrooms for patients. There is no lift. The patients' rooms are all to the south, with at least one south window; they vary in size from 60 to 110 cubic metres. Each has its own chimney and open wood fire; ordinary French windows; papered walls, without rounded corners; pinewood floors, without carpet or curtains; and varnished pitchpine furniture, without carpets, pictures, or curtains in any of the rooms. The lighting is by electricity. There is a good water supply; sewage goes into a cesspool. Near the chief building is a fresh-air gallery with a southerly aspect; and another looking north. There are three other large shelters in the garden. The annexe, which is a building of two stories, contains bedrooms for fourteen patients; it communicates with the main block by a covered way. The third building, a little distance off, has nine bedrooms. The sanatorium is open from 15th Oct. till 15th May. Only early stage cases are received.

The Gorbio Sanatorium

is four kilometres from Gorbio, which dominates it to the north-west, and about the same distance from Mentone, being placed on the side of a little valley covered with pine trees. The soil is porous limestone rock. Around the sanatorium are twelve hectares of

land partly planted with vines, olives and lemons, surrounded with pine woods.

The building has a straight south front, with projecting pavilions to the north in the centre and at the ends. The basement, which has a fresh-air gallery in front of it, contains consulting-room, laboratory, billiard-room, linen room, and a few rooms for the staff. On the ground floor are five bedrooms, drawing-room, vestibule, office, refreshment-room, and dining-room to the west, communicating with the kitchen department behind. The remaining rooms are on the three upper floors. All the bedrooms look south and are in single row. They have separate chimneys and contain over sixty cubic metres air space. Some have a dressing-room for the nurse, others a balcony. The walls are everywhere washable; heating is by low-pressure steam pipes; lighting by electricity. The W.C.s, lavatories and electric lift occupy two of the northern pavilions. There is a terrace in front of the ground floor; and on each floor is a corridor communicating on the same level with the ground to the north.

The medical director practises at Cauterets during the summer.

Sanatorium des Pins,

at Lamotte-Beuvron, is in the centre of France, in a district which is said to enjoy a very equable climate free from winds and with very few wet days. The sanatorium is sheltered on all sides by woods of pine, oak and acacia. The soil is of gravel. There are altogether four buildings, with mostly but not exclusively a southerly aspect. The original building contains six bedrooms, the kitchen, dining-room and administration. The annexe contains twenty-two bedrooms on two floors. Opposite to it, separated by a courtyard, is a third small pavilion intended for such cases as require complete isolation. The last erected building is one for twenty-one patients, three being on the ground floor, the rest on two upper floors. These have sixty-five cubic metres air space, the walls extra thick, the floors partly wood, partly iron, to prevent transmission of sound; and the partitions between contiguous rooms containing an air space.

There is a steam laundry and engine house with destructor, and electric lighting is being introduced. Heating is by low-pressure steam; a hot plate under the dining-room table to warm the feet. The drawing-room communicates with another room by folding doors, which are opened for entertainments. Walls are everywhere

washable; the floors of parquet, or xylolith or covered with cork carpet. Angles are rounded; windows extra large, in a line with the doorways, and provided with sun blinds. There are five fresh-air galleries, four of which are in the gardens. There is a good hydropathic installation; the W.C.s are mostly disconnected by ventilating lobbies. There are two resident medical officers. La Motte is two and a quarter to three hours by express from Paris, on the line to Toulouse.

The Meung-sur-Loire Sanatorium,

on the borders of Touraine, is on sandy soil, and is said to enjoy a dry and bracing climate, with a large amount of sunshine. The grounds, of considerable extent, are covered with fir trees and other evergreens. The building was originally a chateau, but has been entirely reconstructed for its present purpose. Bedrooms have a southerly aspect, large windows, washable walls, and simple furniture. Only early cases are admitted. The sanatorium is two hours by rail from Paris, on the line to Bordeaux.

The Algiers Sanatorium

is not exclusively intended for consumptives, but reserves for them 40 out of 200 beds (see also p. 227). It is considered to be specially useful in laryngeal phthisis, febrile and advanced or complicated forms of pulmonary tubercle.

It is open October to June, exceptionally later. The district is well wooded with olive trees and conifers, and has a limestone soil. The sanatorium is five kilometres from Algiers, and has a park of over ten hectares. It consists of a centre and two wings forming a convexity to the south. On the ground floor, are a number of common rooms; the right wing contains the consulting rooms, surgery, laboratory and administration. Every bedroom has its own balcony, no common fresh-air gallery being provided. The walls are cemented; the furniture is comfortable; strict antiseptic precautions are said to be observed. The nursing is done by a religious order.

The Aubrac Sanatorium

is situated in Aveyron, at its junction with Cantal and La Lozère, at the foot of a chain of mountains and on the edge of a magnificent forest of beech trees.

Long recognised as a valuable high-level station, it was selected in 1895 by Dr. Saunal for the site of a provincial sanatorium. As the results of treatment were extremely good, a permanent sanatorium for paying patients was opened in 1900, 500 metres above the village. The sanatorium consists of a large building in Norwegian style, in two symmetrical parts for the two sexes, with separate dining and drawing-rooms, washable varnished double walls containing a layer of powdered cork, large fresh-air galleries, furniture of lacquered wood or iron provided with moleskin covers, low-pressure steam heating, etc.

Another building in granite has been added, which will be ready this year. This has been planned and constructed with the greatest care, to answer all hygienic requirements. The south front is straight, with projecting pavilions in the centre and at the ends, between which are placed on the ground floor two long southerly fresh-air galleries, with movable glazed screens, and on the first floor two long balconies. On the second and third floors every room has its own balcony. Nothing but cellars are placed in the basement. On the ground floor are the kitchens, coal-cellar, store-rooms and heating apparatus, with windows and doors to the north. On the first floor is the large dining-room, 18 metres long × 6 metres wide × 4 metres high, with three more common rooms, and to the sides the office and three bedrooms. On the second and third floors are more bedrooms; large ones in the centre and wings, smaller ones between. The attics are occupied by linen rooms, box rooms and staff rooms. In the wings also are quarters for nurses and medical officers, laboratory, surgery, dark rooms, etc. In a central pavilion to the north is the grand staircase and electric lift. Water-closets and bathrooms and subsidiary staircases are placed in the wings. On the higher floors the former occupy built-out pavilions on the north side. All the bedrooms are square, the smaller ones 16 square metres × 3.50 high, the larger ones half as big again. With few exceptions they are on the south side, in single row; each has rounded corners, a balcony one metre wide, a chimney for ventilation, large window with fanlight over the casement, large door with fanlight over it exactly opposite, and beyond this a large corridor window. The building is symmetrical, one half for each sex. There is a northern verandah and a northern balcony between the projecting pavilions

for use in hot weather. The place is heated by low-pressure steam and by electricity, and lighted by electricity. Dirty linen, etc., is to be removed twice daily in india-rubber bags. Dettweiler's flasks will be used, as well as Dr. Fauvel's *carnet du tousseur*, intended to prevent dissemination of little particles while coughing. The farm and stables are in separate buildings at a distance.[1]

THE MONT-DES-OISEAUX SANATORIUM,

near Hyères (Var), is intended for middle class patients of small incomes. It consists of three buildings of five stories united by two tiers of galleries. The centre is for administration, the eastern building for men, the western for ladies. Every patient has his own room with balcony or terrace. Electric lighting, a steam-laundry and disinfector, inhalation rooms, etc., have been provided.

Other sanatoria exist at *La Tisnère* (Hautes Pyrénées, 300 metres), *Eaux Bonnes* (Basses Pyrénées, 800 metres, fifteen beds, Oct. to May, Dr. Portes), *Aas-Eaux-Bonnes* (Basses Pyrénées, fifteen beds); and a winter villa at *Arcachon*. A sanatorium with eighty beds is being built at *Lompnes-Hauteville* (Ain).

Climatic Stations recommended to consumptives exist at Le Regard (1,100 metres) and Pralognan (1,545 metres), both in Savoy; at Mont Dore (1,050 metres, Puy de Dôme); Thorenc (1,200 metres, Alpes Maritimes, May to Nov.) and La Foce, near Vizzavone, in Corsica (1,145 metres).

[1] See Andrieu, *Aubrac, climat et sanatorium*, Carré et Naud, Paris, 1901.

CHAPTER XLVI.

FRENCH SANATORIA FOR CHILDREN AND ADOLESCENTS.

Name.	Department.	Opened.	Beds.	
Ormesson	Seine et Oise	1888	130	Œuvre des Enfants Tub. (boys)
Villiers-sur-Marne	,,	1891	220	,, ,,
Villepinte	,,	1878	360	Œuvre de Villepinte (girls)
Champrosay	,,	1878	—	,, ,,
Alice Fagniez	Var (Hyères)	1896	32	,, ,,
Forges les Bains	Seine et Oise	—	224	Assistance Publique of Paris (boys and girls)
Vialas	Lozère	—	15	For Protestant children of the Department
Dax	Landes	—	16	Thermal Waters (boys and girls)
Salies du Salat	Haute Garonne	—	66	Mineral Water Station
Argèles	Hautes Pyrénées	—	15	Girls threatened with Tuberc.
Château de la Tisnère	—	—	—	Pay San. for Con. Children
San Salvadour	Var (Hyères)	—	200	Pay San. for Scrotulous and Consumptive Children

A very complete organisation exists in France for the care of consumptive children. This is directed by a society called *L'Œuvre des Enfants Tuberculeux*, which was founded by private initiative at the end of 1888, and recognised as of public utility by a decree of the French Government on 18th January, 1894. This society, unique in French annals, is entirely supported by private subscriptions, and is intended to promote the foundation of hospitals, asylums, sanatoria, dispensaries, agricultural colonies and other establishments for the gratuitous treatment of tuberculous children of poor patients, irrespective of creed or nationality. The society (which has a council of twelve and is under the scientific direction of a medical committee of twenty members) now has a dispensary in Paris, two hospitals or sanatoria in the country, and several small agricultural colonies for the training of those who have been cured in the hospitals, thus providing an unbroken series of steps whereby a tuberculous child may be cured and afterwards fitted

for a healthy open-air occupation. The dispensary is in the Rue Miromesnil, at its junction with the Rue la Boëtie. It was rebuilt in 1890, and is extremely well suited to its purpose, having light and lofty rooms, with walls and floors which can be readily cleansed. All adults are sent to other clinics, as well as children suffering from non-tuberculous ailments ; and an attempt is made by systematic cross-questioning to prevent the abuse of the charity by those who can afford to pay a fee. Dr. Derecq and Dr. George Petit are the physicians.

The hospital of Ormesson receives consumptive boys up to the age of twelve, those from twelve to sixteen being sent to the hospital of Villiers. None but consumptive children are admitted, and no selection is made, those in every stage being accepted.

The Ormesson Hospital

was started in an ordinary house at the end of 1888 ; enlarged to one hundred beds in 1890, with the help of the wood from the Exposition Universelle ; and completely rebuilt in 1896. It is situated on a breezy plateau overlooking the valley of the Marne in the little village of Ormesson, just above Champigny. The ground slopes towards the south, and the building, together with the high walls surrounding the grounds, afford a little protection against high winds ; but the situation is breezy rather than sheltered. There are five and three quarter acres belonging to the institution, which are partly devoted to playgrounds, partly consist of garden, cultivated and grass land. The soil is calcareous, and rapidly dries after rain. The building (fig. 57) is 114 metres above the sea-level. It is of one story, and consists of a large central glass-covered winter garden with huge windows to the south, and forming with the administrative offices a central axis, on either side of which are two parallel pavilions, making with it a letter **H**. One of these pavilions forms the refectory, and has at the western end the kitchen block. The other three form dormitories, each for about forty beds, and having at the free ends lavatories, bath-rooms and water-closets. The latter are arranged in radiating compartments, so that a number can be supervised by one person. They are isolated by the lavatories and bathrooms, which can be ventilated from end to end. The sisters' rooms lead off the dormit-

ories. The beds are of enamelled iron ; floors are of wood in the dormitories, of tiles in the dining-hall ; the walls everywhere washable, with rounded angles. Windows are large, of the usual French type, in three parts, with the tops rounded. The whole place was exquisitely clean when I visited it. Along the south side of the building is an open verandah on each side of the projecting winter garden. This is somewhat narrow ; and there are, I believe, no other open-air shelters for bad weather ; but the winter garden is very large and well-ventilated, and is probably sufficient for the purpose. The children in the playground are placed under the supervision of two men ; indoors they are under the care of the sisters. Drugs are but little used, reliance being chiefly placed on fresh air, good food and cleanliness.

The Villiers-sur-Marne Hospital

is about three miles from that of Ormesson, and stands on the same high plateau. It is in the midst of cultivated fields and gardens, at the extreme end of the village, and has nine and a half acres of ground belonging to it. It consists of three blocks arranged along one line 120 metres long, forming a long two-story building. The southern side is separated from the road (which is not a main road) by a large gravelled courtyard. On the other side of the road is a patch of garden bounded by trees. The grounds on the north are occupied by playgrounds and meadows ; they rise towards the fortifications of Villiers, with wooded crests in the distance. As in the case of the Ormesson Hospital, there is very little shelter. The soil is the same. The building (fig. 58) was founded in 1891, but was completed in 1896 by the addition of the Pavillon des Enfants de France. The central block contains on the ground floor two large day rooms, the library, drug room, and doctor's room ; and has in front along the south side a verandah with stone arches. On the floor above is a dormitory for the more serious cases, with a single row of beds. It is incompletely divided into separate rooms, and opens in front into a covered balcony with stone arches. Attached to the dormitory are two rooms for the nurses.

The left or eastern wing, called the Pavillon des Enfants de France (fig. 59), is a large hall containing 10,000 cubic metres of air, or 120 cubic metres per head, with an ogival roof rising to twelve metres above the ground, divided into a central and two lateral

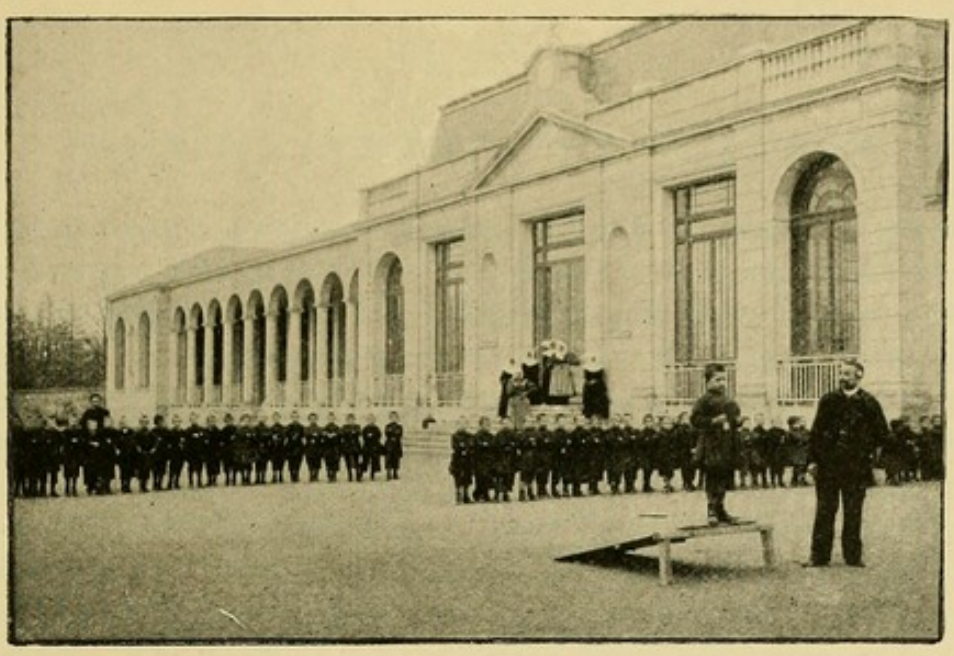


FIG. 57.—THE ORMESSON HOSPITAL. [*See page* 241.



FIG. 58.—THE VILLIERS-SUR-MARNE HOSPITAL—SOUTH FRONT.

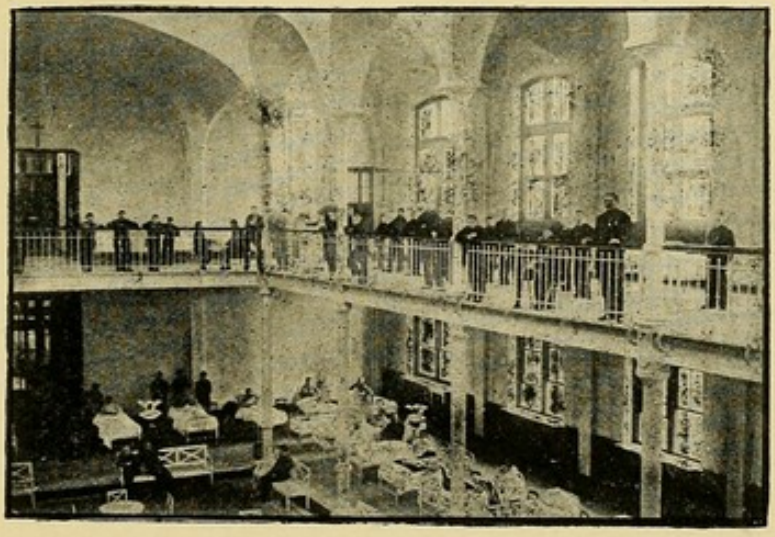


FIG. 59.—THE VILLIERS-SUR-MARNE HOSPITAL.
PAVILLON DES ENFANTS DE FRANCE.

[*Face page* 242.

naves, and partly composed of glass. This is supported by graceful iron columns, and provided with a gallery six metres wide, which runs all the way round. The building is of brick and stone, coated internally with white impermeable enamel, the angles being also rounded. The centre of the ground floor is tiled, and contains the ventilating openings and ozonisers, and is furnished with a few chairs and tables. The part underneath the gallery is slightly raised above the ground level. This and the gallery have varnished boarded floors, and are provided with a single row of blue enamelled iron beds radially arranged, together with other simple furniture. The windows are very large, being two metres wide and four metres high. They consist of two parts, of which the lower is a sashed window (English fashion); the upper a French window in four pieces, each of which can be separately opened, two moreover being perforated. The hall rests on a basement three metres deep impermeable to moisture, and containing the heating and ventilating apparatus, the bacteriological laboratory and electric lighting machinery.

In this basement, beside the calorifer is a reservoir for a medicated solution of creosote, turpentine and eucalyptol, which serves to medicate and purify the incoming hot air. The fresh air from outside passes through metallic gauze either directly into the hall or past the warming apparatus. The hot and cold air inlets are placed side by side in the embrasures of the windows. Round the galleries at the head of the beds are a series of tubes with trumpet-shaped ends, which supply ozone produced by the dynamo. The windows also allow of the direct entrance of fresh air. The vitiated air is carried off through holes in the roof with the help of a jet of steam in a turret. In this way at least 200,000 cubic metres of air are provided in the hall per diem. Eighty children can sleep in this hall, and two sisters, one for each floor, can readily look after them. At the northern end of the Pavillon des Enfants de France on the ground floor are the dressing-rooms, lavatories and bath-room. The latter forms half a circle, and is incompletely divided by radiating partitions two metres high, separating ten white enamelled iron baths. Hot and cold water are laid on in the bath-rooms and lavatory, which are arranged in English fashion, and (like the rest of the building) are heated with hot-water pipes. The walls are covered with Dutch tiles, and have rounded angles; the

floors are of mosaic; the wash-basins of white stoneware on white marble. Uniting the Pavillon des Enfants de France to the central block is the grand staircase, behind which are water-closets and lavatories on each floor.

The western wing is older than the eastern, and contains on the ground floor the kitchen department and chapel. On the upper floor are the quarters for the *personnel*.

The hospital is lighted with electric light. Filtered and sterilised water is laid on in the sick ward.

To the west side of the hospital grounds is a long line of one-story buildings, beginning with the lodge, and including the laundry, steam disinfector, linen store, clothing store, provision department, and workshops for repairs. They are large enough to serve all three establishments—the dispensary and the two hospitals at Ormesson and Villiers. The treatment at Villiers is of the same character as at Ormesson.

The average duration of treatment is 230 days.

The results at Ormesson are better than those at Villiers, probably because the patients more often enter at an earlier stage of the disease, and because under suitable conditions the younger patients are more readily curable. There is year by year a greater proportion of apparent cures, although all phthisical children without selection are sent to the hospitals.

There are four *agricultural colonies* connected with the movement—one of twelve hectares (twenty-nine acres) at Noisy-le-Grand, not far from Villiers; another at Tremilly in the Haute Marne; a third at Le Menillet (Oise); the fourth at Rougemont (Doubs). At each of these colonies there is a medical man in charge.

The Villepinte Sanatorium.

Another important organisation is the Œuvre de Villepinte, which has founded three homes or sanatoria for girls and young women. One of these is at *Champrosay*, for young anæmic workwomen with a predisposition to tuberculosis. Another is the *Alice Fagniez* Sanatorium near Hyères, open 30th October to 1st July, for girls in an early stage. The third is at *Villepinte*, for those aged six to twenty who are definitely phthisical: married women not admitted.

There is also a *dispensary* in Paris, and an *agricultural colony* at Champrosay.[1]

Marine Sanatoria.

There are twenty-three of these institutions, mainly founded by the *Œuvre des Hôpitaux Marins*, with a total of nearly 4,000 beds. Two with together 110 beds receive full-price patients. The first of these, at Berck sur Mer, was opened in 1861. The other is the Maison de Kerfany (Finistère). They are chiefly intended for the cure of scrofula; some exclude pulmonary tubercle.

Mountain Sanatoria.

There are six homes for children in the mountains, two in the Pyrenees, the others in Haute Loire and founded by the *Œuvre des Enfants à la Montagne.*

Holiday Homes.

Other societies exist which are instrumental in sending poor children into the country during the holidays, to the number of many thousands yearly. Prof. Grancher has initiated a scheme for *boarding out* children of poor tuberculous families in the country; the parents are expected to contribute something, even if they themselves require assistance, so as to maintain the natural parental bond.[2]

Mineral Water and Thermal Stations.

Under this heading are to be placed the establishments at Forges les Bains, Vialas, Dax, Salies du Salat, and Argèles. The last named was opened in 1878 by Dr. Bouillard for poor tuberculous girls. There is a simple house, large, airy and sunny, without unnecessary luxury. The inmates work at whatever a "daughter of the people" should know, including agricultural work, and are treated hygienically. There are sulphur waters which are also employed.[3]

The Sanatorium of San Salvadour,

at Hyères, combines the advantages of the Mediterranean climate with those of a sea-bathing establishment.

[1] *Tuberculosis*, March, 1904; see also *Zeitsch. f. Tuberk.*, July, 1904.
[2] *British Medical Journal*, 26th Dec., 1903.
[3] *Zeitsch. f. Tuberk.*, April, 1902.

It is placed in a beautiful park of twenty-five hectares, planted with pines, eucalyptus, mimosas and palms, and consists of two distinct establishments, one near the coast for scrofulous children, the other further inland for those affected with pulmonary tubercle. Children of both sexes from three years to twelve are admitted, the sexes being kept apart. Although primarily for paying patients, a system of purses has been instituted to aid those who could not otherwise afford to place their children there. The Sisters who are in charge have been medically trained in Paris.

Section X.—GERMANY.

CHAPTER XLVII.

GERMAN SANATORIA.

There has been an enormous addition recently to the number of German sanatoria. Not counting small private homes, there are about thirty sanatoria for paying patients, with a total of over 1,500 beds, and about eighty sanatoria for the people with about 6,800 beds.

The cost of erection of a sanatorium for the working classes in Germany varies between £120 and £300 per bed, the smaller institutions being the more expensive. Sanatoria for full-price patients cost from £300 to £600 per bed. Hohenhonnef, which is one of the most luxurious and complete, is said to have cost about £660 per bed without reckoning the ground, but including the doctor's and manager's residences.

The cost of maintenance is usually about 2.50 marks per day in popular sanatoria, half of which is for food. In homes for advanced cases, the daily cost will usually be over 3 marks per day. Full-price sanatoria cost more than double these figures. At Hohenhonnef the daily cost per head has been from 11 to nearly 14 marks; according to Léon Petit the daily cost at Falkenstein is about 6.30 marks per head. According to Schmieden and Boethke[1] the cost of half-timber sanatoria such as the Felixstift and those at Konigsberg, Erbprinzentanne, Schwarzenbach, Albrechtshaus and Marienheim, amounts to from £100 to £150 per bed.

The following table gives the cost of some of the German sanatoria :—

[1] *Zeitsch. f. Tuberk.*, Sept., 1904.

Name.	Marks.	Beds.	Cost per Bed in Marks.	Authority.
Sophienheilstätte	270,000	98	2,750	Schmieden and Boethke [1]
Ruppertshain	210,000	75	2,800	,, ,,
Loslau	325,000	90	3,600	,, ,,
,, after alterations	378,000	,,	4,200	,, ,,
Ludenscheid	480,000	100	4,800	,, ,,
Edmundsthal	302,958	,,	3,029	,, ,,
Felsberg im Odenwald	119,000 (incl. 4,500 mks. for ground)	35	3,400	,, ,,
Albertsberg	306,830	122	2,515	Beaulavon [2]
Brunswick	179,800	58	3,100	,,
Halle a. Saale	—	—	5,500	,,
Altona	—	—	2,500	,,
Oberkaufungen	429,000	100	4,300	Schmieden and Boethke
Lychen (children)	—	—	4,100	,, ,,
Ronsdorf	—	—	4,200	,, ,,
Grabowsee	767,176	189	4,070	,, ,,
Kolkovitz bei Kottbus	620,000	104	6,020	,, ,,
Kronprinz Wilhelm, Obornik	550,000	100	5,500	,, ,,
Belzig (Brandenburg)	—	—	6,090	,, ,,
,, (children)	225,000	30	7,500	—
Beelitz	—	—	8,500	Schmieden and Boethke
Waldbreitbach	674,000	122	5,524	With land and furniture
,,	,,	,,	4,705	Without land and furniture
Oderberg	678,500	115	5,900	Schmieden and Boethke
Rossbach a. d. Sieg	—	—	7,000	,, ,,
Sülzhayn	700,000	100	7,000	,, ,,
Behringhausen	—	—	7,400	,, ,,
Ernst Ludwig (Sandbach)	—	—	9,300	,, ,,
Stadtwald (Melsungen)	—	—	6,600	,, ,,
Marzell	660,960	108	6,120	Liebe [3]

For a discussion of the reasons for these differences, see Schmieden and Boethke, *loc. cit.*

A very useful movement has been the provision of *day-sanatoria* in the outskirts of Berlin and other large towns. People in need of fresh air come out here to spend the day; resting places are provided, and substantial meals at low cost. Those waiting admission come to these places with their families; and the medical officer in charge makes arrangements to teach them the more essential hygienic points.

It has been erroneously stated that the erection of sanatoria for and by the insurance companies in Germany was beginning to be discouraged. The truth is that these companies have so fully pro-

[1] *Zeitsch. f. Tuberk.*, Sept., 1904. [2] *Revue de la Tuberculose*, Dec., 1896.
[3] *Hyg. Rundschau*, 1897, No. 21.

vided for the needs of their clients in this respect that they are now turning their attention to kindred problems, such as the erection of convalescent homes, homes for advanced cases, and open-air colonies for the cured.

There were in September, 1903, sixty-seven sanatoria founded by German insurance societies, capable of treating 360,000 patients annually at three months apiece.[1]

With the exception of Nordrach Colonie and some of the smaller sanatoria, stress is laid in German sanatoria on *hydrotherapy*. There are usually five *meals* a day, sometimes with additional milk between. At Nordrach Colonie only three very substantial meals are given. Rooms are usually *disinfected* by Schering's formalin disinfector; at Oderberg, at Loslau and at Dr. Michaelis' sanatoria at Rehburg simple washing and airing are considered sufficient; at Nordrach the same, with a fresh coat of varnish on to the woodwork. At the Grabowsee Sanatorium the rooms and furniture are cleansed once a week with 1 per cent. lysol; at Dr. Koch's sanatorium in Schömberg, creolin is used for this purpose. Linen is invariably disinfected by steam heat. The use of Dettweiler's spit-flasks (or some modification) is universal; also of spit-cups for bedside use, which are sometimes disinfected with sublimate solution, sometimes with lysol, or with steam. The sputa are usually mixed with peat and burnt; in other places (*e.g.*, Albertsberg) they used to be poured into the W.C. without disinfection; but possibly this has been changed. Many of the modern sanatoria have special places for disinfecting the spit-cups with steam, and the spit-flasks with boiling water, the sputa being poured into the drains after disinfection.[2] At Kottbus a damp cloth dipped in sublimate solution is used on leaving the lavatory to cleanse the boots. Special lavatory basins are provided in many of the modern sanatoria for cleaning the teeth.

Seaside Sanatoria for Children.

There are a few sanatoria for children on the northern coast of Germany, established by a special society. They are not specially for consumptives, and resemble our own convalescent homes in their object.

[1] *Tuberculosis*, Sept., 1903 [2] See Oderberg, Kottbus, pp. 276, 267.

CHAPTER XLVIII.

SANATORIA IN EASTERN GERMANY

Comprising East Prussia, West Prussia, Posen, and Silesia.

Name.	Province.	Elevation in Metres.	Opened.	Beds.	Fees in Marks per Day.	
The Brehmer San.[1]	Silesia	561	1854	156	8-10	Dr. v. Hahn, Dr. Michaelsen and three more
The Brehmer San., 2nd class[1]	,,	,,	1894	179	4-6	Dr. v. Hahn, Dr. Michaelsen and three more
The Römpler San.[1]	,,	550	1875	85	8-11½	Dr. Joel and two assistants
The Weicker San.[1]	,,	560	1893	25[2]	6½-8	Dr. Weicker
Dr. Weicker's Krankenheim	,,	,,	1894	340[3]	4	Dr. Weicker, Dr. Schneider and three others
Reinerz Sanatorium[1]	—	—	—	—	—	—
Loslau Sanatorium	Silesia	300	1898	100	3	Dr. Schrader; Upper Silesia
Königsberg (Hohenstein)	E. Prussia	—	1903	50	3	Men only
Bromberg (Oplawitz)	Posen	—	—	60	—	Women only
Obornik (Kron Prinz Wilhelm)	,,	—	1903	120	—	Men only; Ins. Soc. of Posen
Niederzieder (Landeshut)	Silesia	—	,,	—	—	Women only; for Breslau
Niederschreiberau (Landeshut)	,,	—	,,	93	—	Prussian Hessian Railway; better class workmen
Slawentziz (August Hos.)	,,	—	—	—	—	Pav. for consumptives
Hirschberg Sanatorium	,,	—	—	120	—	For railway servants
Neudorf (Friedland)[1]	—	—	—	—	—	Dr. Kirchnest (non-resident)

The Brehmer Sanatorium,

which is the oldest in existence, is situated at Görbersdorf, a small village in the valley of the Steine, between the Eulengebirge and

[1] Pay Sanatoria.

[2] To be replaced in 1905 by a new building with thirty-two beds.

[3] Of these 240 for men.

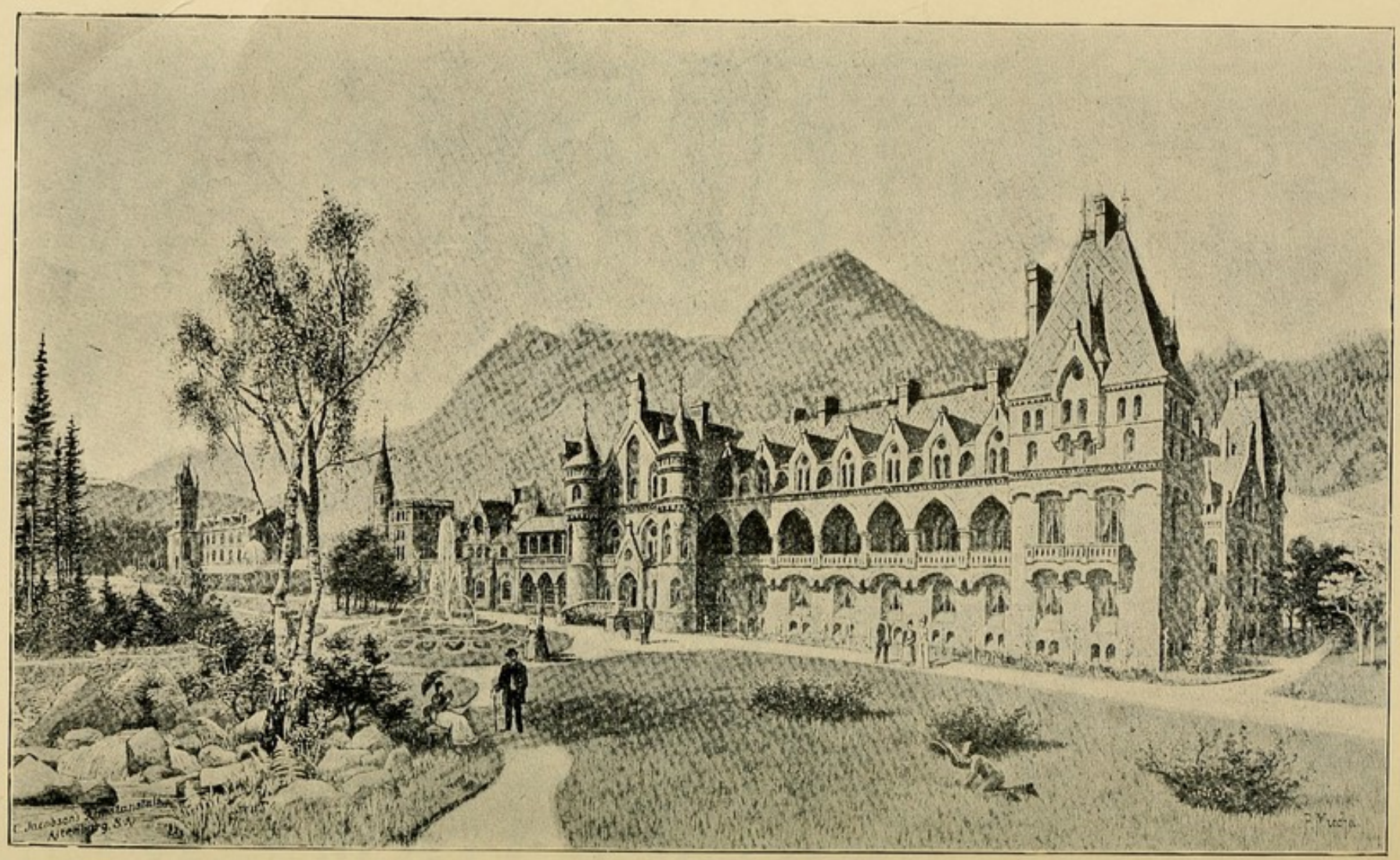


FIG. 60.—THE BREHMER SANATORIUM.

[*Face page* 251.

the Riesengebirge, in Upper Silesia, near the Bohemian frontier. The valley, which runs from north-west to south-east, is sheltered by densely wooded heights, which reach an altitude of 800 to 900 metres above the sea. It is here that Dr. Hermann Brehmer started his treatment in 1854, and from 1859 onwards erected the picturesque establishment which bears his name, the right wing being opened in 1862, and the left wing sixteen years later. Brehmer died in 1889, after which the sanatorium was successively directed by Dr. Felix Wolff-Immermann, Dr. Achtermann, Dr. Petri, and Prof. Dr. Rudolph Kobert formerly of Dorpat University. It has recently been managed by a company, Prof. Kobert and Prof. Flügge being among the directors.

The main climatic features of Görbersdorf are its atmospheric purity and freedom from dust, dryness of soil, shelter against strong wind, and cool summer temperature with abundant sunshine. Its altitude is insufficient to give it the character of an alpine climate, although the barometric pressure is somewhat reduced.

The sanatorium, which stands on porphyritic soil, has a park of 300 acres, consisting mainly of woodland, more than two-thirds of which is laid out in over nine miles of walks. Some of these are on level ground, while others are inclined at various gradients leading uphill from the sanatorium ; and all of them well provided with seats and summer-houses, so that the patient can, under medical advice, take exercise proportioned to his strength, and return downhill when he is getting tired. For robuster patients there are also walks up the mountain side to a height of about 200 metres above the building.

The sanatorium itself consists of a main building (fig. 60) with a number of isolated villas. The chief part of the structure is a huge Gothic pile, with towers, turrets and arches, consisting of three buildings of different dates, united in one line by covered passages and glazed galleries forming the winter garden. The central portion contains the doctor's quarters and administration. The right wing, a square building with a square tower attached to it, goes by the name of "Old Curhaus" ; the left being called the "New Curhaus". On the ground floor are the two dining saloons, library, ladies and gentlemen's conversation rooms, conservatory (or "cold winter garden") and palm house (or "warm winter garden") with a spring of water. The new Curhaus has a handsome entrance and staircase,

ornamented with frescoes and useful maxims. There are in the old and new Curhaus eighty-eight bedrooms with 104 beds. Those on the first floor of the left wing open on to an arcade with Gothic arches; those on the two upper floors have mansard windows. The walls are oil-painted up to a height of one and a half metres. The floors are also painted or covered with linoleum. No large carpets are permitted; but stuffed chairs, rugs and curtains are not objected to. The ventilation is partly by open windows, partly by air shafts for the foul air. The dining-rooms have "Kosmos ventilators," which renew the air five times per hour. The heating is partly by hot air, partly by hot water, partly by tiled stoves for burning wood. The rooms are lighted by oil lamps and candles. There is a lift for patients. There were in Dr. Brehmer's time no *liegehallen* or open-air galleries, as he objected to them, and laid more stress on exercise in the open air than on the rest cure. Under Dr. Kobert, however, several roomy fresh-air galleries have been built.

Of the three villas, the "White House" is close to the new Curhaus, and contains twelve bedrooms with thirteen beds; the "New House," with eighteen rooms and twenty-two beds, is a little farther off; and the "Villa Rosa," with sixteen rooms (one double bedded), is on a higher level in the woods. The establishment also includes chemical and bacteriological laboratories, a meteorological observatory, a large library with several thousand volumes (medical and general), a model dairy with sixty cows under strict veterinary control, stables, laundry and disinfection apparatus. There are two hydropathic installations—one in the main building, one in a cottage in the park. The sewerage is dealt with according to the "Heidelberg Tonnen System"; the disinfection of the waste waters according to Dr. Hulwa's system.

There is a Protestant chapel near the sanatorium, and a Roman Catholic church at Friedland, from which a priest comes over once a fortnight. For the patients' amusement a series of concerts, theatricals and the like are arranged.

Mode of Access.—The nearest stations are Friedland, on the line from Breslau to Freiburg; and Dittersbach, on the Silesian Mountain Railway. The former, which is six kilometres (nearly four miles) from Görbersdorf, is best suited to those coming from Breslau or Austria; the latter, nine kilometres (five and a half miles), is more convenient for the majority of patients. Carriages should be ordered

from the sanatorium. Görbersdorf is a post and telegraph station, but with no night service.

Second-class Patients.

Since April, 1894, patients have also been received under treatment at Görbersdorf at reduced rates. For this purpose a number of houses near the sanatorium have been utilised. Each house has a common assembly room, while kitchen, dining-room, music and reading rooms are in a separate building. The rooms are described by Hohe as roomy, lofty, light and cheerful. Patients have the use of the park and woods of the sanatorium. The dietary is about the same as in the other establishment, but somewhat simpler; the treatment in other respects being identical.

The Brehmer Sanatorium is by far the largest in existence. Including first and second class patients, a total of 335 patients can be accommodated, twenty-six in the village houses with which arrangements have been made, the rest in the various buildings belonging to the sanatorium. In Dr. Brehmer's time the largest number under treatment at one time was about 330; of whom two-thirds had to be lodged in the houses of the village. After his death there was a diminution in the popularity of the sanatorium; but under Dr. Kobert the number of its patients again increased. There are now eight medical officers, three bath attendants and six nurses attached to the institution.

The sanatorium has been somewhat severely criticised by Léon Petit and others, mainly on the ground that hygienic requirements have been sacrificed to architectural beauty. Doubtless much money has been spent on unnecessary adornments; and the heating, lighting and ventilation were open to improvement; but there is reason to believe that of late years many reforms have been effected. The sanatorium grounds are probably the finest in existence; and the place will always be of special interest to practical physicians as the first in which the hygienic methods of treatment of consumption were systematically carried out, and the value of "closed sanatoria" demonstrated.

DR. RÖMPLER'S SANATORIUM.

This establishment, which is placed within a few hundred yards of Brehmer's establishment at Görbersdorf, was opened in 1875 by

the late Dr. Römpler, in two houses belonging to Freiherr v. Rössing, which were shortly after bought by the doctor. The main building of the sanatorium, is in a strip of land of twenty-five to thirty acres, separated from the rest of its grounds in most of its extent by those of the Brehmer establishment. The total area which belongs to it is about 230 acres, seventy being woodland, and is laid out in the same style as that of the larger establishment, but has not yet had time to attain to the beauty of the latter. However, it has every requirement for successful treatment, and the sanatorium is stated to be comfortable and well managed. The park is on the slopes of the mountain side, and rises to a height of 800 metres above the sea-level, a Swiss chalet with balconies and verandahs, which is warmed in winter, being placed in the middle of the grounds for patients to rest in, and get books and refreshments. Other resting places and summer houses are scattered throughout the park.

The main building, or Curhaus (fig. 61), consists of two parts united by a large and well-ventilated winter garden. Each part consists of a centre and two projecting sides, four stories high. The main entrance opens on the one hand into the winter garden, on the other into a large dining-saloon capable of seating 200 persons. Near this are a reading-room, and waiting and consulting rooms for the medical staff. On the first floor are other assembly rooms, music, billiard and ladies' rooms. The Curhaus has over 100 bedrooms for patients, all of them comfortably and suitably furnished, and some provided with balconies. A large fresh-air verandah surrounds the Curhaus from nort-east to south-west. Communicating with this is a long covered walk extending into the grounds and provided with a concert hall. There is also a large terrace with glass roof on the first floor on the south-west side of the Curhaus, affording a fine view of the mountains. There is a passenger lift. The walls in the corridors and bathrooms are oil-painted: elsewhere of washable paper. The floors in the bath-rooms, winter garden, reading-room, balconies and terraces are tiled; in the bedrooms of lacquered wood. The bedrooms are heated by low-pressure steam, the dining-room and common rooms by Perkins' system of hot-water pipes; heating and ventilation of baths and douche rooms being effected by hot-water pipes from the kitchen. Chimneys are only present in one of the common rooms. The water supply is from a spring on the borders of the park seventy

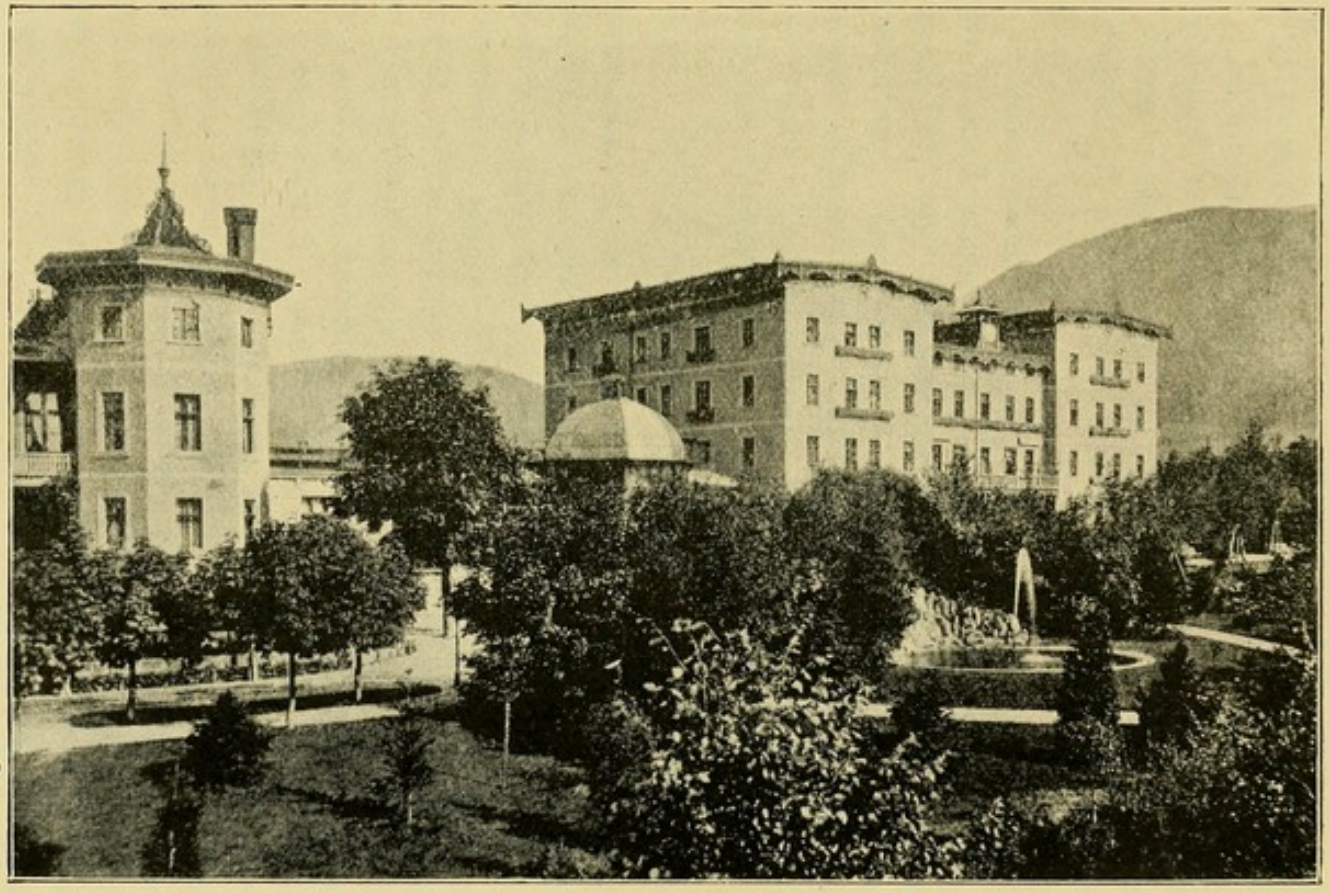


FIG. 61.—THE RÖMPLER SANATORIUM. [*Face page* 254.

metres above the sanatorium, and is therefore able to supply every floor. There are baths in the Curhaus, and baths and douches in a separate bath-house in the park. The water-closets in the Curhaus are provided with a good flush, the waste waters of every kind being filtered through coke one metre below the surface in the park, and the resulting effluent being pure and clear. Two separate villas in the park near the Swiss chalet are devoted respectively to convalescents and to those who wish to live apart from the other patients. There is also a chapel in the park, where service is held once a fortnight. A well-stocked library and numerous games are also provided.

There are two assistant physicians in the establishment, in addition to two trained nurses, three male and two female rubbers.

Both Léon Petit and Hohe speak highly of the arrangements in this sanatorium. The nearest railway stations are Friedland, which is twenty minutes' drive from the sanatorium, and Dittersbach, which is one and a half hours' by carriage. This may be ordered from the sanatorium.

Dr. Weicker's Sanatorium,

or the "Sanatorium of the Countess Pückler," owes its origin to a convalescent home for poor people founded by the late Countess Maria v. Pückler in 1883, at Schmidtsdorf, less than a mile to the west of Görbersdorf, and in the same valley. The institution, which belonged to the village of Schmidtsdorf, was acquired in 1893 by Dr. Hans Weicker, who converted it into a sanatorium for consumptives, and those suffering from diseases of the nose, throat and larynx. It is a small establishment, and its owner intends it to remain so, believing that in this way it is possible to give more individual attention to each patient. The sanatorium is sheltered by mountains to the north, and at a greater distance by wooded spurs to the east and west. The woodland belonging to the establishment amounts to scarcely six and a half hectares (sixteen acres), but the patients have access to the adjoining woods of Count Pless, according to an agreement with the owner; so that plenty of sheltered walks are available, with resting places and pavilions and beautiful views.

The sanatorium building is an oblong block four stories high, with a receding centre portion, in front of which is a terrace, and

higher up two deep balconies. The lower balcony is continued round the house to the east and west ends. There is a small open-air shelter or *liegehalle* touching the eastern end of the house. The rooms are simply furnished ; the walls being partly oil-painted, partly colour-washed, partly papered, and the floors painted or covered with linoleum. Every room has a chimney, and is heated by closed stoves. The lighting is at present by petroleum, but electric lighting is to be introduced. The closets are turf-mould closets, the waste water being clarified by filtration.

Dr. Weicker has introduced some modifications in the couches used, to enable various horizontal or reclining positions to be assumed. A small carriage is used to take slightly febrile patients across the park. Systematic respiratory exercises are prescribed in suitable cases.

Hydrotherapy is employed, but not in the form of douche. In the morning the patients are rubbed with a wet glove with water at 93° F., and replaced in a warm bed without being dried. For night sweats, sponging with solutions of spirit or camphorated spirit is used. Another favourite application is a hip bath at 93° F. followed by affusion at 86°. General massage is also applied every other day if the appetite is unsatisfactory. Moist compresses are used at night to counteract congestion of the lungs. Drugs are but little used, and mainly to combat urgent or troublesome symptoms. Cod-liver oil is seldom used ; very little alcohol is given, and only a moderate amount of milk.

Dr. Weicker's Krankenheim,

at Görbersdorf, is not a "closed sanatorium," but consists of a number of separate houses in the village, devoted since 1894 to the treatment of consumptive patients of the poorer classes. Only one of these—the so-called doctor's house—belongs to Countess v. Pückler's bequest (see p. 255), and is occupied by an assistant physician under Dr. Weicker, having been altered to suit modern requirements. This house contains the kitchen, dining-rooms and administrative rooms, as well as beds for those who may be attacked by intercurrent ailments. The other houses contain each a common room, in addition to bedrooms for the patients. Men and women are separately lodged, and have separate collective dining-rooms ; the women occupying eighty beds in three houses. Nearly all of the

villas have balconies ; but there are also three large sun galleries for common use. Many of the houses were built in Brehmer's time for a better class of patients, but have nothing very unusual in their mode of construction. Others are ordinary village houses altered to suit their new functions. In every case a garden surrounds the house. The rooms are described by Hohe[1] as being lofty and cheerful. The dining-rooms are on the south side. Walls are colour-washed or oil-painted. Windows have washable blinds. The heating is by means of porcelain closed stoves. Most of the bedrooms contain each two to three beds, some being single bedded. The beds are of iron, on wire mattresses, and provided with over-mattresses. The bedding is of wool, changed every week or fortnight. Every patient has his own wooden washstand without drawers. Collapsible iron lounges are used.

The increase in the numbers frequenting the *Krankenheim* is very remarkable, only twelve patients having been treated in 1894 and 510 in 1897. Patients agree to stay at least six weeks and usually remain twelve or thirteen. The majority are sent by the insurance companies and benefit societies, comparatively few paying directly for themselves. The men are under a house physician, with two or at times three male nurses (*Kraschnitzer Diakonen*); the women have a separate house physician, sister and female nurse. In addition to this, one patient in each house is chosen by the rest to act as *Obmann*. He has to take the temperatures every morning and evening (in the mouth), to see that rules are kept, and to report any breach of discipline or any complaint, which must be made in writing. The *Obmänner* collectively meet Dr. Weicker every Sunday, to report progress and make or receive suggestions.

Owing to the situation of the sanatorium, the patients have to use the public roads on their way to the woods. Patients use the same woods as those of the private sanatorium at Schmidtsdorf (see p. 255). The patients' beds are numbered, and each number entitles the occupier to three hours' rest in the fresh-air gallery, according to a prearranged list, thus preventing any clashing. Where longer rest is needed, the patient receives additional numbers.

It has not been found practicable to let the patients do any

[1] *Die Bekämpfung und Heilung der Lungenschwindsucht*, Munich, 1897.

work, as their capacity for work is very unequal, and yet each wishes to do like his neighbour; moreover, in case of hæmoptysis or other complication, the physician is blamed for letting them work. Contrary to the experience of some other directors of sanatoria for the people, Dr. Weicker has not found the women any more easy to manage than the men. To occupy the patients, as well as to aid their recovery, systematic breathing exercises are prescribed; courses of instruction in wood-carving, shorthand, etc., are also given, and no evil results have so far been observed. Rubbing, baths and douches are prescribed in much the same way as at Dr. Weicker's private sanatorium.

Dr. Weicker and the senior resident medical officer are responsible for the whole conduct of the establishment, both in medical and in other matters.

The Loslau Sanatorium

was opened by the *Heilstätten-verein für Lungenkranke* for the district of Oppeln in Silesia. It is a closed establishment exclusively for consumptives of the male sex belonging to the less wealthy classes, such as artisans, clerks, shopkeepers, teachers and the like. Arrangements have been made with the Silesian Insurance Society at Breslau to receive their clients in case of need.

The sanatorium has ninety-four hectares of land, of which ninety-one hectares are pine woods. Touching the grounds is a large forest, the use of which is secured by contract. The building has a southerly aspect, and is sheltered from wind to the north, north-east and north-west. It is a somewhat plain-looking structure of wood and iron, with a long fresh-air gallery on the south side in front of the basement, above which are a ground floor and two upper floors. It has a large dining-saloon and day room, balconies to the upper floors, and bedrooms to accommodate respectively one, two, three, and four patients each. The cubic space allowed in these amounts to forty-eight cubic metres per head, the ventilation being effected by open windows and air-shafts. The walls are coated with enamel paint to a height of two metres, and above this are colour-washed. The floors are of cement, covered with linoleum. The building is warmed by warm-water pipes, and lighted by electricity.

None but early cases are received. Patients remain about three months.

NIEDERSCHREIBERAU SANATORIUM

is in a patch of land traversed by a branch of the Prussian Hessian Railway between the Hochstein and the Moltkefel of the Iser chain of mountains. The southern piece below the railway is intended for a home for the aged, the northern for the sanatorium. A dense wood protects the latter to the east, the Iser chain to the west. The medical officer's house is near the entrance to the grounds. The main block has raised foundations, in front of which is a terrace for walking exercise. The ends of the building are brought a little forward to increase the protection. Near the entrance on the ground floor are the consulting-rooms and bath-rooms, also cloak-rooms with arrangements for brushing clothes. The wards are on the ground floor, first and second floors: twelve being single bedded with small balconies; and fourteen more reserve beds in the attics. On all floors to the north there are lavatories and W.C.s, nurses' room, servants' room, and a store for rugs; also a room for disinfecting spit-cups. Cubic space in wards is thirty to forty cubic metres. Each has a shaft for foul air, extending above the roof.

Three day rooms are provided besides the dining-room; a little altar is erected on the north side of the latter. The assistant medical officer and a voluntary physician live in the main block. The nurses are in the attics apart from the patients. The inspector lives in the administration block. Heating is by low-pressure steam; lighting by electricity. The engine house is thirty-five metres east of the main building.

The *liegehallen* are brought forward at the sides, and have windows at the back.

CHAPTER XLIX.

SANATORIA IN NORTH GERMANY

Comprising Brandenburg, Pomerania, Mecklenburg, and Schleswig Holstein.

Name.	Province.	Elevation in Metres.	Opened.	Beds.	Fees in Marks per Day.	
Blankenfelde	Brandenburg	—	1892	64	—	Women only; all stages
Buch	,,	—	1904	100	—	Men only; adv. stages
Birkenbusch	,,	—	—	—	—	,, ,,
Malchow	,,	—	1892	88	2	,, all stages
Beelitz	,,	—	1902	170	1.50	Berlin Ins. Co. (men); Dr. Pickert
,,	,,	—	,,	60	—	Berlin Ins. Co. (women); Dr. Pickert
Grabowsee	,,	38	1896	200	3	Red Cross Soc.; early stages only; men only
Belzig Kirchenforst	,,	94	1900	94	—	Berlin Brandenburg Ins. Co.; Dr. Moeller; both sexes
Belzig Bleichröder	,,	,,	1903	25	—	Both sexes
Belzig Children's Sanatorium	,,	,,	,,	30	—	Both sexes; Dr. Moeller
Kottbus	,,	80	1900	104	—	Brandenburg Ins. Co.; women only; Dr. Bandelier
Höckendorf San.	,,	—	—	80	—	Stettin San. Society
Eberswalde (Auguste Viktoria Heim)	,,	—	—	—	—	Section for Cons.
Rathenow	,,	—	1900	24	—	For the glass and metal-workers
Rostock	Mecklenburg	—	—	100[1]	—	—
Hohenlychen (Viktoria Louise)	,,	—	1903	80	—	Children; Red Cross Society
Apenrade	Schleswig Holstein	—	—	—	—	—
St. Peters Bathing Establ. (Ploen)		—	—	45	—	On North Sea Coast in a large fir wood; open May-Oct.[2]

[1] *Heilstättenbote*, Jan., 1901; seventy in winter.

[2] *Das Rothe Kreuz*, 1st May, 1901.

Most of the sanatoria in this section are but little raised above the sea-level. Two of them (Malchow and Blankenfelde) might be regarded as homes rather than sanatoria for consumptives, as their position and arrangements are not very suitable for the fresh-air treatment.

The Beelitz Sanatorium.

The Berlin Insurance Co. has purchased 140 hectares (346 acres) of land at Beelitz for the erection of sanatoria, convalescent homes, etc., at a cost of 9,000,000 marks. The estate lies on either side of the Wetzlar Railway, the northern portion being intended for consumptives, the southern for convalescents from other diseases. The main road further divides the estate into two halves, intended for the two sexes respectively. When the scheme is completed there are to be 1,500 beds in all; but for the present about one-third of this number has been completed, *viz.*, beds for 170 consumptive men, sixty consumptive women, and the same number of convalescents. A manager's house has been built for the estate on the convalescent section, and a smaller one on that for consumptive men.[1] The wards contain from one to four beds each and are mostly on the south side.

The floors are of asphalt covered with Dutch tiles. All angles are rounded. The walls are coated with a vitreous glaze. There is a special ventilating machinery which changes the air three times in two hours in the corridors and landings, once every hour in the sisters' and physician's rooms, twice an hour in the wards, three times an hour in the bathrooms and lavatories, five times an hour in the closets. There is both steam and hot-water heating. A large *liegehalle* on each side and on two floors is provided, with chairs in double rows, one row a foot higher than the other, subdivided by glass partitions; there is also a long covered walk for bad weather. There is a church in which Lutheran and Catholic services are held alternately. Five kinds of workshops and greenhouses, etc., have been provided to keep the convalescents of both male divisions employed.[2] The cost of maintenance of this huge undertaking is said to be 1,200,000 marks per annum.

[1] *Zeitsch. f. Tuberk.*, July, 1901.
[2] *British Medical Journal*, 4th Oct., 1903.

The Belzig Sanatoria.

Three sanatoria have been erected by the Berlin Brandenburg Sanatorium Society on thirty-eight hectares (ninety-five acres) of land at Belzig, about seven and a half hours by rail from Berlin. The largest is the *Kirchenforst Sanatorium*, the second (*Bleichröder Stiftung*) being erected with the help of a legacy, while the third is a model *Children's Sanatorium*. The land being somewhat flat, mounds have been heaped up to increase the shelter. The soil is sandy, as elsewhere in Brandenburg. The administrative portions are common to the three sanatoria.

The Kirchenforst Sanatorium

is a symmetrical building, one side of which is for men, the other for women. The wards for one, two, four and six beds respectively, are to the south. The main entrance, in the centre of the north side, has a large hall used as a day room, and in front of this the *liegehallen*. The bath and douche rooms are at the ends of the corridors; the consulting rooms, quarters for assistant medical officers and sisters, the offices, ward kitchens, staircases (two main and two subsidiary) and W.C.s are all to the north. In the basement is the inhalation room; in the projecting side masses, are the quarters for married officers, inspector, master engineer and gardener. On the first floor are two more day rooms. The large dining-room with lavatory next to it unites the main building with the administration block to the north, and leads to the kitchen department. On the first floor of the administration are store rooms and quarters for the staff. The engine house and laboratory form two distinct buildings.

The Bleichröder Sanatorium

is the outcome of a legacy originally given for tuberculin treatment, but, in consequence of an appeal, used instead for building a sanatorium for the less wealthy middle classes. The arrangement is the same as in the large Belzig Sanatorium, but on a smaller scale. There is a large vestibule next the entrance, leading to a day room and *liegehalle* on the south side, and to the dining-room on the north. This communicates with the kitchen of the other sanatorium by an underground passage; it is however not yet used,

the patients dining in the dining-room of the other sanatorium. The wards are all on the south side; most are for one or two beds; a few for more. There is a writing-room on the first floor; bath and douche rooms for men and women respectively on ground floor and first floors. The consulting rooms are on the south side of the first floor.

The engine house for both sanatoria is in a line with the administration block of the other sanatorium. With it are a workshop, laundry and disinfector, and stables. The lighting is by electricity; the heating by low-pressure steam in the main sanatorium, by warm water pipes in the Bleichröder Sanatorium. The laboratory is some fifty metres further off. There is also a church for the common use of the three sanatoria.

The Children's Sanatorium

lies to the west of the Kirchenforst Sanatorium. It consists of a central portion of three stories in centre, one story at sides, and of two wings which project so as to partially enclose a rectangular space. Under the whole building are cellars. The ground floor has in the centre the dining-room and entrance hall with cloak-rooms; and next to these on either side a large day room and large lavatories. In the wings are the dormitories, and at the junction with the central portion the sister's rooms with bathrooms behind. The wings also project northwards, to accommodate the ward kitchen, scullery and closets. In front of the central portion are the *liegehallen*, so that the sister can overlook both these and the dormitories. On the upper floor of the central portion are the doctor's quarters, and a sisters' room to the south, the examination room and a bathroom for matron and doctor to the north. In the roof are two isolation rooms each with two beds and a verandah, and to the north a staff bedroom and bathroom. One side of the building is for boys, the other for girls; there are two separate playgrounds, as well as separate arrangements for sleeping, lavatories, baths, etc. The dining-room and serving-room are connected by an underground passage with the Bleichröder Sanatorium and the kitchen of the chief sanatorium which supplies the food. In the lavatories each child has its own basin, brushes, soap and towel. The water is mixed to the right heat by the sister. In the same room is a closet for each child for clothes and dirty linen.

In the dormitories the pedestals are of iron covered with linoleum. Dirty linen from each floor goes through shafts to the cellar, and thence to the laundry. The floors are covered with linoleum over cement; in the bathroom they are tiled. The lower part of the walls is painted in oil, the upper part colour washed. The doors are covered with linoleum. Every window has a fanlight over it. In the *liegehallen* are cane lounges with hair mattresses and special blanket sacks to take in the whole body of the child. The place is heated and lighted in common with the other two sanatoria; the heating, however, is by hot-water pipes instead of steam.[1]

The Blankenfelde Sanatorium,

near Berlin, was originally a lying-in institution, which, being empty in 1892 at the time of the tuberculin craze, was converted into a women's sanatorium for consumptives. It has since then been gradually changed into a home for the reception of patients with various forms of chest disease.

The Grabowsee Sanatorium

is situated in the midst of a pine wood on a hill near the Grabowsee, and is about six kilometres from Oranienburg, and about eleven kilometres north of Berlin. It was the first sanatorium erected by the Red Cross Society, through the initiative of Geheimerat Dr. Gerhardt. Candidates for admission are examined at the Charité Hospital in Berlin. The site covers ten hectares of land, on diluvial sandy soil, in a neighbourhood free from industrial smoke, noise and dust. The land has been obtained on a long lease at a yearly rental of fifty marks.

Although primarily intended for the working classes, Kuthy[2] states that shopkeepers are beginning to insure beds for themselves in the institution. A committee of ladies has been formed to look after the families of the poorer patients. There are a few free beds, one of which is the gift of the Empress.

The sanatorium consists of over two dozen buildings, most of which are light shelters (*Döckersche Baracken*), with double paper walls, similar to those used in the army. When the sanatorium was first opened the patients were exclusively accommodated in

[1] *Zeitsch. f. Tuberk.*, Oct., 1903. [2] *Loc. cit.*

these *baracken*, but as time went on a few more substantial structures were erected. There are at present some eighteen or more of these light shelters in use, one of which is utilised as a chapel, another as a storehouse, another as the medical officer's residence, another as a workshop, while the rest are summer sleeping quarters for the patients, or (with one side removed) are used as fresh-air shelters (*liegehallen*). They are exceedingly light and portable, being entirely of wood and linen-backed paper, everywhere covered with oil paint. The windows are threefold, the floors a wooden framework which may be covered with linoleum. Windows in the peak of the roof, and ventilators round the stove pipe, with open windows, ensure abundant ventilation. These *baracken* are made of various sizes. In this sanatorium they accommodate eight patients each, and are furnished with beds, long lounge chairs, a table, pedestals, washstand and stove. Ordinary tents were found to be far inferior to these structures.[1]

The remaining structures consist of an administrative block, two winter pavilions, laundry and disinfecting apparatus, and the gas making and storing apparatus. The administrative block, solidly built of timber, contains the kitchen, scullery, larder, serving room, dining saloon, office and library, quarters for one of the assistant medical officers in one wing, and for the sisters and female servants in the other. The kitchen contains a roaster, meat boiler and milk boiler over a water bath. The dining-saloon is a large room, covering 127 square metres. In front of this building is a large fresh-air gallery. One of the winter pavilions, a single-floor structure of similar material, contains twenty-eight beds for patients. The other, with two floors, has fifty-two beds for patients, two day rooms (one covering an area of about 74 square metres), two consulting rooms, two lavatories, water-closets, douche and bathrooms, quarters of the sisters, a room for the bathman, and a common room. The bath and douche rooms are built out, and have a hot cistern over them heated by a steam pipe. Over the main structure is a large cold-water cistern fed by steam power.

Eighty beds can be used in the depth of winter. For the most part, two to eight persons sleep in each room, a few being single bedded. From thirty to thirty-three cubic metres air space is allowed per head. There are ventilating shafts in all the rooms, heated by

[1] Made by Christoph and Unmack, of Niesky, N. Lausitz.

hot-pipes. In the winter pavilions, which are heated by low-pressure steam pipes, there are inlets through the walls near the radiators, and outlet shafts which pass under the corridors and converge to the common chimney over the chief heating apparatus. The administrative block and the *baracken* are heated by ordinary closed stoves with chimneys. The sanatorium is lighted with acetylene gas produced on the grounds. There is a steam laundry with disinfector on the grounds. In this building fresh air is brought into each of the steam radiators. The inspector lives on the first floor. The mortuary is next the laundry. There is a good water supply from a spring sixteen feet deep. The sewage, which is water-borne, passes through sewers with gullies at intervals to a filtering tank, and from this to underground pipes in an irrigation field. The sludge is used as manure.

For the open-air treatment, the fresh-air galleries attached to the permanent buildings, and those formed out of *baracken*, are used. Patients are allowed to fish, play croquet and other games; an aviary and a number of rabbits also help to amuse them. In suitable cases they are permitted to do light work for remuneration. Walks may be taken outside the grounds with medical consent; but all resort to public-houses is naturally forbidden. Most of the patients are treated with douches or friction with cold-water applications; many are taught to do respiratory exercises.

The chief medical officer has several assistants. There are three sisters of the Red Cross in the sanatorium. The Brandenburg Insurance Society sends all its male consumptives to this establishment; most of those from the Berlin Insurance Society also come here.

The sanatorium may be reached from one of two stations: Oranienbaum or Fichtengrund. The latter is a little over two miles' walk.

The Malchow Home for Consumptives,

which is not a sanatorium so much as a hospital for the consumptive poor of Berlin, is situated at the village of Malchow, about eighty miles north-west of Berlin, in the midst of meadows and irrigation fields, on sandy soil. For shelter against winds, which is very inadequate, it is dependent upon the trees in the park, which covers three and a half acres of land.

The building is a long low unpretentious brick building with two floors and three in the centre. On the ground floor are the common rooms, and next to them on the south side two verandahs, which are used as protected walks and fresh-air galleries, but are not sufficiently sheltered to be of much use in bad weather. In the upper floor, which is reached at either end by a wooden staircase from the garden, are the bedrooms and dormitories. Four of these contain two beds apiece, two contain twenty-four each, and two about sixteen ; from thirty-five to forty cubic metres of air being provided per head. There is no central corridor, the rooms being placed immediately next one another. The heating is by low-pressure steam, the lighting by petroleum ; the ventilation by the windows, none of the rooms having chimneys. There are also a laundry and disinfection house, mortuary and water-filtering tank. Douche and shower baths for the patients will shortly be provided. There are three trained nurses (Viktoria Schwestern) ; and the institution is under the direction of a medical man who with the nurses has separate quarters in the old house belonging to the place and also looks after Blankenfelde.

Cod-liver oil, counter-irritants and so-called specifics are not much used, but a good deal of alcohol. According to Léon Petit, there is little or no systematic hygienic training, and very few facilities exist for carrying it out. The means of ventilation are also somewhat inadequate. On these and similar grounds the institution has been somewhat severely criticised by Prof. v. Leyden, Léon Petit, Beaulavon, and others.[1]

Kottbus Sanatorium

is in the midst of an industrial district, ten kilometres from the town of Kottbus. It stands in forty acres of land in a pine wood belonging to the town, in a sunny sheltered position. The soil for a considerable depth is of quartz sand. The main building is solidly built and consists of three floors and attics. The south front has two wings at an obtuse angle with the centre, separated by two slightly projecting towers, and continued by the *liegehallen.* At the end of these are separate villas for the medical director and in-

[1] Prof. v. Leyden, *La sollicitude des grandes villes pour les Tuberculeux*, Buda-Pest Congress, 7th Sept., 1894 ; Beaulavon, *Revue de la Tuberculose*, Dec., 1896 ; Léon Petit, *Le Phtisique et son Traitement.*

spector. The wards are all to the south in single row, and have one to six beds apiece; cubic air space thirty-six to forty cubic metres; fifty-six in single-bedded rooms; height 4·28 metres. On each floor is a nurse's bedroom connected by electric bell and telephone with the wards, etc. The doors, beds, couches, pedestals, are all of lacquered iron; the walls are oil painted to two metres high. Window space allowed is as one to four floor space; fanlights are provided over the casements. The upper panes are of ground glass; wooden sunblinds are placed outside. The floors and stairs are covered with linoleum, except in corridors, W.C.s and bath-rooms, where terrazzo is used. All corners are rounded. A special electrical ventilator brings filtered air from without into cold chambers in the basement, whence it passes to heating chambers and is moistened and distributed by shafts. Other shafts carry off the foul air. Heating is by warm-water pipes in the wards, elsewhere by low-pressure steam; smooth radiators being attached. Lighting is by electricity from their own supply. On the ground floor of the main block are the consulting rooms, office, rooms for the nurses and two large day rooms in the wings. Closets, common lavatories and rooms for brushing clothes with corresponding balconies are to the north of the corridors. Each patient has her own locker for clothes, etc., her own place and utensils in the lavatories, and her own locker in the boot room; also her own serviette holder of papier-maché stamped with a hot iron with her own name. United to the main block by the grand staircase to the north are two structures: on one side the chapel, over the douche and bathrooms, on the other the dining-room with kitchen department under it. A winding staircase in one of the towers unites the latter.

Further off is the engine house and laundry, with disinfector. Still further are the stables and ice house.

The six-bedded wards are not used for patients with expectoration.

Very complete arrangements are made for disinfection.[1]

There are two summer houses in the garden sheltered by the building.[2]

[1] See p. 249.

[2] *Zeitsch. f. Tuberk.*, Jan., 1901; Oct., 1901.

CHAPTER L.

SANATORIA IN CENTRAL GERMANY

Comprising Oldenburg, Hanover, Brunswick, Saxony and adjacent parts, including the Harz Mountains.

Name.	Province.	Elevation in Metres.	Opened.	Beds.	Fees in Marks per Day.	
Oldenburg	Oldenburg	—	—	—	—	—
Rehburg (Michaelis)[1]	Hanover	90	1886	32[2]	2 to 4	Dr. Michaelis; Dr. Scherenberg
,, (Lehrecke)[1]	,,	,,	,,	22	8 to 10	Dr. Lehrecke
,, Kloster San.	,,	,,	1901	—	3 to 4	Royal Hanoverian Sanatorium
,, Bremen San.	,,	,,	1893	30	2 to 3	Dr. Thorspecken; Bremen San. Society
Edmundsthal	,,	—	1899	103	2	Dr. Ritter; for men
,,	,,	—	1903	60	—	,, for women
Gross Hansdorf Invalidenheim	,,	—	,,	30	—	For men unable to work; Hanse Ins. Co.
Lippspringe (Johanniter)	Lippe Dettmold	—	1900	,,	—	Johanniter Society; men
,, (Minden)	,,	—	,,	100	—	Dr. Schaefer
,, (Ziegenrück)	,,	—	—	60	—	Johanniter Society; women
St. Andreasberg[1]	Hanover	—	—	17	—	Dr. Jacubasch
Oderberg	,,	640	1897	115	—	Dr. Ott; Hanse Ins. Co., Lubeck; men
Glückauf	,,	—	1900	—	—	Dr. Servaes; Hanse Ins. Co., Lubeck; women
Felixstift (Andreasheim)	,,	—	1898	40	—	Dr. Jacubasch; Hanover Ins. Co.; women
Königsberg	,,	450	1895	57	—	Dr. Andrae; Hanover Ins. Co.; men
Erbprinzentanne	,,	550	1898	58	—	,, ,, women
Schwarzenbach	,,	576	1899	90	—	Dr. Wegener; Hanover Ins. Co.; women
Altenbrak	Brunswick	310	—	—	6 to 6½	Dr. Pintschovius of Ketzin
,,	,,	,,	—	—	—	,, ,,
Albrechtshaus (Stiege)	,,	500	1897	86	—	Dr. Köhler of Hasselfelde; Brunswick Ins. Co., men
Marienheim ,,	,,	480	1899	30	—	Dr. Köhler of Hasselfelde; Brunswick Ins. Co.; women
Sorge[1]	,,	562	1902	62	3½ to 5	Dr. Sobotta; women
Sülzhayn	,,	450	1898	100	—	Dr. Kremser; Miners Trade Union, Halle on Saale
,, (Fernsicht)[1]	,,	,,	,,	10	8 to 12	Dr. Kremser; Dr. Brandenburg
,, (Waldhaus)[1]	,,	350	—	32	5 to 8	Dr. C. Wiemann; Sister Eliz. Teichgräber
,, Kurhaus	,,	,,	—	22	6½ to 8½	Dr. C. Wiemann; Hoffmann and Atmer
,, Krankenheim	,,	,,	—	—	4½	Dr. C. Wiemann; L. Schäfer
,, Glückauf	,,	,,	—	—	—	,, ,,
,, Hirschfeld	,,	,,	—	—	—	Dr. Hirschfeld
Lostau (Magdeburg)	Saxony	—	1902	60	—	Dr. Petzold
Vogelsang (Gommern)	,,	—	1899	200	—	Patriotic Women's Union of Saxony; Dr. Schudt; women
Adorf	,,	—	—	—	—	For Leipsic
Messeburg	,,	—	—	—	—	—
Duben	Sachsen Anhalt	—	—	—	—	Sachsen Anhalt Insurance Company
Römhild	Saxe Meiningen	—	—	50	—	Thuringian Insurance Company; women
Blankenhayn[1]	Thuringia	—	—	—	7½ to 10½	Dr. Silberstein
Sophienheilstaette (Berka)	Saxe Weimar	—	1898	80	3½	Dr. Koppert; Red Cross Soc., Weimar; men
Milbitz	,,	—	—	—	—	For Reuss
Reiboldsgrün[1]	Saxony	700	1873	150	5 to 11	Dr. Hofrat Felix Wolff
Albertsberg	,,	,,	1898	140	2½ to 3	Saxony San. Soc.; Dr. Schultze; men
Carolagrün	,,	650	1900	120	—	,, Dr. Gebser; women
Jonsdorf	,,	—	1894	33	—	Südlausitzer Krankenkasse
Coburg	Saxe Coburg	—	—	—	—	—
Liebenstein	Saxe Meiningen	—	—	—	—	Dr. Foss
Ostritz Invalidenheim	Saxony	—	—	20	—	For adv. cases; Women's Aid Soc. of Görlitz

[1] Pay Sanatoria.

[2] In winter, twenty beds.

The Rehburg Sanatoria.

In travelling southwards from Hamburg or Bremen, through the North German plain, a range of hills is met with to the west of Hanover, which at once attracts attention by its beautifully wooded and diversified scenery. It is about six miles long, with a direction from south-east to north-west, and rises in parts to a height of nearly 500 feet above the sea-level. Near it, to the north-east, is the Steinhuder lake; while the city of Hanover is some twenty-five miles to the east. The ridge is part of an ear-shaped patch of wealden strata, isolated in the alluvial plain. Its western slope is gentle, and is covered with conifers, oaks and other trees; on the eastern slope, which is more abrupt, beeches predominate. It is in a deep notch of this eastern side that the village of Bad Rehburg is situated, well known for its mineral springs and bathing establishments, and for its "whey cure" in summer. The bathing establishment and much of the surrounding country are in the hands of government. The village consists of a few wide streets of unpretentious houses, and of two main avenues at right angles to one another, overshadowed by beautiful trees, and lined with scattered country villas and rural hotels, each with its own patch of garden. The climate is a warm and moderately moist valley climate, chiefly remarkable for its freshness in summer, and for the absence of strong wind. The chief visiting season has for many years been from May to mid-September; but more recently the place began to be visited in winter also by consumptive patients; and when Brehmer's example led to the erection of so many sanatoria in Germany for the fresh-air treatment, three such establishments were opened at Rehburg, one being for the poor of Bremen, the two others for more wealthy patients. Exaggerated notions of the infectiousness of consumption have unfortunately injured the popularity of Bad Rehburg, which has consequently fallen into undeserved neglect. Those who wish for a quiet rural retreat, with beautiful country in the immediate neighbourhood, would do well to remember this once fashionable health resort. It is served by a narrow-gauge railway, which runs from Wunstorf, at the junction of the line from Hanover to Bremen with that from Berlin to Cologne and Holland.

DR. MICHAELIS' SANATORIUM,

which was specially built for the hygienic treatment of consumptives, is situated in the upper part of the village, and is surrounded on three sides by public woods, which cover over 300 acres of ground. It stands at a distance from the road, surrounded by a garden of about three acres, remarkable for its lofty and beautiful beech trees.

The sanatorium consists of a three-story building, with a few attics in the peak of the roof, and verandahs to the south and east. It has a southerly aspect, and the rooms are so arranged as to admit sunshine into every one. The centre of the building projects in a series of open balconies and fresh-air shelters, each of which stands a little farther out than the one above. The rooms behind these are well lighted by windows in other directions. There are a few common rooms, the dining-saloon having a capacity of about 1,000 cubic metres. The bedrooms, which are twenty in number, vary in size from 50 to 100 cubic metres. They have linoleum-covered floors, whereas in the common rooms there is parquet. The walls are covered with shiny washable paper, and the furniture is also for the most part readily cleansable. The heating is by low-pressure steam; the lighting by naphthalene lamps; but it is proposed to introduce acetylene, unless a public supply of electricity is provided. The visitors are almost exclusively consumptives, of whom only those in chronic or curable stages are admitted. There is a separate annexe for summer use.

As regards treatment, Dr. Michaelis agrees with Dettweiler in advocating rest rather than exercise in the majority of patients who come for treatment. Patients spend much time out of doors—often twelve or thirteen hours a day—lying out on cushioned cane lounges in the garden, the open south verandahs, or the summer-house. There is seldom a day when they are obliged to use the closed verandah. The oleander blooms freely out of doors in most seasons; and the evenings are nearly always still and clear. In cold weather, wraps and hot bottles are provided. During summer patients take whey from the royal establishment; or, if feverish, goats' milk or kefir. The whey is said to increase the capacity for other food. In the morning it is taken hot. The goats, owing to special feeding, yield milk free from the usual strong flavour. Unlike Dr. Dett-

weiler, Dr. Michaelis gives very little alcohol, and never undiluted. Baths and douches are provided in the royal bathing establishment. Dr. Michaelis lives in a separate villa in the village, an assistant medical officer sleeping in the sanatorium. Nurses are obtained as required.

Dr. Lehrecke's Sanatorium

was originally founded by Dr. P. Kaatzer, in 1886, but has been since 1896 under the care of Dr. Hans Lehrecke, who has considerably enlarged the establishment. It is not exclusively for consumptives—patients with various nasal, pulmonary and pharyngeal affections, convalescents from other health resorts, and those who are merely in need of change of air, being also received.

The sanatorium is situated at the junction of the two main roads of the village of Bad Rehburg, in one hectare (two and a quarter acres) of land, close to the royal bathing establishment and Curhaus. It consists of a horseshoe-shaped two-story building next the main road, and of detached blocks in the garden for the kitchen department, bath and douche rooms, engine house, doctor's residence, laboratory and consulting room, etc. The rooms are said to be airy and light, the corridors being well lighted by the staircase skylight, as well as by windows of their own. The bedrooms are in communication with a glass-covered verandah, which is open day and night; some also have sitting rooms attached to them. There are altogether four sheltered verandahs, three of which are over forty feet long, and can be warmed if necessary. There is also an open sheltered terrace, where, under Dr. Lehrecke's direction, and in the charge of an attendant, the patients in summer expose themselves undressed to the air, lying on rugs or hammocks. The common rooms comprise a large dining saloon, reading room, billiard and music rooms. There is also a dark room for photography and examination with Röntgen rays. The lighting is by electricity. Heating is by closed stoves, on each of which is placed a vessel of water. There is a special water supply from a spring in the garden, of pure quality and at a temperature of 10° to 12° C. The water is filtered through sand, and pumped by the electric motor to the top of a tower for distribution throughout the establishment. Closets are of English pattern (Tornado), provided with a good flush and carefully ventilated. There is a very complete

hydropathic installation in a separate wing, with brine baths, mud baths, pine baths, effervescing baths, etc., which, with massage, are applied by skilled attendants under medical direction. The rooms and corridors are laid with linoleum, and washed daily with soap and washing soda, followed by sublimate solution. Noisy and dust-producing household work is done on the flat-topped roof of a separate building, or in a large meadow adjoining the garden. Ozone producers are used in the bedrooms and sitting rooms.

Only consumptives in the first and early second stages are admitted. They are treated by rest and exercise in the open air, and by the "air bath" already alluded to; by active and passive respiratory exercises, massage, electricity, inspiration of compressed air by Waldenburg's apparatus, followed by expiration into slightly rarefied air; methodical holding of the head, breathing through the nose, and graduated walking exercises under medical supervision. Hydrotherapy forms an important part of the treatment.

Drugs are prescribed rather more freely than in some other sanatoria.

Dr. Lehrecke has two assistant physicians under him.

The Bremen Sanatorium

is at Bad Rehburg, a little to the north of the Royal Bathing Establishment. It was the third of those opened in Germany for the poor, being preceded by the one at Malchow and the small one at Falkenstein, now replaced by the Ruppertshain Sanatorium. Originally containing twenty-four beds, it was enlarged in 1894 by the additions of wings, raising the number to thirty, twelve for women and eighteen for men. It was at one time under the medical care of Sanitatsrat Dr. Michaelis, the owner of the private sanatorium, who was chiefly instrumental in founding the Bremen Sanatorium. It stands in a very sheltered position on the hillside, and owing to the slope of the ground the western half of the building has been built on a slightly higher level than the eastern. Close to it are corn fields; a small garden lies to the south, and densely wooded hills protect it to the north and west, and the high beech trees of Bad Rehburg to the east.

The building consists of a centre and two wings, which form a nearly unbroken line facing south. In the centre are a dining-room, day room, doctor's room and matron's room, and in the projecting

bow a room with four beds. The east wing, which is for men, contains two large rooms with four beds each, and two smaller with two beds each, and under the roof another room with two beds. The west wing, for women, has two rooms with four beds each, and two rooms with two each. The rooms are four metres high, the larger being 7 × 9 metres, the smaller $3\frac{1}{2}$ × 7 metres. The walls are colour-washed; and in the dining-room there is also linoleum to the height of the shoulders. Floors are everywhere covered with linoleum, which is daily cleansed with damp cloths. The place was beautifully clean when I visited it, simple, homely and practical. The heating is by means of close (Lönhold) stoves; the lighting with petroleum. The furniture is simple; bedsteads of iron, with spring and horsehair mattresses.

The sanatorium is managed by a matron (a sister of the Red Cross), who does what nursing, rubbing, etc., are needed. She has under her a cook and kitchen maid, housemaid, and a man.

Patients who are medically fit help in the lighter household duties, such as making the beds, cleaning their own boots, and cleaning the spit-cups.

Edmundsthal Sanatorium,

at Geesthacht, for the city of Hamburg, is placed in a little pine wood about thirty metres above the river Elbe, where it is sheltered on three sides by wooded hills. It consists of a main block, engine house, doctor's house and outbuildings. The main block is T-shaped, the top of the T facing south, and has a basement with two upper stories. The whole of the southern portion consists of wards, as well as the ends of the northern pavilion, the connecting piece consisting of kitchen department below, and dining-hall above. In the basement of the southern building are baths and lavatories. Adjoining the wards are wide corridors which form day-rooms; and outside these are verandahs. Four large wards contain twenty beds apiece. These wards are each divided into five divisions by partitions reaching half-way to the ceiling. Four smaller rooms contain each four beds, besides which there are seven single-bedded rooms. All but three of the latter are on the south side. Heating is by low-pressure steam; lighting by electricity. Hot and cold water are everywhere laid on. The place is intended for men who are not insured in the Sickness Insurance Companies. The site

was given by the city of Hamburg, as well as £3,000 per annum for five years. Total cost nearly £17,500, two-thirds of which were given by Herr Siemers.

Another Sanatorium has been added for women.

The Minden Sanatorium,

at Lippspringe, consists of two blocks, each with fifty beds, one for Evangelical, the other for Roman Catholic patients. Each block has a separate kitchen, but the administrative block and disinfector, douche and bathroom, isolation hut and mortuary are in common. The site, which was given free by the parish, is between Paderborn and Lippspringe, surrounded by pine woods excepting to the south, where there is a beautiful view over Lippspringe. The buildings are similar in every respect. In the basement are the kitchen, storerooms, and engines for low-pressure steam heating. The bedrooms on ground floor and first floor are all to the south, and over four and a half metres high : they contain from one to four beds apiece. The *liegehallen* are three in number on each floor, central and lateral. In a projecting pavilion to the north is the dining-room, and over it the nurses' quarters. The floors are of *torgament.* Electric lighting is from the town supply. There are shafts for dirty linen to the basement.[1]

The St. Andreasberg Sanatoria.

St. Andreasberg is a small town of nearly 4,000 inhabitants, with a visiting population of nearly as many more, who come to the place chiefly for hydropathic treatment or for change of air. It is situated partly on the side of a long hill, and partly in some of the adjacent valleys. It is said to be the most elevated town in Northern and Central Germany, and has long been known as a cool summer resort. Mining operations are carried on in some of the neighhouring valleys, but there are no large factories to sully the purity of the air. The place has two hydropathic establishments, and several hundred lodging houses, besides half a dozen hotels, a concert hall and theatre, and a "Kurpark". Electric lighting and electric trams are, it is said, to be introduced before long ; but with all this, it remains a quiet and unpretentious town.

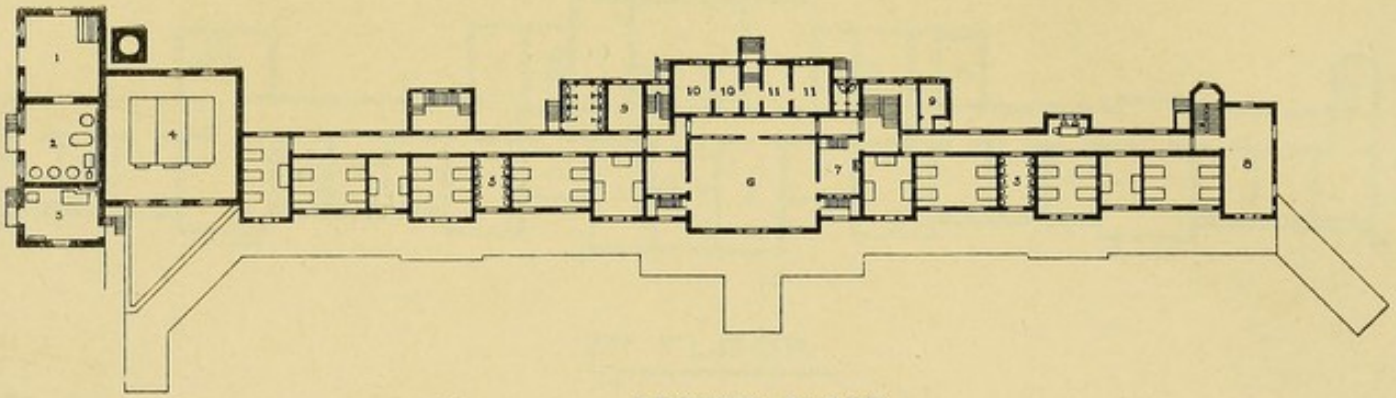
[1] *Heilstättenbote*, Sept., 1901.

The surrounding country is exceedingly varied and picturesque, with open moorland in some directions, and pine-clad mountains with deeply cleft valleys in others. Consumptives in early stages are received at the two hydropathic establishments founded by Drs. Jacubasch and Ladendorf. The former lays special stress on the value of pine baths and inhalations. Despite the somewhat inadequate arrangements, good results are said to have been obtained. St. Andreasberg is the terminus of a small branch railway from Scharzfeld, on the line from Nordhausen to Northeim, about four and a half hours' rail from Hanover. In this neighbourhood are the Oderberg, the Glückauf, and the Felixstift Sanatoria.

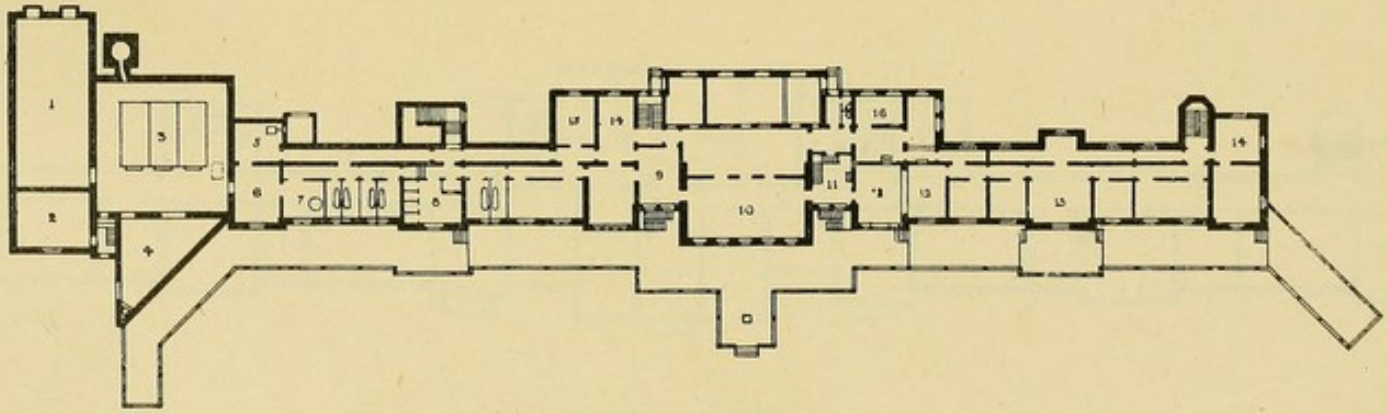
The Oderberg Sanatorium

is on the road from Andreasberg to Oderhaus, in the Harz Mountains, on the south side of the Oderberg. The sanatorium is protected to the north by rising ground covered with woodland; and to the west, and partially to the east, by outstanding thickly wooded spurs of the Oderberg. To the south is falling ground, partly meadow and partly woodland.

The sanatorium consists of a main building, doctor's house, disinfection house, sundry stables and cowsheds, and two cottages for some of the servants. The main building, which has a due south front, and is built of wood on a solid basement, consists of a central block and two wings, with boiler and engine house at one end, all arranged in a long line of 102 metres about 90 from the main road behind. Owing to the fall of the ground, the basement is above ground in front. It contains the kitchen, scullery, bath and douche rooms, cellars and store rooms, some of the ventilating machinery, and the workshop for repairs, and has in front of it a fresh-air gallery with diverging ends (see figs. 62, 63). The ground floor has in the centre the common dining-room, with the inspector's consulting rooms behind, and on either side patient's bedrooms, which all have a southerly aspect. There are also in each wing a lavatory and a nurses' room, and at the eastern end a common room 28 × 13 metres (92 × 42½ ft.) in size. The next floor has in the centre the inspector's quarters, linen rooms, and others for the committee of management; those in the wings resembling the rooms on the ground floor. Above this is an attic floor, of which the centre is occupied by bedrooms for the women servants, linen rooms, etc.,



GROUND FLOOR



BASEMENT

FIG. 62.—ODERBERG SANATORIUM.

[*Face page* 276.





FIG. 63.—ODERBERG SANATORIUM.

[*Face page* 276.

while the sides are like those on the lower floors, excepting that in place of the common room there are four isolation wards. These have no direct communication with the rest of the bedrooms, although they are approached by a passage from the common corridor. Each floor is served by a longitudinal corridor at the back. For security in case of fire, a massive wall with iron doors separates the western wing from the rest of the building. Of the bedrooms, seven are for one patient, fourteen for two, six for three or four, fourteen for four each. A few more can be accommodated in other rooms in case of need. The average cubic space per head is 35 cubic metres, the average floor area, 10 square metres, the height of the rooms being 3·80 metres. The walls are boarded and colour-washed ; the floors of pinewood covered with linoleum, excepting in the kitchen and scullery, where there are tessellated pavement and partially tiled walls, and in the bathrooms, which have glazed tiles and a cement floor. The rooms have double windows. The furniture is of lacquered wood or iron, free from unnecessary dust-retaining irregularities. The dining tables are covered with American cloth, fastened with wooden fillets along the edges. The bedsteads are spring-bottom iron ones ; the mattresses are of horsehair in buttoned-up linen cases, with buttoned-up linen covers outside, and the same system is adopted for the pillows. The washstands and pedestals are of enamelled iron with glass tops. The lavatories on each floor have enamelled iron basins, with hot and cold water laid on, the plumbing resembling that of English lavatories. The water supply comes from springs in a meadow belonging to the institution, to the north of the main road, and is stored in three reservoirs.

The heating is by low-pressure steam, the lighting by electricity. Ventilating fans driven by electricity force a stream of air (which is warmed if necessary) into a long channel in the basement, which in turn supplies every room. In this way 80 cubic metres (2,825 cubic ft.) per head can be supplied every hour. Inlets exist in every room near the ceiling ; outlets near the floor ; these communicate with separate shafts and are covered with gratings. During the greater part of the year the incoming air comes through open windows ; in very severe weather the windows are closed and warm air forced in by the ventilating machinery.

Adjoining the western wing is a boiler and engine house, and next to it the accumulator room, with coal cellar and ashpit outside.

The boiler and engine produce steam of 7 atm. pressure for the electromotor, reduced to 2 atm. for cooking and disinfection, and farther to $\frac{1}{10}$ atm. over-pressure for warming the building and incoming air, and for heating the water for baths and scullery. The closets are movable automatic earth closets, in a partially built out and well-ventilated pavilion to the north of the basement corridor. The waste waters are disposed of by irrigation. Earth closet pails are also provided elsewhere for use during the night, and for the women servants, engine room staff, etc. The fresh-air gallery is $3\frac{1}{2}$ metres wide by 130 metres long, with wood cement roof, the height of which is from 2·75 to 4·6 metres. It communicates directly with the bathrooms, and with the staircase to the dining-saloon, and embraces, with its diverging ends a sheltered gravelled recreation ground. It has places for sixty patients. The doctor's house is about forty yards to the south-east, so placed as to command the fresh-air gallery. The disinfection house, which also contains a mortuary and *post-mortem* room, is about fifty feet westward from the engine house. The disinfector is double, with separate approaches for soiled and disinfected linen. Owing to the altitude, extra superheating is necessary to ensure disinfection. The stables, cowsheds, and houses for the servants, are still farther off (100 to 150 yards) to the west, the latter being near the road.

The staff, which is under an inspector, consists of twenty-five in all, and includes four male nurses (who also clean the rooms), a female cook and three kitchenmaids; a machine tender and his mate; a heater; a steward and his wife; coachman and messenger. Some of the lighter duties, such as the cleansing of the spitcups, are performed by the patients, an overman being chosen for every section of the building (each containing about twenty patients). He is responsible for the tidiness of the rooms, the daily removal of closet pails, and the cleanliness of the closet of his own section, of which he keeps the key; for the regular use of the thermometer, the proper conduct of his own set of patients, extinguishing of lights, observance of rules concerning books, and the like.

The sanatorium is intended exclusively for consumptive men insured in the Hanse Insurance Society of Lubeck who are likely to recover their health or their earning capacity. The average stay is three months; but this can, if necessary, be extended. The charges are defrayed by the insurance company. There is no park

belonging to the establishment, but there is plenty of open land around it; and patients use the fresh-air gallery and recreation ground, or the public pine woods near by. The douche is used after the weekly bath, not usually at other times. Newspapers and political discussions are forbidden. Each patient is free to attend the religious services at St. Andreasberg with the doctor's sanction or to abstain from so doing if he has conscientious scruples.

The nearest railway stations are at St. Andreasberg and Oderthal.

The Genesungshaus Andreasheim,

formerly called the Felixstift, owes its existence to the efforts of the late Dr. Ladendorf, the cost of erection having been largely defrayed by a legacy; but has recently passed into the hands of the Hanover Insurance Co. Situated to the west of St. Andreasberg, about half an hour's walk from the town, it stands on a steep hillside, looking over meadows and a little stream to a pine-clad hill. It has a southerly aspect and is protected on all sides from cutting winds, the most distant view being to the south-west.

The building is a pretty structure in Swiss style, built of wood on a granite foundation, with red-tiled roof; and has accommodation for thirty-two patients at present, which number will be increased to forty when the place is completely furnished. It consists of a raised centre and two wings. In the western wing on the ground floor is a large dining-saloon, with a small serving room to the north, a large window on the western side, and a large covered projecting balcony on the southern front. In the centre of the south side is the entrance hall with office and matron's and consulting rooms; and behind it the staircase. The rest of the ground floor and first floor is taken up with patient's rooms, some of which can be used as sitting rooms if necessary. The centre has a few attics in the peak of the roof. The basement, which is level with the ground in front, contains a light and cheerful kitchen in the left wing, with a small scullery, and near them a bathroom and douche room, the larder, and various store rooms, together with the heating apparatus. The bedrooms, some of which have small balconies, are cheerful and airy, the walls painted, the wooden floor oiled and provided with a strip of carpet near each bed. The rooms are ventilated partly by means of open windows, which are

in three parts independently movable; partly by warm-air inlets near the floor and outlets near the ceiling, which lead into separate shafts. The heating is by low-pressure steam; the lighting by petroleum. There are two to three beds in each room; a few are single-bedded.

The Königsberg Convalescent Home

is situated about 3½ kilom. (two miles) from Goslar, in the northern part of the Harz district, in the midst of beautiful pine woods. It was originally a private villa, but was converted into a sanatorium by the addition of a large dining-saloon. Opened by the Hanover Sickness Insurance Company, purely as a convalescent home for men, it was after a time devoted chiefly to consumptives, owing to the number of other convalescents attached to the insurance company being insufficient to keep it full. The building has a south-east aspect, and has a meadow in front of it with a rapid downward slope. Across the valley in front is a wooded hill; on each side of the meadow and the sanatorium are pine-woods. The ground also falls to the south-west, and rises to the north. Owing to the height of surrounding hills, and the neighbouring pine woods, there is a good shelter against cutting winds.

The building is of wood, in the Swiss style, with a turret in the middle. The chief entrance is at the south-west end, which leads into a corridor running parallel to the front, with rooms on either side. At the opposite (north-east) end is the new wing, containing the kitchen and dining-saloon. From the latter a door leads on to a broad verandah, and thence to the garden. The bedrooms for patients are on the ground floor and first floor. They are placed on all sides of the building excepting the north-east, and hold from two to four beds each. They are light and cheerful, with linoleum-covered floors, washable paper on the walls, varnished wooden wainscots, large French windows (mostly with balconies), and plain, clean-looking furniture. The bedrooms on the second floor are for the staff. There is a reception room on the ground floor near the entrance. Hot and cold water are laid on to every floor. There are three earth closets, but only one bathroom. The basement contains heating apparatus, engine and dynamo room, small accumulator room, four cellars, and a larder; and in the added wing a cheerful kitchen with tiled walls and floor, and windows on three

sides. Near this are a disinfecting room, laundry and stables, and over these a drying space and the quarters of the farm manager. These are all separated from the rest of the house by a narrow passage. The lighting is by electricity, the heating by low-pressure steam. A two-horse power engine supplies a 36-celled accumulator; these suffice both for heating and lighting, and for pumping water from the meadow to a cistern under the roof.

Fourteen patients are lodged in a *Dockersche Baracke*[1] in the meadow. Ninety per cent. of those admitted are consumptives. Patients do light work for wages if the doctor permits, and also the lighter housework.

The institution is managed by a sister of the Hermittenstift in Hanover, and is under the care of Dr. Andrae of Goslar, who comes over twice or three times a week.

The Erbprinzentanne Sanatorium,

opened by the Hanoverian Sickness and Old Age Insurance Company at Zellerfeld, for the reception of women, is situated in one of the most elevated and open parts of the Harz district. Leaving Goslar by rail the train goes panting and puffing up a steep incline through a winding river valley skirted by dense pine woods, until it reaches the bare and open mining country near Clausthal. Adjoining this important mining village is the more purely residential village of Zellerfeld, which climbs the hillside on the way to an elevated plateau consisting chiefly of meadows and cultivated land. About a mile from the village, near a small lake and stream, is a pine wood, by the side of which the sanatorium stands. It was originally a restaurant and brewery, and is next the main road, opposite a village inn. This circumstance is probably less disadvantageous in a women's sanatorium than would be the case in one for men. Altogether $5\frac{1}{2}$ hectares, mostly woodland, belong to the institution, which with the exception of the above-mentioned inn has no other buildings near it. The soil is of sand or rock.

The sanatorium consists of an old wooden structure and a brick-built house to which have been added a new one of timber and plaster on a brick foundation, and some stables. These form three sides of a square, and surround a courtyard partly covered with grass, partly paved with granite blocks—asphalt not standing the

[1] See p. 264.

severe cold met with in this district in winter. Across the road to the north-east is a sheltering line of pine trees, and beyond them a sudden fall to the stream ; behind the sanatorium, and to the sides, a thick belt of trees. High pine-clad hills may be seen on the horizon in most directions ; but the pine trees around the building form the only efficient wind screen.

Each part of the sanatorium consists of a basement, mostly occupied by cellars, and of a ground floor, first floor, and second floor under the roof. On the right of the courtyard at the north-west end is the original wooden building, the ground floor of which is partly occupied by the consulting-room and administrative rooms. At the junction between this building and the centre block are the quarters of the nursing staff. The centre block has a large day room and the dining-saloon on the ground floor, and behind these a wide verandah which also extends along the north-west end. The corridor serving these rooms is next the courtyard, and leads to the closets, of which there are two on this floor, one for the staff and one for the patients. The kitchen, which is also on the ground floor, has a central stove and tiled walls. At the extreme end of the centre block are two bedrooms separated by a short passage from the rest for cases requiring isolation. On the next floor are most of the bedrooms ; there are nine of these, accommodating from two to five apiece, or a total of forty. The walls are painted, floors covered with linoleum. The bedsteads are of iron, the mattresses partly stuffed with vegetable fibre. The washstands are of enamelled iron with drawers and glass tops. The pedestals are also of open ironwork with glass tops. There is one bathroom with two fixed baths. The heating is by means of closed stoves. The staircases are of cement. The further wing is composed of stables and cowsheds, together with the farm manager's house.

The sanatorium is connected with the telephone system.

SCHWARZENBACH SANATORIUM

was originally an institution for nervous diseases belonging to the late Dr. Appenrodt of Clausthal, and was bought by the Hanover Insurance Co. and converted into a sanatorium, at a cost of £7,850. It consists of a main block with seventy-six beds, and a *Döcker Baracke*[1] with fourteen more. The main block has basement,

[1] See p. 264.

ground-floor, first and attic floors. The kitchen is in the basement, together with the heating and disinfecting apparatus and three bath-rooms. There are nine bedrooms on the ground floor. Electric lighting: earth closets.

THE STUBECKSHORN FARM COLONY,

on the Lüneburgen Heath, opened by the Hanover Insurance Co., deserves mention. It has 750 hectares of land, sixty-five of which are pine woods. An old building has been remodelled and a new wooden one erected at a cost of 105,000 marks. A farmer and his wife manage the farm and dairy; there are also a gardener, clerk, five men and four maids. Patients stay as a rule seven weeks and are employed in road making, gardening, and the lighter field work. Some work four hours a day, some six hours, others eight hours. The doctor comes out twice a week from Soltau.[1] The bedsteads are of wood, provided with feather beds and blankets. The heating is by low-pressure steam-pipes; the lighting by petroleum lamps. There are six well-fitted water-closets and lavatories on the north side. The sewage is carried to six clearing tanks, where it is treated with alum and lime, being afterwards filtered through sand on its way to the little stream.

Patients sleep two or three together in one room, a few single-bedded rooms being also provided.

THE STIEGE SANATORIUM,

which is called Albrechtshaus, after the Prince Regent of Saxony, was erected by the Brunswick Sickness and Old Age Insurance Company. It stands near the narrow-gauge railway from Gernroda to Hasselfelde, and a mile or two from the little village of Stiege. The road to the sanatorium passes through a wood, where the twin establishment, Marienheim, is placed.

The sanatorium stands on a slope with meadow land in front of it, and is surrounded on all sides with pine-clad hills. It is a wooden structure on a granite foundation, with solidly built basement and dark-tiled roof, and is sixty-eight metres long, shaped like the letter **E**. Behind the centre is the entrance, with the staircase and kitchen department around it. The kitchen, which is light and rather small but cheerful, and has tiled roof and floor,

[1] *Tuberculosis*, Mar., 1904.

is supplied with hot cupboard, food lift, a central stove, etc., and has next to it a scullery and small store room. Above it on the first floor are the quarters of the house master, and above these a few garret rooms for women servants. Also in the centre, but on the south side, are the dining-saloon on the ground floor, with a verandah in front of it, and two day-rooms on the first floor, both of the latter provided with spacious balconies. Above these, in the peak of the roof, is a drying space. The lateral parts of the central block have a single row of rooms on the south side with a corridor behind. They comprise on the ground floor two bath-rooms, two lavatories, the cook's bedroom, the office, consulting room, two patients' bedrooms each with four beds, and one with two. On the first floor are four rooms with four beds each, two with two beds apiece, a lavatory and room for the chaplain. In the wings on the ground floor are two large dormitories for ten patients each, which however owing to pressure on space have been made to accommodate fourteen apiece. In the lavatories each patient has his own basin and utensils. Under the large dormitories are the chapel in the eastern wing, a gymnasium in the western. The rest of the basement is occupied by heating apparatus and cellars. The patients' bedrooms have a cubic space per head of twenty-seven to twenty-eight cubic metres. The windows are large, of the usual pattern with three sections, and a ventilator is present in each room. The walls are of rough plaster on the lower floor, oil-painted in the upper floor and the lavatories. The floors are of cement in the basement corridor, tiled in the ground-floor corridor, elsewhere covered with linoleum. Most of the rooms are heated by closed stoves burning wood; but three rooms, including a bath and douche room, are heated by steam-pipes. The lighting is by petroleum. The closets are built out on the north side of the corridors. They are six in number and are earth closets, the user distributing peat mould with a spade. The waste waters are collected in a reservoir in the centre of the terrace in front of the building. In fine dry weather they are allowed to irrigate the vegetable garden; in wet weather they are diverted into the wood to the east of the sanatorium. In front of the building is a fresh-air gallery, the roof and overhanging front of which are formed by a roller blind of sail cloth, the floor consisting of the pebble-covered terrace. A *Döckersche Baracke* in the garden serves as a recreation

pavilion. Behind the main building, across the courtyard, are stables, steam disinfector, etc.

Only men are admitted as patients, and not exclusively although chiefly consumptives. The patients do a little garden work and gymnastics, and are expected to ask for work after three weeks unless the doctor forbids it. They stay usually for thirteen weeks.

The staff number nine in all, including the house master. Dr. Köhler, who is medical officer, comes over from Hasselfelde two or three times a week.

The Marienheim,

a sanatorium for twenty female patients, is built a little lower down on the same ground.

The Sorge Sanatorium,

opened by the Johanniter Society, has eleven acres of land and is placed on a southerly slope in the Harz Mountains. It is intended for the less wealthy middle classes.

The main block is mostly of brick on a massive granite base, protected on exposed parts with wooden or zinc tiles. It is divided by *liegehallen* in two tiers into three portions, the central of which, built throughout of granite, looks like a church with a tower. The main entrance is at the eastern end; the patients using one at the western end, where there is a boot room next the central heating apparatus, and a cloak room, which owing to the rapid fall of the land is almost entirely above ground. The rest of the basement contains cellars and servants' quarters. On the ground floor to the right of the main entrance is the office; to the left the matron's room, and on south and west front are a number of patients' rooms. To the north are the kitchen department, bathrooms, W.C.s and a nurses' room. On the first floor over the kitchen is the dining-room with a large balcony to the east; in the northern pavilion, consulting rooms, surgery and inhalation room; in the centre a number of day rooms. On the second floor the arrangement is the same; but over the dining-room are quarters for the second medical officer, and over the consulting rooms a sisters' room. In the centre is a chapel. In the attics are servants' rooms and a few for patients. Most of the wards are in the lateral buildings, and have from one to three beds: cubic space thirty-seven cubic metres:

height 3·75 metres. Walls are oil-painted below, with rounded angles; floors of terrazzo, tiles, or *torgament*[1] and in the day rooms of beechwood parquet. Each ward has iron marble-topped pedestals; iron washstand with china basin, chest of drawers, tables and chairs. Where there are several beds, screens or iron framework are used. There are W.C.s on every floor; acetylene lighting; waste water goes to a dumb well and thence to irrigation fields. The laundry and disinfector are in a separate building.

The medical director has a separate house.[2]

The Sülzhayn Sanatoria.

In the southern part of the Harz, where the land begins to fall towards Göttingen and Nordhausen, is a little niche in the mountain side overlooking the village of Sülzhayn. Densely wooded slopes rise up on three sides, forming a sort of amphitheatre, near the centre of which, on a precipitous rock, has been built the private sanatorium "Fernsicht," by the side of the rising pile of the Sülzhayn People's Sanatorium. The foundations of this imposing structure have been built up on massive stone pillars eighteen metres high, additional room being obtained by blasting the rock behind. On this artificial platform have been erected three buildings: the private sanatorium, the doctor's residence, and the people's sanatorium. In such a situation there is almost perfect shelter against boisterous wind from the colder quarters; while a lovely view is obtained of the country to the south. There are nearly fourteen hectares of woodland belonging to the institution. The soil is of porphyry and graywacke (the latter used in building the sanatorium); the climate that of the Harz Mountains generally—a dry, bracing, equable hill climate, with a fair amount of rain and snow at certain seasons.

The Sülzhayn People's Sanatorium

is planned somewhat like the one at Ruppertshain, with a concave front, a centre and two wings. The dining-saloon is, however, placed behind the centre on the first floor, and communicates by a bridge with the kitchen block still farther to the north. The patients' bedrooms, which are placed in a single row on the south

[1] See p. 287.

[2] *Zeitsch. f. Tuberk.*, Dec., 1902.

side, on three separate floors, contain from one to four beds apiece, with an allowance of forty-two cubic metres per head, and a height of four metres. The floors are made of *torgament*, a patent material consisting of wood shavings incorporated with cement, which is capable of uniting with stone, iron or woodwork, and is warmer to the feet than ordinary cement. The walls are of colour-washed plaster of Paris, the doors of wood without projections and very carefully fitted. The windows are large, but have not been carried up to the ceiling. Throughout the sanatorium all angles are rounded and surfaces smooth. Running in front of the centre block on the basement, which on the south side is on the ground level, is a corridor four metres wide, which can be heated, and serves as a promenade in bad weather. It has very large windows which open out on to a covered strip of garden, and boot rooms on either side. The corresponding parts on the ground floor form a large day room and a fresh-air gallery five metres wide, to be used for rest in the open air, and protected by the balcony overhead. In both the centre and the wings balconies are placed in front of the bedrooms. The lavatories, water-closets, rooms for the nurses, and staircases are at the back of each wing beyond the corridor. There are two water-closets in each wing on each floor. The water-closet basins cover themselves automatically. Next the water-closets are rooms for disposing of the sputa, etc. In one compartment is a boiler for boiling the sputum, after which it goes down a special soil pipe into the drain. In another compartment the spitcups are boiled and the chamber pots cleaned. The common bathrooms and lavatories, which are also to the north, have terrazzo floors covered with parallel wooden laths. Each patient has his own china basin fixed to the wall, with a box for toothbrush, etc.; on one side of the lavatory there is only cold water; on the other hot and cold. The douche rooms, with doctor's room and dressing room, are in the wings on the ground floor, and have the usual arrangement of taps and thermometers to indicate the temperature of the douche. Underneath are the boiler for disinfection of sputum, the inhalation room, and some cellars. There are also a dark room for photography and a library. Each wing has also a lavatory for the nurses, and a small store room; and on the lower floors a common room for the patients.

Behind the centre is the administrative block. This has in the

basement the accumulator room and coal cellar, with the ice cellar on one side and the three heating furnaces on the other. Above these come the laboratory and consulting room, the porter's room and office, on each side of the entrance. On the next floor is the large dining-saloon, with a room for the sisters on one side and a couple of committee rooms on the other. This communicates with the kitchen block by means of a serving room on the bridge. The kitchen block, which has its entrance behind, contains in the basement the larders, store rooms, cellars and engine room. There is also a passage under the road to the main block. On the ground floor is the laundry department with disinfecting apparatus and linen rooms on either side. The disinfector has two approaches; the linen rooms are for storing and mending respectively. The laundry has an electric mangle, and rolling and ironing rooms. An electric lift carries the washed linen up to the drying loft. Above the laundry department is the kitchen department, with scullery, crockery room, vegetable kitchen, and dining-room for the servants. The kitchen is separated from the serving room by a passage, and has a special ventilating shaft. On the next floor are the quarters of the engineer and his wife, together with a separate portion for the woman servants, and a drying loft. The kitchen department has its own staircase, douche and bathrooms, and water-closets.

The sisters are lodged in separate quarters in the roof of the main building. The sanatorium is heated by low-pressure steam pipes, and by closed stoves in addition. It is lighted by electricity. There is an abundant supply of good water, which works a turbine, and has a pressure of 5 or 6 atmospheres. The staircases are of stone, let into the thickness of the walls, without other support.

Only men are admitted.

The chief medical officer has under him a matron and female nursing staff. The assistant medical officer is also appointed on his recommendation, subject to the assent of the matron. All the other officials are directly appointed by the chief medical officer. They consist[1] of an engineer, female cook, two kitchen maids, two male nurses, messenger and night watchman. No inspector has been appointed. The male nurses clean the spitcups. The building is cleaned daily by women from the village.

[1] Liebe, *loc. cit.*

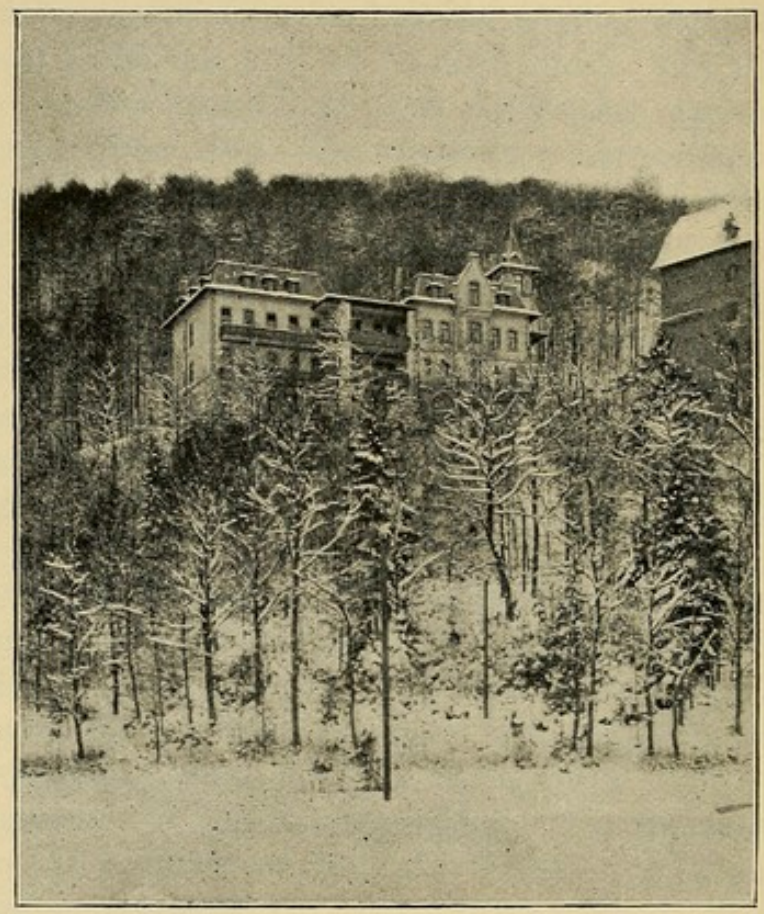


FIG. 64.—FERNSICHT SANATORIUM, SÜLZHAYN.

[*Face page* 289.

THE FERNSICHT SANATORIUM

lies to the west of the miners' sanatorium, and is attached to Dr. Kremser's residence, which is between them. Owing to the rapid fall of the ground it has a deep basement which is above ground on the south side, whereas the doctor's villa has one floor less. There is accommodation for ten patients on the ground and first floors, all being to the south and provided with balconies. Between the two buildings is a deep fresh-air gallery on each of these floors. The basement contains in front a reading room and billiard room, and behind a bathroom and consulting room. Over the latter on the two upper floors are bathrooms and lavatories, together with rooms for the attendants. The south-eastern corner is occupied by the furnace room, above which is the kitchen, and above this the dining-saloon, with a large winter garden in front of it (fig. 64).

In the village of Sülzhayn, is a group of small sanatoria, several of which have been founded by Dr. Kremser, and are served by Dr. C. Wiemann, formerly assistant medical officer at Reiboldsgrün Sanatorium. Of those mentioned in the table, Dr. Hirschfeld's and Glückauf are for the working classes, the others for the middle classes.

The *Waldhaus, Sülzhayn* is under the Evangelical Diaconal Society; it is a three-story building with verandah and grounds of nineteen acres.

Sanatorium Kurhaus has single-bedded rooms, mostly with southern aspect and some with balconies, linoleum or *torgament* floors, warm water heating, and good bath and douche rooms.

Station: Ellrich (Nordhausen-Northeim line).

THE ALTENBRAK SANATORIUM

is in the "Bodenthal," which many regard as the most beautiful part of the Harz district. It lies in a valley open to the south and protected by mountains covered with pine woods, which are only a few steps from the sanatorium. It is managed by an assistant of Dr. Pintschovius, who is himself a resident in the neighbouring village of Ketzin, and in charge of an open sanatorium for the poorer classes.

VOGELSANG SANATORIUM,

Gommern, near Magdeburg, was opened by the Patriotic Women's Union of Saxony. The main block is solidly built and has ac-

commodation for the medical officers, the dining-room, etc., and forty beds for patients. Another block accommodates the male staff. A third contains the steam laundry and eighty beds. Another eighty beds are contained in fifteen *baracken*. Nearly one third of those beds were used all the winter 1899-1900. As in some other similar institutions corsets are forbidden.

The Lostau Sanatorium,

near Magdeburg, is placed on a hill overlooking the city and the river Elbe, and is surrounded by pine woods. The building is somewhat differently planned from the ordinary type of sanatorium, consisting of a number of two-story pavilions running north and south, and united by covered ways and *liegehallen*. A central pavilion is devoted to administration, and has the large dining-room in the middle reaching from front to back. Running east and west is a curved covered way with convexity to the south, from the ends of which run two more pavilions northwards. The northern ends of these are attached by other covered ways to the southern ends of two more pavilions, which are still further out, the whole thus forming a sort of double staircase in outline. The patients' pavilions are divided by incomplete partitions into a longitudinal corridor separating two rows of cubicles, each of which has two beds. The ends contain rooms for one or three beds respectively, with cloak-rooms, staircase, lavatories, etc.

The administration block is planned for 100 beds, but all the pavilions have not yet been erected. Each pavilion is at present heated by hot-water pipes, and has its own furnace. The water is pumped up by a petroleum motor, which will eventually be used to produce electric light. Disinfection is done by a Rietschel and Henneberg disinfector. The plan of the building is said to work well. The cost was 3,500 marks per bed.[1]

Sophienheilstaette

is on a picturesque headland in the midst of the pine woods, overlooking the little town of Tannroda with its ruined castle, and the valley of the Ilm. The soil is a beautiful red sandstone, which has been utilised in building the institution.

[1] *Tuberculosis*, Jan. and Feb., 1903.

The building, which has a southerly aspect and is well protected to the north and east, is in the form of a central block with wings projecting back and front. It is for men only; the wards contain from two to four beds each and have a southerly aspect. The larger wards are in the wings in front. Behind the east wing are the bath and douche rooms; behind the west wing the sisters' quarters. There are altogether two bathrooms and a large douche room. In the centre of the middle block is a large and lofty dining-saloon, and next it a day room. The kitchen is behind, separated from the dining-saloon by the corridor. The windows are all large, but do not reach the floor or the ceiling. The walls are lime-washed; the floors of wood in the bedrooms with fillets to fit into the angles; in the corridors they are of *torgament* (see p. 287). There is central steam heating, with two heaters under the kitchen, and long, large steam pipes under the windows. A ventilation shaft containing a central steam pipe is placed in the middle of the building. The place is lit by electricity. There are eight water-closets with a good water flush. Behind the main block is a courtyard, on the far side of which are being erected stables, disinfecting rooms, etc.

The Reiboldsgrün Sanatorium

is situated on the lower slopes of the Erzgebirge in Saxony. These mountains, which form the natural frontier between Saxony and Bohemia, and reach an altitude of 750 to 800 metres with a few peaks of 1,200 metres, consist of a number of parallel chains separated by valleys, each containing a tributary of the Elbe. Here in the little valley of the Zinsbach, in the midst of a huge forest of pine trees, over ninety miles long by twelve to eighteen wide, is situated the sanatorium of Dr. Wolff, at an altitude of 700 metres above the sea-level.

The district has been known and frequented since 1725 for its ferruginous waters, and had a little thermal establishment, which was acquired in 1873 by Dr. Driver, and converted into a sanatorium for consumptives, after the model of Brehmer's at Görbersdorf. The management since 1892 has been in the hands of Dr. Felix Wolff formerly at the head of Brehmer's sanatorium.

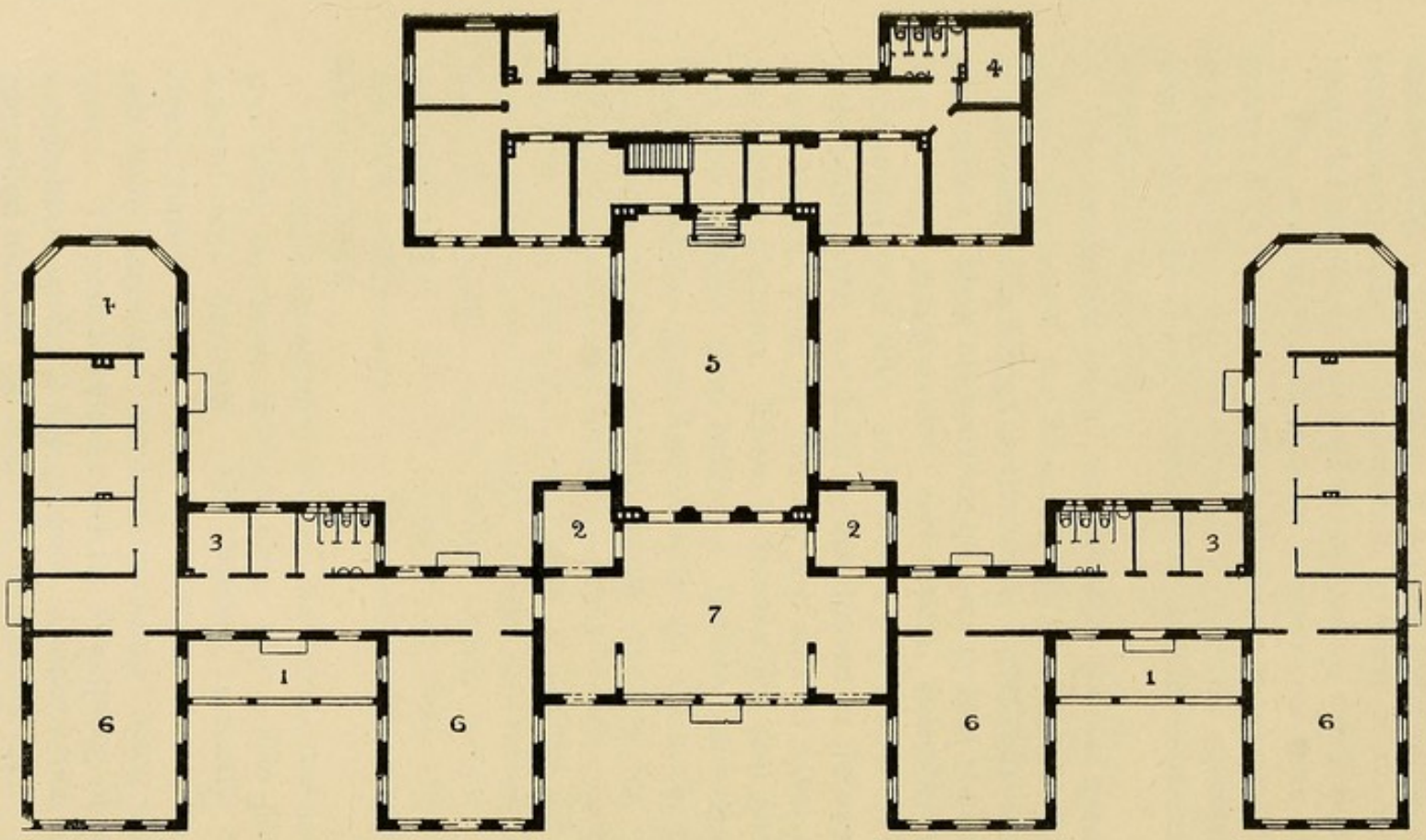
The place is on volcanic soil, permeable, yet free from dust. The climate is a sheltered hill climate, with quiet air and little

variation in temperature. The sanatorium stands in a park of seventy-six and a half hectares, provided with numerous walks, resting-places and summer-houses, and very diversified in character. It also contains an artificial lake, which is in winter used for skating and sledging. The situation is a most convenient one for a closed sanatorium, owing to its isolation, as there is no village or health resort for miles, and pine woods spread on every side.

The sanatorium consists of a group of nine large buildings, arranged for the most part along the northern and eastern sides of a large garden, and connected by covered corridors. There are also a few more small buildings, for the staff and management, and a number of *liegehallen*.

The residential blocks are divisible into an upper and a lower group: the former for those paying the highest fees. There are six residential buildings in the upper group, also a director's house and casino. Most of them are of three or four stories; one of them has a large dining-saloon and several assembly rooms, kitchen department, post office and director's quarters. There is a complete hydropathic and bathing installation in the sanatorium. The lower houses, three in number, are smaller; two are residential, the third is a casino. These bedrooms face east and west. There are also stables, farm buildings, laundry and steam disinfector. About a quarter of an hour's walk up hill in the park is a house (also under medical control) where patients can obtain rest and refreshment, while they enjoy an extensive view over the surrounding country. Convalescents and friends of patients are also quartered here. Most of the bedrooms in the sanatorium are four metres high; the smallest covers fifteen square metres; most are considerably larger. In the upper group there are no rooms under 100 cubic metres capacity. They are mostly single-bedded; some have two beds.

The walls are painted with oil colours for one and a half metres, and lime or colour washed above this. The floors are mostly covered with linoleum. The heating is partly by low-pressure steam, partly by cast-iron or tiled stoves. The lighting is by petroleum lamps, the "regenerative lamp" being used in the larger rooms. The establishment has its own spring of water. There is a chalybeate spring in the ground. Clocks which are magnetically controlled indicate the hours for rest, meals, etc.



GROUND FLOOR

FIG. 65.—ALBERTSBERG SANATORIUM—GROUND PLAN.

1. Fresh-air Galleries. 2. Cloakrooms. 3. Consulting Rooms. 4. Bath Rooms. 5. Dining Saloon. 6. Large Dormitories. 7. Sitting Room.

[*Face page* 293.

Dr. Wolff sends away any patients who do not promptly respond to treatment. There is a good library; some of the more exciting books are forbidden to febrile cases. Patients can attend the church attached to the Albertsberg and Carolagrün Sanatoria.

The *staff* includes one assistant physician in summer, and two in winter; also one trained nurse.

Access: Rautenkrantz Station, on the line from Chemnitz to Aue and Adorf—nearly three miles; or Auerbach Station (four and a half miles) on the line from Berlin and Leipzig to Hof and Munich.

The Albertsberg Sanatorium,

or the *Heilstätte des Vereins für Begründung und Unterhaltung von Volksteilstätten im Königreiche Sachsen*, is situated at Auerbach, about twelve minutes' walk from Reiboldsgrün Sanatorium (described at p. 291), in the open country amidst hills and forests. The ground belonging to the sanatorium is but small (six and a half acres), but the patients have the use of the surrounding State forest. The soil is granite. Woods protect it to the east and wooded hills to the north.

The sanatorium consists of a number of buildings united by covered corridors into the shape of a T (fig. 65), the centre consisting of two floors, while the rest is on one floor only. There are also several detached buildings for the dwelling of the chief medical officer and inspector, the kitchen block, ice house, coal house, stables and laundry. The main block has a southerly aspect, and has red roofs and white walls in the centre, flat "wood cement" roofs elsewhere. From the top of the T four pavilions project, containing dormitories for ten patients each. The space between them is occupied on each side by fresh-air galleries, in the centre by a large library and common room six metres high, with two cloak rooms; over these are double-bedded rooms, and a large balcony with side screens. Behind, forming the central stem of the T, is the large dining-saloon, which is six metres high, and capable of seating 100 persons. Over it are eight single-bedded rooms. The foot of the T is formed by a further expansion with bedrooms, etc., on two floors; and behind this, forming a separate block, is the kitchen department. Baths, closets and lavatories are everywhere on the north side.

Some of the wards are for one to four patients each, others for ten. The cubic space allowed is thirty-five cubic metres per head. The ventilation is by open windows, the upper parts of which are valved; also by ventilating valves and chimneys, which are often common to two rooms. The heating is by low-pressure steam; the lighting by oil-gas with Auer incandescent mantles. The waste water is carried through earthenware pipes to an irrigation patch. The sewage is treated with dry peat mould. Two *baracken*[1] have been added recently.

None but consumptives are admitted, and only those in an early stage. In addition to the fresh-air galleries next the house there is one in the woods. For nursing there is one sister.

Carolagrün Sanatorium

was erected in the same neighbourhood by the same Insurance Society for women. A church has been built in the woods for this and the Albertsberg Sanatorium. The water supply and steam laundry are also common to both.

The Jonsdorf Convalescent Home

is a "closed sanatorium" for patients with various ailments, including early cases of consumption, belonging to the union of *Südlausitzer Krankenkassen*. It was opened in June, 1894, on land given by the town of Zittau, in Saxony. There are rooms for thirty-three patients, the two sexes being accommodated in separate portions of the building. There is central heating by low-pressure steam, and a private water supply.

The home is said to have cost 73,000 marks. It is under the care of Dr. Toop of Oybin.

Jonsdorf is close to the frontier between Saxony and Bohemia, and is connected with Zittau by a narrow-gauge railway.

[1] See p. 264.

CHAPTER LI.

SANATORIA IN WESTERN GERMANY

Comprising Westphalia, Rhenish Prussia, Nassau, Hesse Cassel, and Hesse.

Name.	Province.	Elevation in Metres.	Opened.	Fees in Marks per Day.	Beds.	
Munster Sanatorium	Westphalia	—	—	—	—	Westphalian Insurance Co.
Hagen (Ambrock)	,,	—	1903	—	120	Men only
Auguste Viktoria Knappschafts Sanatorium	,,	—	1904	—	150	For the Bochum Trades Union at Meschede
Altena Sanatorium	,,	420	1898	3½ to 5	100	Men only; Dr. Stauffer
Altena Johanniter Sanatorium	,,	—	—	3	—	—
Lüdenscheid Sanatorium	,,	—	—	—	—	—
Behringhausen (Meschede)	,,	—	1902	—	150	Miners' Trades Union; Dr. Spanken
Hohenhonnef[1]	Rhenish Prussia	236	1892	10 to 13	109	Dr. Meissen; Dr. Kornemann
Honnef	,,	79	—	—	—	—
Waldhof-Elgershausen, 1st Div.[1]	,,	375	1900	6 to 8½	26	Dr. Liebe
,, 2nd Div.[1]	,,	—	—	3½ to 4	28	,,
,, 3rd Div.[1]	,,	—	—	4 to 4½	62	,,
Holsterhausen (Werden) San.	,,	—	1902	—	100	Men only; Dr. Köhler; for Essen, etc.
Krefeld Sanatorium	,,	—	—	—	—	—
Mönchen-Gladbach Sanatorium	,,	—	1903	—	—	Dr. Schäfer
Ronsdorf Sanatorium	,,	—	1901	—	131	Men only; Dr. v. Mengershausen
Aix la Chapelle Sanatorium	,,	—	—	—	—	—
Rosbach (Auguste Viktoria)	,,	—	1902	—	130	Men only; Dr. Weischer
Godesberg Sanatorium	,,	—	—	—	—	—
Wittlich ,,	,,	—	—	—	—	—
Waldbreitbach ,,	,,	240	1903	—	122	Women only; for Coblenz
,, Neuwied San.	,,	—	1901	—	102	Men only; Dr. Schüler
Sonnenberg Sanatorium	,,	288	—	—	100	Men only, Dr. Henssen; for Saarbrücken, etc.
Braunfels ,,	Nassau	—	1899	—	32	—
Falkenstein[1] ,,	,,	400	1876	9 to 15½	114	Dr. Besold; Dr. Gidionsen
Naurod (Niedernhausen) San.	,,	280	1901	4 to 5	50[2]	Wiesbaden San. Soc.; Dr. Wehmer
Ruppertshain Sanatorium	,,	400	1895	2½ to 5	122[3]	Dr. Nahm
Soden ,,	,,	—	—	—	—	For poor Jews; Dr. Hughes, Dr. Rothschild
Reichelsheim (Eberbach) San.[1]	Hesse	—	1901	—	—	Women only
Oberkaufungen Sanatorium	Hesse Cassel	—	1900	—	120[4]	Women's Union of Cassel; Dr Curschmann
Melsungen ,,	,,	—	—	—	120	For railway servants
Ernst Ludwig (Sandbach) San.	Hesse Darmstadt	—	1901	—	114	Hesse Ins. Co.; Dr. Lipp of Reichelsheim
Hanau (near Frankfort) ,,	Hesse Cassel	—	—	—	—	Dr. Ambrosius

[1] Pay Sanatoria. [2] Thirty men. [3] Ninety men. [4] Seventy-six men.

The Altena Sanatorium

is about four kilometres from Lüdenscheid, between the villages of Hellersen and Brünninghausen. It stands on the south side of a hill which is wooded with oaks and pines, and sheltered to the north-east by more distant hills. The ground in front of the sanatorium consists of grass land with gardens and little ponds.

The sanatorium buildings consist of a main block, an administrative block, doctor's villa, and open-air galleries. The main block has a basement, ground floor, and three upper floors, all the patients' rooms being to the south.

Behind the main corridor are three pavilions projecting north. The central one is separated by the entrance drive, bridged over on the first floor. It contains the kitchen department, above which are the dining saloon and quarters for second medical officer and female staff. The western pavilion has bath and douche rooms, lavatories and a ward kitchen, the eastern the laundry and disinfector, linen rooms, etc.

The lavatories have water laid on over each fixed basin, and shelves above for washing utensils. In each bathroom are three fixed baths and a dressing bench of xylolith plates. In the douche room are various douche and spray apparatus, and a compartment where the medical officer can regulate the temperature. A separate bathroom is provided for the staff. The W.C.s on each floor have porcelain basins with oaken seats and automatic flush. The urinals also have automatic water supply; these walls are of polished granite, the floors of terrazzo. The main staircases are at each end of the corridor. On the south side are in the centre the office, consulting rooms and laboratory, a large day room overhead; and higher still a ward with seven beds. At the ends are large rooms on each floor, one of which is used as a day room, the rest being eight-bedded wards. Between centre and ends are other bedrooms with from one to four beds apiece. They are furnished with iron bedsteads, steel and horsehair mattresses, iron pedestals with glass plate, and a clothes locker for each patient. The floors are covered with linoleum. Every room has a ventilation shaft and electric bells. Heating is by low-pressure steam; lighting at present is by petroleum; in the future by electricity. The water supply, which is said to be good and abundant, comes from springs in the

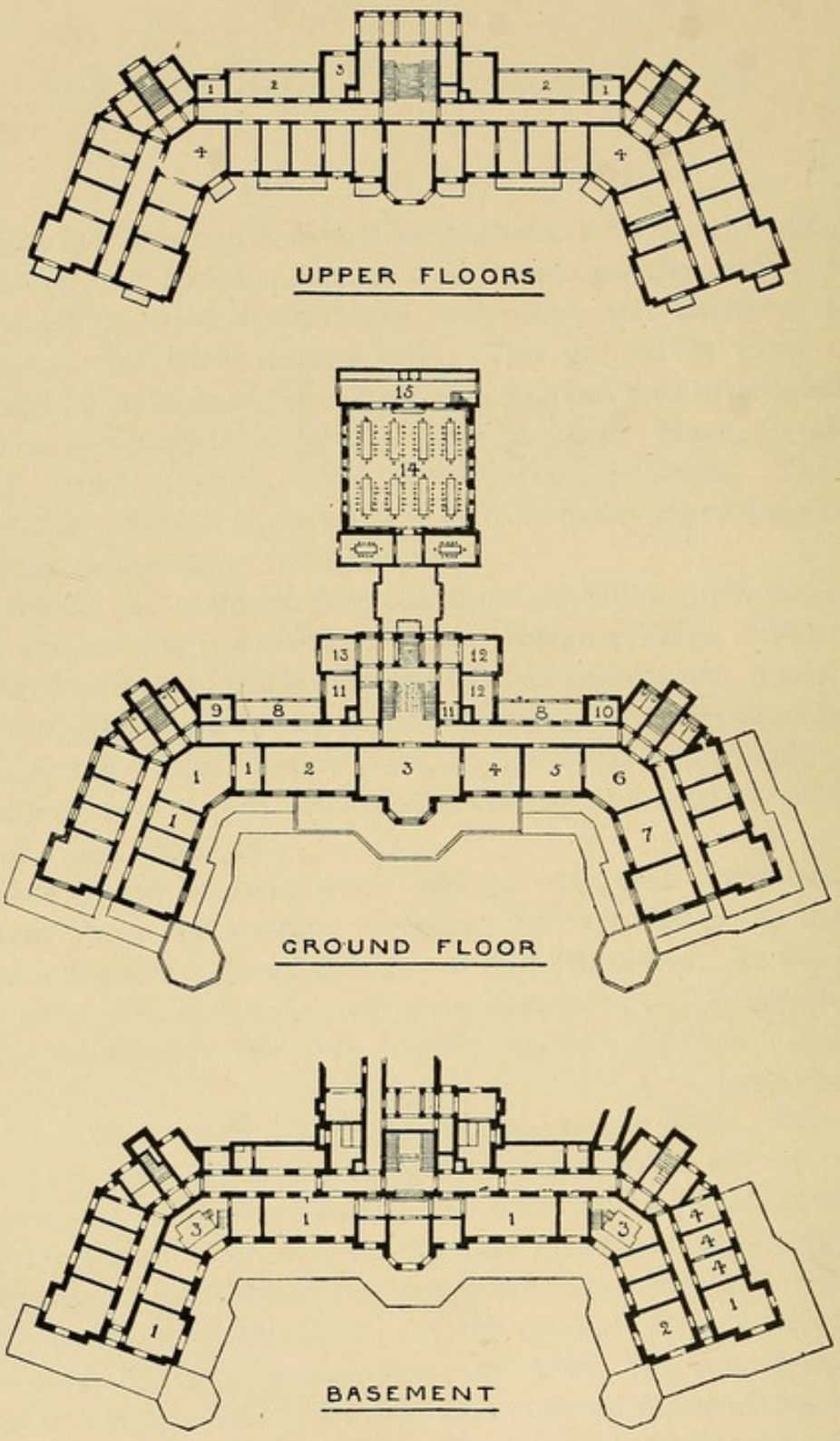


FIG. 66.—THE HOHENHONNEF SANATORIUM.

Basement :—

1. Cloak Rooms.
2. Inhalation Room.
3. Heating Apparatus.
4. Douche Rooms.

Ground Floor :—

1. Consulting and Waiting Rooms.
2. Winter Garden.
3. Reception Room.
4. Reading Room.
5. Ladies' Room.
6. Music Room.
7. Billiard Room.
8. Cloak Rooms.
9. Servants' Room.
10. Nurses' Room.
11. Hairdressing Room.
12. Office.
13. Post Office.
14. Dining Saloon.
15. Serving Room.

Upper Floors :—

1. Nurses' Room.
2. Balcony.
3. Small Kitchen.
4. Room for Convalescents.

[*Face page* 297.

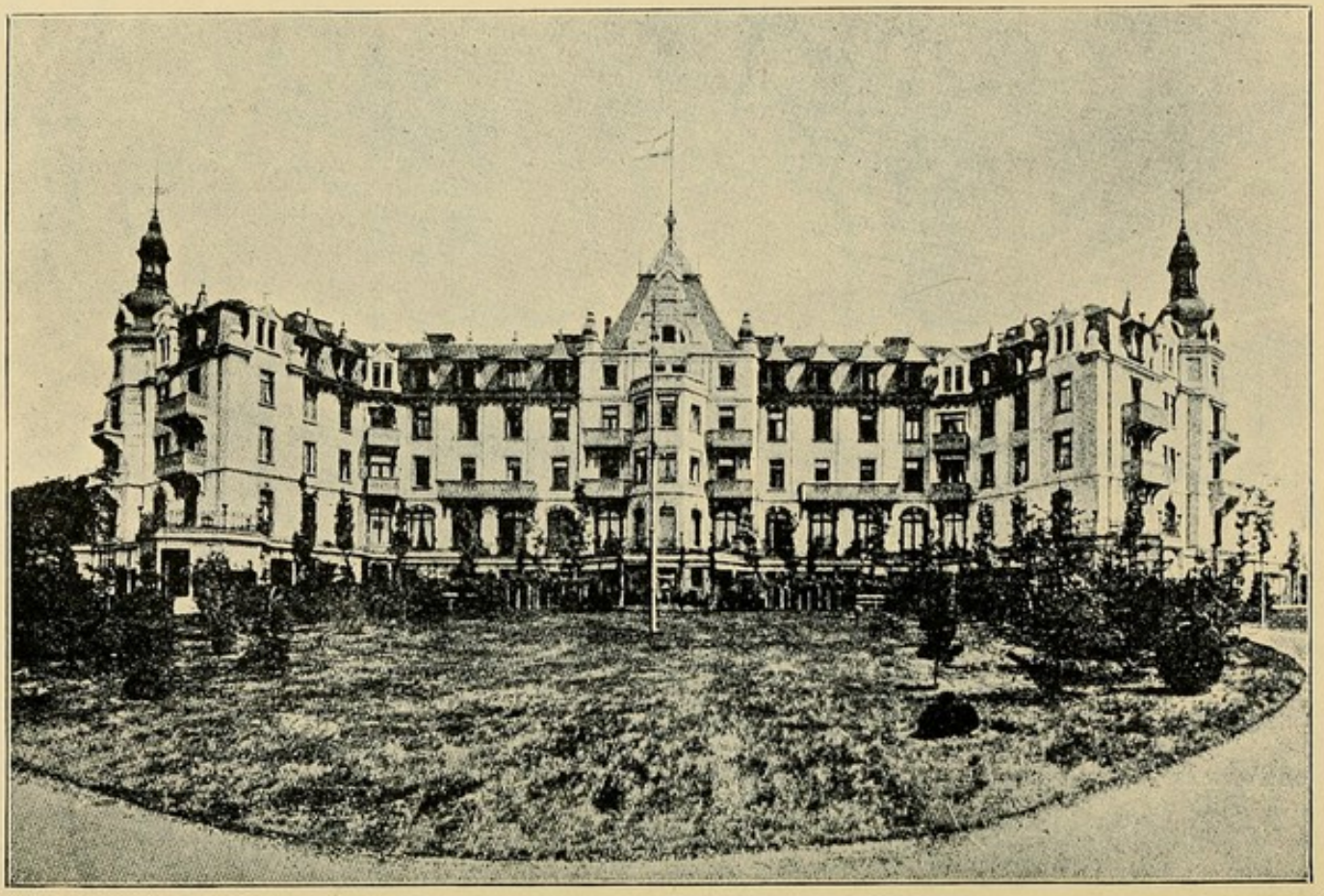


Fig. 67.—View of Hohenhonnef Sanatorium. [*Face page* 297.

neighbouring mountain, and is pumped by a benzine motor to a reservoir in the woods.

The laundry is done by machinery, driven by a benzine motor; the disinfector has separate approaches for dirty and clean linen. There is a boot room on the ground floor. The kitchen has a tiled floor, and is provided with two steam boilers and a roaster, with a food lift to the serving room above.

The *liegehallen* are not in front of the building, but form curves to the sides. The doctor's house is at the end of one of these, commanding a view of the front.

The staff is under the medical director. A Red Cross sister acts as housekeeper; another as secretary, a third attends to the nursing. There are also a bathman, a porter, a female cook with two kitchen-maids, and two laundry-women. There is compulsory instruction in out-door work. Average stay twelve weeks.

Lüdenscheid may be reached *viâ* Hagen and Brügge.

The Hohenhonnef Sanatorium

belongs to a company whose shares are held by the inhabitants of a large part of western Germany, and of even more distant parts. The sanatorium is managed by Dr. Meissen, formerly an assistant of Dr. Dettweiler, and is situated in the Siebengebirge, 158 metres above the Rhine, in a beautifully wooded and picturesque district, with fine views of the distant Eiffel mountains and the Rhine valley. The climate of this district is mild and sunny, but is not so dry as that of central Germany. The soil is Lower Devonian, composed of hard rocks at a considerable angle, so that it remains very dry. The grounds cover about forty hectares of land, consisting partly of old and newly planted pine woods, partly of garden, partly of vineyards, and are continuous with a large extent of similar land on three sides.

The sanatorium, which is built of white stone and plaster, makes a very conspicuous landmark above the river side. It has a south-westerly aspect, and is well sheltered by higher hills (from 90 to 210 metres higher) on the north and east, but is still somewhat exposed to south-westerly gales. However, these are not frequent, while the pine trees will in a few years afford better shelter.

The sanatorium consists of a five-story building (figs. 66, 67) with two wings which diverge at a somewhat more open angle than those at Falkenstein. Owing to the slope of the hill, the basement

is on the ground level in front, while the entrance behind is on a higher floor. The basement is occupied by cloak rooms, bath and douche and inhalation rooms, furnaces for heating the building, and a few bedrooms for visitors. On the same level, in front and round the eastern wing, is a deep verandah with cemented floor, which can be protected when necessary with glass, and part of which can be cooled in summer by streams of water on the roof. This is used as a fresh-air gallery, and is provided with cane lounge chairs, electric lights and bells, and small tables. Above it is an uncovered balcony. On the ground floor of the building are a series of intercommunicating handsome reception rooms, consulting rooms, laboratories, and drug rooms, as well as a few bedrooms for patients, and near the entrance the bureau and post office. The upper floors contain patients' rooms in a single row along the centre, a double row in the wings. There are large balconies both front and back, the northerly ones being specially frequented in summer during the heat of the day. Bath-rooms, water-closets, rooms for attendants and nurses, and a large room for convalescents, are found on all the upper floors, which are served by a lift for patients, as well as staircases. The patients' rooms are nearly all on the sunny side of the building, and are well ventilated. Each is four metres high, and has large windows and a chimney; while none have less than seventy cubic metres air space. The windows are double, for extra protection in stormy weather; the doors are also double, to prevent noise. Great care has been taken in constructing and arranging the sanatorium so as to facilitate thorough disinfection and cleansing without raising dust. Angles and corners are rounded, projecting cornices and mouldings avoided. The floors are made of "gypsdielen," consisting of bamboo and other light materials, incorporated with plaster of Paris, and are covered with linoleum or parquet. The walls are papered, as it is contended that this facilitates natural ventilation through their pores. Carpets, curtains and the like are sparingly used, and chosen of kinds which do not hold the dust and are readily cleaned. The furniture also is simply constructed but comfortable; leather-covered chairs, cane lounges, and the like. The whole building is heated with low-pressure hot-water pipes, which can be separately regulated in every room, and is lighted by electricity. Even the summer houses in the woods and the fresh-air galleries are provided with electric light and electric bells. The dining saloon—a large, handsome, well-lighted

room—is situated in a detached block to the north, reached by a bridge from the first floor, and has no direct communication with the kitchen department and storage rooms beneath. The servants sleep in a separate building in the wood behind the sanatorium. The water supply, which is excellent, comes from a deep well in the Asbach valley, about half a mile behind the institution, where also are found the steam laundry and disinfector, and the engines for pumping and electric lighting. The sewage and waste water are carried into the Rhine after precipitation in settling tanks with peat and coke bottoms, the solid parts being mixed with peat and dried in sheds, and afterwards applied to the land. At high tide the waste water is made to irrigate a meadow. Kitchen refuse is buried with ashes.

In treatment, Dettweiler's methods are mainly adopted. There are now two fresh-air shelters in the woods, and a third is to be constructed. Some of the walks in the pine wood are very well sheltered, and the fresh-air galleries next the sanatorium can be used for both rest and exercise. One portion, indeed, can be warmed in winter or cooled in summer. There is little or no douching of patients, but rubbing with the wet sheet or with spirit is commonly adopted. The milk is supplied from a model dairy farm belonging to one of the directors. There are three male and three female nurses, one of each on each floor. A small Roman Catholic chapel is to be found in the grounds. For Protestants service is held once a fortnight in the ladies' saloon. There is a good library, and in other respects patients are well entertained and looked after. Concerts are held about once a fortnight.

Separate houses for the chief medical officer and the managing director have been recently built close to the western wing.

There are two assistant medical officers. The *personnel* number seventy-nine.

This is perhaps the most luxurious sanatorium for consumptives on the continent. There is, indeed, a little danger lest the internal comfort should tempt the patients, to spend too much time indoors; but I saw no indications when I was there of such mistaken conduct, which is no doubt prevented by Dr. Meissen's watchful care. There are fewer facilities for uphill walks from the sanatorium than might be wished, and the shelter from certain winds is not yet sufficient; but in almost every respect it is a model establishment, marvellously complete in its details.

It may be reached by the right Rhine railway, taking carriage from Königswinter or Honnef; or by the left Rhine railway to Rolandseck, and thence by ferry to Honnef; or by steamer to Königswinter or Rolandseck. The institution is twenty minutes by road from Honnef, or forty from Königswinter.

Waldhof-Elgershausen Sanatorium

is on the south-west declivity of the Westerwald on the water-shed between the Dill and the Ulm, surrounded by beautiful pine woods, in a very picturesque neighbourhood. The soil is the same as at Falkenstein; and the Taunus mountains, Feldberg and Altkönig may be seen in the distance. It consists of a main building, (*Heiligenhaus*) originally an abbey attached to a large church, later on the residence of the late Prince Albrecht of Solms-Braunfels, and converted by Dr. Liebe to its present uses; in addition there are a small administrative block (originally a hunting lodge), and a number of more modern additions. There are at present seven solidly built houses, a wooden summer house with two beds, and five *liegehallen*. The establishment is intended as a link between the sanatorium for the people and the more expensive private sanatoria. It consists of three divisions, a first class for full-price patients, a second division for children, the third being for adults paying lower fees. The better class rooms are partly in the old building, partly in a modern erection (*Eigenhaus*). The main building contains on the ground floor kitchen, staff room, two dining-rooms, reading-rooms and a few bedrooms for patients. On the upper floors are other bedrooms and in the attics the servants' quarters. The *Eigenhaus* is built in accordance with modern ideas, the floors of *torgament*[1] brought up on to the walls in a curve; the walls enamel painted; the windows and doors free from projections etc. In the first divisions the bedrooms are mostly single-bedded; the second and third have wards, each with a number of beds. The children's division has four wards, each with seven beds. Arrangements are made for schooling out of doors. There is another block containing the benzine motor, dynamo and accumulators, laundry, bakehouse, bath and douche rooms, disinfector and mortuary. The stables and cowsheds are in another building. There are also a bath house with complete installation and an open-air swimming bath: also air baths,

[1] See page 287.

and sun baths. Electric lighting; heating by "Irish Stoves"; water-closets; sewage treated by Prof. Dunbar's methods. No alcohol is given.

Station: Katzenfurt (Kreis Wetzlar); about an hour's drive from the sanatorium.

Holsterhausen Sanatorium

is between Velbert, Werden and Kettwig, on a sheltered declivity open to the south, looking towards the woods of Graf and the valley of the Ruhr; and has 378 acres of land. It consists of a main building, a medical officer's house, and an engine house. The main building is of granite on raised foundations, and is double, with a northern and a southern portion and connecting link. The northern portion has in the basement a boot room with exit to a small court for cleaning the boots; also two day rooms, a gymnastic room, disinfector for sputa, dirty linen room, bathroom and quarters for male servants. In the northern portion, which runs parallel, is the dining-room with kitchen underneath; the office, consulting rooms and laboratory. The basement and three upper stories of the southern portion contain the twenty wards, seven being single-bedded. There are four large *liegehallen*, one of which can be used as a promenade. There is a separate building for examination before admission, and for operations. The doctor's house is to the east, and further east the engine block.[1]

Ronsdorf Sanatorium

is in the upper part of a valley open to the south-west, richly wooded with fir and deciduous trees.

It consists of a main building, dining-room, administration and engine house. The main building has day rooms on the ground floor and basement, the latter united with the *liegehallen* by glazed verandahs and corridors. Near the entrance are boot-cleaning rooms, douche room, six bathrooms, and a room for cleaning the spit-flasks. The wards have from one to six beds each, and are on the ground floor, first and second floors, and a few in the attics. Six single-bedded rooms have wide balconies in front of them, on to which beds can be wheeled. On each story there are two lavatories, each patient having his own place in them; also four W.C.s. The floors

[1] *Zeitsch. f. Tuberk.*, Dec., 1902; Oct., 1903. *Tuberculosis*, March, 1903.

are without cracks, made of *torgament*[1] or in parts tiled or covered with linoleum. The walls are painted to the height of two metres. There are ventilating shafts in each room, to carry off the foul air to the roof. The dining-room is at the eastern end, projecting forwards from the building line. The kitchen is under it. The rooms for matron and other women are in the main block. The laundry and engine room are separated by the yard from the administration block. The *liegehallen* are two on the west side of the house, one above and the other in front at a lower level; a third is on the east side. They have wooden backs with windows to them, little tables and roll-up blinds.

Dr. v. Mengershausen was previously under Dr. Turban, Dr. Römpler and Dr. Meissen.[2]

Auguste Viktoria Stiftung,

at Rosbach on the Sieg, stands on a very rapid slope in the midst of a large woodland tract of mixed deciduous and coniferous trees, sheltered to north and east, open to the south.

It consists of a main block with the engine block to the west, the administration block to the north, and *liegehallen* to the east. In the administrative block are, near the entrance on the ground floor, cloak rooms, boot rooms, dining-room for doctors, porter's room, office, consulting room, W.C.s and quarters for the servants. In the basement are the kitchens; and on the first floor a large dining-room and a chapel. Over this, the quarters of the two medical officers and matron; also the library, bathrooms and W.C.s for the staff. Connecting the administrative with the main block is the chief staircase. In the main block are, in the basement, the heating apparatus, sputum boiler, cellars, bath and douche rooms, and four day rooms; and near the main staircase, a place for emptying the spit-cups. Also an inhalation room, a bath for men servants approached from the yard behind, and entrance for the coal carts, which drive in and are tipped up after the door is shut. The two upper floors are occupied mainly by the wards, six with eight beds, two with six, ten with four, four with three, eight with two, and two single-bedded. Cubic space per head: 32-57 cubic metres. The lavatories are at the ends of the building. On the first floor is an examining room and laboratory. In the attics are four patients' rooms with separate lavatory and

[1] See p. 287.

[2] *Zeitsch. f. Tuberk.*, April, 1902.

W.C.; also box rooms and servants' rooms. The *liegehallen* are solidly built in two stories, and form four successive steps; cloak rooms and W.C.s are attached. The engine block has with it the laundry, and over it the men's quarters. The floors are of cement or terrazzo, excepting in the wards, where they are of *torgament*.[1] In the corridors, linoleum. The walls in bathrooms and lavatories are of glazed tiles and white enamel; elsewhere painted 1·60 metres high, colour washed above. Day rooms have washable walls; staff rooms are papered.

A separate medical director's house is to be built.[2]

Waldbreitbach Sanatorium

is on the slopes of the Westerwald, looking south-south-east towards the valley of the Wied. Surrounding it are grounds of thirty-five hectares, mostly mixed woodland with oaks, birches, and fir trees.

It consists of a main building for patients, management, assistant medical officer and servants; a kitchen block; an engine house with laundry; medical director's house; stables and washhouse next to the engine house.

The main block has a straight front with four floors and attics, and three peaks. Owing to the rapid slope the basement is above ground on the south side. It contains the heating apparatus—three low-pressure steam boilers, two for the greater part of the building, the third for the bathrooms, also the bath and douche rooms, the laboratory, day rooms and recreation rooms. In front of it the garden has been levelled up between the *liegehallen*, which are in two tiers, connected on the east with a playground. Two more *liegehallen* are in the wood. The ground floor contains single-bedded rooms separated by sliding doors from a wide balcony (2·2 metres) below which is a cemented walk for wet weather. The wards on the four upper floors are for one, two, four, five, seven and eight beds respectively.

The floors are of *torgament*[1] in bathrooms and laboratory, etc., linoleum covered in the wards. Walls and doors are painted; shafts are placed in the dividing walls; fanlights over all windows, which also have blinds. The W.C.s are to the north of the corridor.

[1] See p. 287. [2] Described in *Zeitsch. f. Tuberk.*, May, 1903.

Next them are places for cleaning spit-cups. The washstands are movable; bedroom furniture is simple, on tall feet.

Waste water is clarified and then sent into the Wiedbach.[1]

Braunfels Sanatorium,

a boarding house temporarily utilised as a sanatorium by Dr. Liebe before the opening of Waldhof-Elgershausen (p. 300), has since been converted into a sanatorium for the people. It consists of a main block, with two gardens provided with shelters, and of a number of houses in the village.

The Falkenstein Sanatorium

was the first of its kind erected in western Germany, being opened in 1876 by a company of citizens of Frankfort, under the influence and direction of the well-known Dr. Dettweiler.

It is situated about fifteen miles north-west of Frankfort, on the southern slopes of the Taunus Mountains, at the upper end of a valley which is exceedingly well sheltered on the west, north, and east by hills of from 450 metres to nearly 900 metres above the sea-level. The soil consists of clay-slate, gneiss and porphyry. The surrounding country is picturesque and well wooded, with extensive forests of beech and other trees. The climate is a moderately moist hill climate, with plenty of sunshine in summer, but a good deal of rain and fog during the cold part of the year.

The sanatorium has a south-east aspect, and enjoys an extensive view over the little town of Cronberg and the flat valley of the Main, which, with Frankfort on its banks, can be distinguished in the distance.

The grounds, of 5·71 hectares, are partly meadow land, partly garden in terraces, with clumps of bushes and trees, and are continuous on the north-west side with the extensive neighbouring public woods. Both are provided with a number of paths at various gradients, well supplied with seats, and in the grounds with summer-houses of various shapes and sizes, some of which can be turned round for shelter against wind.

The sanatorium consists of a main building with two additional villas united to it by covered corridors. The main building (fig. 68) has a central block and two wings, which diverge at obtuse angles

[1] *Zeitsch. f. Tuberk.*, May 1904.

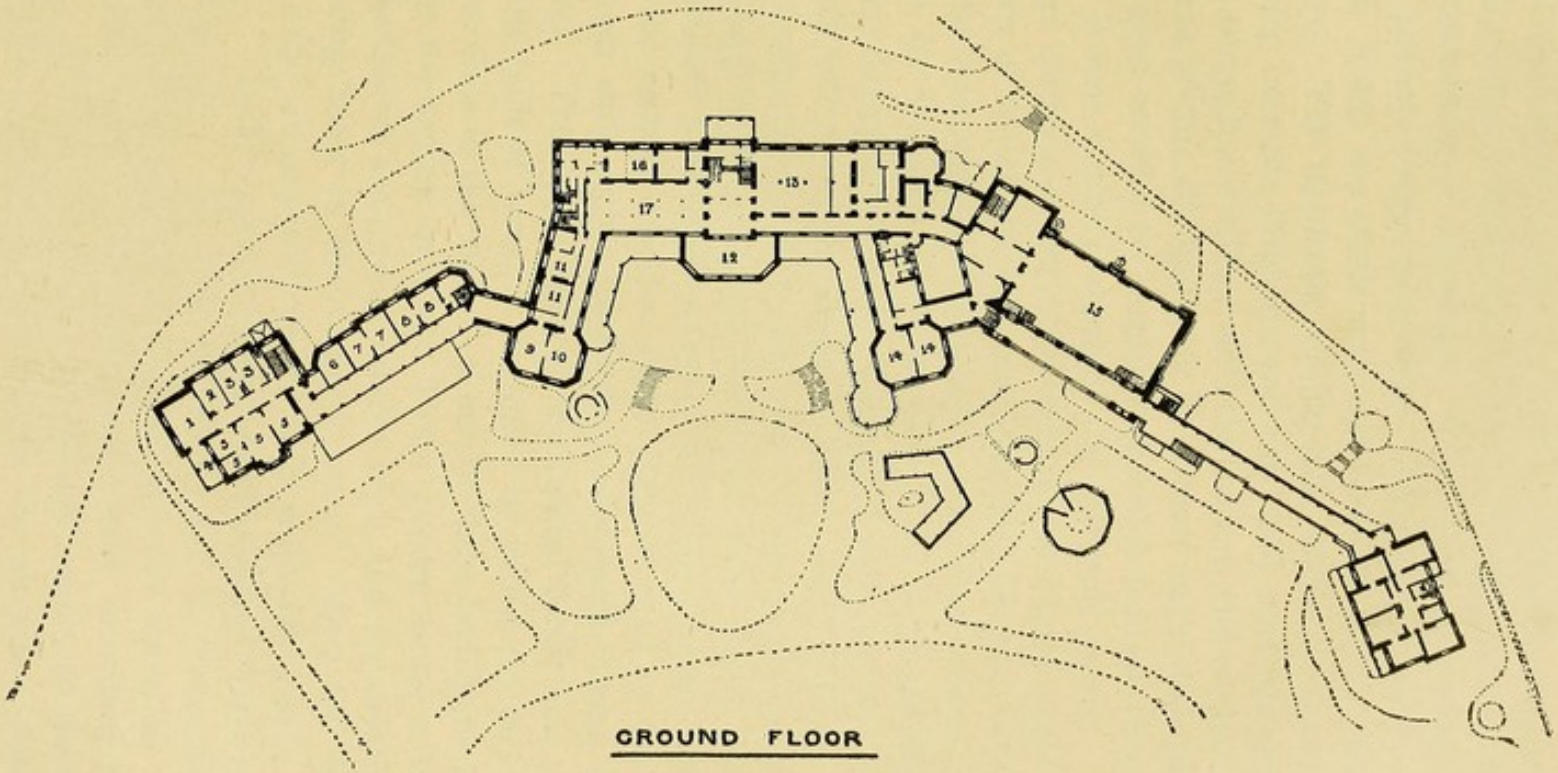


FIG. 68.—THE FALKENSTEIN SANATORIUM—GROUND PLAN.

1. Board Room.
2. Visitors' Room.
3. Rooms for the Staff.
4. Verandah.
5. Consulting and Waiting Rooms and Laboratory.
6. Lavatory.
7. Mortuary.
8. Gardeners' Quarters.
9. Library.
10. Billiard Room.
11. Visitors' Rooms.
12. Winter Garden.
13. Reading Room.
14. Conversation and Music Rooms.
15. Dining Saloon.
16. Office.
17. Winter Garden.

[*Face page* 304.

and enclose a stone terrace with deep verandahs, under which the patients rest on cane sofas. On the ground floor of the central block are a large winter garden, a rather gloomy reading-room, and cloak rooms, with a well-lighted corridor in front, looking on to the terrace and extending to the wings. Behind are the entrance, grand staircase, porter's lodge, dark room, W.C.s and lavatories. At the ends of the wings are music and conversation rooms, billiard room, and library. The handsome dining-hall, which is placed in a separate building over the kitchens, and can easily seat 200 guests, communicates through a vestibule with the eastern end of the central corridor. In front of this, diverging by an obtuser angle than the eastern wing, is an open corridor 60 metres long, which leads to the eastern annexe. This is now entirely occupied by patients' rooms. A similar but shorter corridor on the other side of the centre leads to the western annexe, of which the basement contains the bath and douche rooms, the rest consisting of laboratories, consulting rooms, and the private rooms for the four medical officers and their establishment. The kitchen department, water-closets, and dining rooms for servants and officials are grouped around a small court near the dining-saloon. The position of the latter near the garden might be turned to greater advantage by bringing the windows on the south side down to the ground, and leaving them open during meal times. At present, however, the eastern corridor, which runs in front of the dining-saloon, interferes with such a desirable arrangement, owing to a difference of level. The upper part of the central block and wings, which is partially built of wood, is occupied by bedrooms on two floors, with smaller ones in the attics. Some of these bedrooms have balconies, one in the centre over the winter garden being a very large one. The bedrooms are 4 to 4½ metres high, and are mostly of good size, excepting those in the topmost story. Very few have chimneys. The walls are papered, partly with washable, partly with ordinary paper. The floors are everywhere of polished wood, or else covered with linoleum. Carpets are only used in strips by the bedside. Curtains and hangings are all of washable material. The furniture is mostly simple in character, but varies according to the kind of room. Stuffed articles have washable covers to them. There are no special ventilating contrivances, the air being renewed by open windows. Nor is there any lift. The place is heated by steam pipes on the Bacon system. Lighting is by electricity. The water

supply, which is abundant and of excellent quality, is obtained from private springs at the top of the neighbouring hill. In case of drought, there is a second supply from Cronberg. Hot and cold water are laid on to each floor; but the supply of bathrooms was far too limited when I visited the institution. The drainage system, which was constructed in 1883, under the direction of an English engineer, appears to be very good and complete of its kind. The water-closets, although not built out, are of good pattern, and are found on every floor. The sewage, with the rest of the waste water, runs into precipitating tanks in a shed in the grounds, where it is treated with acidulated aluminium sulphate, and repeatedly clarified by a partially automatic apparatus. The sludge is mixed with peat, leaves, or earth, and then used in the garden, while the liquid effluent irrigates a field. There was no objectionable smell when I visited the place. Most of the outbuildings—the stables, cowsheds and pigstyes, the somewhat primitive laundry, the steam disinfector, etc.—are on the other side of the road, behind the building on the north side.

The proximity of the village inn, although in some respects convenient, is in others a disadvantage, or, possibly, in certain cases, a hygienic danger.

The treatment of the patients is according to the late Dr. Dettweiler's well-known methods. More stress is laid upon rest in the open air than upon graduated exercise, for which, indeed, the grounds are less suitable than at some other establishments. There is plenty of provision for open-air treatment, the deep verandahs, balconies, summer houses, and long covered corridors being available in all weathers. One of the corridors, indeed, is glazed, and can be heated to any desired degree, while an abundant supply of fresh air can be admitted. Hydrotherapy is systematically made use of, beginning with dry rubbing and passing through spirit rubbing, cold ablutions, and the cold wet sheet to the cold douche. The number of those who use the latter is, however, much smaller than formerly. Owing to the very small number of baths, patients are somewhat unnecessarily restricted in their use of hot baths, being only allowed to have them at intervals, and with water below 96° F.

There are no trained nurses, unless they are specially ordered from Frankfort, in which case there is no convenient accommodation for them. The servants' quarters are also, as I am informed, not

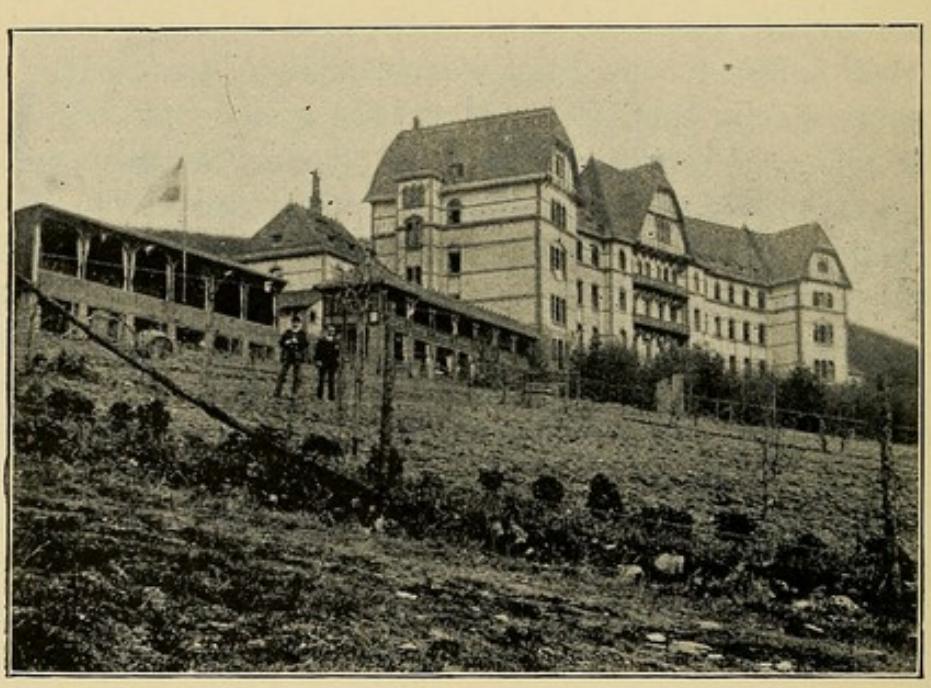


FIG. 69.—RUPPERTSHAIN SANATORIUM.

[*Face page* 307.

quite satisfactory according to English notions, and apt to lead to awkward consequences in the event of accidental illness. Various local societies amongst the patients help to keep them amused; and conjurers, singers and others, come fairly often. There is a Roman Catholic church in the village. Protestant services are held twice a month in the large board room. There is also a synagogue in Falkenstein.

The sanatorium is primarily intended for consumptives; but relatives are admitted when there is room.

Falkenstein was for years the only sanatorium in western Germany for the rational treatment of consumptives, and has had a great influence in promoting the erection of other sanatoria, both in Germany and in other countries. For this reason, the names of Dettweiler and of Falkenstein will always be held in honour by practical physicians all over the world. To Dettweiler also belongs the credit of having brought about the erection of the neighbouring sanatorium for the poor, which was the first of its kind in Germany (see below).

Falkenstein may be reached by carriage from Cronberg, which is the terminus of a short railway line from Frankfort, and about forty minutes' journey from that city. The sanatorium can also be reached by carriage from Soden railway station.

The Ruppertshain Sanatorium

is the successor of a small establishment at Falkenstein, founded by Dr. Dettweiler for the consumptive poor in 1892 with the help of the Frankfort Convalescent Association. This earlier sanatorium, which was merely an ordinary village house, was replaced in 1895 by a specially constructed building near Königstein in the Taunus Mountains, about forty minutes' drive from the older institution. The new sanatorium is at the head of a wide valley, with a south-easterly aspect, and is sheltered on three sides by mountains, for the most part covered with trees of various kinds. The soil, as at Falkenstein, consists of slate, gneiss and porphyry; the climate is that of the Taunus district generally. The grounds, of 4½ hectares (11 acres), are partly wooded with newly planted trees, partly meadow and cultivated land.

The sanatorium as originally constructed formed part of a circle, with thickened ends (fig. 69), comprising a basement, ground floor, first and second floors, and an attic floor within a steeply pitched

and lofty roof. Projecting from the western end are two fresh-air galleries on the basement level, leading on to a terrace in front with a view over the Main valley as far as the Odenwald. Behind the galleries on each side is a built-out pavilion, connected with the main block by a short corridor. The kitchen department was originally in the western pavilion, the stables and washhouse on the eastern side.

The basement (fig. 70) of the main block is occupied by cellars, heating apparatus, and bath and douche rooms on either side. The ends, which project slightly, contain two common rooms next the fresh-air galleries. On the ground floor in the centre are the rooms for the chief medical officer and the matron. Corresponding parts in the two next floors (fig. 71) are occupied by two large dining saloons. There are also a nurses' room and a small ward kitchen on each side and on each floor. The rest of the building on the south side is occupied with bedrooms. These open into well-lighted corridors, two metres wide, which have no other rooms to the north, excepting at the ends, which contain lavatories and closets, and in the basement also a mortuary.

The wards are arranged for one, three, and five beds respectively. More recently, a new kitchen and dining-rooms have been built at the eastern end, and beyond this a new wing for women; resembling the original portion. Men and women have separate sun galleries and dining-rooms. There are large verandahs in front of the latter.

The building is heated by low-pressure steam. For ventilation, the windows are constantly left open, day and night. There are ingenious wooden shutters attached to the windows, worked from inside, which admit air while they exclude rain, and can also be arranged as sun blinds.

Only early cases are supposed to be admitted, but the medical officers in their report, complain that many unsuitable cases are sent in. Patients have the use of the public woods on the other side of the road. Their treatment is as at Falkenstein in all essentials (see p. 304). Smoking is forbidden.

Patients stay at least twelve weeks, if suitable. Patients are expected to make their beds, brush their clothes and boots, etc., or else pay three marks per month for attendance. There is a good water supply. Waste water is disposed of by irrigation.

Station: Eppstein on the line from Frankfort to Limburg.

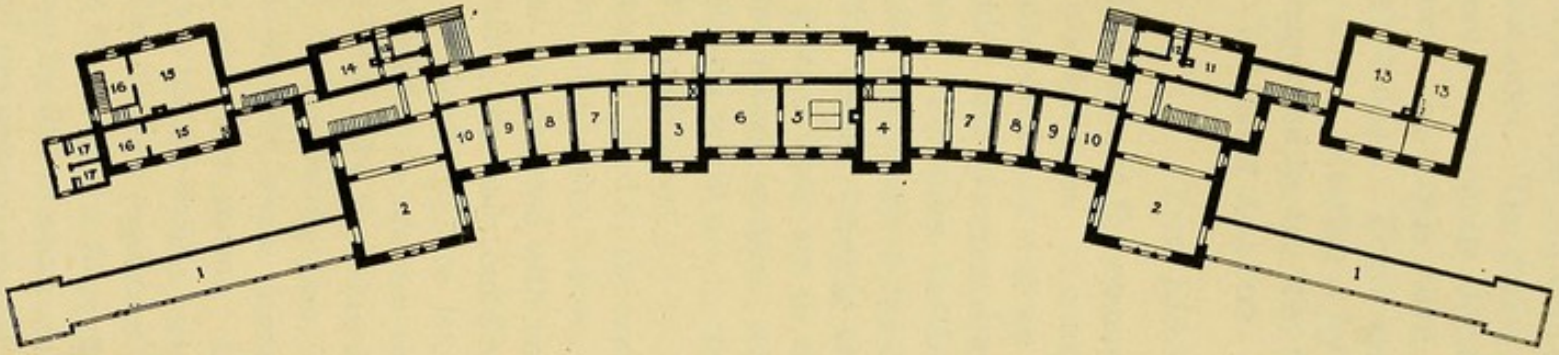


FIG. 70.—RUPPERTSHAIN SANATORIUM.

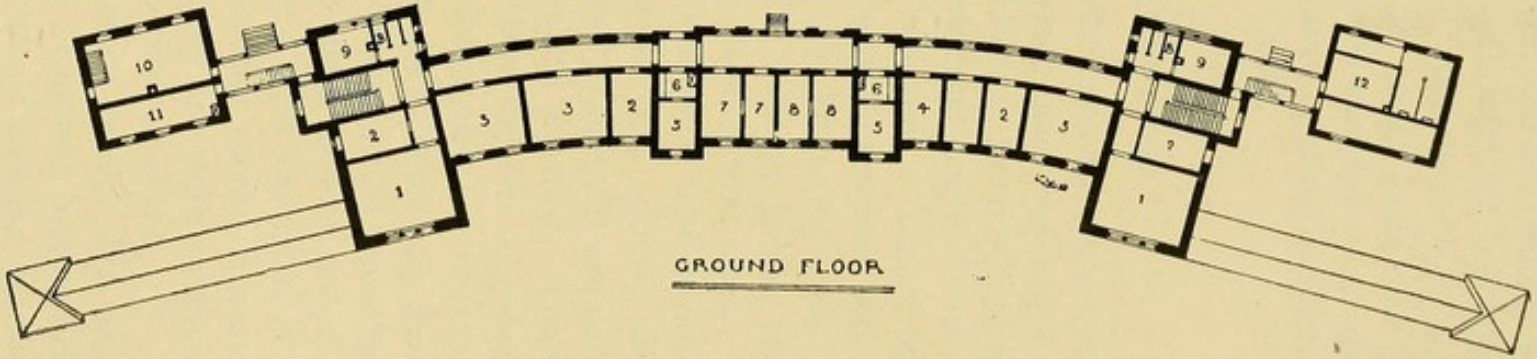
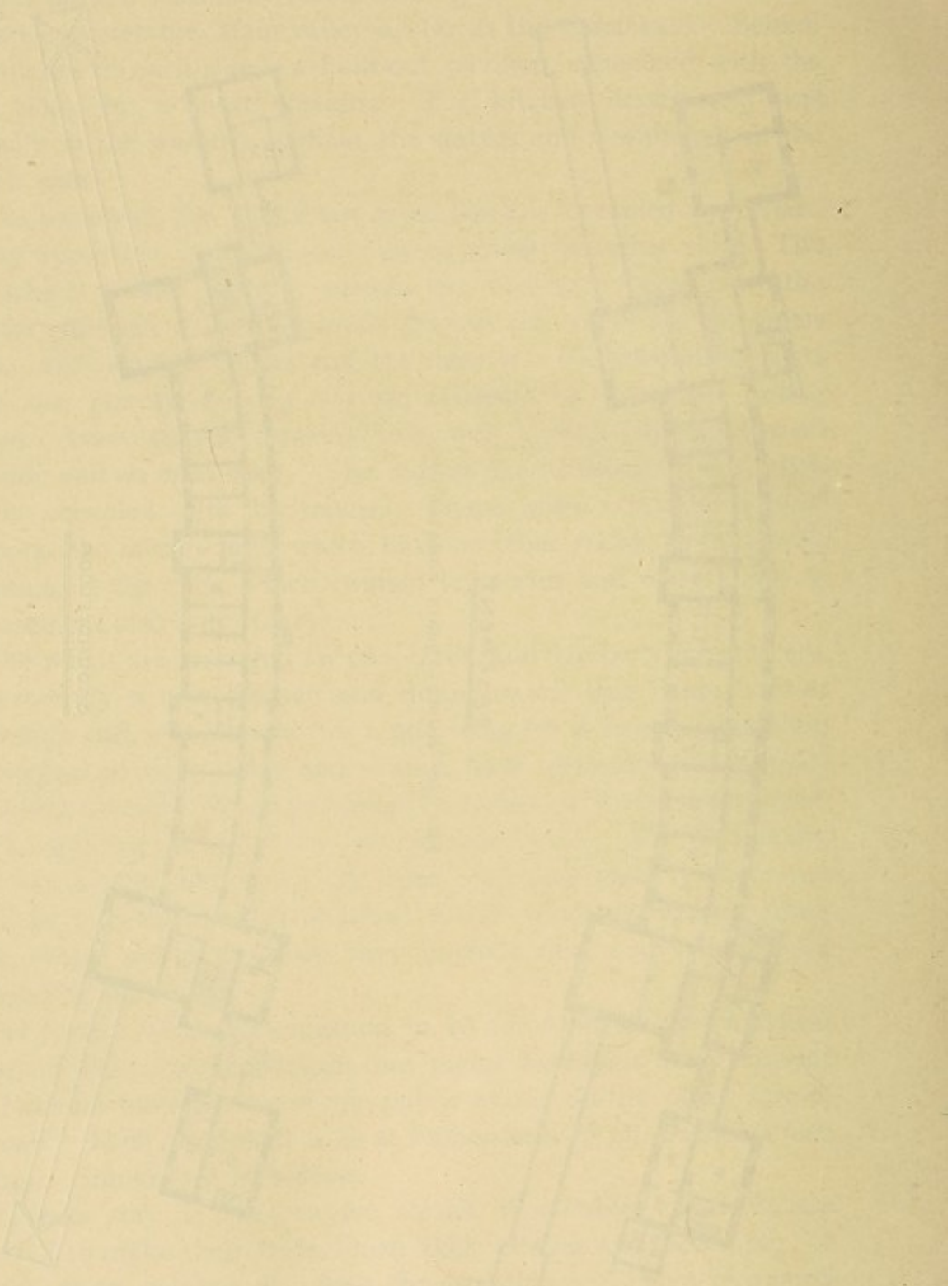


FIG. 71.—RUPPERTSHAIN SANATORIUM.

[*Face page* 308.



Oberkaufungen Sanatorium

is on a wooded cliff with a south-west aspect, and has two *liegehallen* at the sides. The dining-room is to the north, with kitchen beneath. There is a separate doctor's house. The main block is of several stories; the rooms have each from one to seven beds, ten being single-bedded. There are separate lavatories and day rooms for the two sexes. Heating is by low-pressure steam; lighting by electricity. Management by the Red Cross Sisters of Cassel.

Cost nearly £24,000.

The Ernst Ludwig Sanatorium

at Sandbach, in the eastern Odenwald, is sheltered to north and east by wooded hills. It consists of a three-story main building, united by a covered way with an administration block to the north, separate laundry and pumping-house, doctor's residence, engine-house and stables. The main building has in the basement a chapel in the middle, day rooms at the ends; also cloak and boot rooms, bath and douche rooms, heating chambers, W.C.s and baths for staff. On the ground floor are to the north side the staircase in the centre, sisters' rooms, warders' room and writing room to the sides. The twenty-six wards are in the three upper floors, each with two to six beds: cubic space 30½ to 34½ cubic metres per bed. There are six lavatories placed at the ends of the corridors. The walls are painted below, lime washed above, and in the bathrooms are tiled. The staff rooms are papered with sanitary paper. There are two *liegehallen*; one along the main building, another parallel to this but in front on a lower level. There is also a *Döcker* house[1] increasing the accommodation in summer time. The covered way which connects the main block with the administrative block is used as cloak room, and leads to the dining-room on the first floor. The basement of the administration block contains various consulting rooms, laboratory, office and linen rooms. On the second floor are store rooms and quarters for the maids, including separate baths and closets.

The doctor's residence is near the entrance gates. The engine house is 130 metres from the main building. Lighting by electricity; heating by low-pressure steam and by hot air. There is a mortuary behind the laundry, east of the main building.[2]

[1] See p. 264.

[2] *Zeitsch. f. Tuberk.*, March, 1902.

CHAPTER LII.

SANATORIA IN SOUTH GERMANY

Comprising Alsace-Lorraine, the Palatinate, Baden, Wurtemberg, and Bavaria; including the region of the Black Forest.

Name.	Province.	Elevation in Metres.	Opened.	Beds.	Fees in Marks per Day.	
Nordrach Colonie[1]	Baden	460	1888	51	10 to 13	Dr. Otto Walther
,, (Hettinger)[1]	,,	?450	1900	40	8 to 15½	Dr. Hettinger
Friedrichsheim (Marzell)	,,	840	1899	161	—	Dr. E. Rumpf; Baden Insurance Co.
St. Blasien[1]	,,	800	1878	62	10 to 15	Dr. Sander
Wehrawald[1]	,,	860	1901	100	10½ to 14½	Dr. F. Lips
Schloss Röteln[1]	,,	340	—	—	—	Dr. Petermann; less wealthy middle class; not exclusively for cons.
Arlen	,,	400	1897	16	2½	Dr. Weibel; cotton operatives of both sexes
Schömberg (Baudach)[1]	Wurtemberg	650	1890	40	6 to 10	Dr. Adolf Koch
,, for the people	,,	,,	1893	70	3 to 4	,,
,, New San.[1]	,,	,,	1899	65	—	Dr. G. Schröder; Dr. Naegelsbach
Wilhelmsheim (Schiffrain)	,,	435	1900	100	—	Dr. Knapp; men only
Boblingen[1]	,,	510	1901	45	—	For surgical tuberculosis
Alberschweiler	Alsace-Lorraine	—	1900	56+	—	Dr. Freymuth; men only; for Lorraine
Saales (Tannenberg)	Alsace-Lorraine	643	1904	100	—	Men only; for lower Alsace
Altweier (Leopoldinenheim)	Alsace-Lorraine	—	1903	30-40	—	Women only; Alsace Lorraine
Mannheim	Bavaria, Palatinate	—	—	—	—	—
Dannenfels	Bavaria, Palatinate	400	1892	18	—	Dr. Boyé
Alberschweiler	Bavaria, Palatinate	380	—	50	—	For Speyer and the Palatinate
Deggendorf	Bavaria	—	—	—	—	For Lower Bavaria
Planegg	,,	557	1898	120	3½	Upper Bavaria; men only; Dr. Krebs
Harlaching	,,	—	1899	212	—	Munich Town Council; women only
Engelthal (Hersbrück)	,,	—	1899	60	—	For Nuremberg; Dr. Bauer
Fürth	,,	—	1903	53	—	For upper Franconia; women only
berölkofen	,,	—	1900	20	—	A Convalescent Home; special section (out of 80)
Luitpoldheim (Lohr)	,,	—	1901	30	—	For Lower Franconia and Aschaffenburg.

Southern Germany.

THE NORDRACH COLONIE

is about thirty miles from Strassburg, and four and a half miles from the little village of Nordrach, in the Grand Duchy of Baden. Leav-

[1] Pay Sanatoria.

ing the little station of Biberach, on the railway from Offenburg to Constance, and following the road through Zell and up the valley of the Nordrach, which is dotted with picturesque wooden peasants' houses, a small cluster of cottages is met with at the bifurcation of the valley, which marks the position of the disused glass factory now replaced by Dr. Walther's sanatorium. The place is sheltered on all sides excepting the south-west, by pine-clad hills, which gradually slope to a height of about 900 metres on the north and east, the sanatorium itself standing about 450 metres lower down. The subsoil is a coarse red sandstone, which rapidly absorbs moisture; the wind shelter is very complete; a southerly aspect with an open valley and lower hills to the south ensure plenty of sunshine, while the distance from the nearest town (fifteen miles) and the nearest railway station (nine miles) ensures rest and tranquillity for the patients. The air is pure, and the river Nordrach ensures an abundant supply of good water and a never-failing source of power. The climate is that of a moderately elevated hill district—somewhat variable and moist as compared with Alpine climates, but with a fresh, still air, and a large proportion of rainy days. According to Dr. Rowland Thurnam,[1] it is somewhat colder in winter and hotter in summer than places on the English south coast, and is visited at times by heavy rainstorms, while in winter there are severe frosts and snow, interspersed with occasional gales of wind, and a certain amount of mist and dull weather. It is very rare to see any dust blown about —an obvious advantage to phthisical patients. About eighty acres of ground belong to the sanatorium, which is further surrounded by miles of forest land, traversed by a network of paths. The grounds are provided with paths at every variety of gradient, with seats at intervals, but with only three small huts or shelters, and no regular *liegehallen* or covered walks. This arrangement is made of set purpose, as Dr. Walther believes that when rest is needed it is best taken in isolation, in the patient's own bedroom.

The sanatorium was originally started in 1888, when it consisted of a single house with accommodation for ten patients. It now has rooms for fifty-one, besides a small villa for old patients who may come on a visit.

The sanatorium consists of detached buildings, none of which

[1] Harris and Beale, *The Treatment of Pulmonary Consumption*, London, 1895, p. 376.

have more than two floors and basement. The office, kitchen department, and rooms for the staff, are situated in the old *Gast-haus* (or inn) *zum Anker*, which is connected by telephone with the railway station at Biberach, and with the patients' houses. Attached to this building is the dining-saloon, a light and cheerful building about forty by twenty feet, with large windows back and front, linoleum-covered floor, and varnished panelled wooden walls. These windows are taken out of their frames during the warmer part of the year: those in front look out upon the road, those behind on the side of the hill. The dining-saloon and a small ante-room with piano and a recently erected library pavilion constitute all the common rooms in the sanatorium, so that there is every inducement for the patients to spend their time out of doors. The houses are not connected in any way, so that the road has to be used in going to and fro. The main building (fig. 72) is situated on the slope of the opposite hill, some twenty or thirty feet higher than the dining-saloon. It is a plain wooden building with a little turret near each end, consisting of single rows of bedrooms on the first and second floors with corridor at the back. The main aspect is south-east, and the ends of the building retreat slightly to follow the convex face of the hill. The patients' bedrooms are not particularly large (3·5 metres × 4·5, and 2·7 high) but they have a relatively large window space amounting to about half the size of each room, and the windows and doors are permanently kept open. The walls and ceilings are entirely lined with plain varnished wood, which is revarnished whenever a patient leaves. The floors are covered with linoleum, which is washed down every morning. In one corner of each room is a shower bath or douche apparatus; in another is a plain iron bedstead with woollen bedclothes; and the remaining furniture is of lacquered wood or iron, and of equally simple character. There are a few strips of carpet, and washable curtains. Hot and cold water are laid on for the douche and the washstand. The corridor is similarly built with pinewood panelling, which here is oiled. The windows of the corridor are opposite the bedroom doors. The water-closets, which are built out of the corridor, are provided with a good flush of water. Twenty patients can be accommodated in this building. The rest are lodged in other villas farther up the valley. Dr. Walther occupies one of these. Another villa is occupied by eleven slight cases; this is the only existing building in



FIG. 72.—NORDRACH COLONIE, ANSTALT.

[*Face page* 312.

the sanatorium which has a common bathroom for the patients. In all essential respects, the other villas are constructed and furnished like the main building. There are no special ventilating contrivances. The lighting throughout the sanatorium is by electricity generated by a motor driven by water power; all the rooms, too, have electric bells; and one entire villa is heated by electricity. Elsewhere the sanatorium is heated by low-pressure steam pipes, which can be regulated for each building as a whole. Passages and closets are not separately warmed. There is a good and plentiful supply of drinking water from springs out of the sandstone rock. The sanatorium possesses its own farm of ten cows, which are fed on barley and hay only. The milk for cooking is, however, obtained elsewhere. Dr. Walther considers it unnecessary to test the cows with tuberculin. Patients have the milk fresh or boiled, whichever they prefer. There is a steam laundry in the sanatorium, and a mechanical refrigerator for meat and for ice. All meat is kept a fortnight before being used.

Some of the descriptions of Nordrach Colonie give rather a wrong impression of the place, as if it merely consisted of ordinary peasants' houses and were devoid of all comfort. No attempt is made, it is true, to provide more than ordinary comfort, or to rival the luxury and sumptuousness of a first-class modern hotel. But these are not at all necessary, and in some respects are misplaced in a sanatorium. The rooms, as far as I saw them, were exceedingly carefully and practically, though simply, fitted up, and were exquisitely clean and sweet, which is more than can be said of one or two other sanatoria that I have seen. Opinions may differ as to particular details of Dr. Walther's system of management, but for all that he does or omits he has excellent reasons to give.

Open-air treatment at all hours, weather and seasons is very rigidly enforced, extra wraps being provided in bad weather, but no other difference being made. Patients walk about in even rainy weather without any special protection. They take their own temperatures four times a day *in recto* as a guide to treatment. Until for eight successive days the temperature has failed to reach 38° C. (100·4° F.) patients are kept absolutely at rest in bed with open windows. They are then permitted to take very gradually increasing exercise, mainly walking, never faster than two miles an hour, so as not to cause dyspnœa or disturb the circulation. The first walk

may only consist of a few yards on level ground, followed by a long rest on a lounge chair in the open; afterwards shorter or longer uphill walks are prescribed, according to the progress made. Patients are encouraged to do without heavy overcoats and wraps while out walking, although they may wrap up as much as they like while resting. Not more than three or four are allowed to walk together, and visits from friends or relatives are discouraged. Even attendance at the little chapel at Nordrach is objected to, although there is no regular service in the institution. Dr. Walther believes weather and season to be of no importance, and does not even take meteorological observations. Nor are any special precautions adopted against draughts. As he himself told me, patients live in a thorough draught from the first moment of their arrival, with absolutely no bad effects, although no attempts are made to "harden them" against catching cold. Hydrotherapy is not systematically employed with this object, but patients bathe or douche themselves with hot or cold water, very much as their own instinct leads them, and in clothing are also allowed to please themselves within certain limits. They all rest for an hour before the midday and evening meals.

Several inaccurate accounts have been given concerning the *diet* at Nordrach, even by presumably trustworthy observers, and Dr. Walther was at some pains to correct these inaccuracies. Three meals a day are provided, at 8.30 A.M., at 1 and at 7 P.M. The breakfast consists of coffee, bread and butter, and cold meat of some kind. Dinner includes two hot courses of meat, or fish and meat, with plenty of potatoes and green vegetables, and sauces containing butter. Following this are pastry, farinaceous pudding, fruit or ice cream, with coffee to finish. Supper consists of one hot and one cold course, together with tea. Milk is added to the dietary until the patient's weight has reached a reasonable standard, never more than a half-litre being given with each meal. The meals are taken in the presence of the doctor, who encourages the patient to finish what is given him, and eat a reasonable quantity of every kind of food provided. The stories about patients being compelled after vomiting to begin their dinners over again against their will are inaccurate. So also are the statements as to enormous quantities of meat or food generally being given. The proportion of nitrogenous food given is if anything less than usual; and no attempt is made to emulate Debove and others of the same school in hyper-alimentation.

The quantity is regulated so as to produce a steady gain in weight during the earlier weeks of about 1 lb. per week. Under this regime dyspepsia is said not to be common, and soon to disappear, if present with improving nutrition and strength. There seems however to be some truth in the statements that the dietary is somewhat inelastic for those who are already dyspeptic. The use of alcohol is kept down to a minimum, without any absolute prohibition.

Drugs are but little used. There are practically no amusements, excepting walking, reading, and occasionally a little music. Light literature is permitted, but business communications or work of any kind are forbidden.

Monthly examinations are made of the lungs and expectoration. When after about twenty examinations no bacilli are found in the sputa, and when after injection of one c.c. of the sputum into a guinea pig tuberculosis does not appear within three to six weeks, the patient is considered fit to return home, and to undertake moderate regular work.

Dr. Walther has two assistant medical officers.

Access: Nine miles from Biberach-Zell, and ten miles from Gengenbach, on the Black Forest Railway, whence it may be reached by carriage.

Dr. Hettinger's Sanatorium

is situated in the Nordrach valley, nearer to Biberach-Zell. It has the appearance of a handsome hotel with five (and in the lower seven) stories, square built, with large balconies on the first floor, smaller ones above, and a deep verandah on the ground floor. There is a fine dining-room on the first floor, with windows on one side, and a number of other common rooms. The consulting rooms, laboratory and doctor's quarters, are on the second floor behind the patients' bedrooms. The bedrooms are 3·80 metres high, with oil-painted walls, floors of cork covered with linoleum, and large windows. Central steam heating; electric lighting; an isolated disinfector; *fosses Mouras* for the sewage. Three resident medical officers.

Friedrichsheim Sanatorium,

near Marzell, on the Blauen, is about ten kilometres from Baden-weiler and from Kandern, in an isolated and picturesque spot amongst the pine woods. The main building is a T-shaped mass

consisting of a four-story south front, with a three-story pavilion stretching northwards from its centre, and smaller sanitary pavilions near the ends. On the ground floor of the south front are common rooms, cloak rooms, douche and bathrooms, quarters for second medical officer and rooms for destroying sputa and cleansing spit-cups. In front of the floor is a *liegehalle* leading off at an obtuse angle. On the upper floors are the wards, forty-five in all with 111 beds, and one, two, or four beds in each: height 3·40 metres, cubic space 28 to 42 cubic metres per head. Angles are rounded, floors covered with linoleum, walls with washable paper. The windows reach the floor, even where there is no balcony. The lavatories and W.C.s are north of the corridor in the sanitary pavilions. The northern central pavilion has on the ground floor the linen rooms, store rooms and cellars, over this the dining-saloon, office and consulting rooms, and above these the quarters of the matron and nurses, the steward and the chaplain. A linen lift for clean linen and a shoot for dirty linen connect each floor. Most of the wards are on the south front in a single row; but behind this is a double row leading to large wards in the northern pavilion. The kitchen department is in a separate building to the north; the engine house with laundry, etc., lying north-east, and the medical director's house to the east near the entrance. There are fifty beds in a *Döcker Baracke*[1] for summer.[2] The *liege-hallen* are at an obtuse angle with the south front, at the sides.

Dr. Sander's Sanatorium,

in St. Blasien (Baden), was founded by Dr. Haufe, in 1878, but has been since 1895 under the management of Dr. Albert Sander.

St. Blasien is an ancient and picturesque little town in the valley of the Alb, in the southern portion of the Black Forest, famous for its eleventh-century cloisters and church, and boasting of a flourishing kursaal and hydropathic establishment. The district is on primary rocks. The town itself is somewhat shut in, as, notwithstanding its elevation above the sea-level, it is surrounded on all sides by mountains, one of which—the Feldberg—is the highest peak in the district, and rises to a height of 1490 metres. This circumstance renders the place unpleasantly hot in the height of summer, although in winter it is probably much more agreeable. The drainage is also somewhat

[1] See p. 264.

[2] *Zeitsch. f. Tuberk.*, March, 1900.

primitive, and spoils the charm of what would otherwise be at certain seasons a most desirable health resort.

Dr. Sander's sanatorium is at the western end of the town, on the pine-clad valley side, a little raised above the main road, and nearly 100 feet above the lowest part of the town. It has a southerly aspect, and has recently been rebuilt. It consists of three separate buildings, enclosing a terrace with glass verandah. Behind it rises the forest, which is traversed with paths and has a large shelter among the pine trees, for use in bad weather. The ground floor of the central block has at the eastern end the large dining-saloon which communicates with the kitchen below. Further on are a number of common rooms, and the office and grand staircase. In the western wing are consulting rooms, laboratory, cloak rooms and lavatories, and a dark room; in the basement the laundry, on the first floor the quarters of the second medical officer.

In the eastern villa are the quarters of the medical director, the douche and bathrooms, and a few patients' rooms. Most of the bedrooms are in the central block on the three upper floors. Four-fifths of these have a southerly aspect; about half being in single row. The walls are oil-painted and smooth with rounded angles; the floors covered with linoleum, or lined with terrazzo or parquet. The rooms are four metres high; fanlights are placed over the windows and balconies in front of most of the bedrooms. There is a large glass verandah in front of the ground floor for winter use, and over this a long verandah. The whole building has been made of more or less fireproof materials, all balconies of iron, and very little woodwork being used in construction. The well-kept garden is directly continuous with the pine wood behind the sanatorium. There are two bridges from the second floor of the main block, leading directly into the woods; electric lighting; low-pressure steam heating; modern sanitary arrangements.

There is plenty amusement for patients, both in the establishment and (during the season) in the town. Indeed Dr. Léon Petit rightly regards the proximity of the town and the kursaal as a serious drawback.

Patients are admitted in all stages, and stay from four to fourteen months. When the temperature out of doors falls below $-7°$ C. patients are not allowed outside.

Stations: Albbrück (Basel line to Constance) 26 kilom.; Titisee

(Höllental Railway) 30 kilom. : *i.e.* about four hours' drive by omnibus or carriage.

The Wehrawald Sanatorium,

near Todtmoos, is placed on a southern spur of a lofty and thickly wooded range of hills overlooking the valley of the Wehra, surrounded on two sides by a beautiful pine wood and on three sides by lofty mountains. Todtmoos is a recognised health resort, and the district is one of the most beautiful in the Black Forest.

The main building is a fine structure with cellars, ground-floor and four upper stories, and projecting lateral wings to the north ; a separate engine house with laundry and lay manager's quarters is placed at the bottom of the adjacent valley ; the medical director's house being also separate, but connected with the main building by the *liegehallen*, and placed upon a common platform of granite rock.

The main building, based upon designs of Dr. Turban of Davos, has a straight front, with a spacious verandah eighty metres long to the south, ending on the west in a summer house and on the east in the medical officer's house. Above this is a long balcony, most of the rooms on upper floors being also provided with short balconies. The central portion of the main block is one room thick, with corridor to the north ; but the latter is blocked at the ends. On the ground floor are a large vestibule in the centre, leading to the main staircase and hydraulic lift ; to one side two large cloak rooms with the ladies' baths and douche attached ; to the other side three common rooms. The entrance is at the eastern end of the corridor. In the western wing are the gentlemen's douche and bathrooms, and behind these the operation room, consulting rooms and laboratory. In the western wing, beyond the post office, porter's room and office, are a spacious dining-saloon with kitchen department behind. The wings are of one story only. The W.C.s. and servants' staircase (the latter approached from the north by a covered way) are on either side of the central staircase, north of the corridor. On the upper floors there are also linen rooms, housemaids' closet, etc.

The rooms are everywhere carefully finished off, with rounded corners, walls covered with sanitary paper half-way up, and then oil painted ; plaster of Paris floors covered with linoleum, electric lighting, and low-pressure steam pipes. The bedrooms have double doors, and double glass ventilators over windows and balcony doors. About

two-thirds look south, the rest east and west. The place is sumptuously furnished.

Dr. Lips, the managing physician, was formerly under Dr. Turban at Davos, and treats his patients in the same way. From this description, it will be seen that the sanatorium is very complete and beautifully finished, but open to criticism from a medical point of view.[1]

Station: Wehr, on line from Basel to Schopfheim and Säckingen: drive of 2½ hours.

The Arlen Sanatorium.

In the south-west corner of the Black Forest, in the Grand Duchy of Baden, to the south of Hohentwiel, is a small sanatorium for male consumptives in connection with the Heinrichs Hospital, both of which were founded by the factory owner, Commercienrath Carl Ten Brink, for the benefit of his workmen.

The sanatorium stands in open country, at the foot of a mountain running from north-west to south-east, which shelters it from north and east winds. It has a fine garden of 1·2 hectares, surrounded by other gardens. It consists of one story on a high ground floor, arranged in two symmetrical halves, for eight male and eight female patients. On each side are a large day room, one dormitory for four beds, two rooms with two beds apiece, and a lavatory. The bedrooms have an average space of 48 cubic metres per bed. There are a common dining-room, kitchen, matron's and doctor's rooms, and two bathrooms. On the south side of each half is a large verandah, and smaller ones to east and west, besides a long covered walk in the garden. The building is heated by warm-water pipes and lighted by electricity. Every room has a chimney for ventilation. The walls are enamel-painted. The sewage is carried into a neighbouring stream.

Although mainly intended for consumptives, it is not reserved exclusively for such patients. The douche is not used, but other forms of hydrotherapy are employed. There are two female and one male nurse.

The nearest station is Arlen-Rielasingen, on the line from Singen to Winterthur. Singen is a junction on the line from Cassel, and that from Basel to Constanz.

[1] See correspondence in *British Medical Journal*, June and July, 1902.

The Schömberg Sanatorium

is situated in Würtemberg, in the northern part of the Black Forest, south-east of Pforzheim, and not very far from Wildbad. A convalescent home was erected here in 1888, by Herr Römpler, which, being much frequented by consumptives, was converted in 1890 into a sanatorium exclusively for such patients, and placed under the care of the late Dr. Baudach. It is now under the medical direction of Dr. Adolf Koch, formerly of Falkenstein. There were originally only twenty-five beds; but in 1893 a large three-story building was erected, when the older building was utilised for the reception of less wealthy patients (see p. 321).

The village of Schömberg lies in a valley on the mountain crest, between the Enzthal and the Nagoldthal, surrounded by pine-clad heights to the north, east and west. The sanatorium is on the southern slope of a hill in the midst of the village, but in a fairly open situation. It has about 1½ hectares (3½ acres) of ground, partly laid out as a garden. The paths all lead uphill towards the woods, which are distant about ten minutes' walk. The soil is of porous sandstone, as in other parts of the Black Forest; the climate in summer cool and pleasant, without excessive evening fall of temperature, and in winter is for the most part sunny, the snow remaining the whole season on the ground.

The building has a south-south-east aspect, all the patients' rooms being on the south side. It is of oblong form, with a deep verandah along the front, and balconies to every other floor but the uppermost. In the basement there are a douche room, a large steam disinfector, laundry, kitchen and central heating apparatus for low-pressure steam pipes. The ground floor contains the dining-hall and other assembly rooms, such as the reading room, billiard room, and ladies' room. The largest of these contain respectively 250 and 320 cubic metres air space. On the upper floors are the bedrooms, and on each floor a bathroom and servants' room. The rooms have an average capacity of 60 to 80 cubic metres; their walls are oil-painted for 1½ metres from the ground near the beds, colour-washed elsewhere. They are ventilated by air shafts, and by open upper hinged window panes, and decorated simply but comfortably. The heating is by low-pressure steam; the lighting partly by benzine incandescent lights or petroleum, partly by means of candles. There is a good water supply. The water-closets lead into settling tanks.

The treatment is much as at Falkenstein, with a large proportion of rest in the open air. Besides the fresh-air verandah, which is intended mainly for those whose rooms have no balcony, there are several shelters in the grounds, in one of which, on the edge of the wood, patients can obtain milk, and enjoy a beautiful view of the surrounding country. There are one male and one female nurse; besides which nursing sisters are obtainable in case of need. The general management is in the hands of Herr Römpler, himself an example of recovery from pulmonary disease. The medical director, Dr. Koch, who lives in another house close by, is assisted by Dr. Wehmer, formerly at Görbersdorf. The latter lives in the sanatorium.

A good library, piano, croquet and other games are provided for the patients. There is a Protestant service in the village church; no Roman Catholic service is available.

Schömberg is a telegraph station, and is on the telephone. It may be reached by carriage in one and a half hours from Liebenzell (on the line from Pforzheim to Calw), or from Höfen (on the Wildbad line). Heavy luggage comes *viâ* Höfen. Pforzheim is not far from Carlsruhe.

The Schömberg People's Sanatorium

was originally founded by Dr. Baudach. It consists of a number of houses in the village under the charge of an experienced married manager. The patients are kept quite separate from those of the private sanatorium both in the woods and fresh-air galleries, but are otherwise treated in much the same way. Never more than three sleep in one room.

The New Sanatorium,

at Schömberg, was planned by the late Dr. Baudach, who however died soon after it was opened. Dr. Schröder, who conducts the establishment, was formerly under Dr. Meissen at Hohenhonnef.

The sanatorium is on sandstone (Bunter sandstein), on a high plateau between the valleys of the Enz and the Nagold, surrounded by pine woods and well protected against wind, and possesses a garden of six acres. The building, which looks south-south-east, has five stories, mostly with verandahs and balconies. The administrative department is in the basement, and in front of it a covered

walk for patients. On the ground floor is the dining-room in the centre, reaching from front to back; on the west side of it some other day rooms, on the east, day rooms and bathrooms. The bedrooms occupy the upper floors, both front and back. Walls are covered with washable paper, floors partly of pitch pine, partly covered with linoleum, partly terrazzo. Heating is by low-pressure steam; lighting by incandescent gas burners (Phœbus system) the gas for which is made on the spot. The sanatorium possesses its own laundry. The W.C.s and staircases occupy projecting pavilions to the north. There are two large and three small *liegehallen* in the woods. The staff includes three resident medical officers, and three nurses (one male).[1]

Wilhelmsheim Sanatorium,

in the Black Forest, is on the south side of the fairly steep slopes of the Löwenstein Mountains, overlooking the Murrthal. It is well protected by woods and hills to the north and east, and fairly well to the west. The building, which has three stories and attics, stands on a terrace surrounded on three sides by woods, the ground rising 50 metres behind it, and falling in front about 260 metres to the bottom of the valley. A separate doctor's house stands a little to the north-west. The sanatorium contains sixteen rooms for three apiece, and eighteen with fifty-two. The capital (300,000 marks) was borrowed at 1 per cent. for ten years from the Wurtemberg Savings Bank, and was guaranteed partly by the State, partly by the Wurtemberg Insurance Co., partly by the Central Sanatorium Committee in Berlin; partly also by boards of guardians, sick benefit societies, manufactories, private donors, etc.

Access: Oppenweiler Railway Station, four kilometres.[2]

Böblingen Sanatorium,

for surgical tuberculosis, is situated some eighteen kilom. from Stuttgart, in a beautiful position surrounded by woods, and possesses nine and a half acres of land. The building is a handsome pile of three stories with attics and two towers. It consists of a central portion with two wings, the eastern of which projects northwards and slopes south-east at an obtuse angle; the western wing

[1] *Zeitsch. f. Tuberk.*, Nov., 1901.
[2] View in *Das Rothe Kreuz*, 15th Jan., 1901.

sloping north-west. The kitchen is in the basement of the west wing, and has over it the dining-room. The rest of the basement contains the cellars, heating apparatus, engines, laundry, etc., with a few bedrooms on the south side for the staff. The grand entrance is at the eastern end; the back of the eastern wing containing an operation room, laboratory, office, consulting rooms, etc. The oblique part of the east wing, which is separated from the central portion by the grand staircase, is for children. The other bedrooms occupy the upper floors of the central portion on the south side. There is a large verandah over the children's wing, and other verandahs and balconies in front of the central bedrooms, which are mostly single-bedded.[1]

Tannenberg Sanatorium,

in a valley running south-east from the Vosges, is protected by mountains in every direction excepting the south, where it overlooks the little town of Saales. It consists of three buildings united by double tier *liegehallen*. The lateral buildings have a basement, two upper stories and attics, and alone contain the wards. The central building is for administration and for the common dining-room, etc. In the ground floor of each lateral building are cloak rooms and day rooms. The upper floors have lavatories for fourteen patients each, and wards, mostly for two to three beds, a few with four, and sixteen single-bedded. There is a bathroom on each floor, and a few portable baths are also provided with means to fit them up for use in the rooms of bed-ridden patients.

The examination room, laboratory, office, and quarters for the medical director and most of the staff, are in the central block: there is a covered wall with big windows behind each *liegehalle*. The engine house with heating apparatus, laundry, and lighting apparatus, is in a more distant block. Heating by high-pressure steam, converted into low-pressure steam in the buildings. Electric lighting. The staff consists of two sisters, two nurses, a housekeeper, a sister for the kitchen, six maids, a secretary, engineer, furnace man, porter, and laundry woman.[2]

The Dannenfels Sanatorium.

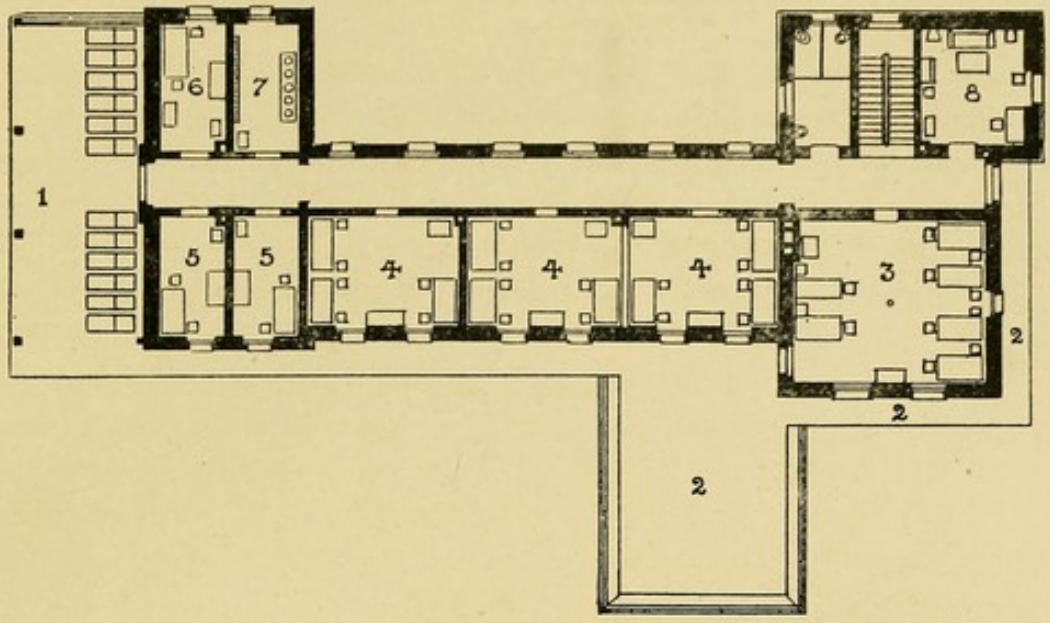
The *Badische Anilin und Soda Fabrik* at Ludwigshafen, on the Rhine, are remarkable for the care which they take of their large

[1] *Zeitsch. f. Tuberk.*, June, 1901. [2] *Ibid.*, July, 1904.

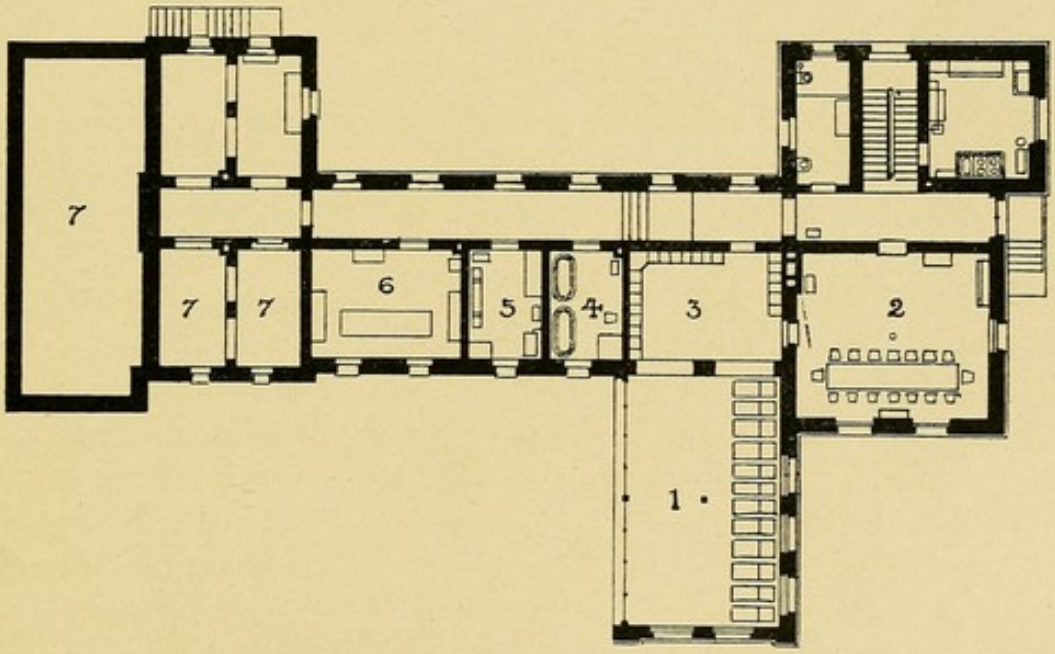
staff of workpeople. They have over 4,000 workpeople, whom they have provided with a number of model dwellings, a large restaurant where they can obtain meals below cost price, another dining-hall where those who receive their meals from home may eat them in company of their wives and children; baths, lavatories and dressing rooms, with soap and towels gratis; a large free bath for the wives and children (who are not employed in the factory); a lying-in cottage; a school of cookery and household management for the daughters; a cottage hospital for women and children, and another for men; a convalescent home in the country, and a sanatorium for consumptives. In addition to this they have a system of premiums for long service from five years upwards; a savings bank; a sick fund, also open to those who are called out on military service; a fund for widows, orphans and invalids; and a pension fund for those over sixty years of age.

The convalescent home and the sanatorium for consumptives are both near Kirchheimbolanden in the Pfalz. We need only describe the latter.

It is situated at Dannenfels, at the foot of the Donnerberg, on twenty-five hectares (sixty-two acres) of land, which is partly meadow and garden, partly covered with chestnut woods. It is on the eastern side of a hill, and is protected by woods to the north. The eastern end is a three-story pavilion (fig. 73), with a ground floor, first and second floors and attics. From this extends a long two-story prolongation, consisting of a single row of rooms on each floor, with a corridor along the northern side, and surrounded on the east, south and west by a balcony with two fresh-air resting places on a level with the first floor. One of these resting places (which has no roof) extends southwards over a built-out pavilion near the eastern end, ten metres long by six wide. Under it is another shelter open to the west, and with windows to south and east, for use in cold weather. The other first floor shelter is somewhat larger, and occupies the western end of the building, on a level with the garden. The ground floor contains, in addition to the cold weather pavilion, a large dining-room at the eastern end, a day room, bathroom, doctor's room, ironing room and cellars; and on the northern side, the kitchen and administrative rooms at either end of the house. The first floor contains patients' rooms along the south side; office, staircase, lavatories, closets, and nurses' rooms on the northern side.



FIRST FLOOR



GROUND FLOOR

FIG. 73.—THE DANNENFELS SANATORIUM.

Ground Floor :—

1. Fresh-air Gallery.
2. Dining Saloon.
3. Sitting Room.
4. Bathroom.
5. Consulting Room.
6. Ironing Room.
7. Cellars.

N.E. corner, Kitchen.

First Floor :—

1. Fresh-air Gallery.
2. Open Platform.
3. Room for six Beds.
4. Rooms for three Beds apiece.
5. Single-bedded Rooms.
6. Nurses' Room.
7. Lavatory.
8. Office.

[*Face page* 324.

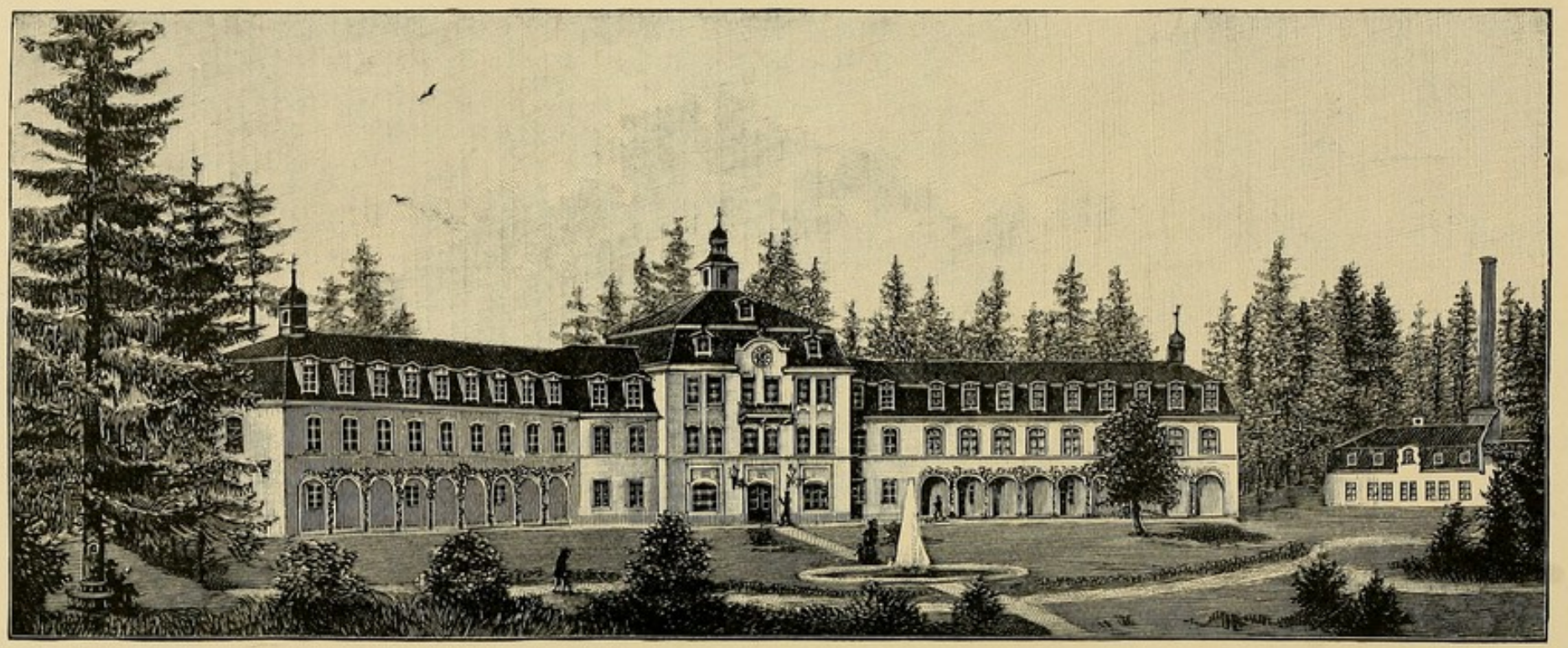


FIG. 74.—THE KRAILLING SANATORIUM.

[*Face page* 325.

In the second floor of the eastern end are two rooms for the matron and a reserve room; the attics being occupied by additional administrative rooms. The patients sleep six in one room, three each in three other rooms, and three in single-bedded rooms. There is also an outbuilding for cows, pigs, hens and laundry.

The sanatorium is open the whole year. It is under the care of a sister of the *Bavarian Frauenverein vom Rothen Kreuz.*

Patients now usually stay six months; and the results are stated to be notably better than with only thirteen weeks. They do some of the light work when fit for it.

The Luitpoldheim,

for Würzburg and district is in the Lichterwald, near Lohr, in the Spessart, a district famous for its extensive forests of oak and beech trees. The basement contains various cellars and store rooms, together with kitchen and laundry. On the ground floor a dining-room for the men at one end and one for the women at the other, with laboratory, consulting and drug room between, and bathrooms and rooms for servants behind. The fresh-air verandahs diverge from the ends next the dining-rooms, each forming an obtuse angle with the front of the building. On the two upper floors there are nurses' and linen rooms behind, and bedrooms in front, some single-bedded, some for three, others for four beds each.

The Krailling Sanatorium

was built by the Sanatorium Society of Upper Bavaria to the west of Planegg. Besides working men belonging to the sickness insurance societies (especially that of Upper Bavaria), it receives private patients of the industrial and commercial classes—shop-keepers and the like—at low fees; and a number of separate rooms with one or two beds each have been provided with this object. The Sanatorium Society itself was mainly established through the efforts of Prof. v. Ziemssen in 1895. Amongst the most prominent supporters has been the Baroness Hirsch, who gave a donation of £5,000.

The sanatorium (fig. 74) stands in a wooded neighbourhood on gravel soil and has an area of 16½ hectares belonging to it, laid out in a variety of paths. It consists of a main building with diverging wings running north-east and north-west respectively, and is connected by a subterranean passage about 200 feet long with a sub-

sidiary block. The main building has a basement, ground floor, first and second floors. In the basement on the north side are the kitchen, scullery and larder. Next to the latter, in the angle of junction between the centre and the western wing, is the ice cellar. Electric ventilation shafts go from the kitchen to the highest point of the building, and lifts to the serving room and to the tea kitchens on the upper floors. To prevent the entrance of cellar air into the upper floors there are no cellars under the parts occupied by the patients, and the cellar stairs do not lead into the shafts of the main staircase but into the open air. In the middle of the ground floor on the south side is the large dining-saloon, with a serving room and servants' dining-room to one side and a reading room to the other. The dining-saloon is also used as a day room. In the wings are two fresh-air galleries, with room for forty couches. Behind the western wing is a corridor with a number of rooms for the sisters; and in the angle above the ice-house is the Catholic chapel. The corresponding angle on the eastern side is occupied by a Protestant chapel. Behind the eastern wing is a corridor with laboratory, consulting and waiting rooms, and separate bathrooms for the patients, the medical staff and the sisters, as well as a douche room. Part of the corridor is used as a dressing-room. To the north of the centre block, behind the dining-saloon, is the main entrance, with a visitors' room on one side and two rooms for the house master on the other. Outside these are water-closets, and outside these again, rooms for clean and dirty linen, separated from the two chapels by the main staircases.

The first floor contains patients' rooms on the south side, and at the back of the centre block a committee room, lavatory, tea kitchen, and another large room, besides the water-closets and linen rooms, as on the floor below. The second floor is somewhat similarly arranged. The patients' rooms have an average air space of thirty-eight cubic metres. Those on the second floor in the wings have mansard windows. As originally planned, there were two rooms with five beds, fourteen with four beds, four with three beds, fourteen with two beds, and eight with one bed apiece; but 120 can actually be accommodated in the building. The linen rooms are so arranged that dirty linen can be sent down from each floor on one side of the building by a lift into the basement, and clean linen be drawn up by another lift on the opposite side. The build-

ing is heated by low-pressure steam, and lighted by electricity. The outbuilding contains in the basement the disinfector with two approaches and bath, another bath room for servants, heating apparatus and cellars. On the ground floor are the washhouse, stables, cowsheds, workshop, tool-house, laundry, engine and dynamo for electric light, mortuary, and common room for men servants. Above are the servants' bedrooms, in addition to hay loft and dry room, the latter with lifts to the disinfecting room and the laundry.

There are ten nursing sisters.

The sanatorium is twenty minutes' walk from the Planegg station on the line from Starnberg to Munich, which is distant two hours by rail.

The Harlaching Sanatorium

was built by the Munich Town Council for convalescents of both sexes, including consumptives, but is now devoted to female consumptives. Situated in ten hectares of ground, it is surrounded by woods to the south, west and east. The main building has a southerly aspect, and consists of three stories with basement underneath for heating apparatus and cellars. The entrance is in the centre of the north side; near to it are reception rooms, an office, a transverse corridor leading to the wards, and then the double staircase. Further south is a projection containing cloak rooms and day rooms for men and women respectively, and a smoking room. Over this are reading rooms, sisters' rooms, and a chapel and saloon for Protestant worship. Wards with twenty beds each and *liegehallen* on the south side run on each floor towards the wings; these also project southwards and contain a twelve-bedded room on each floor, a nurses' room, a subsidiary staircase, and on the north side W.C.s and bathrooms separated by a ward kitchen. At the southern extremity of the wings are some isolation rooms. The sexes are separated by a line running north and south through the building and grounds. Separate passenger lifts have been provided, as well as food lifts. To the south of the sanatorium are large lawns; to the sides of these, large vegetable gardens. The floors are *betonirt* and covered with linoleum; ventilating shafts are provided in the wards, ending in the chimneys above the roof. Heating is by low-pressure steam, lighting by electricity.

A large separate administration block has been provided to the

north, sufficient eventually for 500 patients. It contains a large kitchen, scullery, dining-room for the sisters, doctor's room, laboratory, drug-room and porter's bedroom. On the upper floor are twenty rooms for the house master, physician, and three assistant physicians, and in a separate portion for the nurses. The food is drawn by mechanical means through a subterranean passage to the dining-room in the basement of the main block. Servants are lodged in the wings of the administration block. In another building are the laundry, steam disinfector, and quarters for the engineer and his mate.[1]

Engelthal Sanatorium

near Hersbrück, consists of ground floor, first and second floors, with basement for disinfector, laundry, engines and douche room, and attics for the servants. The centre and ends project slightly back and front. In the centre of the ground floor are the consulting rooms and laboratory in front, the entrance, reception rooms and staircases behind; above are the quarters of the doctor and nurses. At the eastern end on the ground floor is a large day room, and over it the dining-saloon. The kitchen block is behind this wing. There are lavatories, W.C.s and bathrooms to the north of each of the projecting parts, those in the centre being for the staff. Low-pressure steam heating, electric lighting, and high-pressure water supply have been provided; also a Roentgen-ray apparatus. The wards contain from one to six beds, mostly three or four, those with fewest beds being on the ground floor. In front of one wing on the terrace is a *liegehalle* with windows at the back; in front of the other the stairs leading to the day room from the grounds.

[1] *Das Rothe Kreuz*, 1898, No. 16: Liebe, *loc. cit.*

Section XI.—HOLLAND.

CHAPTER LIII.

HOLLAND.

Dutch Sanatoria.

Name.	Opened.	Beds.	Physician.	
Putten op de Veluwe	1900	—	Dr. Haentjens	Full-price patients
Oranje Nassaus Oord	1901	100	Dr. J. W. F. Donath	Full-price; 10 free beds
Hellendoorn	1902	54[1]	Dr. H. W. Boele	For the poor
Voorst	proj.	24	Dr. Brocx	Charges to be 4 and 5 gulden per day[2]
Amsterdam	proj.	—	—	For the poor

In addition to the above, there is a Dutch Sanatorium at Davos in Switzerland (see p. 366). A society for the erection of sanatoria has existed in Holland since 1896.

The Sanatorium of Putten op de Veluwe

was founded mainly through the exertions of Dr. P. K. Pel, not far from the Zuyder Zee. It consists of a solidly built house in the usual style of Dutch country houses, with basement, ground floor and first floor. A verandah festooned with creepers runs along the south and west sides of the ground floor. The windows are of the ordinary English kind, provided with louvre blinds to keep out rain. The floors are covered with linoleum; the furniture is fairly simple and cleansable. Surrounding the house are gardens and woodland, with sheltered paths and a large reversible *liegehalle*. There are 2½ hectares of garden, and round it 100 hectares of woodland.

Altitude: Thirty metres. Heating is by closed stoves; lighting

[1] Eventually to have 105 beds. [2] *Zeitsch. f. Tuberk.*, Nov., 1901.

by gasoline glowlights. Disinfection is done with formaldehyde; sputa are treated with hetol.

The place has recently been enlarged by the addition of a second pavilion. A doctor's house will be added.

Charges: 3½ to 6 frs. per day, inclusive.

Access: Station on Dutch Central Railway within a short drive.

Oranje Nassaus Oord.

A popular subscription of 300,000 florins was given to the Queen Regent of Holland on the accession of her daughter, Queen Wilhelmine, to the throne. The greater part of this sum was handed over for the erection of a sanatorium, together with one of the royal parks for a site.

This is at Renkem in Gelderland, near the Rhine, and is sheltered to a slight extent by high trees. An artificial hill has been raised at the least protected spot and planted with trees. The buildings are of various sizes, mostly with two floors, basement and attics. Together with the old palace they form a semicircle of 110 metres diameter. The wards contain from one to six beds each. Where several occupy one room, the cupboards have wings which have screens to increase the privacy. The sanatorium is provided with a dining-room, conversation-room, reading-room, and winter garden; also a surgery, laboratory, director's room and complete hydropathic installation, in which the douche can be regulated either by the patient himself or by the doctor in an adjoining room.

The floors are mostly of *torgament* (see p. 287), elsewhere of wood covered with linoleum. There are verandahs front and back. The verandahs are paved with terrazzo. Electric lighting; central heating, the pipes brought through a tunnel. The corridors are also warmed and can be used as a promenade. W.C.s have been provided. Patients themselves wash the sputa into a septic tank.

The kitchen is at a distance, the food being brought by an electric tram. Near the kitchen is the engine house and laundry. Opposite the old palace is the director's villa, and next to it that of the matron and assistant physician.[1]

Hellendoorn Sanatorium,

for the people, is in the province of Overysel, and is protected to the north and east by a hill fifty metres high and surrounded by pine

[1] *Zeitsch. f. Tuberk.*, April, 1902. *Lancet*, 27th July, 1901.

woods. The district is stated to be fairly free from fogs. The buildings consist of a picturesque main block one story at the sides, two stories in the centre, forming a curve with day rooms and verandahs to the sides, and twenty-five metres to the north a separate administrative block with servants' quarters, kitchen, etc. There is a separate kitchen for Jews. Both sexes are admitted, but are kept each to one side of the sanatorium, with separate lavatory, bathrooms and douche room, consulting room, fresh-air gallery, entrance and cloak room. The nurses alone attend on the patients, the servants being forbidden to enter the part set aside for the patients. The wards are all to the south. On each side are three for four patients apiece, and two with six beds each. On the other side of the corridor, which ends in the day room, are the lavatories, W.C.s and an isolation room. In the centre on the ground floor are the rooms for the doctor, management, the laboratory and surgery, dining-room for nurses, and bathrooms; on the first floor the quarters of the assistant medical officer, nurses' rooms and rooms for patients who require special nursing.

There are beds for thirty men and twenty-four women; this number will be eventually increased to 105 in all. The corridors are three metres wide. The floors are of *torgament* (p. 287). There is also a laundry, disinfector, and engine house for electric lighting and central heating, by either warm water or low-pressure steam at will. The water is pumped up from a special well by an electric motor. Further off are houses for the medical director, secretary and engineer; also stables, and a *baracke* (p. 264) for infectious cases. The sewage goes into septic tanks. Cost of erection 260,000 gulden, including 25,000 for the furniture.

Charges: 1.70 gulden per day; some free beds.[1]

[1] *Zeitsch. f. Tuberk.*, Nov., 1901; Oct., 1902; May, 1903. *Lancet*, 27th July, 1901.

Section XII.—ITALY; JAPAN; MONACO.

CHAPTER LIV.

ITALY; JAPAN; MONACO.

Italy.

There is in Italy a national association for the prevention of tuberculosis with numerous branches; also a Parliamentary Committee for sanatoria instituted by Prof. Bacelli. After the assassination of King Humbert it was decided to raise money by public subscriptions for the erection of sanatoria and other institutions in various parts of Italy to perpetuate his memory, all these sanatoria to be under one common direction.[1] In *Piedmont* sanatoria are to be opened near Cuneo and Novara for Turin. The latter is at Gozzana near Lake Orta, 350 metres above the sea-level, with a due south aspect, well sheltered against the north.[2] In *Liguria* a sanatorium ("Villa Quisisana") has been established under Dr. Curt Stern for paying patients, and another under the same physician for Russian consumptives. There is a sanatorium at Nervi under Prof. Maragliano for paying patients, and another is to be opened for the poor of Genoa. In *Lombardy* a private sanatorium has been opened at Sondrio,[3] a public one (the first of the sanatoria for the people) at Sortenna for Milan;[4] a special block of the new hospital at Monza is devoted to consumptives; and a special dispensary has been opened at Milan. In *Venetia* sanatoria are to be opened for the poor of Verona and Padua; the latter is to have thirty beds, and to be completed by an asylum of 100 beds for incurable cases. A sanatorium is also projected at the foot of the Alps of Cadore. In *Emilia* sana-

[1] *Tuberculosis*, April, 1902. *Zeitsch. f. Tuberk.*, Oct., 1902, and Nov., 1901. *Lancet*, 15th June, 1901.

[2] *Lancet*, 29th Sep., 1900. [3] *Zeitsch. f. Tuberk.*, Oct., 1902.

[4] *Lancet*, 29th Sep., 1900; *ibid.*, 14th Nov., 1903. *Tuberculosis*, April, 1902; *ibid.* April, 1904.

toria are to be opened for Reggio and Parma. In *Tuscany* a memorial sanatorium is to be opened on the sea-coast at Leghorn,[1] and others for Pisa and Florence. A Finsen light institute is also to be opened in Florence: a donation has been given towards the fund by the King. In *Umbria* a private sanatorium for paying patients exists near the Cascade della Marmore.

In *Rome* a special gift from the King of 200,000 lire to the commune of Rome to commemorate the birth of Princess Yolande has been devoted partly to the erection of a special isolation hospital near the hospital of St. John with 300 beds in connection with the other hospitals of the city; partly to the transformation of the Bathing Establishment at Porto d'Anzio into a children's sanatorium. Other marine bathing institutes are similarly to be tranformed.[2] In *Campania* a sanatorium has been opened for the poor of Naples at Pozzuoli. The Villa Filangiere was given for this purpose to the town of Naples by the Duchess Ravaschieri. It stands on the Colle Madonnella overlooking the bay of Baia, surrounded by rich vegetation and protected to the north by the Solfatara whose sulphurous vapours are supposed to be beneficial.[3] Another sanatorium is projected for Salermo. In *Apulia* a sanatorium is to be opened for Taranto. In *Sicily* there is a sanatorium for full-price patients at Palermo where patients are treated by Prof. Cervello's methods (inhalation of formalin and iodine); also one for the poor.

The Villa Quisisana

at San Remo replaces the Sanatorium Riviera, which was sold by Dr. Curt Stern after two years' use.

The climate and subtropical vegetation of San Remo are too well known to need description. Sheltering the town are three ridges of mountains rising from 150 to 1,500 metres above sea-level. The sanatorium is in the newer part of the town, surrounded by gardens. The building has a ground floor and three upper stories, served by a passenger lift, and containing forty-five bedrooms with sixty beds, dining-saloon, music room, reading room, writing room and billiard

[1] *Zeitsch. f. Tuberk.*, Feb., 1904.

[2] *Tuberculosis*, April, 1902. *Lancet*, 15th June, 1901. *Zeitsch. f. Tuberk.*, Nov., 1901; *ibid.*, Oct., 1902.

[3] *Lancet*, 12th Aug., 1899.

room; floors are of pitch pine; there are no carpets or curtains; heating is by German porcelain stoves, lighting throughout by electricity. There is a complete hydropathic installation. Five meals a day are provided. A gymnasium is in the building and massage is also employed. Dr. Stern and his wife live in the sanatorium. The sanatorium is open 1st October to middle of June; it is not exclusively for consumptives.

Terms: 12 to 30 lire per day, with few extras.

The Russian Sanatorium.

A sanatorium also under Dr. Stern has been opened at San Remo in memory of the Grand Duchess Alexis Michailovitch for poor Russian consumptives. There are thirty beds, three free.[1]

The Sondrio Sanatorium,

or "First Italian Sanatorium," opened in 1903, owes its existence to private initiative, having been built with a capital of 500,000 lire raised by the exertions of Dr. Antonio Zubiana, under whose direction it remains. Situated in the Valtelline at Sortenna above the village of Sondalo amidst woods of larch and fir, it enjoys a magnificent view over the valley extending from Tirano to Belladora. The aspect is south-west, the altitude 1,250 metres.

The building contains sixty bedrooms, all on the south side and mostly with balconies. Inside, all angles are rounded; the walls are covered with washable glazed linen, or painted and varnished. The floors are laid with tiles, or wooden parquet, or covered with linoleum. Heating is by low-pressure steam; lighting by electricity. The windows have double casements; there are airy verandahs. There is a plunge bath for every eight patients, and a complete hydropathic installation; also rooms for laryngoscopy, radiography, operations, chemical and bacteriological investigations. A steam laundry and disinfector are attached to the place. In addition to the large dining-room, there are two drawing-rooms (one for ladies), a writing room, recreation room and music room; also a covered gallery for wet weather. Owing to the rapid slope of the ground, there is access by bridges from each floor to the grounds.[2]

Access: Three hours' carriage drive from Tirano Station.

[1] *Zeitsch. f. Tuberk.*, March, 1904. [2] *Lancet*, 14th Nov., 1903.

THE SANATORIUM UMBERTO I.

for Milan is to be in the same district. The commune of Sondalo gives the land free of cost. Before deciding on the site, four meteorological stations were set up in the Alps at various heights from 800 to 1,300 metres. There has been a large public subscription. The Savings Bank at Milan has offered 30,000 lire per annum on condition that twelve beds are placed at their disposal, and the sanatorium is called after Humbert I. There will be 100 beds.[1]

THE ISTITUTO CERVELLO,

at Palermo, has been founded by Commendatore Florio on the model of the Paris Pasteur Institute at a cost of 5,000,000 lire. Full-price patients are received, the treatment including inhalations of formalin and iodine.

THE PALERMO SANATORIUM

for the poor has also received a donation of 60,000 lire from Commendatore Florio. The local Savings Bank has given 25,000 lire towards the fund.[2]

Japan.

A SANATORIUM is stated to exist in this country.[3]

Monaco.

AT the *New Hospital of Monaco*, which contains altogether eighty beds in separate pavilions, one block has been set aside for consumptives. The hospital is in the midst of olive woods; it looks south, and is protected by mountains on every side excepting south-west, from which quarter the wind seldom blows. Altitude 80 metres. Climate that of the Riviera.

The pavilion for consumptives is on the ground floor, and is subdivided by a partition, half being for men and half for women. It has sixteen beds placed in a single row along the northern wall, which is left unpierced. There is also a small ward with two beds for serious cases. The southern façade has large glazed bays formed of French windows surrounded by fanlights, opening on to the terrace.

[1] *Tuberculosis*, April, 1902; *ibid.*, April, 1904. *Zeitsch. f. Tuberk.*, Oct., 1902.
[2] *Lancet*, 26th Aug., 1899. [3] *Das Rothe Kreuz*, 1897, No. 17.

The floors are of parquet, the walls washable; there are no curtains or hangings. Bathrooms are furnished with douches. Heating is by low-pressure steam; sewerage on English lines. The wards are fumigated with formalin for an hour every day while patients are absent, then freely ventilated.[1]

[1] Vivant, *Berl. Tub. Congr.*, 1899.

Section XIII.—NORWAY AND SWEDEN.

CHAPTER LV.

NORWAY AND SWEDEN.

There are in *Norway* seven private sanatoria, whose charges average four to eight kr. per day: Mesnalien, Grefsen, Tonsaassen, Gjösegaarden and Trögstad in the south-east, Lergrovik and Sövde in the west. For the poor, there are Reknaes, Lyster Sanatorium, and two others in preparation. A number of small *homes for advanced cases*, some with four to six beds, others with ten to twenty, are to be opened throughout the country, for those who have no proper accommodation at home. An association of ladies has been especially active in promoting the erection of these homes. There are also two *sea hospices* for scrofulous children, at Frederiksvaern (100 beds) and at Hageviken (forty beds) respectively: charges 1 kr. per day; the rest defrayed by the State and by private subscriptions.

In *Sweden* there are three jubilee sanatoria at Hålahult, Hessleby and Österåsen; two private sanatoria built by large firms for their workmen: the "Separator Co." of Stockholm, and the Woodware Co. of Franz Kempe at Helsan; also two private sanatoria for full-price patients at Mörsil and at Säfsjö, and one for the poor at the Sabbatsberg Hospital (thirty-two beds). There are *homes for advanced cases* at St. Göran, Stockholm (108 beds), and near Gothenburg (sixty beds). There is a *seaside home* for scrofulous children at Flyrsö near Gothenburg, and another projected in Scania. These institutions in so far as they are for the poor have greatly benefited by the popular present of £100,000 to the King, on the twenty-fifth anniversary of his accession, which His Majesty devoted to philanthropic purposes. A large addition has recently been made to this fund by public subscription. A law came into operation in Norway in 1901,

whereby cases of illness and of deaths from tuberculosis are notified to the Health Department, who are empowered to deal suitably with the sufferers, the expense being divided between the State and the local public treasuries, wherever the patients are without means.[1]

NORWEGIAN SANATORIA.

Name.	Opened.	Altitude in Metres.	Beds.	Fees in Kroner.	
Mesna Sanatorium	—	—	—	4 to 8 per day	Near Lillehammer
Grefsen Sanatorium	1900	170	102	115 to 145 per month	Near Christiania; Dr. John Mjöen
Tonsaassen Sanatorium	1885	625	35-90	4 to 8 per day	Near Laerdalsören; Dr. Jac. Sömme
Gjösegaarden Sanatorium	—	—	—	,,	—
Trögstad Sanatorium	—	—	—	,,	—
Lergrovik Sanatorium	—	—	—	,,	—
Sövde Sanatorium	—	—	—	,,	—
Reknaes Sanatorium	1897	300	70	1·35 per day; or free	Near Molde; Dr. Edv. Kaurin
Lyster Sanatorium	1902	470	80	—	Near Bergen; Dr. Holmboe
Saetersdalen Sanatorium	—	—	100	—	Projected.

SWEDISH SANATORIA.

Name.	Opened.	Beds.	
Hålahult Sanatorium	1901	104-124	Jubilee Sanatorium
Hessleby Sanatorium	1901	104-124	,, ,,
Österåsen Sanatorium	1900	112	,, ,,
Hamra Sanatorium	—	35	Separator Co. of Stockholm
Helsan Sanatorium	—	14	Franz Kempe and Co.
Mörsil Sanatorium	—	55	Full-price sanatorium
Säfsjö Sanatorium	—	30	,, ,,
Sabbatsberg Hospital	—	32	Early cases
St. Göran Home	1902	108	Advanced cases
Gothenburg Home	—	60	,, ,,

Norway.

GREFSEN SANATORIUM

is about half a mile from Christiania, 170 metres above the sea-level, on the southern declivity of the pine-clad Grefsenberg, which rises to 260 metres above sea-level. It consists of an old hydropathic establishment, with six houses united by bridges, three looking south,

[1] *Trans. Berlin Tuberculosis Congress*, 1899. *Zeitsch. f. Tuberk.*, April 1902; Oct., 1902. *Tuberculosis*, June, 1902; Sept. 1903.



FIG. 75.—TONSAASSEN SANATORIUM. [*Face page* 339.

three east and west. These have been provided with linoleum floor-covers, washable wall papers or painted compo-board for the walls, low-pressure steam heating, and acetylene lighting. For ventilation there is an inlet under the radiator, and an outlet at floor and ceiling of each room. Most of the bedrooms are single-bedded. There is a large well-wooded park; *liegehallen* are placed on an eminence, a little higher than the sanatorium, reached by a curved easy path.

The cost was 300,000 kr. There is a full staff, with three medical officers and a dentist. Five meals a day are provided.

Half free and quite free beds are to be established with the help of a special grant from the Storthing; and the sanatorium is to be enlarged to 140 beds.[1]

Tonsaassen Sanatorium

is on the road between Laerdalsören on the Sogne Fjord and Christiania, not far from Odnaes on the Randsfjord. Originally a summer bathing resort, it has of late years been more and more frequented by consumptives. The climate is cool and sunny in summer, dry and cold in winter. It is less pleasant in April, when the snow melts, and in autumn, which is foggy. There is very little wind, especially in winter. There are six months of continuous snow.

The sanatorium lies in a hollow in Tonsaassen Mountain, which rises to a height of 800 metres above sea-level. The ground forms part of a plateau which is surrounded to the west, north and east by heights of 1,490 to 1,980 metres, and gradually drops to the south-east towards the great lakes, and the sea-coast. Soil: slate and blue quartz, of the Cambrian system; being much fissured, it dries rapidly after rain. The grounds cover 3,250 acres, mostly pine woods. The sanatorium (fig. 75) consists of a Kurhaus, six other buildings, doctor's house, bath house, bakery, outhouses, etc., mostly arranged round the head of the little valley. The chief building has the dining-room and other common rooms on the ground floor. It is heated by open wood fires. The bedrooms are in four different buildings, with different tariffs. Some are only used in summer, and have no heating apparatus. The others have closed stoves.

In one of the buildings no tuberculous patients are admitted; in the other buildings some rooms are used exclusively for tuberculous,

[1] *Tuberculosis*, Oct., 1902. *Zeitsch. f. Tuberk.*, Feb., 1901; *ibid.*, Jan., 1903.

others for non-tuberculous cases. There are verandahs and balconies on every floor. Most of the rooms are of good size, and simply furnished. Lighting is by electricity. There is a very complete hydropathic installation. Five or six meals are provided daily. No advanced cases are admitted.

Terms: In summer 120 to 175 kroner for four weeks; in winter 150 to 180 kr., inclusive.

Access: From Christiania by rail, steamer and carriole *viâ* Randsfjord, Spirillen or Mjösen (one day); from Bergen *viâ* Laerdalsören.

Reknaes Sanatorium,

near Molde, on the north side of the beautiful Molde Fjord, was originally a leprosy hospital, but was converted into a sanatorium for consumptives. Molde is sheltered by mountains to the north and west, and has a milder climate and more luxurious vegetation than most other parts of Norway.

The sanatorium is situated in a large garden on a knoll overlooking the fjord, a little to the west of Molde. It consists of a wooden building of two stories, composed of a centre and two projecting wings, which together enclose a courtyard, and are separated by a road in front from a long *liegehalle*. The wards are for two to four patients each; average cubic capacity, 140 to 150 cubic metres; common rooms about 200 cubic metres; all provided with chimneys. There are also bath and douche rooms. Five meals a day are provided.

Staff: A medical director, four nurses, and ten servants.

Ten beds are reserved for children. Both sexes are admitted.

Lyster Sanatorium

is supported by the funds of the St. Jörgen's Leprosy Hospital at Bergen, and lies in a sheltered part of the Sogne Fjord. The climate is very rainy, but mild and equable. Planned like Hohenhonnef (p. 297) with wings diverging at obtuse angles from the centre, it has three stories over a basement, and surmounted by a few attic rooms. The ends of the wings are thickened; but here as well as in the centre there is only a single row of bedrooms in front of the corridor. The western wing is served by a corridor at right angles to the main one, so that the rooms there look south-west as in the eastern wing. The administration, etc., is placed in a central pavilion projecting north-

wards, and in various isolated buildings. There are twenty-one wards with four beds apiece and twelve single-bedded; cubic space, thirty-six cubic metres per head. There is a lavatory on each floor in the wings, each patient having his own place. There are verandahs in front of the ground floor in the wings, and *liegehallen* in two tiers sunk below the level of the building. The rooms are carefully finished, with rounded corners, cement walls, etc. Electric lighting; heating by steam pipes; drains discharge into septic tanks; W.C.s, etc., north of the corridor; grounds eighty hectares, partly hilly, reaching to the limits of woodland above.

The State pays 1.80 kr. out of the daily cost of 3 kr.[1]

Sweden.

The Jubilee Sanatoria.

The gift of the people to King Oscar on the 25th anniversary of his accession amounted to over 2,200,000 kronen, and was devoted by him to the erection of sanatoria. The Reichstag in 1898 added 850,000 kronen, which sufficed for the erection of three sanatoria, for which the sites were offered on the State domains, as well as large quantities of timber for building. One of these is the most northerly in Europe, in latitude 63°, where the mean temperature is 2 to 3° C., the annual precipitation is 16 inches; and the snow remains on the ground 155 days in every year. The middle one is in latitude 60°; mean temperature 4° C.; annual precipitation 24 inches; 100 days per annum of snow on the ground. The southernmost is in latitude 57°-58° C., with a mean temperature of 6° C., and a rainfall of 22 inches. The northern sanatorium has fifty hectares of land; the other two have each 100 hectares, and are in the midst of extensive forests. All are within easy reach of a railway station; placed on gravel soil on a southerly slope, with mountains to the north and good shelter against wind.

The northernmost sanatorium is mainly built of wood, and consists of four one-story buildings united by a corridor. The other two are two-story buildings, built partly of brick, partly of wood; they have *liegehallen* in front of the basement, or on a lower level of the grounds, and *baracken* (see p. 264) for additional summer accommodation. The area provided in the wards is 7·5 square metres,

[1] Plans and description in *Tuberculosis*, July, 1903.

air space 30 cubic metres per head ; in the single-bedded rooms still more is allowed. The floors are of cement covered with linoleum. There are two staircases for each pavilion. The sexes are separated excepting in the dining-room. The common rooms are in the main block, and can be thrown into one. The kitchen department is quite separate, and the administration forms another block. The doctor's house is arranged to oversee both the entrance and the *liegehallen.*

Charges: In each sanatorium thirty beds at 50 öre, forty-two at 1·25, twenty at 2·50, and eight at 3·50. If it be necessary to raise the charges, the higher priced beds will be raised before the others.

The St. Göran Home for Consumptives,

Stockholm, opened 1902, is built of granite with galvanised iron roofing, in the shape of a ⊥, with the main entrance to the north and another to the west. Inside there are glass walls with doors shutting off the corridors, which are to be used as day rooms, and have windows to the east, north and west. Those on the northern wing are lighted by the staircase windows ; those elsewhere have a southerly aspect. The place is heated by steam pipes, and has electric lifts, electric lighting ; ventilation from windows and from warm chambers on each floor, the air being drawn out by shafts. In the basement is the heating apparatus with coal cellar and store-rooms. On the ground floor are six wards, each with six beds ; for these 6·85 square metres and 26·74 cubic metres have been allowed to each bed ; there are also doctors' rooms, laboratory, nurse's room, ward kitchen, and quarters for two servants, a room for cleaning sputum flasks, with a cistern for disinfecting linen, bathrooms and lavatories for patients, and W.C.s. The floors are of cement, with cork mats, excepting in the sanitary pavilions and flask room, which have mosaic. The corners are everywhere rounded, the walls oil-painted. There are six wards with six beds each on the first and second floors ; the former for men, the latter for women. The assistant medical officer is quartered on the first floor, the nurse on the second floor. The other arrangements are similar to those on the ground floor. There is a lift for passengers. In the attics are quarters for matron and three nurses. There is a *liegehalle* out of doors, with a small room attached for mattresses, etc., which can be warmed.

Section XIV.—PORTUGAL AND MADEIRA.

CHAPTER LVI.

PORTUGAL AND MADEIRA.

Portugal.

As a sequel to the Berlin Tuberculosis Congress in 1899, a congress was called together at Lisbon, under the presidency of the Queen of Portugal, to consider the means to adopt for combating tuberculosis. Three Commissions were formed, administrative, technical, and educational for propaganda. The Queen gave 20,000,000 reis towards the funds of the society. In 1901 a National League was formed, with the co-operation of the chief medical and scientific societies. In addition to public hygienic measures a number of institutions for the treatment of tuberculosis have already been opened. There are *Dispensaries* at Lisbon, Porto, Faro, and Braganza; two *Marine Sanatoria* for scrofula with 160 beds; special *hospitals* and *infirmaries* at Lisbon and a few other towns; others being built for Coïmbra, Braga and Portalegre; a *Sanatorium for the tuberculous poor* at the old fort of Ontao on the sea-coast near Setubal, with 100 beds; and another being built at Guarda.[1]

Madeira.

A comprehensive scheme for sanatoria and health resorts has been inaugurated for Madeira. A German Committee of which Prince Hohenlohe is President has had a concession granted by the Portuguese Government for the erection of the necessary buildings, etc., on condition that 20 per cent. of the patients shall be Portuguese, who are to be received free of charge. The Government will make no customs charges on the material, provided that 500,000 frs. are paid down as deposit. Drs. Fränkel and Pannwitz of Berlin (the

[1] *British Medical Journal*, 8th Dec., 1900. *Tuberculosis*, Sept., 1903.

latter is Secretary-General of the Berlin Tuberculosis Association) have visited the island together with Dr. Lancastre, Physician-in-Ordinary to the Queen of Portugal, to find the best site. The syndicate has a capital of 40,000,000 marks, and is to erect a theatre, a circus and hotels, and to lay out parks and pleasure grounds, and establish a steamship service between Madeira and Italy. They will erect two sanatoria on the sea-coast and two in the mountains.[1]

[1] *Lancet*, 5th Dec., 1900.

Section XV.—RUSSIA.

CHAPTER LVII.

SANATORIA FOR CONSUMPTIVES IN RUSSIA.

Name.	Locality.	Beds.	Opened.	Payment in Roubles.	Free Beds.	Open.	Physician.
Imperial Sanatorium Alexander	Halila, Finland	32	1891	40-75 per m.; 10 beds @ 25 per m.	44	whole year	Dr. J. G. Gabrilovitsch
Maria	,, ,,	25	1893				
Nikolaj	,, ,,	120	1895				
Otwozk Sanatorium	Otwozk, Poland	31	1893	3.15-3.90 per d.	—	whole year	Dr. J. Geisler
San. of the United Russian Doctors	Taitzi, Baltic Province	50	1897	40-60 per m.	20	whole year	Dr. M. K. Verbitzky
Evangelical San.	Pitkäjärvi, Finland	28	1898	75 per month	—	whole year	Dr. A. v. Pezold
Section for Cons., Posnansky Hospital	Lodz, Poland	8	1899	free	—	whole year	Dr. S. Sternling
San. for Poor Hebrews	Kieff, Bojarka	57	1899	free	—	12 v.-15 viii.	Dr. S. L. Charol
Gastria Sanatorium	Yalta, Crimea	24	1900	125-220 per m.	—	whole year	Dr. J. F. Lebedev
Zauslar Pension for Poor Sick Visitors	,, ,,	22	1900	40-65 per m.	2	1 ix.-31 v.	Dr. P. A. Tamburer
Emp. Alexander III. Sanatorium	Massandra, Crimea	30	1901	40 per month	2	15 ix.-1 v.	Dr. M. W. Dempel
San. for Cons. in Gulripsch	Suchum-Kale, Caucasus	100	1902	40-50 per m.	—	10 cold ms.	Dr. S. S. Jemeljanov
Nummela Sanatorium	Röykka, Finland	70	1903	3-15 Fin. mks. per day	6	whole year	Dr. A. v. Bonsdorff
San. for Cons. in Takaharju	Punkaharju, Finland	72	Shortly	3-7 Fin. mks. per day	24	—	Dr. K. Brax
San. for Consumptives	Gagry, Caucasus	40-50	1904	100-150 rbles. per day	—	—	Dr. E. J. Schapschal

Sanatoria for Surgical Tuberculosis.

Name.	Locality.	Beds.	Opened.	Payment in Roubles.	Free Beds.	When Open.	Physician.
Seaside Sanatorium for Children	Windau, Courland	60	1900	15 per month	24	whole year	Dr. O. J. Hopfenhausen
Högsand Sanatorium for Children	Lappvik, Finland	30	1901	1 Fin. mark per day	22	1 vi.-15 ix.	Dr. R. Gardberg
Alupka Sanatorium for Children	Alupka, Crimea	50	1902	—	6	—	Dr. A. A. Bobrow
Zarskoyan Sanatorium for Children	Zarskoje Sselo	44	1904	—	32	—	Dr. X. Dombrowsky

In addition to the above, there are two sanatoria which are only to a small extent for consumptives, namely, Dr. F. D. Weber's Sanatorium "Quisisana" in the Crimea, and Dr. M. F. Sulschinsky's Black Sea Sanatorium at Gelendschick in the Caucasus. Sanatoria are also being built at Kieff (100 beds, payment 50 roubles per m.) and Mrösy, near Warsaw (120 beds). Others are projected near St. Petersburg, Sestroreszk, Moscow, Wologda (100 beds), Knäshji-Gory in Tver (for poor women), Sendsischew, Pjatorsk in the Caucasus (for poor students), Ssotschi in the Caucasus (for artisans), and another at the same place for customs officials, at Alupka (200 paying beds), one in the Crimea in the Caucasus for the St. Petersburg Teachers' Association, Aluschta in the Crimea (paying patients, Dr. Somow), in Bessarabia (for poor children), near Dorpat (for poorer middle classes), and five in Siberia (near Tomsk, Port Arthur, and Poloschnaja respectively). A sanatorium for curable and an asylum for incurable cases is to be erected at the provincial hospital at Rjetschiza (Moscow); a separate portion of the Dünaburg Evangelical Hospital is also to be set apart for consumptives, and a colony for consumptives is projected at Swatye Gorki in memory of Prof. Laschkevitsch. There are also in existence a number of convalescent homes for children, not specially for tuberculosis, including one under Dr. Bohl at Oranienbaum (35 beds), one at Arensburg (60 beds, Dr. W. Arnd), and colonies at Arensburg, Reval, Staraja-Russa, Druskeniki and Slavjansk, established by the Russian Society for Preserving the Health of the People. A sanatorium for consumptive children is projected at Sestrorezk by the Sisters of the Red Cross (20 beds). I am indebted for many of these facts to Dr. v. Pezold's article in *Zeitsch. f. Tuberk.*, April, 1904.

The *Moscow Sanatorium* is the result of a gift from the Rachmanow family of 200,000 roubles. An estate of 388 hectares belonging to the city has been given at Tichwinskoje. Two-thirds of this is covered by very old pine trees; it is traversed by a river. There are to be five two-story buildings of stone, to accommodate 350 men and 150 women (not exclusively consumptives). The place will have electric light, telephone to Warsaw, a system of sewers, a farm of fifty cows, etc.[1]

A special department for consumptives exists at the *Wola Hospital* (Warsaw), organised by Dr. Natanson. It stands in a

[1] *Zeitsch. f. Tuberk.*, Oct., 1901.

park of fifteen acres, and is arranged on a southerly slope in a horse-shoe shape. The bedrooms contain at most two beds; they are paved with a specially smooth and resisting kind of porcelain, the walls up to a certain height being similarly coated, and all corners rounded. The heating is by stoves, charged from the corridor. Slops and linen are removed through special shafts, the linen falling into an antiseptic bath in the basement. Patients stay during the daytime in the grounds. Treatment is free.[1]

Special wards for consumptives have been set aside in several of the Russian Hospitals, *e.g.*, the Military Hospital of Zarskoje Selo, near St. Petersburg. Dr. S. Unterberger was one of the first to advocate this.[2]

The Sanatoria at Halila.

A sanatorium was founded at Halila in 1889 by Dr. Dittmann, a homœopathic physician. Not being a financial success it was bought by the Russian Government and converted, in 1891, into a popular sanatorium, now called the *Alexander Sanatorium*. Two more (*Maria* and *Nikolaj*) have been subsequently added. The ground consists of 1,000 hectares of wood and moorland near the Halila lake, numerous paths have been made at suitable gradients, with seats at every fifty metres. Some twenty buildings are now on the ground, including the three sanatoria, which are under common management. There are no large towns or factories in the neighbourhood.

The Alexander Sanatorium

consists of a pinewood structure on a granite foundation in the shape of a T, with ground floor and first floor, and contains thirty-eight rooms. Most of these rooms are east and west of a wide corridor which leads on to an open verandah on the south side, or on to balconies above it. The bedrooms are $4\frac{1}{2}$ metres high and $8 \times 5\frac{1}{2}$ metres, and have chimney shafts for ventilation. Their walls are of varnished pinewood, the floors covered with linoleum. The furniture is of white enamelled pinewood. There are also common rooms, a music room, a reading room, billiard room, and winter and summer dining-rooms, as well as two bathrooms, douche room, consulting room, and a laboratory with chemical, bacteriological,

[1] Léon Petit, *loc. cit.* [2] *St. Petersburgh Med. Work.*, 1896, No. 32.

histological and microphotographic apparatus. The kitchen department is united by a warm corridor with the rest of the building. There are balconies to the north as well as south. Heating is by Swedish porcelain stoves; lighting by electricity. There is an abundant water supply, which is mostly pumped up by a steam engine from the Halila lake into two highly placed reservoirs, the drinking supply being stored in a third reservoir. This water supply is common to all three sanatoria, and is capable of supplying from 60,000 to 90,000 litres per diem, or from 400 to 600 per head. The water-closets are of English pattern, with powerful spiral flush, and carry the sewage through earthenware pipes to a small lake adjoining the property, where it is purified by filtration through sphagnum, the solids being put on to the fields.

Patients receive four *meals* a day, in addition to milk or other supplementary food. They spend most of the time out of doors from 8 A.M. till 10 P.M. Morning and evening they are treated with douches, baths and massage. Wet compresses are much used. Sputa are received into Dettweiler's flasks, random spitting being strictly forbidden. Spittoons containing water are also used. The bed and body linen, which with handkerchiefs, etc., is provided by the patient, is disinfected by steam before being washed. There is a good library with newspapers, etc.; patients also amuse themselves with piano, chess, photography, etc.; and in winter there is sledging. They are also encouraged to do light work in the garden; and a bookbinder's apparatus is to be set up for them. Dr. Gabrilovitsch is the chief medical officer.

The Maria Sanatorium

is intended for children who have a predisposition to consumption, and especially for the girls of the schools for the nobility who may show such tendencies. The sanatorium contains thirty-five rooms, all placed on the south side of the building, a long, wide, airy, glazed corridor being placed to the north and used in bad weather for walking exercise. The rooms resemble those in the Alexander Sanatorium, but are rather more luxuriously furnished. They have air-shafts for the foul air, and also means of warming the incoming air. The flooring is of parquet. Heating is by Swedish stoves, lighting by electricity, and the sanitary arrangements are like those of the Alexander Sanatorium, but rather more complete. The walls

in the kitchen and bathrooms are tiled, the kitchen being placed on the ground floor. The lower floors and the walls have been built with damp-proof courses.

The Nikolaj Sanatorium

was built by the Grand Duchess Alexandra Jossefowna for the military classes. It is planned like Hohenhonnef (see p. 297), in three stories, and has 120 rooms. The front has a southerly aspect, and is provided with three tiers of fresh-air galleries and diverging wings. The large dining-saloon is over the kitchen in a separate block to the north, united to the main building by a vestibule and winter garden. The walls and ceiling are of varnished wood, the floors covered with linoleum. For ventilation there are separate air-shafts and fans, with electro-motor. The heating is by low-pressure warm-water pipes. The foundations have a damp-proof course, the electric lighting, water supply and sewerage being part of the same system as in the other two sanatoria, and the rooms of the same size. Dirty linen is put into numbered sacks and sent down a linen shoot into the basement to be disinfected and washed.

This establishment is not far from Novajakirka, on the branch railway from Viborg to St. Petersburg.

The Taitzi Sanatorium

was founded mainly in consequence of the advocacy of a lady, Dr. R. Pavlowskaja. This led to a report in 1895 by the Society of Medical Practitioners in St. Petersburg, an appeal to the public for funds, and the establishment of a society under the presidency of Countess Woronzova-Dashkova, and the high protectorate of the Empress Maria Theodorovna. Soon after the Emperor Nicholas II. sent a contribution to the society of 467,000 roubles (nearly £50,000) for the erection and maintenance of a sanatorium in memory of the Empress Maria Alexandrovna, who was herself a victim of consumption. He also made them a gift of his property of Taitzi, near Gatschina, on the Baltic coast, about twenty-five miles from St. Petersburg. This place has long been famous for its magnificent park and its sheltered situation, and contains twenty-two dessiatinen (sixty acres) of arable land, gardens, meadows, and woods. Extensive alterations were made at the cost of the Department of Imperial Properties, the land being drained, the mill removed,

a pond filled in, water-courses cleansed, and their banks turfed. The old stone castle, which dates from the 18th century, was fitted for the accommodation of twenty patients, while other buildings were altered to receive the doctor, nursing staff and servants. Verandahs were constructed on every side of the sanatorium, and a solarium on the roof. New buildings have since been added; also a laboratory, disinfector, electrical apparatus, laundry and chapel.

The old building or *Maria* section has in the basement the kitchen, surgery and servants' quarters. On the ground floor is the dining-room, serving room, four rooms each for two patients, and a bathroom. The rooms retain the handsome old mahogany furniture and engravings; the china was sent from the Imperial factory. At the four corners of this floor are small semicircular verandahs, each forming a *liegehalle* for two to four patients. On the first floor is a large dayroom with a piano, a library, and six wards, five for two each, two single-bedded; also nurses' room, consulting room, bathroom, and lavatory under a cupola in the centre. The cubic air space is 48 cubic metres. This section is for twenty women. Dr. Pavlowskaja describes the building as beautiful from an architectural point of view, but not perfectly suitable for its purpose.

A new building for men, the *George* section, was opened in 1897 about 120 metres away. It is a rectangular two-story stone building with twenty beds. On each floor is a corridor with wards on the south side, and verandahs or balconies on the west, south and east, the entrance being to the north. In the centre of the first floor is a large dining-room. There are four wards with four beds each, five with two, four single-bedded. Heating is by steam-pipes and closed stoves. There is a power station for electric lighting and laundry.

The sanatorium is 86 metres above sea-level.

Distance from the Baltic Railway Station of Taitzi, $2\frac{3}{4}$ kilometres; from St. Petersburg, 34 kilometres.

The management is in the hands of a committee of twenty, eight of whom are doctors. Free patients stay three months,

A *third* building with ten beds was opened in 1900.[1]

[1] *Rev. de la Tuberculose*, Oct., 1899. *Zeitsch. f. Tuberk.*, July, 1901; July 1902; Jan., 1903.

Gastria Sanatorium

is 140 metres above sea-level, and contains twenty-three rooms in two main buildings and two separate pavilions. Area of grounds: 3 hectares.

Pitkäjärvi Sanatorium

is a two-story building with a basement. Of the twenty-nine rooms twenty-four are on the south side; the dayrooms, dining-room, and administration being placed in two lateral projections to the north, and over these the consulting rooms, and doctor's and maid-servants' quarters. Roomy balconies and verandahs occupy the centre of the south side. The bedrooms are all single-bedded; women above, men below. The walls are cemented and oil-painted; 56·6 cubic metres air space is provided. Heating is by closed stoves.

Area of grounds: 49½ hectares. Elevation 62 metres above sea.

Access: 10½ kilometres from Terrijökki Station on the Finland Railway.[1]

The Massandra Sanatorium

was originally a boarding-house for consumptives opened in 1895 on the south coast of the Crimea by the Duchess Maria Bariatinsky. In 1899 it was decided to enlarge this, and the Emperor intervened to make it a more important institution. Twenty hectares from the Imperial domains were set aside for this purpose, worth 400,000 roubles. It was endowed with 265,000 roubles; the Emperor personally giving 50,000 roubles to build the new sanatorium, and 175,000 roubles being raised by voluntary subscriptions. For the main building, the Minister of the Interior advanced a sum of 50,000 roubles; and a yearly subsidy of 5,000 roubles is given by the Government.

Eleven pavilions in all have been built, one of which is for severe cases, and another forming the main block. Nine pavilions contain from six to twelve beds apiece; they are of two stories, with the bedrooms to the south. These are single-bedded, and have 52 to 78 cubic metres air space. In the larger houses there is a verandah of 101 cubic metres to every three rooms, and in the smaller ones a common verandah of 213 cubic metres. To the north is a room for the staff, bathrooms, and a room for cleansing spit

[1] *Zeitsch. f. Tuberk.*, Jan., 1901; July, 1901.

flasks. The floors are of painted wood (asphalt in the corridors, bathrooms and flask room). Walls and ceilings are whitewashed. Heating is by low-pressure steam ; electric lighting, and fixed basins with water laid on in each bedroom.

The main block contains the dayrooms, dining-room, library, doctor's rooms, and overhead the nurses' quarters. In a separate building is the laundry with disinfector and machinery. There is also a lodge and a kitchen block with quarters for the staff. The new sanatorium, which cost in all at least 300,000 roubles, was opened by the Czar and Czarina in person.[1]

Yalta may be reached from Sebastopol by steamer and carriage.

Nummela Sanatorium

has been opened by a society of Finnish doctors in Helsingfors between this town and Hangö. Land to the extent of 60 hectares has been given by the State. The houses are of stone.

Takaharju Sanatorium

is being erected by the Finland Medical Society *Duodecim*, near Nyslott on the Saima lake. A grant of 30 to 40 hectares of land has been received from the State.

The Gagry Sanatorium,

on the east coast of the Black Sea, is a place which was a health resort in Greek and Roman times, for the revival of which 100,000 roubles have been given by the Ministry. Three zones are to be established, a seaside portion, a middle and an upper zone. The whole scheme, with which considerable progress has already been made, is under the management of Prince v. Oldenburg.[2] A piece of land of about 40 acres in this neighbourhood has been obtained by Dr. Schapschal on which a sanatorium is being built at his own expense.

There are to be three buildings: a main two-story block, partly of wood, for thirty to forty patients of both sexes ; a doctor's house, and a kitchen block with dining-room attached. Estimated cost, 100,000 roubles.[3]

[1] *Zeitsch. f. Tuberk.*, June, 1901. *Tuberculosis*, April, 1904.
[2] *Zeitsch. f. Tuberk.*, Oct., 1902. [3] *Tuberculosis*, Jan., 1904.

Gelendschik Sanatorium

is on the coast, 38 kilometres from Novorossisk, shut in to the east, north and west by mountains rising to 600 metres. Monthly charges, 90-110 roubles.

Balaclava Sanatorium.

A sanatorium with seventeen beds for paying patients has been opened here.[1] Fees, 40 to 90 roubles per month, with two free beds.

Quisisana.

This is a sanatorium not specially for consumptives, but admitting such patients in early stages. Situated in a suburb of Yalta, in a bay on the Black Sea coast, it is protected to the north, west, and partially to the east by the Yaila Mountains, which rise to a height of 1,500 metres. The soil is slate, quartz, crystalline limestone and marble, mixed with clay, diorite, etc. The sanatorium is 61 metres above the sea-level, with a view of the sea to the south. It stands in a terraced garden of one-third acre, next to a wood of seven acres; and all the neighbouring houses are also surrounded by gardens. The grounds are on the mountain side, and are laid out with paths of various gradients.

The sanatorium, which was founded in 1886, consists of several buildings, one of which is a wooden structure with seven rooms and four verandahs and balconies, the others being solidly built of stone. Higher up is the main block, which is built in two stories and contains twenty-four bedrooms with seven verandahs and balconies, the dining-room and drawing-room. Still higher is the doctor's residence, which contains the bathroom, laundry and kitchen department, in addition to ten bedrooms with three verandahs and balconies. A little way off are the stables, cowsheds, etc. The verandahs have for the most part glazed sides and open fronts. The average air space in the bedrooms is 31 cubic metres; the common rooms collectively contain 200 cubic metres. There are no ventilating chimneys, but double ventilation for winter and summer, admitting fresh air through open windows or warmed air next the heating apparatus. This consists of Warsaw porcelain stoves with hermetical seal and chimney. Throughout the winter every window

[1] *Tuberculosis*, Jan., 1904.

is opened while the patients are at meals. The lighting is by stearine candles and petroleum. There is room for thirty patients. As a rule only one sleeps in each room, but exceptionally two or even three may sleep together.

The sputa are disinfected with carbolic solution and then poured down the W.C. Linen of healthy patients is washed at home; of those who are ill by the public laundries, which also disinfect by steam. Rooms are disinfected on the departure of each patient by the public health authorities, and repapered and repainted of a different colour, mainly to give confidence to the visitors, the floors being washed and disinfected with sublimate solution and then treated with beeswax and turpentine. The solid sewage and kitchen refuse are removed every day and carried out to sea by a special steamer. The liquid sewage is carried along the seashore in ventilated sewers.

Patients in the third stage are not admitted, nor as a rule any which require nursing. The treatment is by open air, good food and the like, but not by the Brehmer methods. Dr. Weber seeks to make the place a home, and to banish everything suggestive of a hospital or sanatorium.

Charges: 70 to 90 roubles per month, and 10 roubles for medical attendance.[1]

[1] *Zeitsch. f. Tuberk.*, Dec., 1902; Feb., 1902.

Section XVI.—SPAIN AND THE CANARY ISLANDS.

CHAPTER LVIII.

SPAIN AND THE CANARY ISLANDS.

Spain.

According to Cortezo,[1] a sanatorium has been erected at *Las Navas*, 1,200 metres above sea-level, two and a half hours by rail from Madrid. Another was opened in 1900 at Porta Coeli near Valencia.

A bill was introduced into the Spanish Cortes in 1903, providing a sum of 500,000 *pesetas* in the annual budget for the erection of sanatoria for the poor. Of this amount 200,000 pesetas was to be used in purchasing the Porta Coeli Sanatorium and converting it into a national sanatorium.[2]

A tuberculosis *Dispensary* was opened in 1903 at Madrid, founded by Dr. José Verdes Montenegro. It has a clinical laboratory, X-ray department, and complete apparatus for disinfecting clothes; and is to be maintained by the municipality and other public bodies.[3] The Queen Regent of Spain was present at the opening ceremony.

There is an *Instituto Rachitico* for scrofulous and rachitic children under Dr. Panzeri near Milan. There are also private sanatoria in the Canary Islands.

Porta Coeli Sanatorium,

originally a convent belonging to the Carthusians dating from the thirteenth century, was converted into a sanatorium for consumptives mainly through the exertions of Dr. Moliner. The Queen Regent of Spain accepted the Protectorate, and help was obtained from Spanish

[1] *Berlin Tuberculosis Congress*, 1899.
[2] *British Medical Journal*, 14th Feb., 1903. [3] *Ibid.*, 9th May, 1903.

students, workmen's unions, etc., with a State subvention. There are two large sleeping pavilions on a terrace with southerly aspect, surrounded by an amphitheatre of pine-clad mountains. Behind is the Sierra de Maquera. The soil is Trias; altitude 360 metres. Mean annual temperature 22° C., mean winter temperature 14° C.

Ten free beds are reserved for Germans; there are some beds for full-price patients.[1]

The Canary Islands

enjoy a bright and equable climate, with a large proportion of sunny days and very few rainy days in summer. The mean temperature in summer is 70° F., in winter 63°. There are very few days in which the temperature reaches 90° in the shade, and none within 15° of freezing point. The soil is rocky and dry. In addition to one or two hotels which cater for invalids, there are sanatoria at Santa Catalina and at Guimar, each of which has an English doctor. The Hotel Metropole overlooking the harbour of Las Palmas, and the Hotel Santa Brigada at Monte keep trained nurses in residence.

The Santa Catalina Sanatoria

was designed by Mr. A. J. Maclaren, himself originally a sufferer from pulmonary tuberculosis. It belongs to a company, and is managed by Mr. and Mrs. Sauerbrei, the latter of whom is an English-trained nurse and hospital sister. Another trained nurse is kept in the place, and a third during the winter months. Medical officers: Dr. Brian Melland and Dr. Fleming Baxter. The place consists partly of an hotel for convalescents and pleasure seekers, partly of a sanatorium for consumptives who occupy a separate wing and are said to be treated strictly on Nordrach lines. The grounds (eighteen acres) reach from the sea-level to 76 metres above the sanatorium. At this height is a bare table land with golf links, which extend to 150 metres above sea-level. North and south of the grounds is farm land with very few roads or habitations. The public roads are dusty in hot weather, but can easily be avoided. For 240 days annually the north-east trade winds blow direct on to the sanatorium.

The building is planned on the model of Falkenstein, but with three stories instead of five, and a less cramped kitchen department. The concavity looks east-north-east. The dining-room, billiard room

[1] Dominé, *Berlin Tuberculosis Congress*, 1899.

and smoking room occupy the northern wing on the ground floor. In the central part are a large entrance hall and reception rooms in front of the corridor, and smaller rooms behind it. Verandahs and balconies surround both wings on the two lower floors and line the eastern side of the centre. The top floor leads on to large terraces over the wings which are partially covered with roofing. The servants are quartered in a separate block to the north-west. The south wing, containing twenty out of the eighty bedrooms, is set aside for those requiring Nordrach treatment. In this wing there is a separate dining-room without windows. The floors are polished, with a few small slips of carpet; walls whitewashed; French windows with large square fanlights; extra large windows to all the common rooms; louvre shutters to all outside doors and windows. Electric lighting; water supply and sewage those of Las Palmas. Milk from a herd living in the open is sterilised before use.

Terms: Five guineas or less; medical attendance extra.

The Guimar Hotel,

is twenty miles south of Santa Cruz, 366 metres above sea-level, commanding an extensive view over mountains and sea. The pretty village of Guimar is some 65 metres lower down; and towering above it to the south-west is the Peak of Teneriffe, which rises to 3,700 metres above sea-level. The surrounding district is well wooded, and supplies Orotava, Santa Cruz and Laguna with their earliest and best fruit. There are a croquet lawn and bowling green at the hospital; also a billiard room and dark room.

Physicians: Drs. Stanford Harris and J. Campbell Graham.

Terms: Five guineas inclusive.

Section XVII.—SWITZERLAND.

CHAPTER LIX.

SWISS SANATORIA.

Switzerland.

Name.	Locality.	Elevation in Metres.	Opened.	Beds.	Physician.	Proprietors.
Dr. Jacobi's San.[1]	Arosa	1860	—	90	Dr. Jacobi	—
Dr. Turban's San.[1]	Davos Platz	1573	1887	100	Dr. Turban	A Company
Sanatorium du Midi[1]	,,	1560	—	60	Dr. Michel	Hug and Wennips
San. Schweizerhof[1]	,,	—	1903	120	Dr. Peters	—
Reform. San. Pension Bernhard[1]	,,	—	—	35	Dr. H. Frey	—
Alexanderhaus	,,	—	1882	60	Dr. Peters	Evangelical Sisters
St. Joseph Haus	,,	—	—	46	—	R. C. Sisters
Schulsanatorium Fridericianum	,,	—	—	40	Dr. Peters	—
San. Schatzalp[1]	Davos Schatzalp	1865	1901	115	Drs. Spengler and Neumann	A Company
Dutch Sanatorium	Davos Platz	1560	1897	50	Drs. Spengler and Schuurmann	—
English Sanatorium (Alexandra)	Davos Dorf	—	—	100	(Being built)	—
San. Davos-Dorf[1]	,,	—	1898	70	Dr. Dönz	Hvalsöe and Henrichsen
New Davos Dorf Sanatorium[1]	,,	1560	1896	56	Dr. Philippi	Frei and Neubauer
International San.[1]	,,	—	—	48	Dr. Humbert	A. Hirsch
Dr. Dannegger's San.[1]	,,	—	1902	55	Dr. Dannegger	Abr. Gredig
Sanatorium Pisch[1]	,,	—	—	30	Dr. Volland	—
Basel Sanatorium (In der Stille)	,,	1600	1896	86	Dr. Nienhaus	—
Clavadel Sanatorium[1]	Davos-Clavadel	1694	1901	58	Dr. E. Frey	Frl. Gadmer
German Sanatorium	Davos Wolfgang	—	,,	80	Dr. Brecke	—
Rigi Colony[1]	Rigi	1665	—	—	Dr. Erni	—
Wald Sanatorium	Wald, Zurich	907	1898	90	Dr. Staub	—
Aegeri Sanatorium	Aegeri, Zurich	820	1885	—	—	For Scrofulous Children
Braunwald San.	Braunwald, Glarus	1180	1897	30	—	—
Wallenstadt Sanatorium (St. Gallen)	Klobisberg	—	—	50	(Being built)	—
San. Grand Hôtel[1]	Leysin	1450	1892	180	Dr. Exchaquet	—
San. du Mont Blanc[1]	,,	,,	,,	140	Dr. Morin	—
Hot. de Chamossaire[1]	,,	? 1450	1901	,,	Dr. Meyer	—
Sanatorium Populaire	,,	? 1400	,,	100	Dr. Hensler	—
San. for Children	,,	1400	1900	15	—	—
Montana San.[1]	Montana	1500	1903	38	Dr. Stephani	A Company
Beauregard San.[1]	,,	1520	1902	75	Dr. C. Fischer	—
Popular Sanatorium for Geneva	Clairmont-sur-Sierre	1480	1903	65	Dr. Veillard	—
Erzenberg San.	Erzenberg (Basle)	—	—	68	Dr. Christ	Dr. Christ
Heiligenschwendi Sanatorium	Near Thun	1140	1895	108	Dr. J. Käser	—
Heiligenschwendi San. for Children	,,	,,	1903	40	,,	—
Malvilliers San.	Boudevilliers, Neuchatel	860	1899	22	Dr. Reymond	—

[1] Sanatoria for full-price patients.

There has been a large addition to the number of sanatoria for consumptives in Switzerland during the last few years. Some of the hotels in Davos which formerly received both tuberculous and non-tuberculous inmates have approximated to the true sanatoria, by placing their management partially in the hands of medical men, who in some cases reside in the hotel. At Leysin and Arosa there are also several hotel-sanatoria of this kind. It is however difficult to entirely get rid of the disadvantages of a mixed community, as the rules have to be framed in part for the convenience of visitors instead of patients, and the benefits derived by the latter depend largely upon their own determination and power of resisting temptation. The common rooms are habitually overheated ; and many patients are tempted to stay in them during the evening to listen to concerts, etc., when they should be out of doors, and are apt to defer to the opinions and advice of perennial habitués instead of those of the doctor. On the other hand, they have some advantages, since they enable the invalid to spend his time very pleasantly with his family and friends. It should be remembered that both in Switzerland and in Germany a tax on visitors has usually to be paid ; and there are apt to be more extras than is usual in England. Numerous meals are usually provided, contrary to the prevailing practice in English sanatoria. There has been a further extension in the number of beds available for the less wealthy consumptives in Switzerland. The cost of erection in these cases has usually amounted to 6,000-6,500 frs. per bed : the cost of maintenance about three frs. per day.

CHAPTER LX.

EASTERN SWITZERLAND

Including Grisons, Glarus, St. Gallen, and Zurich.

THE AROSA SANATORIUM.

Arosa is a small hamlet in a branch of the Schaufiggerthal, about six hours' drive from Chur. The road ascends the valley of the Plessur in an easterly direction as far as Langries, where it takes a sharp turn to the south-west. The Arosa valley itself forms a long oval, surrounded on all sides by snow mountains, and rises from 1,750 to 1,892 metres above sea-level. It is divided by the Tschuggen mountains on the north into an upper and a lower part; and its sides are clothed to a height of about 1,900 metres by pine woods, broken by two fine lakes.

The climate has the usual characteristics of an Alpine resort: with a little more sunshine than Davos, and rather more wind. Altogether the climate of Arosa is regarded by Dr. Ewart as more stimulating than that of Davos.

The sanatorium is situated on the northern side of the valley, sheltered to the north by the Tschuggen, to the east by pine woods and the approximation of the mountains; while it is open to the south and west. It is isolated from other buildings by private grounds. Owing to the steepness and the permeable soil, the surface is soon dry after rain and during the melting of the snows.

The sanatorium consists of an old and a new Kurhaus side by side, and a separate building for laundry and disinfection. The ground floor of the old Kurhaus (fig. 76) is mainly occupied in front by three common rooms, behind by the kitchen department. In front of it is a deep verandah, protected at the eastern end by the projecting music room, and ending at the western end in a pavilion. On the ground floor of the new Kurhaus, which stands back some

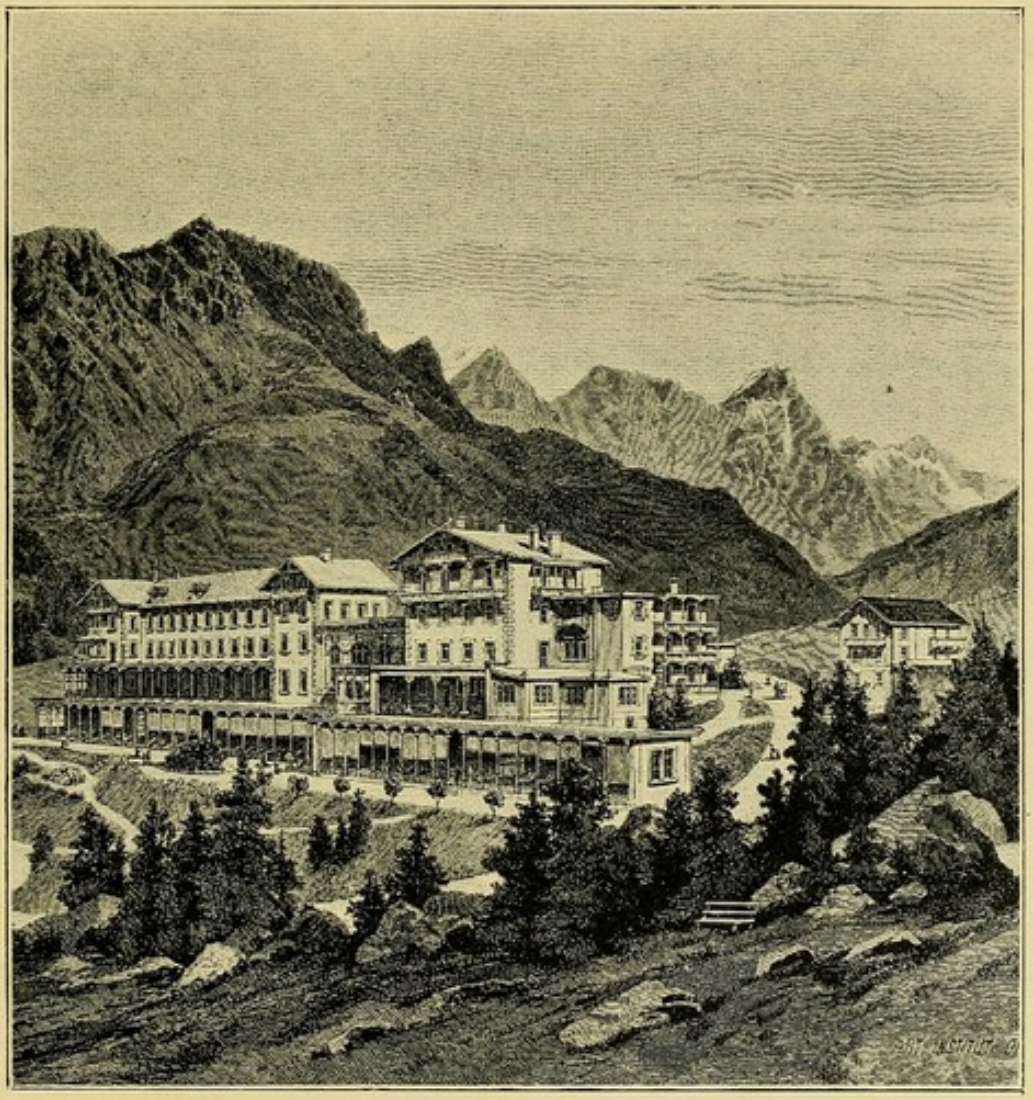


FIG. 76.—AROSA SANATORIUM. [*Face page* 360.

ten metres, are a ladies' room, offices, consulting rooms, etc., and on the south front another verandah. Uniting the two buildings is a large dining-saloon six metres high, with cubic capacity of 960 cubic metres. Each building has a terrace in front of it, and on a lower level a *liegehalle*. There are two upper floors in the new Kurhaus, three in the old, which are occupied by bedrooms. Most of these have at least one window to the south, and are of good size; some have separate balconies. Every room is lined with wood, and has linoleum-covered floors. Heating is by low-pressure steam, lighting by electricity. There is a private water supply, and good sanitary arrangements. The baths and douches are partly in a built-out pavilion at the western end of the new Kurhaus, partly next the kitchen in the older building.

Seven meals a day are provided.

Charges: For rooms, 1.50-6 frs. per diem, or 3 to 7 if double bedded.

Attendance: 8 frs. per diem. Entrance fee, 15 frs. In winter 1 fr. extra per day for heating and lighting.

DAVOS

is situated amongst the mountains of Grisons in a high funnel-shaped valley traversed by a little torrent, the Landwasser. The valley runs from north-east to south-west at an altitude of about 1,560 metres; it is twelve kilometres long and one wide, and is protected to the north by a high chain of snow mountains, and to the east by a strongly projecting mountain spur. The valley to the south is covered with fields and surmounted by pine woods. At the northern entrance is Davos Dorf; then the valley forms an angle and enlarges; and here is Davos Platz. To the north-east of Davos Dorf is the Davos lake. Davos Dorf receives more sun than Davos Platz, but is much less sheltered from the north. Owing to the growth of population the two are continuous; but Davos Platz is more crowded, and is served by a railway from Landquart. A tram line runs between the two, as well as the railway. The population consists partly of consumptives, partly of pleasure seekers. Facilities abound for skating, tobogganing, sledging, snowshoe running and the like; also for concerts and entertainments in crowded halls. The place has very great climatic advantages, but also the dangers inseparable from a fashionable resort.

There are a number of hotels and pensions, some of them

very well arranged, and possessing many of the structural features of medical sanatoria, but without their medical control of the arrangements. Most of the hotels charge from 7 frs. 50c. to 14 frs. per day; in the pensions the terms are from one to two frs. less. The Schweizerhof Hotel is now managed more or less like a sanatorium, and has medical officers in residence.

Dr. Turban's Sanatorium

is in the south-west part of Davos Platz on the mountain side. Sheltered by mountains and forests to the north, it has a fine view to the south and south-west over meadows and the town of Davos to the mountains beyond. It has a garden of seven hectares (seventeen acres) with walks as gentle gradients, adjoining the grounds of the Kurverein, to which patients have access on payment of a subscription. In these grounds "the paths are somewhat steep, and insufficiently provided with seats, while in summer there is too little shade".[1] The sanatorium (fig. 77) consists of four buildings united by covered passages, and of an isolated villa for the chief medical officer and the managing director. The main building is a long erection on four floors, with a basement, having a covered verandah in front of the ground floor, and open balconies to the other floors. In the basement are the administrative rooms and cellars, the laundry, disinfecting and heating apparatus. On the ground floor is a large dining-saloon, 15 × 10 metres and 5½ metres high, with room for 120 guests; a drawing-room, reading-room, billiard-room, office, doctor's rooms and laboratories, gymnasium, douche and bathrooms. Above these are patients' bedrooms on three floors, all on the south side, and opening into a well-lighted corridor, the staircase being also to the north. The largest of the other villas is to the east, the remaining two being at the upper or western end. The bedrooms average 57 cubic metres in capacity. They are heated in the main building by low-pressure steam pipes, the rest of the establishment being served by porcelain closed stoves or hot-water pipes. In each bedroom of the main building is a radiator which can be regulated, and which has a ventilating inlet next to it. On the opposite wall is an outlet leading to a chamber under the roof. In addition to this, the windows, which are French windows with an upper hinged pane, are always kept partly or en-

[1] V. Jaruntowsky, *Sanatoria for Consumptives*, trans. by E. C. Beale. London: Rebman Publishing Co.

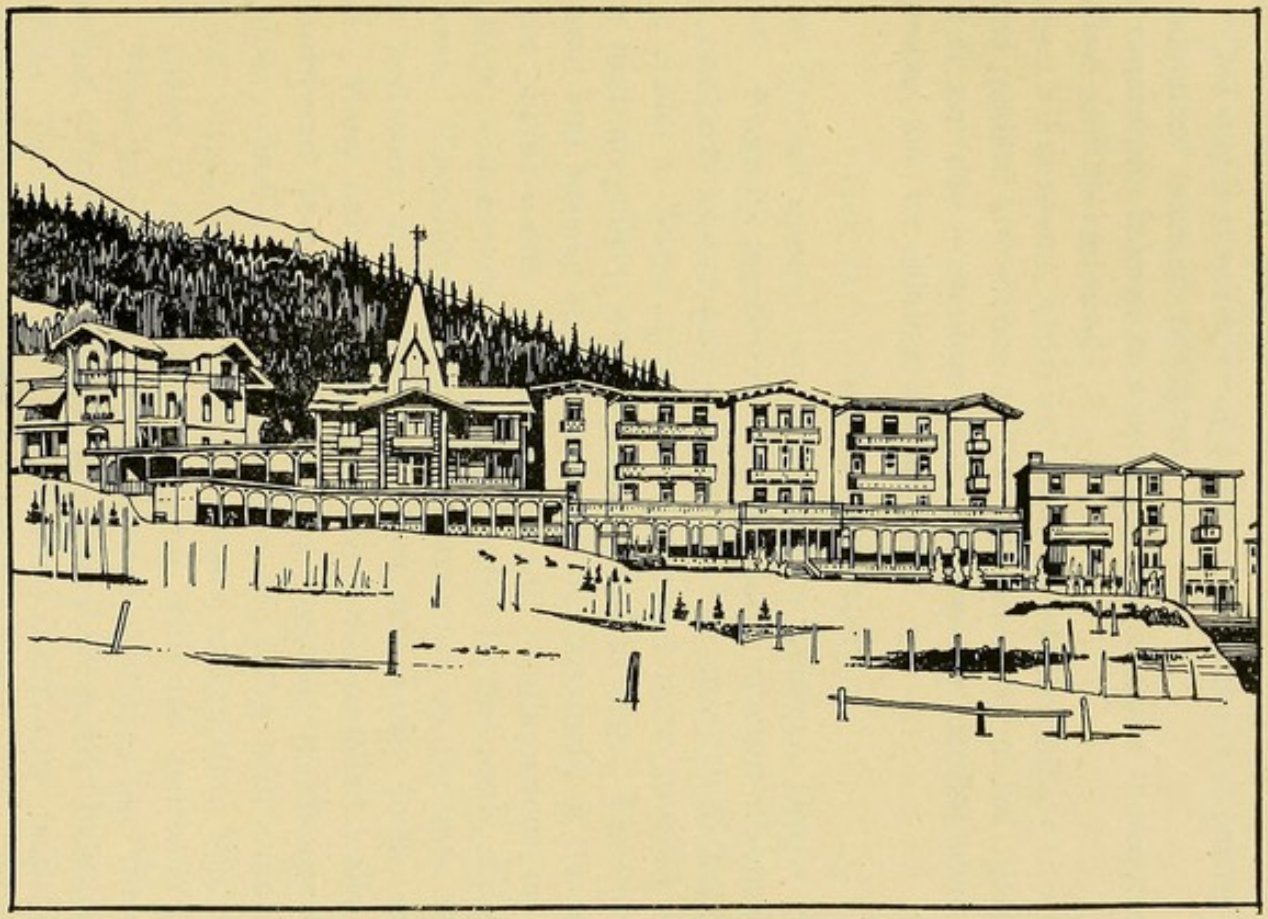


FIG. 77.—DR. TURBAN'S SANATORIUM, DAVOS. [*Face page* 362.

tirely open. There is a similar arrangement over the doors of the balconies. The walls are of wooden panels with rounded angles. The floors are covered with linoleum. The lighting is by electricity, the bedrooms having bed and table lamps which can be shaded. The water-closets have a good flush. There is a very good water supply.

The diet is varied, with six *meals* a day, including much milk and butter. One day it is *recherché*, the next it is simple in character.

No advanced cases are admitted.

The sanatorium belongs to a company, but is under the control of Dr. Turban and his assistant.

Charges : For rooms, 2 to 6 frs. ; double-bedded rooms, 5 to 7 frs. ; board and medical attendance, 11 frs. ; entrance fee, 20 frs. Reduction of 1 fr. per day in summer ; special terms for medical men and their families, also for children and servants.

The New Davos Sanatorium

is in the English quarter, on the boundary between Davos Platz and Dorf. From its position it receives a large amount of sunshine. It has a southerly aspect, and consists of a four-story stone building and of a châlet in Swiss style, both connected by a covered walk with the fresh-air gallery, which is twenty metres long. The kitchen department and heating apparatus are in the basement of the main block, the dining-room, drawing-room and reading-room on the ground floor, with entrance, W.C.s and office to the north, staircase to the west. Consulting and waiting rooms are on the first floor. Patients' bedrooms are placed on all sides, but mostly to the south and east. Many have balconies : all have wood-panelled walls and linoleum-covered floors ; electric lighting, heating by low-pressure steam pipes ; double doors and windows, the latter with a fanlight. Good water supply, bath and douche rooms, and modern W.C.s.

The châlet is a three-story building with ten patients' bedrooms. These have parquet floors, but are otherwise like the rest. The medical officer's quarters and laboratory are in this building.

Charges : 10 frs. per day for inclusive board and treatment ; 1 to 6 frs. (or with two together) 4 to 7 frs. for the room. The place is not exclusively for consumptives.

The Davos Dorf Sanatorium

stands back from the road in an elevated position, where it receives plenty of sunshine. It is a four-story stone building with all the

patients' bedrooms to the south of the corridors, and offices to the north. In front of the basement is a verandah, above this a balcony and smaller balconies on other floors. Hydraulic lifts serve every floor. Heating is by low-pressure steam, lighting by electricity. Attached to the main block by a passage is an annexe, the Villa Maria.

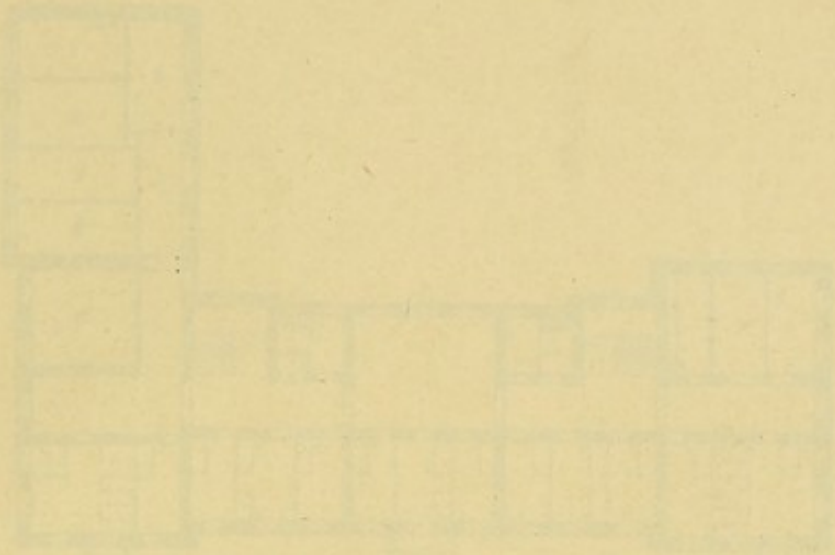
The Schatzalp Sanatorium

is a large building on a plateau above Davos Platz, with which it is connected by a funicular railway. Behind it to the north is the mountain; spread out in front are the pine woods overhanging Davos. From its position, it receives more sunshine than Davos, and is free from the drawbacks arising from the larger population of the latter. The sanatorium has over forty hectares private grounds, and enjoys an extensive view over the Davos valley. The ground floor contains a number of large day rooms, as well as laboratory, consulting room, and doctor's quarters. In front of it is a long covered way leading at the sides to two *liegehallen*. The three upper floors consist mainly of bedrooms placed north and south of the corridors, with here and there a solarium. Most of those on the south side have balconies. Bathrooms, staircases, W.C.s, linen rooms, and those for the servants, are entirely on the north side. The kitchen is on the ground floor to the north-east, and projects beyond the other floors. Heating is by low-pressure steam, lighting by electricity. Electric bells and telephone connect the various parts of the building. There is a steam disinfector and a complete douche and bathing department on the ground floor. The rooms are large, with painted panelled walls, and floors covered with linoleum over felt. Wardrobes are let into the walls, and furniture is washable. The walls are constructed so as to be sound proof. There are double doors and windows, the latter with ventilators and outside blinds. There is a covered way to the railway station; telegraph and telephone to Davos. Dr. Neumann lives in the building; Dr. Spengler visits every day from Davos.

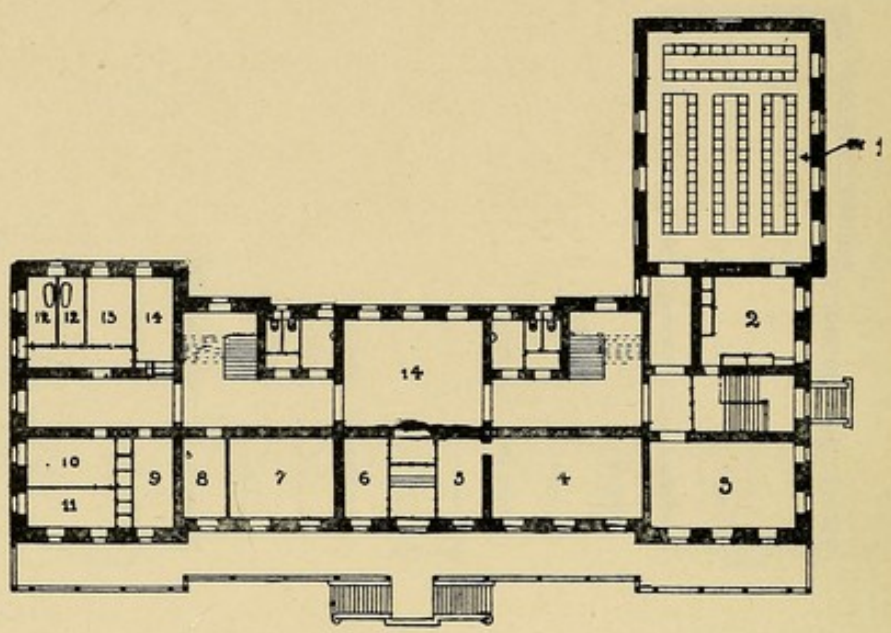
Charges: Board and attendance, 12.50 frs.; rooms, 2 to 15 frs. per day. Entrance fee, 20 frs.; disinfection on departure, 7 frs.

The Clavadel Sanatorium

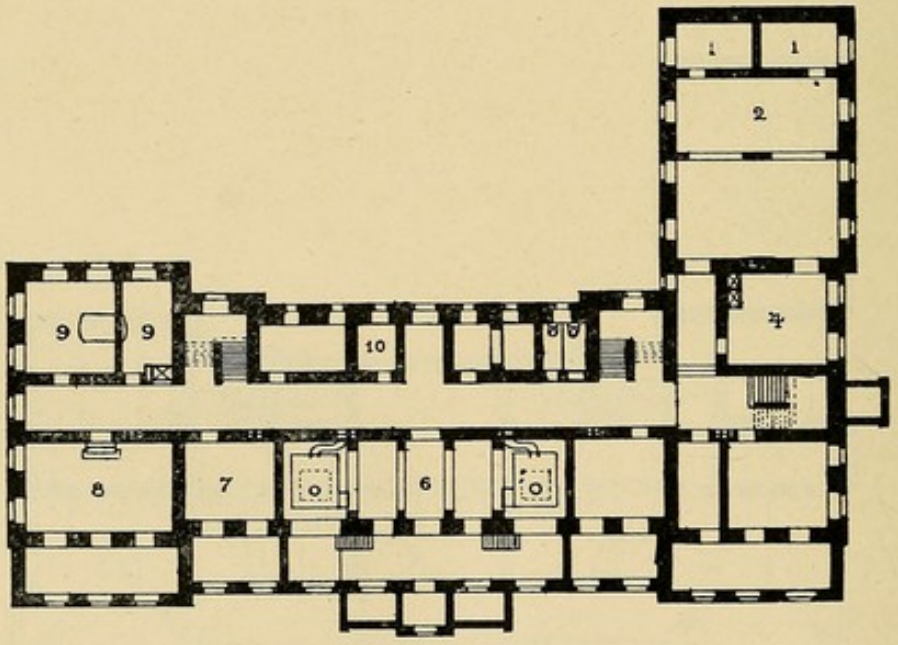
is the successor to a Kurhaus in which patients have been treated since 1890. It is on a small plateau about one and a half miles from







GROUND FLOOR



BASEMENT

FIG. 79.—SANATORIUM "IN DER STILLE," DAVOS.

[*Face page* 365.

Davos Platz, on a somewhat higher level. It receives a large amount of sunshine, and is well sheltered by pine woods and mountains to the north, enjoying an extensive view to the south over the Davos valley and the Sertig valley and distant mountains between. The building contains fifty-eight patients' bedrooms, mostly to the south, with large balconies. Complete bathing departments; electric lighting; rooms supplied with hot and cold water.

Charges: Board and attendance, 12.50 frs.; rooms, 2 to 10 frs. per day. Entrance fee, 20 frs.

THE SANATORIUM "IN DER STILLE,"

at Davos Dorf, was founded by a society at Basel, on the initiative of the medical profession and with the help of public subscriptions. It is placed at the foot of the Seehorn, near the entrance to the Fluelathal, in a very sheltered position, with a south-westerly aspect, and protected to the east and west by pine woods. *Grounds:* two hectares. The building is of stone, on a more concentrated plan than are most other sanatoria, with the view of economising heat as much as possible. The administrative portion has been built for 100 patients, which is more than the present accommodation. The building (figs. 78, 79) forms an oblong block, with a wing projecting north from the eastern end, containing kitchen, dining-room and manager's and medical officer's quarters. In the main portion are, in the basement, heating apparatus, laundry, disinfector, workroom and storerooms. On the ground floor, office and manager's rooms, porter's room, waiting and consulting rooms, laboratory, bath and douche rooms, a large vestibule on the north side, and two large common rooms on the south side for the two sexes. There is another common room at the junction with the wing. Along the southern side is a verandah, the floor of which is sunk a few steps; it is of wood over cement, and rests on a projecting part of the basement. The upper floors contain bedrooms on the south side, chief medical officer's quarters, vestibule, bathroom, lavatories, etc., on the north side; the nurses' rooms and staircases being also at the back. The bedrooms contain from one to four beds apiece, about one-third being single-bedded. The height of ground floor is 3·25 metres; first, second and third floors, 2·90, 2·85 and 2·80 respectively. The dining-room is five metres high. The stairs and foundations are of cement; the floors in patients' quarters of oak or boxwood, or else of pine covered with

linoleum; in the kitchen of terrazzo. The inner walls are smooth and free from mouldings, with rounded corners and angles, and covered with oil-coated and washable linen paper. The windows are double, with fanlights above. In the laboratory, douche rooms and bathrooms there are enamel-painted walls; in the common rooms and dining-saloon breast-high wooden panelling. The furniture is of plain lacquered pine wood. Heating is by low-pressure steam, lighting by electricity.

Charges: 5 frs. per diem; or in some cases 3 frs. Those who pay the full charge have first choice of single rooms. Sick societies and hospitals that subscribe towards the funds of the sanatorium can send patients at 2 frs. per diem. Some of the beds are reserved for inhabitants of Basel and district; others are free to all irrespective of habitat or nationality, so far as there is room. Patients undertake to stay at least thirteen weeks. Men and women take their meals in common.

The cost is said to have been 650,000 frs., the daily cost 3.50 frs. per day.

The Dutch Sanatorium

at Davos for poor people was founded by a private society, and is maintained chiefly by voluntary subscriptions from residents in Holland, including the Queen. The house (not specially constructed) is on the hillside, sheltered from the north and west by mountains. It is in the usual Swiss style, and consists of basement, three upper floors and attics. The bedrooms, which have from one to three beds apiece, are large; their walls are of varnished wood or covered with washable paper; each has a closed stove and plain wooden furniture, and linoleum-covered floor. The windows are French casements with a fanlight above; the lighting is by electricity. Most of the rooms on the south side have balconies. There are also three large verandahs at the western end of the house, of which the lower is glazed, the upper ones being provided with solid roofs and thick blinds on the windy side. There is a suitable bathroom; W.C.s with good flush; sewers connected with those of the town. There are two common rooms.

The *staff* includes a resident medical officer and a trained nurse.

Charges: 4 frs. per day inclusive. The sanatorium is for patients of Dutch nationality.

The German Sanatorium

is not far from Wolfgang Station on the Lake of Davos. It is intended for middle-class patients of German nationality, and is built in the usual sanatorium style, with south rooms, *liegehalle* and verandahs in front, and corridors, offices, bathrooms, etc., behind. There are a few north rooms for companions of patients.

A new wing with thirty more beds is to be added.

Charges : 6 frs. per day in single-bedded, 5 frs. in double-bedded rooms, 3.50 where there are four together.

The Alexanderhaus

is the Diakonissen-haus under a new name; it admits patients in advanced stages at moderate charges and was originally founded by Dr. Alexander Spengler. An affiliated institution is for the supply of trained nurses. It is a Protestant institution, and has no resident medical officer.

The St. Joseph Haus,

formerly called the Villa Pravignan, is a similar institution exclusively for Roman Catholics and under the charge of a Sisterhood.

The Alexandra Sanatorium

at Davos for British patients will, it is stated, cost £30,000. The charges are to be from 25s. to 30s. per week.[1]

The Braunwald Sanatorium,

for Glarus and neighbouring cantons, is on an elevated terrace near the baths of Stachelberg, in the valley of the Linth, but 600 metres above the stream.

Surrounded by woods and meadows, it looks south-south-west and is well sheltered by mountains from north-east winds. It has a dining-room, workroom, fresh-air gallery, and rooms for gymnastics and games in bad weather, as well as wards containing from one to three beds apiece. There are two windows to each bedroom, surmounted by fanlights. Air space is 30 cubic metres per head. The walls are wainscoted to a man's height, and all corners rounded. Heating is by hot-water pipes, lighting by electricity. Furniture of

[1] *British Medical Journal*, 22nd Oct., 1904.

varnished wood. Both sexes are admitted. Patients are received by arrangement from Thurgau.

Terms: 2½ to 4 frs. per day, according to domicile and number of beds in a room.

Wald Sanatorium,

for the canton of Zurich, is on the Faltigberg, a little north of the southern end of the lake of Zurich. It has thirty hectares of land, including both woods and meadows. The building has a southerly aspect. It consists of a central administrative block and a three-story pavilion on each side, for men and women respectively, with open-air corridors between. Patients are also received from Schaffhausen.

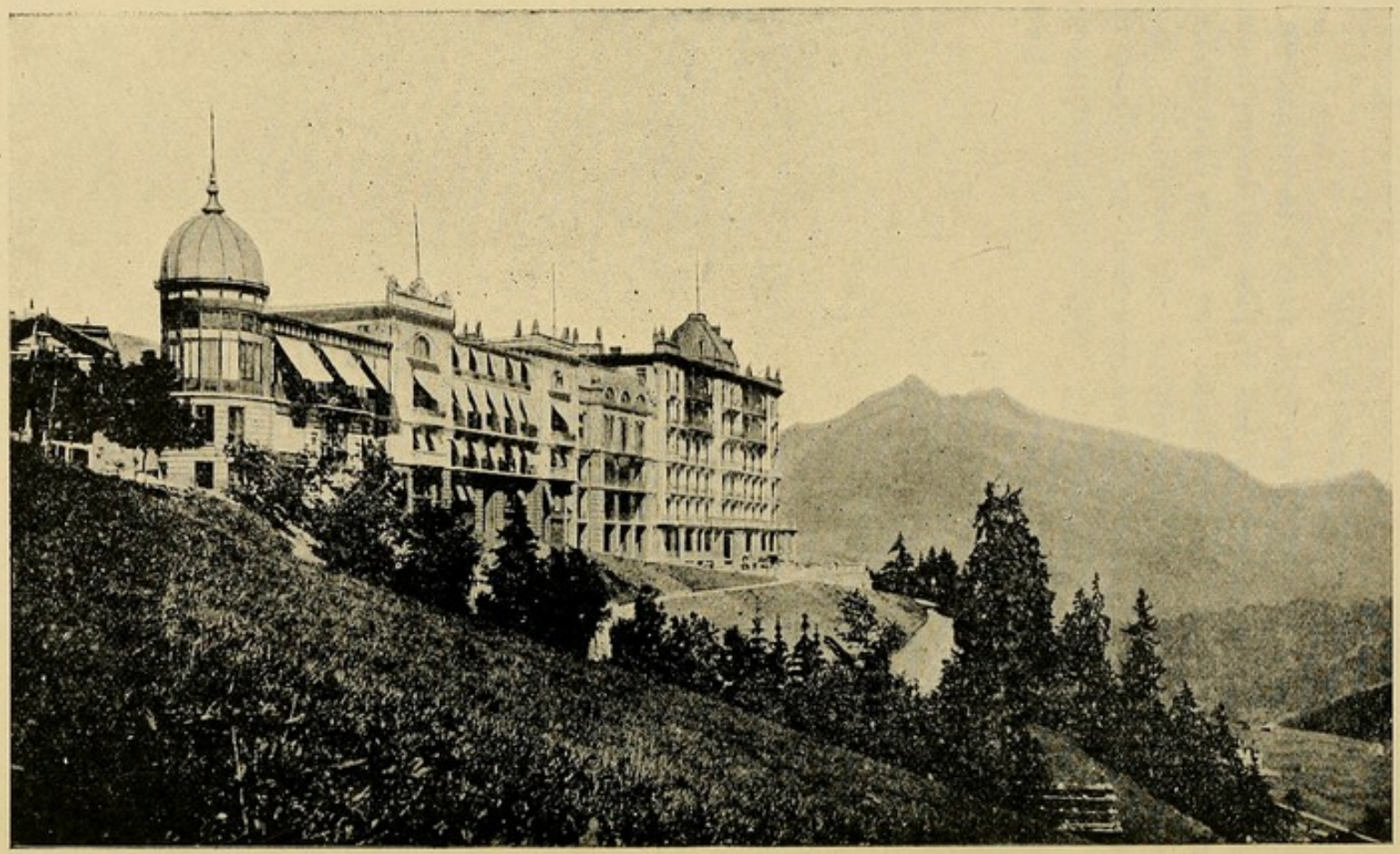


FIG. 80.—SANATORIUM DU MONT BLANC, LEYSIN. [*Face page* 369.

CHAPTER LXI.

CENTRAL AND WESTERN SWITZERLAND.

The Leysin Sanatoria.

Leysin, which has the highest parsonage in the Canton of Vaud, is situated above the lower part of the Vallée des Ormonts, on a wide plateau at the foot of the Tours d'Ai. The valley, which has long had a reputation for the cure of scrofula, runs from north-east to south-west, the sanatoria being on its northern side, above the usual fog and cloud-level for this part of the Alps. The soil is dry and calcareous. The district is said to have rather more sun than Davos. Three sanatoria for full-price patients are to be found here, in addition to a small one for poor children and a larger popular sanatorium for men and women.

The Sanatorium Grand Hôtel

is on a slightly higher level than the two other pay sanatoria. It is a five-story stone building, with patients' bedrooms mostly on the south side, the kitchens, storerooms, servants' apartments and staircases being on the north side. The dining-saloons, drawing-room, winter garden and glazed galleries for exercise indoors, are on the ground floor and basement. There is also a large *liegehalle*, 30 metres long, on the eastern side of the building, and another in the grounds. The bedrooms are 3 metres high; each has a chimney for ventilation, and double windows, the tops of which can be separately opened. There are roomy balconies in front of most of these. The second floor communicates with the first by means of a footbridge. The building is heated by low-pressure steam; lighting by electricity.

Terms: 11 to 19 frs. per day; in addition to extras.

The Sanatorium du Mont Blanc,

at one time called an hotel, is a four-story building with a tower at the western end surmounted by a cupola (fig. 80). Balconies run

round this tower and along the southern side of the rest of the building. The room and arrangements are much the same as in the Sanatorium Grand Hotel.

Terms: 9 to 15 frs., and extras.

The Hotel de Chamossaire

lies to the east of the foregoing. Arrangements somewhat simpler.

Terms: About 8 frs. per day, and extras.

Access: An electric rack and pinion railway connects Aigle with Leysin.

The above three sanatoria are under common management.

The Leysin Sanatoria for the People.

There were originally two small sanatoria at Leysin, one for men and the other for women. Now the larger Popular Sanatorium has been opened, the former is closed, and the latter devoted to children.

Terms: 2 to 5 frs. per day, according to the number of beds in a ward.

Dr. Stephani's Sanatorium

at Montana was founded by him by means of a company. Dr. Stephani was one of the first to point out the climatic advantages of Montana, and started a sanatorium at the Hotel du Parc. This was described in the second edition of this book, but has since reverted to its original functions of an hotel for tourists. Dr. Stephani was for a time medical director of the sanatorium of Beauregard, until his present establishment was opened. Montana forms a plateau overlooking the village of Sierre (Valais) protected by an amphitheatre of mountains to the north, and by pine woods to east and west. In front of it is a panorama of mountains, including the Bietschhorn and the Simplon, the glaciers of Zermatt, the Matterhorn and Mont Blanc. This plateau enjoys a large proportion of sunshine with very little fog.

Dr. Stephani's sanatorium is a four-story building (fig. 81) with large balconies at the western end, and a large dining-saloon with winter garden over the kitchen at the eastern end. The rooms are placed north and south of the corridor. They have œbolithe floors, with rounded angles, a fanlight over the window, but none over the door. Heating is by low-pressure steam; lighting by electricity. There is one bath-

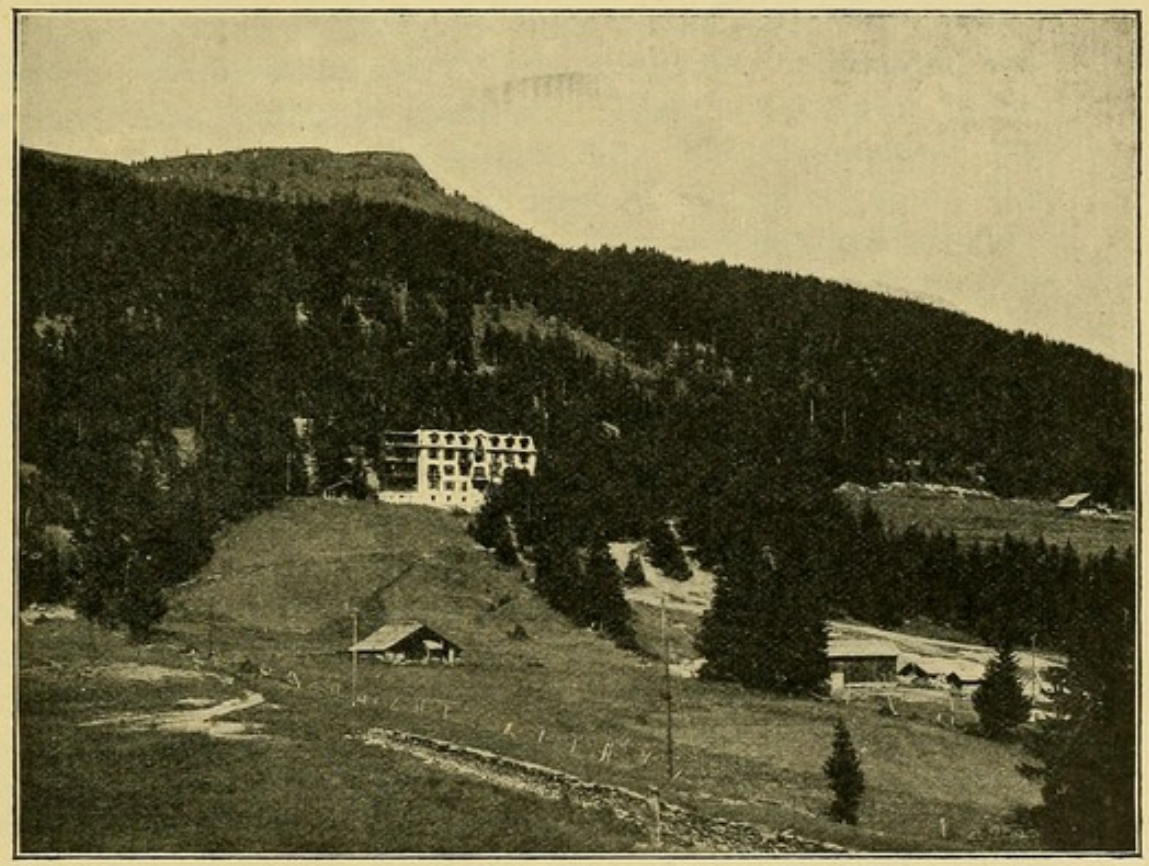


FIG. 81.—THE MONTANA SANATORIUM. [*Face page* 370.

room; the consulting room is on the first floor, a drawing-room on the ground floor, two W.C.s on each floor. No lift. Three of the rooms have two beds apiece; the rest being single bedded.

The building is of stone, with wooden balconies.

Terms: 17 to 22 frs. per day, according to room; 1 fr. more in winter.

Access: Sierre is on the Simplon railway route; hence by horse in one and a half to two hours, by carriage in three and a half hours.

The Beauregard Sanatorium

is a large building consisting of three blocks united by fresh-air galleries. The bedrooms are all on the south side; heating is by low-pressure steam, lighting by electricity. There is a complete hydropathic installation; also a passenger lift. The dining-saloon and kitchen are in an annexe on the level of the second floor. The floors are of cement with rounded angles and linoleum covering; the walls covered with washable paper. The sanatorium is being reorganised.

Terms: 10 to 25 frs. per day.

Access: See Dr. Stephani's Sanatorium.

The Genevese Sanatorium for the People,

at Clairmont-sur-Sierre, is surrounded by a semicircle of mountains covered with pine woods, being open to the south-south-east. It is a four-story building, the centre of which is a little higher and more prominent than the rest, and separates the men's from the women's section. The centre contains the quarters of the medical director and lay manager, the dining-saloon on the south side, and underneath the kitchen department. The wards consist of four with six beds apiece, in the wings, eight with three each, two with two beds each, and ten single-bedded rooms in the attics. The lavatories, etc., are separate for each section, a pair for each floor. There is an easy staircase, but no lift. A large verandah runs along the south side in front of the basement; it is 50 metres long and is divided into small sections by glazed partitions. Heating is by low-pressure steam, lighting by electricity. The incubators in the laboratories, sterilisers, and flat-irons in the laundry are also heated by electricity. There are fan-lights over the large windows, and over the doors into the corridors. The north side is exclusively devoted to administration, sanitary

room; the consulting room is on the first floor, a drawing-room on the ground floor, two W.C.s on each floor. No lift. Three of the rooms have two beds apiece; the rest being single bedded.

The building is of stone, with wooden balconies.

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pavilions, etc. There are seven bathrooms, two douche rooms, fifteen W.C.s.

Terms: 4 to 7 frs. per day, according to domicile and number in a room. A reduction is made for children of ten to fifteen years. Three months' fees have to be paid in advance.

The Heiligenschwendi Sanatorium

was opened to commemorate the 600th anniversary of the Swiss Confederacy, and the 700th of the City of Berne, and is intended primarily for the inhabitants of Berne and the canton. Patients recommended by subscribers have the preference. The tuberculosis commission for Freiburg maintains certain beds in this sanatorium. Soleure also sends patients. The sanatorium is about one and a half hours' walk from Thun, on an elevation overlooking the lake, with a lovely view of the Niesen, Jungfrau and the Alps. The situation is sheltered; the Blume mountain lies to the north; wooded hills to the west. The building, which faces south-south-west, consists of a central mass (fig. 82) united by covered corridors with two slightly projecting lateral pavilions. Behind the eastern pavilion is a separate *dépendance*. In front of the central block and the connecting corridors are the fresh-air galleries, which are glazed. In the central part is the dining-saloon, and on either side of it a common room. The former is for both sexes; but in other respects they are kept apart. The northern part of the central block contains the kitchen, etc. On the first floor are a few single-bedded rooms to the south, and over them a number of attic rooms. Both lateral pavilions have on the ground floor two large rooms with eight beds each, and windows on three sides, and a few smaller rooms for one or two beds apiece, and the same on the first floor. The *dépendance* contains the manager's and the doctor's quarters. There is also an outbuilding behind the western corridor with laundry, disinfector, stables, etc. Recently a children's pavilion with forty beds has been added. The inner walls are painted with glossy oil paint; the floors are of simple washable parquet. Heating is by low-pressure hot-water pipes; lighting by electricity. The windows are very large, reaching down to the ground, the lower part being guarded by a grating. There are good baths, a good water supply, and "Unitas" W.Cs.; simple furniture, lounge chairs in two parts. None but consumptives are admitted. Patients do a little work in the establishment; also sledging in winter.

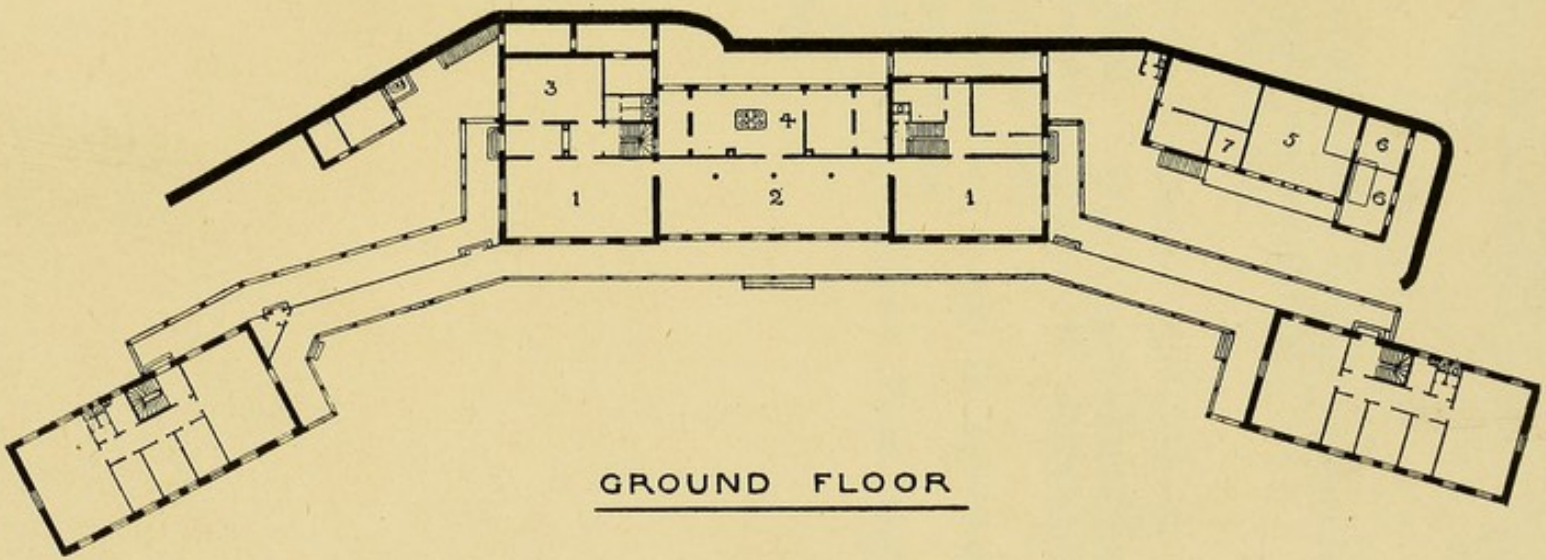


FIG. 82.—THE HEILIGENSCHWENDI SANATORIUM.

[*Face page* 372.

The *staff* includes a manager, matron and trained nurses, but no resident medical officer.

Charges: 1½ to 4 frs. per day, according to means.

The cost of the building without land was about £216 per bed for the first fifty-two beds.

The Rigi Colony

is an open colony under medical direction in private houses, each of which receives not more than ten patients.

Terms: 3 to 4 frs. per day.

The Erzenberg Sanatorium,

at Langenbrück (Basel), is chiefly intended for children. There are separate sections for non-pulmonary and pulmonary tuberculosis, the former having forty-eight beds.

Terms: For children 2 to 3 frs. per day according to age; adults exceptionally accepted at 4 frs.

Patients are received from Soleure, Basel, Aargau, the Grand Duchy of Baden, etc.

Access: viâ Olten.

INDEX.

A.

Aalborg Sanatorium, 216.
Aas-Eaux-Bonnes, 239.
Aberdeenshire, 189.
Achtermann, Dr., 61.
Adelaide, 207.
Adirondack Cottage Sanitarium, 37, 60, 69, 71, 91.
Administration, 18.
Adorf, 269.
Advantages of sanatoria, 59.
Aegeri Sanatorium, 358.
Africa, South, 36, 213, 214.
Agnes Memorial Sanatorium, 67, 74.
Agricultural colonies, 71, 80, 96, 106, 111, 148, 150, 160, 215, 228, 244, 245, 283.
Aiken, 70.
Ain, 227.
Air, 13, 34, 36, 38.
Aix-la-Chapelle Sanatorium, 295.
Alabama, 67, 173.
Alberschweiler Sanatoria, 310.
Albertsberg Sanatorium, 22, 28, 269, 293.
Albrechtshaus Sanatorium, 269, 283.
Albuquerque, 69.
Alcohol, 48.
Alderney Manor Sanatorium, 175, 177.
Aldershot, 163.
Alexander Sanatorium, 345, 347.
Alexander III. Sanatorium, 345.
Alexanderhaus, 367.
Alexandra Sanatorium, 367.
Alexian Bros. Hospital, 68.
Algiers, 227, 232, 237.
Al Hayat Sanatorium, 222.
Alice Fagniez Sanatorium, 240, 242.
Alland Sanatorium, 111.
Almshouse Hospital, Long Island, 68.
Alpes Maritimes, 227-232.
Alpine resorts, 6, 7, 11, 36, 56, 57.
Alsace, 310.
Alsenberg, 126.
Altadena, 67.
Altadore Sanatorium, 200, 204.
Altena Sanatoria, 295, 296.
Altenbrak Sanatorium, 269, 289.
Altitude, 6, 12.
Altweiler Sanatorium, 310.
Alupka Sanatorium, 345.
Ambrock Sanatorium, 295.
Ambrosius, Dr., 295.
American Sanatoria, 12, 13, 14, 28, 54, 55, 67-110.
— Climatological Association, 60.
Amherst Hospital, 205.
Amsterdam Sanatorium, 329.
Amusements, 15, 42, 58.
Anæmia, 41.
Ancoats, 62.
Andrae, Dr., 269.
Andreasheim Genesungshaus, 279.
Angicourt Sanatorium, 227, 228.
Apenrade Sanatorium, 260.
Appenrodt, 282.
Arcachon, 239.
Argèles, 240.
Argentine Republic, 109.
Arizona, 67.
Arlen Sanatorium, 310, 319.
Armley Hall, 130, 139.
Arnold, Dr. F. S., 151.
Arosa, 358, 360.
Aschaffenburg Sanatorium, 310.
Asheville, 70, 102.
Ashmark, 188, 195.
Aspect, 14.
Assistance Publique, 224, 227, 228, 240.
Assouan, 223.
Aubrac Sanatorium, 232, 237.
Auchterhouse Sanatorium, 188, 191.
Aufrecht, Dr., 60.
August Hospital, 250.
Auguste Viktoria Sanatorium, 260.
— — Rosbach, 295, 302.
— — Knappschafts Sanatorium, 295.
Austin Bluffs, 76.
— Hospital for Incurables, 205, 207.
Australia and New Zealand, 205-209.
Austria-Hungary, 111-121.
Aveyron, 232, 237.
Axbridge, 175, 182.
Ayrshire, 188, 195.

B.

Baden, 113, 310.
Baden Insurance Co., 310.
Badenweiler, 315.
Badische Anilin Fabrik, 223.

Balaclava Sanatorium, 352.
Balconies, 23.
Balkan Provinces, 122.
Ballard Sanatorium, Pueblo, 67.
— Pulmonary Sanitarium, 67, 108.
— Dr. W. H., 67.
Balmoral, 192.
Baltimore, 68, 87.
Banchory Sanatorium, 192, 193.
Bang, Dr., 216.
Barclay, Dr. W. I., 68.
Bardswell, Dr. N. D., 146.
Barlow Sanitarium, 67.
— Dr. W. J., 67.
Barnhill Sanatorium, 188.
Barr, Dr. L., 227.
Barrasford, 130, 136.
Basel Sanatorium, 29, 358, 365.
Basses Pyrénées, 232, 239.
Bathrooms, 21, 27.
Baths, 39.
Battle Creek Sanitarium, 74, 76.
Baudach, Dr., 310, 320, 321.
Bauer, Dr., 310.
Bavaria, 310.
Baxter, Dr., 356.
Bay View Asylum Hospital, 68.
Beauregard Sanatorium, 358, 371.
Bedford, 146.
— (N. Y.), 69, 96.
Beds, 26.
Beeches, The, 146, 148.
Beelitz Sanatorium, 260, 261.
Beggs, Dr. W. N., 67.
Behringhausen Sanatorium, 295.
Belbroughton Sanatorium, 141, 143.
Belfast, 200, 202.
Belgium, 123-128.
Bellefield Sanatorium, 188, 198.
Bellevue Hospital, 61, 71.
— Sanitarium, 130, 131.
Belzig Sanatoria, 31, 260, 262.
Beneke, Dr., 13.
Bennett, 67.
Bergen, 340.
Berka Sanatorium, 269.
Berkshire, 151, 152.
— Hills (N. Y.), 96.
Berlin Insurance Co., 260, 261.
Bernese Sanatorium, 358, 372.
Beton Armé, 125.
Bideawhile Sanitarium, 70.
Birch Hill, 130.
Birdlip, 175.
Birkenbusch Sanatorium, 260.
Bischoffsheim, Mr., 146.
Black Forest, 6, 310, 315, 316, 318-322.
— Sea, 353.
Blackwall's Island (N. Y.), 69, 89.
Blankenfelde, 260, 264.
Blankenheim, 269.
Blathwayte, Dr., 151.
Bleichröder Sanatorium, 260, 262.
Blencathra, 130.
Bligny Sanatorium, 227, 231.
Blinds, 24.
Blue Mountains, 207.
— Ridges Mountains, 68, 81.
Blumenfeld, Dr., 12, 38.
Böblingen Sanatorium, 310, 322.
Bobrow, Dr., 345.
Bochum, 295.
Bockryck Sanatorium, 124, 128.
Boehle, Dr., 329.
Boerne, 70, 107.
Bohemia, 117.
Bonsdorf, Dr., 345.
Boots and shoes, 27.
Bordeaux, 227.
Borgoumont Sanatorium, 124.
Boserup Sanatorium, 216, 219.
Boston, 60, 68, 71, 82-84.
Bottles, hot, 37.
Boulder, 67, 68, 74.
Bourne Castle Sanatorium, 143.
Bournemouth, 5, 151, 153-155.
Bowditch, Dr., 52, 60, 68, 83.
Bowdon Sanatorium, 130, 135.
Boxroom, 29.
Boyé, Dr., 310.
Bozen, 117.
Bradford, 130, 138.
Brandenburg, 260.
— Insurance Co., 266.
Braunfels Sanatorium, 295, 304.
Braunwald Sanatorium, 358, 367.
Brax, Dr., 345.
Brazil, 109.
Brecke, Dr., 358.
Brehmer, Dr. H., 12, 26, 41.
— Sanatorium, 16, 32, 56, 61, 250.
Bremen Sanatorium, 273.
Bridge of Weir Sanatorium, 188, 194, 198.
Brink, Carl Ten, 319.
Bristol, 181, 182.
British Sanatoria, 12, 13, 54, 129-204.
— Colonies, 205-214.
— Columbia, 210, 212.
Brocx, Dr., 329.
Bromberg Sanatorium, 250.
Brompton Chest Hospital, 59, 171, 172.
— Sanatorium, 26, 164.
Brooklyn Home for Consumptives, 69, 90, 99.
Brooks, Dr. M. I., 67.
Broomhill Sanatorium, 195.
Brouardel, Prof., 224.
Brown, Dr. Haydn, 151.
Browne, Sir J. Crichton, 52.
Bruggmann Sanatorium, 126.
Brunswick, 269.
Brussels Sanatorium, 126.
Buch Sanatorium, 260.
Bucharest, 122.

Buda Pest, 115, 120.
— — Congress, 24.
Buffalo State Hospital, 69, 70.
Buildings, 18.
Bulgaria, 122.
Bunting, Dr. Dora, 141.
Burrilsville, 70.
Burton-Fanning, Dr., 37.
Business, 43.
Butler, Dr. D. P., 68.
— Sanitarium, 68, 85.

C.

Cabinet, pneumatic, 43.
Caernarvon, 186.
Calcutta, 214.
Calgary Sanitarium, 210, 212.
California, 67, 108.
Camberley, 151, 164.
Cambridge (U.S.A.), 68.
— Sanatorium (New Zealand), 205, 209.
Campbell, Dr. Jeanette, 68.
Campos dó Jordao, 110.
Camps, tuberculosis, 71, 90.
Canada, 210-212.
Canadian Valley, 87.
Canary Isles, 355, 356.
Canigou Sanitarium, 37, 232.
Cantal, 232.
Cape Colony, 213.
Carlingford Bay, 203.
Carolagrun Sanatorium, 269, 294.
Carpathian Mountains, 119.
Carpets, 25, 26.
Cascade della Marmore, 333.
Cassel, 295.
Castlereagh Hills, 202.
Cataract Hotel, 223.
Catskill Mountains, 94.
Caucasus, 345.
Cauldwell, Dr. C. M., 100.
Caverhill Sanatorium, 188, 197.
— Dr., 188.
Ceilings, 25.
Central Germany, 269.
— Scotland, 188, 191.
— and Western Switzerland, 369.
Cervello, Prof., 333, 335.
Chagford Sanatorium, 175, 176.
Chairs, 26.
Chalet Sanatoria, 18.
Chalk Downs, 13.
Chamossaire, Sanatorium de, 358, 370.
Champrosay Sanatorium, 240, 242.
Channel Islands, 258.
Channing Home, 68.
Charity Hospital, 61.
— Sisters of, 67.
Charol, Dr., 345.
Chécy, 227, 229.
Cheddar, 175.
Cheltenham, 180.
Cheshire, 131.
Chestnut Hill Hospital, 70, 104, 105.
Chicago, 68, 74.
Chico Springs, 69.
Children's Sanatoria, 22, 30, 31, 123, 133, 158, 160, 198, 215, 217, 224, 240, 260, 263, 300, 322, 337, 343, 345, 358, 371, 372, 373.
Chill, 34, 42.
Chiltern Hills, 159, 160.
Chobham Ridges, 164.
Christ, Dr., 358.
Christiania, 338.
Cimiez, 227.
Cincinnati Branch Hospital, 70.
Citronelle, 67, 73.
City of London Hospital for Diseases of the Chest, 60, 171, 172.
Clairmont sur Sierre, 358, 371.
Clapp, Dr., 83.
Clar, Dr. Conrad, 111.
Class distinctions, 30.
Clavadel Sanatorium, 358, 364.
Clermont-Ferrand, 232.
Cleveland, 70.
Climate, 34, 36, 56, 73, 74, 87, 91.
Clinics for tuberculosis, 71.
Clinton Co., 103.
Cloakrooms, 21, 27.
Closets, 21, 53.
Clothing, 37-39.
Clwyd, Vale of, 186.
Coblentz, 295.
Coburg, 269.
Cold, 36, 38.
Colebrook, Dr. Esther, 151, 160.
Collins, Dr. Moses, 67.
Colonies, agricultural, 71, 80, 96, 106, 111, 148, 150, 160, 215, 228, 244, 245, 283.
— British, 205-214.
Colorado, 10, 36, 67, 73, 74.
— Sanitarium, 43, 67, 74.
— Springs, 67, 76, 77.
— Tent Colony, 67.
— University, 74, 76.
Comfort, 70.
Common rooms, 21.
Complications, 34, 44.
Concord, 108.
Connecticut, 67, 71, 73, 80.
Construction, 18.
Consulting rooms, 21.
Convict Camp, 67.
Conway, 186.
Cook County Hospital for Tuberculosis, 68.
Cooper, Dr., 188.
Copenhagen, 219.
Cork Co., 201.
Corners, rounded, 25.
Cornet, Dr., 12.

Corney Hospital, 68.
Cornwall, 175.
Corridors, 21, 23, 25.
Cotswold Hills, 178, 180.
— Sanatorium, 175, 178.
Cottage Sanatoria, 18, 19, 74, 77, 79, 85, 91, 94, 107, 108, 197, 264, 310.
Cotton, Dr., 59.
Covington, 68.
Crace-Calvert, Dr., 186.
Craigleith, 188, 195.
Crieff, 194.
Crimea, 345.
Cromer, 147, 148.
Crooksbury Sanatorium, 26, 27, 151, 161.
Croquet, 42.
Crossley, W. J., 135
Crouzet, Dr., 232.
Cuba, 116.
Cubic space, 22.
Cullis Home for Consumptives, 68.
Cumberland Sanatorium, 130, 131.
Cupboards, 26, 29.
Curhaus auf der Hohen Rinne, 121.
Curschmann, Dr., 295.
Curtains, 24-26.
Cuspidores, 51.
Cycling, 42.

D.

Dairy Farmers' Sanatorium, 216.
Dalby, Dr., 151.
— Sanatorium, 205, 208.
Dallas, 70.
Damp, 37.
Daneswood Sanatorium, 146.
Dangerfield, Mr. J., 144.
Danish Sanatoria, 216-221.
Dannegger, Dr., 358.
Dannemora, 70, 71.
Dannenfels Sanatorium, 310, 323.
Dart, 240.
Dartmoor, 175, 176.
— Sanatorium, 176.
Davidson, Dr. A. H., 107.
Davos, 8, 11, 29, 30, 329, 358-367.
— Dorf Sanatorium, 358, 363.
— — — New, 358, 363.
Dayton, 70.
Debove, Dr., 48.
Decoration, 18.
Deggendorf, 310.
Delamere Sanatorium, 135.
Delaware, 68, 71.
Dempel, Dr., 345.
Denbigh, 186.
Denmark, 215.
Denver, 67, 74, 77, 79, 80.
De Peyster Hospital, 69, 99.
Derecq, Dr., 241.
Destructor, 17.
Dettweiler, Dr., 6, 11, 16, 38, 41, 48, 50, 61, 297, 304, 307.
— flasks, 50.
Devon, 175, 176.
— and Cornwall Sanatorium, 175, 176.
Diakonissenhaus, 367.
Diamantina Hospital, 205.
Didworthy Sanatorium, 175, 176.
Dienne Sanatorium, 232.
Diet, 34, 46.
Dining-saloon, 23.
Disinfectants, 50, 52.
Disinfection, 71.
Dispensaries for tuberculosis, 71.
Distemper, washable, 25.
Diver, Dr. E., 130.
Döcker Baracken, 264.
Dombrowsky, Dr., 345.
Donath, Dr., 329.
Dönz, Dr., 358.
Doors, 21, 23.
Dorcey, Ex-Senator, 89.
Dorchester, 68, 84.
Dorking, 151, 166.
Dorsetshire, 175, 177.
Douche, 39.
Down, Co., 200, 203.
Drainage, 15.
Draughts, 23.
Driver, Dr., 291.
Driving, 42.
Düben, 269.
Dublin, 200, 201.
Dumarest, Dr., 229.
Dundee, 192.
Dunning, 68.
Dunstone Park Sanatorium, 175, 176.
Durban, 214.
Durham Co. Sanatorium, 130, 131.
Durtol Sanatorium, 232, 233.
Dust, 13, 24, 25, 35.
Dutch Sanatoria, 329-331.
— Sanatorium, Davos, 329, 358, 366.
Dyspepsia, 41.

E.

Earth closets, 53.
Easebourne Hill, 167.
East Anglian Sanatorium, 146, 149.
— Bridgewater, 68.
— Las Vegas, 69.
Eastby, 130, 138.
Eastern Counties, 146.
— Germany, 250.
— Switzerland, 369.
East Ward's Island, 89.
Eaux-Bonnes, 239.
Eberbach Sanatorium, 295.
Eberswalde Sanatorium, 260.
Echuca, 205, 206.
Edgmont Sanatorium, 69.

Edinburgh, 188, 195, 197.
Edmundsthal Sanatorium, 269, 274.
Egypt, 36, 222.
Electric Lighting, 25.
Elevator, 19.
Ellerslie, 194.
Elliott, Dr. G. H., 211.
Eloise, 68.
Engel Home for Consumptives, 175, 183.
Engelthal Sanatorium, 310, 328.
Engine house, 17.
English Sanatoria, 54, 358.
Erbprinzentanne, 269, 281.
Erie County Hospital, 69.
Erni, Dr., 358.
Ernst Ludwig Sanatorium, 295, 309.
Erzenberg Sanatorium, 358, 373.
Erzgebirge, 291.
Esmonnet, Dr., 232.
Esperanza Sanitarium, 67.
Essex, 146.
— Co., 99.
Etlinger, Dr., 175.
Eubæolith, 118.
Eudowood Sanitarium, 68, 81.
Eversfield Hospital, 151, 166.
Eversley, 151, 156.
Ewart, Dr. William, 358.
Ewens, Dr., 146.
Exchaquet, Dr., 358.
Excreta, 53.
Exercise, 16, 34, 35, 41.
Exercises, respiratory, 43.
Expectoration, 50.

F.

Facy, Dr., 146.
Falkenstein Sanatorium, 38, 39, 47, 51, 61, 295, 304.
Falkiner, Dr., 175.
Fanlights, 23.
Fanning, Dr. W. J., 146.
Farnham, 151, 161, 164.
Farnhurst, 68.
Fatigue, 42.
Felixstift Sanatorium, 269.
Felkin, Dr., 151.
Fennel, Miss E. P., 68.
Fernsicht Sanatorium, 269, 289.
Feuillas-Pessac Sanatorium, 227.
Fever, 41.
Financial, 33.
Finland, 345.
Fireplaces, 24.
Firs Home, 151, 154.
Fischer, Dr., 358.
Fish, Dr. Cecil, 186.
Fisher, Dr. T. C., 175, 176.
Flasks, 50.
Flies, 51.
Florida, 68, 73, 80.
Florio, Commendatore, 335.
Flower Mission Pavilion, 68.
Flugge, Prof., 50.
Flyrsö, 337.
Fodéré, Dr., 13.
Food, 34, 49.
Forced feeding, 48.
Forfarshire, 188, 191.
Forges les Bains, 227, 231, 240.
Forks, 53.
Forster Green Hospital, 200, 202.
Fort Bayard, 69.
— Dodge, 68.
— Stanton, 69, 80.
— Wayne, 68.
Fortbreda, 200, 202.
Foss, Dr., 269.
Foster, 70.
— Dr. Michael G., 36.
Foxhall, 67.
France, 224.
Fränkell, Dr. Joseph, 98.
Frankfort, 295, 304, 307.
Franklin Humanitarian Home, 70.
Fredensborg Sanatorium, 216, 220.
Frederiksvaern, 337.
Free Home for Consumptives, 68, 84.
— — — the Dying, 171.
French Climatic Stations, 239.
— Holiday Homes, 245.
— Marine Sanatoria, 245.
— Mineral Water Stations, 245.
— Mountain Sanatoria, 245.
— Sanatoria, 47, 52, 224-246.
— — for Children, 240-246.
Frey, Dr. E., 358.
— — H., 358.
Freymouth, Dr., 310.
Friedland, 250.
Friedenheim, 171.
Friedrichsheim Sanatorium, 310, 315.
Frimley, 165.
Furniture, 18, 26, 29.
Fürth Sanatorium, 310.

G.

Gabriels Sanitarium, 69, 93.
Gabrilowitsch, Dr., 345.
Gagry, 345, 352.
Gambier, Dr., 151.
Games, 42.
Gardberg, Dr., 345.
Garfield Memorial Home, 99.
Garthwaite-Wylie Memorial, 77.
Garthwaite, Dr. J. S., 67.
Gartloch, 199.
Gastria Sanatorium, 345, 351.
Gateforth Hall, 130, 139.
Gault, Dr. J. H., 208.

Gebser, Dr., 269.
Geisler, Dr., 345.
Gelendschik Sanatorium, 353.
Geneste and Herscher spray, 52.
Geneva Sanatorium, 358, 371.
George Sanatorium, 350.
Georgia, 6.
Gerhardt, Dr., 11.
German hospital, Philadelphia, 103.
— Sanatoria, 6, 8, 12, 13, 15, 30, 32, 42, 47, 52, 247-328.
— — for Children, 249, 263.
— Day Sanatoria, 247.
— Seaside Sanatoria, 249.
— Sanatorium at Davos, 358, 367.
Germany, 36.
Gidionsen, Dr., 295.
Giresse, Dr., 232.
Gironde, 227.
Gjösegaarden Sanatorium, 337, 338.
Glarus Sanatorium, 358, 367.
Glasgow, 194, 195, 198.
Gleitsman, Dr. J. W., 102.
Glen Gardner, 69.
Glockner Sanitarium, 67, 71, 77.
Gloucestershire, 175, 178, 183.
Glückauf Sanatorium, 269.
Godesberg Sanatorium, 295.
Golf, 42.
Gommern Sanatorium, 269.
Goodchild, Dr., 188.
Goodlet, Captain, 207.
Görbersdorf Sanatoria, 16, 56, 61, 250, 253, 256.
Gorbio Sanatorium, 232, 235.
Goslar, 280.
Gothenburg, 337, 338.
Gouverneur Hospital Dispensary, 71.
Grabowsee Sanatorium, 260, 264.
Graham, Dr. J. Campbell, 347.
Grampian Sanatorium, 188, 189.
Grand Hôtel, Sanatorium du, 358, 359.
Grange-over-Sands, 137.
Grasse, 232.
Gravenhurst, 210, 211.
Gray, Dr. John, 130.
Grefsen Sanatorium, 337, 338.
Gries Sanatorium, 117.
Gross Hansdorf, 269.
Ground floor rooms, 20.
Grounds, 16, 18, 35.
Guimar Hotel, 357.
Gulripsch, 345.
Gymnastics, 43.

H.

Hæmoptysis, 34, 41.
Haentjens, Dr., 329.
Hagen, 295.
Hageviken, 337.
Hahn, Dr. von, 250.
Hahnemann Home, 151, 154.
Hailey Sanatorium, 151, 159.
Hålahult Sanatorium, 337, 338.
Halifax, 212.
Halila Sanatorium, 345, 347.
Hamburg, 274.
Hamline University Free Dispensary, 71.
Hampshire, 151, 152.
Hampstead Hospital for Diseases of the Chest, 171.
Hamra Sanatorium, 338.
Hanau, 295.
Hance, Dr., 60.
Handkerchiefs, 51.
Hanker, Dr. W. H., 68.
Hanover, 269.
Hanseatic Sickness and Old Age Insurance Co., 55, 269.
Harlaching Sanatorium, 310, 327.
Harris, Dr. Stanford, 357.
Hartford, 67.
Hartz Mountains, 269, 276.
Haslev Sanatorium, 216, 221.
Hassall, Dr., 156.
Haufe, Dr., 316.
Haupt, Dr., 62.
Haushalter, Dr., 231.
Haute Gironne, 240.
Hautes Pyrénées, 239, 240.
Hauteville Sanatorium, 227, 229.
Hazaribagh, 214.
Heat, 35, 36.
Heatherside, 26, 151, 164.
Heating, 17, 24.
Hebron, 68.
Heidelberg, 205.
Height above sea, 6, 12.
— of building, 19.
Heiligenschwendi Sanatorium, 329, 330.
Heilstätten-Correspondenz, 11.
Hellendoorn Sanatorium, 329, 330.
Helms, Dr., 216.
Helouan, 222, 223.
Helsan, 337, 338.
Hensler, Dr., 358.
Henssen, Dr., 295.
Heron, Dr., 60.
Hersbrück Sanatorium, 310, 328.
Hervé, Dr., 232.
Hesse, 295.
— Cassel, 295.
— Darmstadt, 295.
— Insurance Co., 295.
Hessleby Sanatorium, 337, 338.
Heswall Sanatorium, 130.
Hettinger, Dr., 310, 315.
Hill-climbing, 16.
Hiller, Dr., 50.
Hillside Home Convalescent Sanatorium, 188, 194.
Hind, Dr. Clara, 151, 165.

Hindhead, 161.
Hirsch, Baroness, 325.
Hirschberg Sanatorium, 250.
Hirschfeld, Dr., 269.
Höckendorf Sanatorium, 260.
Hoff-Hansen, Dr., 216.
Högsand Sanatorium, 345.
Hogs Back, 163.
Hohenhonnef Sanatorium, 22, 32, 37, 52, 295, 297.
Hohenlohe, Prince, 343.
Hohenlychen Sanatorium, 260.
Hohenstein Sanatorium, 250.
Holden, Dr. G. W., 67.
Holiday Homes,
Holland, 329.
Holmboe, Dr., 338.
Holmes, Dr. A. M., 67.
Holstein, 260.
Holsterhausen Sanatorium, 295, 301.
Holt Sanatorium, 146, 148.
Holy Ghost Hospital for Incurables, 68.
Home comforts, 58.
— for Consumptives, Denver, 67, 72, 77.
— — Consumptive Females, 171.
— — Incurables, 69.
— of Mercy, Philadelphia, 70.
Honnef, 295.
Hopfenhausen, Dr., 345.
Horn Hall Sanatorium, 132.
Horsham, 164, 168.
Hospital Sanatoria, 19.
— for Tuberculous Insane, 69.
Hotel Sanatoria, 18, 19, 222, 223, 356, 357, 359.
House of Mercy, 104, 105.
— — Rest for Consumptives, 69, 99.
— — the Good Samaritan, 68.
Howard, 70.
Hughes, Dr. T. H. J. E., 130.
— Dr., 295.
Hull and E. Riding Convalescent Home, 130, 140.
Humbert, King, 332.
— Dr., 358.
Hungarian Sanatoria, 112-121.
Huntsville, 70, 106.
Hurd-Wood, Dr., 151.
Hydrotherapy, 22, 34, 39, 55.
Hyères, 239, 245.
Hygeia, 67, 72, 73.

I.

Idylwild Sanitarium, 67, 108.
Illinois, 68, 81.
— State Sanitarium, 81.
— Camp for Tuberculosis, 68.
In der Stille Sanatorium, 29, 358, 365.
India, 214.
Indiana, 68, 81.
Indianopolis, 68.
Indio, 67.
Industrial Sanitarium, Denver, 79.
Infection, 34, 50, 59.
Infirmary for Consumption, 171.
Insane, 71.
Insurance law, German, 55.
International Sanatorium, 358.
Inverness, 188, 189.
Iowa, 68.
Ipsden, 151, 159.
Ireland, 200.
Isager, Dr., 216.
Isle of Wight, 151, 156.
Isolation, 15, 17, 58.
Instituto Cervello, 335.
Italy, 5, 6, 332.

J.

Jack, Mrs. F. A., 68.
Jackson, 69.
Jacobi, Dr., 37, 358.
Jacubasch, Dr., 269.
James Brown Sanatorium, 205, 207.
Japan, 39, 332, 335.
Jemeljanow, Dr., 345.
Jersey, 151, 158.
Joel, Dr., 250.
Johanniter Society, 269, 285.
Johns, Dr. Denton, 175, 178.
Johns Hopkins Hospital, 81.
Jonsdorf, 269, 294.
Jubilee Sanatorium, 338, 341.
Juelsminde Sanatorium, 216, 217.
Jutland, 220.

K.

Kamloop Sanatorium, 210, 212.
Kane Summit Hospital, 70.
Käser, Dr., 358.
Kaurin, Dr., 338.
Kelling Sanatorium, 146, 148.
Kempe, Franz & Co., 338.
Kent, 151, 158.
Kentville Sanitarium, 210, 212.
Keresztenysziget, 120.
Kieff, 345.
Kilmore Hospital, 205.
Kilpedder, 200, 204.
Kimberley Sanatorium, 213.
Kime, Dr. J. W., 68.
King Edward's Sanatorium, 151, 167.
— of Sweden and Norway, 337.
King's Sanatorium, 30, 32, 151, 167.
— County Hospital Infirmary, 69.
Kingswood, 130, 133.
Kingussie, 188, 189.
Kingwood Sanatorium, 151, 160.
Kinross, 188, 193.
Kirchenforst Sanatorium, 262.
Kirchnest, Dr., 250.

Kitchen, 21, 22.
Klebs, Prof. Edwin, 73, 74.
Klobisberg Sanatorium, 358.
Kloster Sanatorium, 269.
Knapp, Dr., 310.
Knightwick, 141, 144.
Knives, 53.
Knopf, Dr. S. A., 10, 11, 71.
Koch, Dr., 50.
— Dr. Adolf, 310, 320.
Köhler, Dr., 295.
Königsberg Sanatorium, 250, 269, 280.
Koppert, Dr., 269.
Kornemann, Dr., 295.
Kottbus Sanatorium, 260, 267.
Krailling Sanatorium, 325.
Kramps, Dr. A. F., 68.
Krankenheim, 256.
Krebs, Dr., 310.
Krefeld Sanatorium, 295.
Krehler, Dr., 269.
Kremser, Dr., 269.
Kron Prinz Wilhelm, 250.

L.

Laboratory, 17.
Ladendorf, Dr., 279.
Laerdalsören, 338.
Lago di Garda, 118.
La Hulpe, 126.
Lake Kushaqua, 69.
Lake Nebagamon, 70.
Lakewood Sanitarium, 70.
Lamotte-Beuvron Sanatorium, 236.
Lanarkshire, 188, 198.
Lancashire, 130, 133.
Landes, 240.
Landeshut, 250.
Lanfine Cottage Home, 195.
Langenbrück Sanatorium, 373.
Lare's, Mrs., Sanatorium, 67.
Las Navas, 355.
Las Vegas Sanitarium, 69, 71, 72, 87.
La Tisnère, 239.
Laundry, 17, 52.
Laurentian Sanitarium, 210, 212.
Lavatories, 21, 27, 29.
Lawson, Dr., 188.
Lay St. Christophe Sanatorium, 227, 229.
Lebedev, Dr., 345.
Leeds, 130, 139.
— Hospital, 130.
— Sanatorium, 130.
Lehrecke, Dr., 269, 272.
Leicestershire, 141.
Leith Poorhouses, 196.
Leopoldinenheim, 310.
Lergrovik Sanatorium, 337, 338.
Leriche, Dr., 232.
Leyden, Prof. von, 11.
Leysin Sanatoria, 358, 369.
Liberty, 69, 94.
Lichterwald, 325.
Liebe, Dr., 48, 295, 300, 304.
Liebenstein, 269.
Liebermeister, Prof., 12.
Liège, 124.
Liegehallen, 23, 24.
Lift, 19.
Light, 24.
Lille, 227.
Lillehammer, 338.
Lincoln Co., 86.
— Hospital and Home, 69.
Lindley, Dr. Walter, 67.
Linen, 52.
— room, 29.
Linford Sanatorium, 151, 155.
Linoleum, 25.
Linolith, 124.
Lipp, Dr., 295.
Lippe Dettmold, 269.
Lippert, Hofrath Christian, 111.
Lippspringe Sanatorium, 269, 275.
Lips, Dr., 310, 319.
Liverpool Benevolent Asylum, 205.
— Hospital for Consumptives, 130.
— Parochial Sanatorium, 130, 134.
— Sanatorium, 130, 133.
Llanbedr Hall Sanatorium, 186.
Loch Leven, 193.
Lodz, 345.
Lohr Sanatorium, 310, 325.
Loir et Cher, 232.
Loiret, 227, 232.
Lompnes-Hauteville Sanatorium, 239.
London Chest Hospitals, 170.
— Infirmaries, 170.
— Open Air Sanatorium, 25, 151, 152.
Long Stratton, 146, 148.
Loomis Hospital and Dispensary, 69, 190.
— Sanitarium, 69, 71, 90, 94.
Lorraine, 310.
Los Angeles, 67.
Loslau Sanatorium, 250, 258.
Lostau Sanatorium, 269, 290.
Louisiana, 68.
Lozère, 240.
Lubeck, 269.
Lüdenscheid Sanatorium, 295.
Ludwigshafen, 323.
Luft Kur Sanatorium, 175, 182.
Luitpoldheim, 310, 325.
Luther Hospital, 68.
Lyons, 227, 229.
Lyster Sanatorium, 337, 338, 340.

M.

Macfie, Dr. R. C., 188.
Madeira, 5, 343.
Madrid, 355.

Magdeburg-Altstadt, 60.
Maine, 68.
Maitland Cottage Sanatorium, 151, 160.
Malchow Sanatorium, 260, 266.
Maldon Sanatorium, 146.
Malibran, Dr., 232.
Mallony, Rev. E. D., 68.
Malvilliers Sanatorium, 358.
Management of sanatoria, 32.
Manasse, Dr., 56.
Manchester Hospital Sanatorium, 135.
— Sanatorium, 130.
Manhattan State Hospital, 69, 89.
Mannheim Sanatorium, 310.
Mansfield Sanatorium, 141.
Maragliano, Prof., 332.
Marclay, Dr. W., 83.
Margate, 31, 151, 158.
— Sea-bathing Infirmary, 31.
Maria Bariatinsky, Duchess, 351.
— Sanatorium, 345, 348.
— Theodorowna, Empress, 349.
Marienheim Sanatorium, 269, 285.
Marilla Völgy Sanatorium, 119.
Marine Hospital Sanatoria, 69.
Markeszuwski, Dr., 232.
Maryland, 68, 81.
— Hospital for Consumptives, 68.
Marzell Sanatorium, 310, 315.
Massachusetts, 68, 71.
— State Sanitarium, 20, 68, 81.
Massage, 41.
Massandra Sanatorium, 345, 351.
Materials, 20.
Mats, 26.
McCall, Dr. Annie, 151.
— Dr. William, 175, 181.
McConnell, Dr. H. W., 148.
McDougall, Dr. Mary., 151.
Meals, 71.
Mears, Dr., 188.
Meathop Sanatorium, 130, 137.
Mecklenburg, 260.
Medical officer, 33.
Meissen, Dr., 295, 297.
Melbourne, 205.
Melland, Dr., 356.
Melsungen Sanatorium, 295.
Melton, Dr. F. C., 67.
Memorial Hospital, Orange, 69.
Mendip Hills, 175, 182.
— — Sanatorium, 175, 182.
Mengershausen, Dr. von, 295.
Mentone, 235.
Meran, 121.
Mercy Hospital, 67.
— Sisters of, 67.
Merseburg Sanatorium, 269.
Meschede, 225.
Mesna Sanatorium, 337.
Mesnalien Sanatorium, 337.
Metropolitan area, 170.
Meung-sur-Loire Sanatorium, 232, 237.
Meurthe et Moselle, 227.
Meyer, Dr., 358.
Miami Valley Hospital, 70.
Michael, Dr. J. G., 67, 73.
Michaelis, Dr., 62, 269, 271.
Michaelsen, Dr., 250.
Michel, Dr., 358.
Michigan, 68, 74.
Middlesex, 170.
Midhurst, 151, 167.
Midi, Sanatorium du, 358.
Midland Counties, 141.
— Sanatorium, 141, 143.
Milan, 332, 335.
Milbitz Sanatorium, 269.
Mildmay Consumptive Home, 175, 177.
Milk, 46.
Miller, Dr. William, 107.
Millet, Dr. C. S., 68.
Milnathort, 188.
Milton, Dr. J. Penn, 175.
Minden Sanatorium, 275.
Miners' Trades Union, 295.
Minneapolis, 69, 71.
Minnesota, 68, 69, 71.
Mirot, 70.
Mississippi, 69, 71.
Missouri, 69.
Mjöen, Dr. John, 338.
Molde, 338, 340.
Moliner, Dr., 355.
Möller, Dr., 260.
Monaco, 332, 335.
Mönchengladbach Sanatorium, 295.
Moncur, A. H., 191.
Monrovia, 67, 108.
Montana Sanatorium, 358, 370.
Mont Blanc, Sanatorium du, 358, 369.
— des Oiseaux, 232, 239.
— sur Meuse Sanatorium, 127.
Montefiore Country Sanitarium, 69, 96.
— Home, 69, 71, 90, 97.
Monte Video, 110.
Montreal, 212.
Moorcote Sanatorium, 151, 156.
Morin, Dr., 358.
Morningside, 188, 197.
Morrison, 77.
Mörsil Sanatorium, 337, 338.
Mortuary, 17.
Moscow, 346.
Mount Alto, 70.
— Lofty, 207.
— Macedon, 205, 206.
— St. Rose Hospital, 69.
Mount Vernon Hospitals, 171, 172, 173.
Mourne Mountains, 203.
Mundesley Sanatorium, 47, 146, 147.
Munich, 310, 327.
Munster Sanatorium, 295.
Muthu, Dr. Chowry, 175.

N.

Naegelsbach, Dr., 310.
Nagy-Szeben, 121.
Nahm, Dr., 61, 295.
Nancy, 229.
Napkins, 51.
Naples, 333.
Nassau, 295.
Natal, 214.
Natanson, Dr., 346.
National Jewish Hospital for Consumptives, 67.
— Sanatorium, 151, 153.
— Society for Prevention of Tuberculosis (American), 71.
Naunyn, Prof., 11.
Naurod Sanatorium, 295.
Nayland, 146.
Neill, Dr. Thomas, 188.
Nelson's Ranch, 67.
Neuchâtel, 358.
Neudorf Sanatorium, 250.
Neuschmecks Sanatorium, 120.
Neuwied Sanatorium, 295.
New Albany, 68.
Newcastle, 200, 201.
New Canaan Pulmonary Sanitarium, 67, 80.
— Cumnock, 195.
— Davos Sanatorium, 363.
— Forest, 155.
— Hampshire, 69, 86, 108.
— Haven Dispensary, 71.
— — County Sanitarium, 80.
Newington, Dr., 151.
New Jersey, 69, 86.
— Mexico, 69, 86.
— South Wales, 205.
— York, 69, 70, 71, 80, 89, 90, 91.
— — Arbeiter Ring, 90.
— — Charity Organisation, 90.
— — Hospital and Dispensary, 96.
— — State Sanitarium, 99.
— Zealand, 205, 209.
Nice, 232.
Nichols, Dr. J. H., 68.
Nicholas II., Emperor, 349.
Nicolaj Sanatorium, 345, 349.
Niedernhausen Sanatorium, 295.
Niederschreiberau Sanatorium, 250, 259.
Niederzieder Sanatorium, 250.
Nienhaus, Dr., 358.
Night sweats, 34.
Nordrach Colonie, 14, 22, 24, 35, 37, 39, 43, 47, 310.
— (Hettinger Sanatorium), 310, 315.
— in Wales, 186.
— on Dee, 192.
— on Mendip, 175, 181.
— Ranch, 67, 76.
Norfolk, 146.
Northamptonshire, 141.
North Brother Island, 69.
— Carolina, 70, 102.
— Conway, 69.
— Dakota, 70.
— Germany, 260.
Northern Counties, 130.
— — Chest Hospital, 137.
— Scotland, 188.
Northumberland Sanatorium, 130, 136.
Northwood, 171.
Norway, 337, 338.
Nott Home, 70.
Nottinghamshire, 141.
Nova Scotia, 210.
Number of patients, 32.
— per room, 20.
Nummela Sanatorium, 345, 352.
Nunyara Sanatorium, 205, 208.
Nuremberg, 310.
Nurses, 32.
Nurses' Training School, 95.

O.

Oak Park Sanitarium, 70.
Oakes, Rev. F. W., 67, 68.
Oberkaufungen Sanatorium, 295, 309.
Oberölkofen Sanatorium, 310.
Objections answered, 58.
Obornik Sanatorium, 250.
Occupation, 29, 30, 42.
Ochil Hills Sanatorium, 188, 193, 194.
Ockley Sanatorium, 151, 165.
Odenwald Sanatorium, 309.
Oderberg Sanatorium, 22, 29, 32, 46, 52, 269, 276.
Ohio, 70.
Oldenburg, 269.
Ontario, 210.
Open Air Colony, 68.
Oplawitz, 250.
Orange, 69.
Oranje Nassaus Oord, 329, 330.
Oregon, 70.
Orleans, 227, 229.
Ormesson Hospital, 31, 240, 241.
Oscar, King, 340.
Österåsen Sanatorium, 337, 338.
Ostritz Invalidenheim, 269.
Ott, Dr., 269.
Ottawa, 68.
Otwozk, 345.
Outbuildings, 17.
Overton Hall Sanatorium, 151, 154.
Oxfordshire, 151, 159.

P.

Paignton, 175, 176.
Painswick Sanatorium, 175, 180.
Paisley Sanatorium, 188, 199.
Palatinate, 310.

Palermo, 333, 335.
Palmer Park, 76.
Papyrolith, 25.
Parkstone, 175.
Parramatta Home for Consumptives, 205.
Pasadena, 67, 108.
Pasteur Sanitarium, 69, 98.
Patients' day, 44.
Patriotic Women's Union, 269.
Pau, 234.
Pavlowskaja, Dr. R., 349.
Peebles, 188, 197.
Pel, Dr. P. K., 329.
Pembroke Sanatorium, 69, 108.
Penmaenmawr, 186.
Pennsylvania, 70, 71, 102, 103.
Pensacola, 68, 80.
Penzoldt, Dr., 29, 30.
Peppard, 151, 160.
Perfit, Dr., 211.
Perkiomenville, 70.
Perspiration, 34, 42.
Perthshire, 188, 194.
Pesel, Dr. H. G., 151.
Petermann, Dr., 310.
Peters, Dr., 358.
Petit, Dr. George, 241.
— Dr. Léon, 5, 13, 29, 32, 36, 58.
Pettit, Dr. J. W., 68.
Petzoldt, Dr., 269.
Peyrot, Dr. J. T., 224.
Pezold, Dr., 345, 346.
Philadelphia Hospital, 70, 103, 104.
Philip, Dr. R. W., 188, 196.
Philippi, Dr., 358.
Phipps, Henry, 74, 81, 103.
— L. C., 74.
— Institute, 70, 71.
Phoenix, 67.
Phthisis Infirmary, 69.
Pickert, Dr., 260.
Pigbone Sanitarium, 70.
Pines, The, 151, 158.
— Cottages, 69.
Pineshire Sanitarium, 70.
Pine Ridge Camp, 70.
Pinewood, 152.
Ping pong, 42.
Pins, Sanatorium des, 232, 236.
Pintschovius, Dr., 269.
Pisch, Dr., 358.
Pitkäjärvi Sanatorium, 345, 351.
Placid Lake, 99.
Plan of sanatorium, 20.
Planegg Sanatorium, 310.
Plehn, Dr. F., 222.
Ploen Sanatorium, 260.
Plymouth, 68.
Pneumatic cabinet, 43.
Pocono Mountains, 103.
Poland, 345.
Pollock, Dr., 60.
Poore, Dr. G. Vivian, 9.
Porta Coeli Sanatorium, 355.
Portbury, 175, 182.
Portugal, 343.
Posen, 250.
Position of sanatorium, 14.
Pott, Dr. F., 154.
Pottenger Sanatorium, 67, 108.
Powell, Sir R. Douglas, 7.
Pozzuoli, 333.
Pravignan, Villa, 367.
Prisoners, Wards for Consumptive, 67, 69, 70, 71.
Providence, 70, 71, 83.
Pruen, Dr., 180.
Prussia, E., 250.
— W., 250.
— Rhenish, 295.
Pueblo, 67.
Pullar, Sir Robert, 194.
Pulse rate, 42.
Punkaharju, 345.
Purcell, Sister A. M., 68.
Putten op de Veluwe, 329.
Puy de Dôme, 232.
Pyrénées Orientales, 232.

Q.

Quarrier, Mr., 198.
Quebec, 210.
Queen Elisabeth Sanatorium, 115.
— Victoria Homes, 205, 207.
Queensland, 205.
Quiet, 21.
Quisisana Sanatorium, 352.
— Villa, 333.

R.

Railway Sanatorium, 295.
Rain, 35, 37, 38.
Rand, Dr. H. F., 67.
Ransome, Dr. A., 8, 13, 22, 50, 61.
Rathenau Sanatorium, 260.
Ravaschieri, Duchess, 333.
Raybrook, 69, 99.
Reading, 161.
Redlands, 67.
Refsnaes Sanatorium, 216.
Rehburg Sanatoria, 62, 269, 270.
Reiboldsgrün Sanatorium, 7, 30, 43, 47, 54, 58, 269, 291.
Reichelsheim Sanatorium, 295.
Reichenhall, 12.
Reinerz Sanatorium, 250.
Reinhardt, Dr., 160.
Reknaes Sanatorium, 337, 338, 340
Relapses, 44.
Renfrewshire, 188, 198.
Rest, 16, 21, 35, 37, 41.
Resthaven Sanatorium, 67, 77.

Results, 34, 54.
Reuss, 269.
Reymond, Dr., 358.
Rhode Island, 70, 71, 102, 106.
Rich, Dr. F. R., 68.
Richmond House Convalescent Home, 169.
Riesengebirge, 251.
Rigi Colony, 358, 373.
Riley, Dr. W. H., 76.
Ringwood, 151, 155.
Rio de Janeiro, 110.
Ritter, Dr., 269.
Riverside Sanitarium, 69.
Riviera, 5, 6, 8, 333.
— Sanatorium, 62.
Roberts, Dr., 209.
Robertson, Dr., 158.
Robinson, Dr. J. A., 68.
— Dr. Wm., 133.
— Dr. W. K., 67.
Rockefeller Institute, 81, 91.
Rocky Mountains, 75, 78, 79, 86, 87.
— — Industrial Sanitarium, 67.
Roma Hospital, 205.
Römhild Sanatorium, 269.
Römpler Sanatorium, 60, 61, 250, 253.
Rönsdorf Sanatorium, 295, 301.
Roosa, Dr. St. John, 94.
Rosbach Sanatorium, 295, 302.
Rostock Sanatorium, 260.
Rostrevor Sanatorium, 200, 203.
Rothschild, Dr., 295.
Rouen, 227.
Roumania, 122.
Royal Hospital for Diseases of the Chest, 171, 172.
— — — Incurables, 200.
— National Hospital for Diseases of the Chest, 151, 156.
— — — — (Ireland), 200, 201.
— Sea-bathing Infirmary, 151, 158.
— Victoria Hospital for Consumptives, 188, 195.
— — Memorial Sanatorium, 175, 183.
Röykka Sanatorium, 345.
Ruck, Dr. von, 102.
Rudgwick Sanatorium, 151, 168.
Rumpf, Dr., 310.
Ruppertshain Sanatorium, 295, 307.
Rush Hospital for Diseases of the Chest, 70, 103, 106.
Russia, 345.
Russian Doctors' Sanatorium, 345.
— Sanatoria, 334.
Ruthin, 186.
Rutland, 68, 85.

S.

Saales Sanatorium, 310, 323.
Saarbrücken, 295.
Sabbatsberg Hospital, 337.
Sabourin, Dr., 48, 232.
Sachsen Anhalt, 269.
Saetersdalen, 338.
Säfsjö Sanatorium, 337.
St. Agathe des Monts, 210, 212.
St. Agnes Hospital, 103.
St. Andreasberg, 269, 275.
St. Annes Sanitarium,
St. Anthony's Sanitarium, 68.
St. Blasien, 310, 316.
St. Catherine's Home for Consumptives, 151, 158.
— — Hospital, 69, 90.
St. Elizabeth's Hospital, 68.
St. Gallen, 358.
St. Göran Home, 337, 342.
St. Jörgen Leprosy Hospital, 340.
St. Joseph's Haus, Davos, 367.
— — Home, 151.
— — Hospital (Providence), 70.
— — — (N. Y.), 69, 90, 100.
— — Sanatorium, Albuquerque, 69.
— — — Asheville, 70.
— — — Silver City, 69.
St. Leonards-on-Sea, 151, 166.
St. Louis, 69.
St. Luke's Hospital, 69, 90.
— — House, 171.
St. Martin Lantosque, 232.
St. Mary's Hospital, 103.
— — Sanatorium, 107.
St. Michael's Home, 175, 183.
St. Pancratius in Arco, 118.
St. Paul, 68.
St. Peter's Bathing Establishment, 260.
— — Home, 171.
— — Hospital (Brooklyn), 69, 90.
St. Regis Lake, 93.
St. Rochus Hospital, 68.
St. Vincent's Sanatorium, 69.
Salies du Salat, 240.
Sanatoria for the poor, 28.
Sanatorium treatment, 34.
Sandbach Sanatorium, 295, 309.
Sander, Dr., 310, 316.
Sandgate Sanatoria, 259.
San Gorgonio Mountains, 108.
— Remo, 333.
— Salvador, 240, 245.
Santa Brigida, 356.
— Catalina, 356.
— Fè, 69, 87.
Saranac Lake, 69, 91, 99.
Saugmann, Dr., 216, 219.
Saunal, Dr., 232, 238.
Savill, Dr. Philip, 175.
Saxe Coburg, 269.
— Meiningen, 269.
— Weimar, 269.
Saxony, 269.
Schäfer, Dr., 269, 295.

Schäler, Dr., 295.
Schapschal, Dr., 345.
Schatzalp Sanatorium, 358, 364.
Schepelern, Dr., 216.
Scherenberg, Dr., 269.
Schiffrain, 310.
Schleswig, 260.
Schloss Röteln, 310.
Schmitsdorf, 255.
Schneider, Dr., 250.
Schnurmann, Dr., 358.
Schömberg Sanatorium, 310, 320, 321.
Schools, open-air, 131, 358.
Schrader, Dr., 250.
Schröder, Dr., 310, 321.
Schrötter, Prof. von, 111.
Schulsanatorium Fredericianum, 358.
Schultze, Dr., 269.
Schwarzenbach, 269, 282.
Schweizerhof Sanatorium, 358.
Scotch Sanatoria, 188.
Scranton, 70, 71.
Screens, 23, 26, 37.
Scurfield, Dr., 133.
Seabreeze, 69.
Seaside Tent Sanitarium, 69.
Seats, 16.
Seattle, 70.
Seine et Oise, 227, 240.
Senator, Prof., 11.
Separator Co., 338.
Servaes, Dr., 269.
Seton Hospital, 69, 90, 101.
Sewage, 15, 53.
Sexes, separation of, 30.
Sharon Sanitarium, 52, 68, 83.
Shelter, 6, 14, 16, 24, 36.
Sherwood Forest Sanatorium, 141.
Shotley Bridge, 130.
Shutters, 24.
Sidlaw Hills, 191.
— Sanatorium, 188, 191.
Siebengebirge, 297.
Sierra Madre, 108.
Sierre, 370.
Silberstein, Dr., 269.
Silesia, 250.
Silkeborg Sanatorium, 216, 220.
Silver City, 69.
Sinclair, Dr. F. H., 200.
Single row of rooms, 20, 23.
Sites for sanatoria, 12.
Size of sanatorium, 32.
Skjörping Sanatorium, 216.
Slawentziz, 250.
Sledging, 42.
Slippers, 25.
Smith, Dr. A. Scott, 175.
— Dr. J. O., 206.
— Dr. Mary, 146.
— Dr. W. H., 68.
Smyth, Dr. J. C., 200.
Smyth, Dr. Mander, 151.
Sobotta, Dr., 269.
Societies, 71.
Soden, 62, 295.
Soil, 6, 12-14.
Soldiers, General Hospital for, 69.
Solly, Dr. E., 10, 54, 56.
Somerset, 175, 181, 183.
Sömme, Dr., 338.
Sondrio Sanatorium, 332, 334.
Sonnenberg Sanatorium, 295.
Sophienheilstätte, 269, 290.
Sorge Sanatorium, 273, 285.
Sortenna Sanatorium, 332, 334.
South Africa, 36, 213.
— America, 109.
— Australia, 205, 206.
— Carolina, 70.
— Eastern Counties, 151.
— Germany, 310.
— Hero, 70.
— Western Counties, 175.
Southern Alberta, 210, 212.
— Mountain Camp Sanitarium, 70.
— Pines Sanitarium, 70.
— Scotland, 188, 195.
Sövde Sanatorium, 337, 338.
Spain, 355.
— Queen Regent of, 355.
Spanken, Dr., 295.
Spengler, Dr., 368.
Speyer, 310.
Speyside, 189.
Spillmann, Dr., 231.
Spit cups and flasks, 51.
Spittoons, 51.
Spoons and forks, 53.
Sputum, 50.
Spuyten Duyvil, 69, 101.
Stables, 17.
Stachelberg Sanatorium, 367.
Staff, 32, 34.
Staffordshire, 143.
Stairs, 25.
Stamford Pulmonary Sanatorium, 80.
Stanhope, 130.
State Hospital for Consumptives, 67.
— — for the Insane, 68.
Statistics, 54.
Stauffer, Dr., 295.
Stawell Hospital, 205.
Steeb, Dr. H. G., 68.
Steede, Dr., 200.
Stephani, Dr., 358, 370.
Steriliser, 53.
Stern, Dr. Conrad, 151, 154.
— Dr. Curt, 332, 333.
Sternling, Dr., 345.
Stevenson, Dr. R. A., 151.
Stewart, Dr. J. S., 188.
Stiege Sanatorium, 283.
Stirling, Dr., 188.

Stockholm, 337, 342.
Stony Wold Sanatorium, 69, 89.
Strandgaard, Dr., 216.
Stubeckshorn Farm Colony, 283.
Stuttgart, 322.
Suchum Kale, 345.
Südlausitzer Krankenkasse, 269.
Suffern, 69, 98.
Suffolk, 146, 149.
Sullivan County, 94.
Sulschinsky, Dr., 346.
Sülzhayn Sanatoria, 52, 269, 286.
Summer-houses, 37.
Sun Mount Tent City, 69.
Sunny Rest Sanitarium, 70.
Sunrise Mountain Park, 77.
Sunshine, 17, 18, 36, 37.
Surgical tuberculosis, 31, 310, 322.
Surrey, 151, 161.
Sussex, 151, 166.
Swedish Sanatoria, 337.
Swiss Sanatoria, 12, 358.
Sydney, 207.
Szontagh, Dr. von, 120.

T.

Table utensils, 53.
Taitzi Sanatorium, 345, 349.
Takaharju Sanatorium, 345, 352.
Tamburer, Dr., 345.
Tannenberg Sanatorium, 310, 323.
Tannroda, 290.
Tannwald Sanatorium, 117.
Taunus Mountains, 304, 307.
Temperature, 41-43.
— of rooms, 24, 35.
Tennis, 42.
Tent Sanatoria, 69, 76, 81, 89, 90.
Terrace, 23.
Terrazzo, 25.
Tewfik Palace Hotel, 223, 232.
Tewkesbury, 68.
Texas, 70, 71, 102, 106.
Thirlmere, 205, 207.
Thorenc, 232.
Thorspecken, Dr., 269.
Throat, examination of, 22.
Throne Hospital, 200.
Thun, 358.
Thurnam, Dr., 175.
Tilford, 151, 163, 164.
Tisnère, Château de la, 240.
Tolson, Dr. G. R., 68.
Tomlinson, Dr. W. S. Paget, 137.
Tonsaason Sanatorium, 337-339.
Torgament, 25, 287.
Torquay, 175, 177.
Touraine, 237.
Town life, 62.
Towson, 68, 81.
Treatment, 34.
Trees, 14, 15, 17.
Trelat, Prof., 24.
Trespoey Sanatorium, 232, 234.
Trevelyan, Dr., 130.
Trinity Settlement, 67.
Trögstad Sanatorium, 337, 338.
Trudeau, Dr., 60, 92.
Tucson, 67.
Tunnel Brande, 109.
Turban, Dr., 55, 358, 362.
Turner, Dr. Duncan, 206.
Tyrol, Austrian, 117, 121.

U.

Uj-Tatra-Füred, 120.
Umberto I. Sanatorium, 335.
United States (*see* America).
— — Sailor's Sanatorium, 86.
University Hospital (Pennsylvania), 103.
Unterberger, Dr., 63, 346.
Uruguay, 110.
Utensils, table, 53.

V.

Vale of Clwyd Sanatorium, 186.
Vallée des Ormonts, 369.
Value of sanatorium treatment, 59.
Vanderbilt Clinic, 71.
Var, 232, 240.
Veillard, Dr., 358.
Ventilation, 9, 18, 22, 23, 35.
Ventnor, 29, 151, 156.
Verandahs, 23, 37.
Verbank, 69, 99.
Verbitzky, Dr., 345.
Verhaeren, Dr., 232.
Vermont, 70.
Vernet les Bains, 232.
Veylefjord Sanatorium, 216, 218.
Vialas, 240.
Victoria Sanatoria for Consumption, 205, 206.
Viktoria Luise Sanatorium, 260.
Villa Quisisana, 333.
Villepinte, 240, 242.
Villiers-sur-Marne Hospital, 22, 31, 240, 242.
Visitors, 43, 58.
Vogelsang Sanatorium, 269, 289.
Volland, Dr., 358.
Voorst Sanatorium, 329.
Vosges, 323.

W.

Wadmore, Dr., 151.
Waldbreitbach Sanatorium, 295, 303.
Waldenburg's pneumatic cabinet, 43.
Waldhof-Elgershausen, 88, 295, 300.
Wald Sanatorium, 358, 368.

Wales, 185.
Walker, Cass Co., 69.
Walker, Dr. Jane, 146.
Wallasay, 131.
Wallenstadt Sanatorium, 358.
Wallingford, 159.
— Sanatorium, 67.
Walls, 25.
Walshe, Dr., 13.
Walters, Dr. F. R., 151, 163.
Walther, Dr. O., 6, 14, 40, 181, 310.
Wards for Tuberculous Prisoners, 69.
Wards Island (N. Y.), 69.
Warrenpoint, 203.
Warwickshire, 143.
Washington, 70.
Water closets, 53.
— supply, 15.
Watt, Dr. E., 188.
Watteville, Dr. de, 188.
Weather, 6, 35.
Weatherley, Dr., 184.
Weber, Dr., 354.
— Sir Hermann, 12, 36.
Wegener, Dr., 269.
Wehmer, Dr., 295.
Wehrawald Sanatorium, 310, 318.
Weibel, Dr., 310.
Weicker, Dr., 37, 250, 255.
Weir-Mitchell treatment, 43.
Weischer, Dr., 295.
Weissmayr, Dr. A. Ritter von, 115.
Wellington Lake, 67.
Wells, 182.
Welsh Sanatoria, 186.
Wentworth Falls Sanitarium, 205, 207.
West Australia, 206.
Westchester Co., 96.
Western Germany, 295.
Western Hospital for Incipient Consumptives, 175, 177.
Western Mountain Consum. Hospital, 70.
Westerwald, 300, 303.
Westmorland, 130, 137.
Westphalia, 295.
Wheeler, Dr. Charles E., 175.
White Gables Sanitarium, 107.
White Haven Sanitarium, 70, 103.
White, Dr. J. E., 67.
Whitehead, Dr., 158.
White Mountain Tent Sanitarium, 69.
Whitmead Hill Sanatorium, 151, 163.
Wicklow Co., 200, 201, 204.
Wiemann, Dr., 269.
Wiesbaden Sanatorium Society, 295.
Wildbad, 320.
Wilhelmina, Queen, 330.
Wilhelmsheim Sanatorium, 310, 322.
Williams, Dr. C. Theodore, 7, 14, 79, 216.
Williamson, Dr., 158.
Wilson, Dr. G. Morton, 186.
Wilson Fox, Dr., 60.
Wiltshire, 175, 183.
Winchfield, 156.
Wind, 35, 36.
Windows, double, 21, 22, 23.
Winsley Sanatorium, 175.
Winter Home for Consumptive Girls, 169.
Winyah Sanitarium, 61, 70, 102.
Wisconsin, 70.
Withernsea, 130, 140.
Wittlich Sanatorium, 295.
Woburn Sands, 146.
Wokingham, 151, 152, 156.
Wolff-Immermann, Dr., 8, 269.
Wolfgang, 358, 367.
Women's Aid Society of Görlitz, 269.
— Union of Cassel, 295.
Wood, Dr. Herapath, 130.
Woodburn Sanatorium, 188, 197.
Woodcock, Dr., 130.
Wooden buildings, 20.
Woodhurst Sanatorium, 151, 166.
Woodilee, 199.
Worcester, 71, 82, 141, 143, 144.
Work, 29, 30.
Workshop, 17.
Worthing, 169.
Wright, Mrs. L. B., 67.
Wurtemberg, 310.
Wurzburg, 325.
Wynn Farm, 106.

Y.

Yalta Sanatorium, 345.
Yonkers (N. Y.), 69.
Yorkshire, 130, 137.
Young Ladies' Charitable Association, Boston, 84.
Y.M.C.A. Health Farm, 67, 80.

Z.

Zakopane Sanatorium, 119.
Zarskoje Sanatorium, 345.
Zauslar Pension, 345.
Zealand, 218.
Zellerfeld Sanatorium, 281.
Ziemsen, Prof. von, 11, 63, 325.
Zubiana, Dr. Antonio, 334.
Zurich, 358.

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